KENTUCKY CTE
EMPOWERED
Today's Career and Technical Education

2025 – 2026
PROGRAM OF STUDIES

Kentucky Department of Education
Office of Career and Technical Education

2025-2026 Program of Studies Revisions

HB 342 amends KRS 158.1411 to require, beginning with students entering grade 9 on or after July 1, 2025, successful completion of a one credit course in financial literacy for high school graduation. This requirement also applies to students participating in the Early Graduation Program (EGP) established in KRS 158.142. House Bill (HB) 342 (2025), Financial Literacy Elective Course Code Guidance Document.

Prior to scheduling students into courses, schools should carefully review the Searchable State Course Code Database to ensure that teachers assigned to the selected courses meet the certification requirements.

Please note that additional teacher certifications, including business, family/consumer sciences, math and economics, have been added to 080719 and 201011 to provide increased flexibility when scheduling students to courses. All certification information can be found by accessing the course codes linked below.

The following uniform academic state course codes incorporate the required concepts provided in HB 342 and align to the *KAS for Financial Literacy*:

- 080719 Financial Literacy (Math Credit)* (Previously named Personal Finance (Math Credit)) *(may award both a third or fourth-year personalized credit in math and an elective credit in financial literacy)*
- 201011 Financial Literacy for Mathematics* (Previously named Money Skills for Math) *(may award both a third or fourth-year personalized credit in math and an elective credit in financial literacy)*
- 080780 Business Math (Math Credit)
- 060170 Personal Finance (CTE Credit)
- 060301 Introduction to Finance
- 201010 Money Skills
- 080772 Business Math (CTE Credit)

Special Education Course Codes

- 600181 Basic Money Skills
- 600182 Money Skills for Independent Living

The 2025-2026 Program of Studies Version 1.2 reflects the following changes:

- 080719 - Personal Finance (Math Credit) is now 080719 - Financial Literacy (Math Credit).
- 201011 - Money Skills for Mathematics is now 201011 - Financial Literacy for Mathematics.

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Agriculture TRACK Youth Apprenticeship CIP 01.0101.99

Animal Science Systems CIP 01.0901.00

Environmental Science and Natural Resources Systems CIP 03.0101.00

Food Science and Processing Systems CIP 01.1001.00

Plant Science Systems CIP 01.1101.00

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Agricultural Education - Kentucky Department of Education

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Agribusiness Systems CIP 01.0101.00

Agribusiness systems contribute to the production, processing, marketing, distribution, financing and development of agricultural commodities and resources. This includes food, fiber, wood products, natural resources, horticulture and other plant and animal products and services. Agribusiness is a high-tech industry that uses satellite systems, computer databases and spreadsheets, biotechnology and many other innovations to increase efficiency and profitability.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **030715** Principles of Agricultural Science and Technology
- **030711** Agriscience (CTE Credit) **OR** **030712** (Science Credit)

Choose (2-3) two – three credits from the following:

- **010131** Agribusiness and Farm Management
- **010121** Agriculture Employability Skills
- **010111** Agriculture Sales and Marketing
- **010110** Agriculture Communications
- **010101** Advanced Agricultural Economics and Agribusiness Management

May substitute (1) one credit below for a pathway course:

- **010641** Greenhouse Technology
- **030790** Agricultural Education Co-op*
- **030791** Agricultural Education Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Agricultural Power, Structural, Technical Systems CIP 01.0201.00

The Agricultural Power, Structural, Technical Systems pathway is built on the application of concepts and technology in engineering, hydraulics, pneumatics, electronics, power, structures, and controls to the field of agriculture. Students design agricultural structures, machinery, and equipment while utilizing safe operation and maintenance practices.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **030715** Principles of Agricultural Science and Technology
- **030711** Agriscience (CTE Credit) **OR 030712** (Science Credit)

Choose (2-3) two – three credits from the following:

- **030718** Emerging Agricultural Technology
- **010241** Agriculture Construction Skills
- **010231** Small Power and Equipment
- **010212** Agriculture Power and Machinery Operation
- **010211** Agriculture Structures and Designs

May substitute (1) one credit below for a pathway course:

- **010121** Agriculture Employability Skills
- **030790** Agricultural Education Co-op*
- **030791** Agricultural Education Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Agriculture TRACK Youth Apprenticeship CIP 01.0101.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Animal Science Systems CIP 01.0901.00

This pathway focuses on the scientific principles underlying the breeding, care, and management of agricultural animals and the production, processing, and distribution of agricultural animal products. This includes developing better, more efficient ways of producing and processing meat, poultry, eggs and dairy products, as well as studying genetics, nutrition, reproduction, growth and development of animals.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **030715** Principles of Agricultural Science and Technology
- **030711** Agriscience (CTE Credit) **OR 030712** (Science Credit)

Choose (2-3) two – three credits from the following:

- **020501** Animal Science
- **020502** Animal Technology
- **020510** Equine Science
- **020503** Small Animal Technology
- **020511** Veterinary Science

May substitute (1) one credit below for a pathway course:

- **010702** Food Science and Technology
- **010701** Food Processing, Distribution and Marketing
- **020520** Aquaculture
- **030713** Agri-biology Interdisciplinary
- **010121** Agriculture Employability Skills
- **030790** Agricultural Education Co-op*
- **030791** Agricultural Education Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Environmental Science and Natural Resources Systems CIP 03.0101.00

This pathway focuses on the studies and activities relating to the natural environment and its conservation, use, and improvement. The basic principles of environmental science and natural resource management are the foundational concepts of this pathway. Subjects addressed include air, soil, water, wildlife, plants, and energy sources. Instruction related to using these resources economically and recreationally is also included.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **030715** Principles of Agricultural Science and Technology
- **030711** Agriscience (CTE Credit) **OR 030712** (Science Credit)

Choose (2-3) two – three credits from the following:

- **030610** Forestry
- **030609** Environmental Science and Technology
- **030611** Wildlife Resources
- **020520** Aquaculture
- **010611** Introduction to Greenhouse and Crop Production
- **030713** Agri-biology Interdisciplinary

May substitute (1) one credit below for a pathway course:

- **010121** Agriculture Employability Skills
- **010641** Greenhouse Technology
- **030790** Agricultural Education Co-op*
- **030791** Agricultural Education Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Food Science and Processing Systems CIP 01.1001.00

This pathway focuses on applying biological, chemical, and physical principles to the study of converting raw agricultural products into processed forms suitable for direct human consumption and storing such products. Human health and safety related to food processing and consumption are continually addressed in this pathway.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **030715** Principles of Agricultural Science and Technology
- **030711** Agriscience (CTE Credit) **OR 030712** (Science Credit)

Choose (2-3) credits from the following:

- **030713** Agri-biology Interdisciplinary
- **010702** Food Science and Technology
- **010701** Food Processing, Distribution and Marketing
- **020210** Agribiotechnology

May substitute (1) one credit below for a pathway course:

- **020501** Animal Science
- **010111** Agriculture Sales and Marketing
- **010121** Agriculture Employability Skills
- **030790** Agricultural Education Co-op*
- **030791** Agricultural Education Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Plant Science Systems CIP 01.1101.00

This pathway focuses on the scientific principles that underlie the breeding, cultivation, and production of agricultural plants and the production, processing, and distribution of agricultural plant products. Includes instruction in the plant sciences, crop cultivation and production, and agricultural and food products processing.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **030715** Principles of Agricultural Science and Technology
- **030711** Agriscience (CTE Credit) **OR 030712** (Science Credit)

Choose (2-3) two – three credits from the following:

- **010611** Introduction to Greenhouse and Crop Production
- **010621** Floriculture and Floral Design
- **010641** Greenhouse Technology
- **010651** Nursery and Orchard Technology
- **010631** Landscape and Turf Management
- **010610** Crop Technology

May substitute (1) one credit below for a pathway course:

- **010131** Agribusiness and Farm Management
- **010121** Agriculture Employability Skills
- **010111** Agriculture Sales and Marketing
- **030713** Agri-biology Interdisciplinary
- **030790** Agricultural Education Co-op*
- **030791** Agricultural Education Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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BUSINESS AND MARKETING

BUSINESS AND MARKETING EDUCATION CAREER PATHWAYS

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Business Education TRACK Youth Apprenticeship CIP 52.0101.99
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Financial Services CIP 52.1908.00
Hospitality, Travel, Tourism and Recreation CIP 52.1910.00
Marketing CIP 52.1401.01
Management and Entrepreneurship CIP 52.0701.00
Marketing Education TRACK Youth Apprenticeship CIP 52.1400.99
Retail Services CIP 52.1803.00
Supply Chain Management CIP 52.0203.00

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Business and Marketing Education - Kentucky Department of Education

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Accounting CIP 52.0301.00

This pathway generally prepares individuals to practice the profession of accounting and to perform related business functions. Includes instruction in accounting principles and theory, financial accounting, managerial accounting, cost accounting, budget control, tax accounting, legal aspects of accounting, auditing, reporting procedures, statement analysis, planning and consulting, business information systems, accounting research methods; professional standards and ethics; and applications to specific for-profit, public, and non-profit organizations.

BEST PRACTICE COURSES
Choose (2-3) two - three credits from the following:

- **060122** Accounting and Finance Foundations
- **070122** Financial Management
- **070125** Advanced Accounting (Special Teacher Training Required) **OR** **060399** Financial Analysis for Managers

Choose (1-2) one - two credits from the following:

- **080719** Financial Literacy (Math Credit) **OR** **060170** Personal Finance (CTE Credit)
- **060411** Introduction to Management
- **070750** Microsoft Office Specialist
- **060111** Business and Marketing Essentials
- **070743** Office Administration
- **060108** Business Education Internship
- **060107** Business Education Co-op*
- **060112** Digital Literacy **OR** **110110** Computer Literacy
- **060109** Ethical Leadership

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Administrative Support CIP 52.0401.00

This pathway is designed to provide students with advanced experience to propel them into the 21st-century business world as they serve as college interns, administrative assistants, graduate assistants, and office managers. Instruction includes fundamental business procedures, human resource management, time management software, workstation management, travel planning, financial reporting, payroll, mail procedures, effective communication, and ethical decision-making skills.

BEST PRACTICE COURSES
Choose (3-4) three – four credits from the following:

- **060112** Digital Literacy **OR 110110** Computer Literacy
- **060122** Accounting and Finance Foundations
- **070743** Office Administration
- **060111** Business and Marketing Essentials

Choose (0-1) zero – one credit from the following:

- **070971** Medical Office Procedures
- **070750** Microsoft Office Specialist
- **070881** Legal Office **OR 060121** Business Law
- **060155** Business Communications
- **170131** Medical Terminology (.5 – 1 credit)
- **170141** Emergency Procedures (.5 credit)
- **060108** Business Education Internship
- **060107** Business Education Co-op*
- **080708** Marketing Education Internship
- **080707** Marketing Education Co-op*
- **060109** Ethical Leadership
- **060411** Introduction to Management
- **060751** Multimedia Publishing

May substitute ONE credit below for the Accounting and Finance Foundations course:

- **080719** Financial Literacy (Math Credit)
- **060170** Personal Finance (CTE Credit)
- **070125** Advanced Accounting (Special Teacher Training Required)
- **070122** Financial Management
- **080772** Business Math (CTE Credit)
- **080780** Business Math (Math Credit)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Business Education TRACK Youth Apprenticeship CIP 52.0101.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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E-Commerce CIP 52.0208.02

This pathway focuses on the creation, execution, transmission, and evaluation of commercial messages in various media intended to promote and sell products, services, and brands, and that prepares individuals to function as advertising assistants, technicians, and managers. Includes instruction in advertising theory, marketing strategy, advertising design and production methods, campaign methods and techniques, media management, related business management principles, and applicable technical and equipment skills.

BEST PRACTICE COURSES
Choose (2-3) two - three credits from the following:

- **060112** Digital Literacy **OR** **110110** Computer Literacy
- **080716** Marketing Principles
- **081511** Advertising and Promotion
- **060751** Multimedia Publishing
- **060199** Web Page Design **OR** **081310** Fundamentals of Social Media Marketing

Choose (1-2) one - two credits from the following:

- **080310** Principles of Entrepreneurship
- **060111** Business and Marketing Essentials
- **080717** Marketing Applications
- **081411** Retail Operations Specialist
- **060761** Advanced Multimedia Publishing
- **081512** Promotional Applications and Media
- **080708** Marketing Education Internship
- **080707** Marketing Education Co-op*
- **060108** Business Education Internship
- **060107** Business Education Co-op*
- **070750** Microsoft Office Specialist
- **060109** Ethical Leadership
- **060170** Personal Finance (CTE Credit) **OR** **080719** Financial Literacy (Math Credit)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Financial Services CIP 52.1908.00

This pathway prepares individuals to perform various customer services in banks, insurance agencies, savings and loan companies, and related enterprises. Includes instruction in communications and public relations skills, business equipment operation, and technical skills applicable to the methods and operations of specific financial or insurance services.

BEST PRACTICE COURSES
Choose (2-3) two - three credits from the following:

- **060311** Financial Services I
- **060122** Accounting and Finance Foundations
- **060301** Introduction to Finance

Choose (1-2) one - two credits from the following:

- **060351** Financial Services II
- **060111** Business and Marketing Essentials
- **060108** Business Education Internship
- **080719** Financial Literacy (Math Credit) **OR** **060170** Personal Finance (CTE Credit)
- **060107** Business Education Co-op*
- **080708** Marketing Education Internship
- **080707** Marketing Education Co-op*
- **080716** Marketing Principles
- **060399** Financial Analysis for Managers
- **070122** Financial Management
- **060109** Ethical Leadership
- **080720** Invest – Insurance Education for Future Leaders

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Hospitality, Travel, Tourism and Recreation CIP 52.1910.00

The Hospitality, Travel, Tourism and Recreation career pathway prepares individuals to provide services in the hospitality and leisure fields. Includes instruction in hospitality operations, customer sales, marketing techniques, assistance operations and techniques, essential office management, sports, recreation and equipment management, and food and beverage services. The Hospitality, Travel, Tourism and Recreation career pathway is a hybrid pathway that consists of courses within Family and Consumer Sciences Education and Marketing Education. It blends two program areas to help students explore technical skills in the industry.

BEST PRACTICE COURSES
Choose (3) three credits from the following:

- **080910** Principles of Hospitality **OR 200610** Principles of Hospitality
- **080716** Marketing Principles
- **200641** Specialized Services in Hospitality
- **080717** Marketing Applications
- **080911** Travel and Tourism Marketing
- **200442** Advanced Foods and Nutrition

Choose (1) one credit from the following:

- **080310** Principles of Entrepreneurship
- **200441** Foods and Nutrition **OR 200113** FCS Essentials
- **200601** Internship: Hospitality, Travel, Tourism and Recreation
- **200690** Co-op*: Hospitality, Travel, Tourism and Recreation
- **080708** Marketing Education Internship
- **080707** Marketing Education Co-op*
- **081121** Sports and Event Marketing
- **060109** Ethical Leadership

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Management and Entrepreneurship CIP 52.0701.00

This pathway generally prepares individuals to plan, organize, direct, and control the functions and processes of a firm or organization. Includes instruction in management theory, human resources management and behavior, accounting and other quantitative methods, purchasing and logistics, organization and production, marketing, and business decision-making.

BEST PRACTICE COURSES
Choose (2-3) two - three credits from the following:

- **060111** Business and Marketing Essentials
- **060411** Introduction to Management
- **080310** Principles of Entrepreneurship

Choose (1-2) one - two credits from the following:

- **060112** Digital Literacy **OR** **110110** Computer Literacy
- **060596** Business Economics (Economics Credit) **OR** **080317** Business Economics (CTE Credit)
- **060108** Business Education Internship
- **060122** Accounting and Finance Foundations
- **060107** Business Education Co-op*
- **080708** Marketing Education Internship
- **080707** Marketing Education Co-op*
- **080716** Marketing Principles
- **070750** Microsoft Office Specialist
- **060109** Ethical Leadership
- **060155** Business Communications

May substitute (1) one credit below for the Accounting and Finance Foundations course:

- **070125** Advanced Accounting (Special Teacher Training Required)
- **080719** Financial Literacy (Math Credit)
- **060170** Personal Finance (CTE Credit)
- **070122** Financial Management
- **060399** Financial Analysis for Managers
- **080772** Business Math (CTE Credit)
- **080780** Business Math (Math Credit)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Marketing CIP 52.1401.01

This pathway generally prepares individuals to undertake and manage developing consumer audiences and moving products from producers to consumers. Includes instruction in buyer behavior and dynamics, principles of marketing research, demand analysis, cost-volume and profit relationships, pricing theory, marketing campaign and strategic planning, market segments, advertising methods, sales operations and management, consumer relations, retailing and applications to specific products and markets.

BEST PRACTICE COURSES
Complete (2) two credits:

- **080716** Marketing Principles
- **080717** Marketing Applications

Choose (2) two credits from the following:

- **081511** Advertising and Promotion
- **081121** Sports and Event Marketing
- **080111** Fashion Marketing
- **081411** Retail Operations Specialist
- **080310** Principles of Entrepreneurship
- **081512** Promotional Applications and Media
- **080911** Travel and Tourism Marketing
- **060122** Accounting and Finance Foundations
- **080719** Financial Literacy (Math Credit) **OR** **060170** Personal Finance (CTE Credit)
- **060111** Business and Marketing Essentials
- **080708** Marketing Education Internship
- **080707** Marketing Education Co-op*
- **060109** Ethical Leadership
- **081310** Fundamentals of Social Media Marketing

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Marketing Education TRACK Youth Apprenticeship CIP 52.1400.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.
[1]

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Retail Services CIP 52.1803.00

This pathway generally prepares individuals to perform operations associated with retail sales in a variety of settings. Includes instruction in over-the-counter and other direct sales operations in business settings, basic bookkeeping principles, customer services, team/staff leadership and supervision, floor management, and applicable technical skills.

BEST PRACTICE COURSES
Choose (2–3) two – three credits from the following:

- **081411** Retail Operations Specialist
- **080111** Fashion Marketing
- **081431** Retail Marketing Management **OR** **080717** Marketing Applications

Choose (1–2) one – two credits from the following:

- **080310** Principles of Entrepreneurship
- **080716** Marketing Principles
- **081512** Promotional Applications and Media
- **081511** Advertising and Promotion
- **081310** Fundamentals of Social Media Marketing
- **060122** Accounting and Finance Foundations **OR** **080719** Financial Literacy (Math Credit) **OR** **060170** Personal Finance (CTE Credit)
- **080708** Marketing Education Internship
- **080707** Marketing Education Co-op*
- **060109** Ethical Leadership
- **060111** Business and Marketing Essentials

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Supply Chain Management CIP 52.0203.00

This pathway prepares individuals to manage and coordinate all supply chains in an enterprise, ranging from acquisitions to receiving and handling, through internal allocation of resources to operations units to the handling and delivery of output. Includes instruction in acquisitions and purchasing, inventory control, storage and handling, just-in-time manufacturing, logistics planning, shipping and delivery management, transportation, quality control, resource estimation and allocation, and budgeting.

BEST PRACTICE COURSES
Complete (4) four courses:

- **060111** Business and Marketing Essentials
- **060411** Introduction to Management
- **060123** Principles of Supply Chain Management
- **060124** Supply Chain Management Applications

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COMPUTER SCIENCE

COMPUTER SCIENCE CAREER PATHWAYS

Additive Manufacturing CIP 15.1307.00
Computer Programming CIP 11.0201.01
Computer Science TRACK Youth Apprenticeship CIP 11.0101.99
Cybersecurity CIP 14.0902.00
Data Science CIP 11.0802.00
Digital Design and Game Development CIP 36.0113.00
Information Support and Services CIP 47.0104.01
Network Administration CIP 11.0901.01
Network Security CIP 11.1003.00
Web Development/Administration CIP 11.0801.01
Course specific documents are available at the Kentucky Department of Education Program Area Page: Computer Science - Kentucky Department of Education

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Additive Manufacturing CIP 15.1307.00

A program that prepares individuals to apply technical knowledge and skills in using three-dimensional (3D) computer technology to create technical illustrations and models used in manufacturing, design, production, and construction. Includes instruction in 3D computer-aided design (CAD), 3D printing, 3D model design and construction, and 3D scanning.

BEST PRACTICE COURSES
Choose (3) three credits:

- **332001** Introduction to 3D Printing Technology
- **332002** Engineering Mechanics for 3D Printing
- **332003** Additive Manufacturing Applications

Choose (1) one credit from the following:

- **210110** Engineering Capstone
- **480179** Special Problems (CAD)
- **110226** Project-Based Programming
- **210331** Engineering Internship
- **210330** Engineering Co-op*
- **480142** Co-op* I (CAD)
- **480145** Internship (CAD)
- **110918** Computer Science Co-op*
- **110919** Computer Science Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Computer Programming CIP 11.0201.01

The Computer Programming pathway courses will prepare students to design and create apps and troubleshoot the latest programming languages used in the industry. The coursework will include instruction in the principles of Computational Science, App Development, Computer Programming and Web Page Development. Upon Completion of this career pathway, students will be prepared for an entry-level position or continue their education in Computer Programming.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **110110** Computer Literacy **OR** **060112** Digital Literacy
- **110251** Computational Thinking
- **110201** Introduction to Programming
- **110710** Introduction to Computer Science
- **110205** JAVA Programming I
- **110206** JAVA Programming II
- **110220** Object-Oriented Programming I
- **110221** Object-Oriented Programming II
- **110230** Cybersecurity
- **110226** Project-Based Programming
- **110701** AP Computer Science A
- **110711** AP Computer Science Principles
- **110801** Web Page Development
- **110809** JavaScript
- **110821** App Development with Swift
- **110918** Computer Science Co-op* **OR** **110919** Computer Science Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Computer Science TRACK Youth Apprenticeship CIP 11.0101.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Cybersecurity CIP 14.0902.00

The Cybersecurity pathway is a blend of programming, cybersecurity, and hardware engineering disciplines. Students will learn to research, design, develop, and test computer systems and components. The coursework explores robotics, electricity, ethical computing, and security concerns in today's digital society.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **110110** Computer Literacy **OR** **060112** Digital Literacy
- **110222** Cyber Literacy I
- **110223** Cyber Literacy II
- **110224** Cyber Science
- **110225** Computer Science Fundamentals
- **110230** Cybersecurity
- **110912** Security Fundamentals
- **110918** Computer Science Co-op* **OR** **110919** Computer Science Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Data Science CIP 11.0802.00

Students will apply software systems and industry software to acquire, collect, store and communicate data meaningfully to clients. Students will manage projects, work in teams, think critically, solve problems and propose solutions to design problems. Further, they will learn to apply literacy, mathematics, and science concepts and use technology to solve real-world challenging problems effectively. Through project-based learning, students will explore the future of data science and learn those habits of behavior and mind unique to professionals in the field. Data Science leverages technology, data, and communication by instilling in a new generation the knowledge, imagination, and flexibility to tackle complex issues successfully in a data-rich digital world. It is the process of designing systems that take raw data and convert it into new knowledge that can be applied to any field while considering the impact on individuals, organizations, and society.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **110110** Computer Literacy **OR** **060112** Digital Literacy
- **111001** Computer, Networks, and Databases
- **111002** Design for the Digital World
- **110211** Introduction to Database Design
- **110204** Productivity Software
- **110918** Computer Science Co-op* **OR** **110919** Computer Science Internship

[1]

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Digital Design and Game Development CIP 36.0113.00

The Digital Design and Game Development pathway courses provide students with a thorough understanding of techniques for designing advances in games, apps, AR/VR and other experiences. The courses will cover 2D and 3D graphics, animation, character development, program design and coding, texturing, scripting, and game setup using state-of-the-art software development tools. Completing students will have developed the skills necessary to create 3D graphics and applications that can be used for games and simulations.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **110110** Computer Literacy **OR** **060112** Digital Literacy
- **110201** Introduction to Programming
- **110251** Computational Thinking
- **113605** Game Design and Development Principles
- **110226** Project-Based Programming
- **113601** Introduction to Digital Game Graphics
- **113602** Advanced Game Development and Publishing
- **113603** Advanced 3D Game Development
- **113604** Digital 3D Graphics and Special Effects II
- **110918** Computer Science Co-op* **OR** **110919** Computer Science Internship

[1]

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Information Support and Services CIP 47.0104.01

The Information Support and Services pathway focuses on the design of computing systems. The courses include instruction in the principles of computer hardware and software components, algorithms, databases, and telecommunications.

BEST PRACTICE COURSES
Complete (4) four credits from the following:

- **110110** Computer Literacy **OR** **060112** Digital Literacy
- **110101** Computer Hardware and Software Maintenances
- **110102** Help Desk Operations
- **110302** Management of Support Services
- **110917** Internet Technologies
- **110906** Network Hardware Installation and Troubleshooting
- **110918** Computer Science Co-op* **OR** **110919** Computer Science Internship

[1]

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Network Administration CIP 11.0901.01

The Network Administration pathway courses will help students learn new administration support skills or upgrade existing computer information systems skills. Students will be able to install networking software on an appropriately sized computer properly, configure the software for a simple server environment and connect it correctly to a physical network, manage a simple networking environment, effectively troubleshoot problems, add new users and attend to security concerns; and work within the ethical/professional parameters in the field of network administration.

BEST PRACTICE COURSES
Complete (4) four credits from the following:

- **110110** Computer Literacy **OR** **060112** Digital Literacy
- **110101** Computer Hardware and Software Maintenance
- **110251** Computational Thinking
- **110901** Introduction to Networking Concepts (non-vendor)
- **110917** Internet Technologies
- **110902** Network Fundamentals/Cisco I
- **110903** Routing Protocols and Concepts/Cisco II
- **110904** LAN Switching and Wireless/Scaling Networks/Cisco III
- **110913** Microsoft Client/Server Configuration
- **110918** Computer Science Co-op* **OR** **110919** Computer Science Internship

[1]

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Network Security CIP 11.1003.00

The Network Security pathway will help students be able to properly design and install a wired LAN, including all network devices, physically connect servers and desktop computers, properly design and install a wireless LAN, including all network devices, and make physical LAN connections for servers and desktop computers, integrate the Wireless LAN with wired LAN and work within the ethical and professional parameters in the Computer Networking profession. Students will be team members, learn new network administration support skills and upgrade existing computer information system skills.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **110110** Computer Literacy **OR** **060112** Digital Literacy
- **110101** Computer Hardware or Software Maintenance
- **110901** Introduction to Networking Concepts (non-vendor)
- **110912** Security Fundamentals
- **110230** Cybersecurity
- **110918** Computer Science Co-op* **OR** **110919** Computer Science Internship

[1]

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Web Development/Administration CIP 11.0801.01

The Web Development/Administration pathway involves creating, designing, and producing interactive multimedia products and services. This will include developing digitally generated or computer-enhanced media and adhering to web standards in business, training, communications and marketing. Organizations of all types and sizes use digital media, web pages, and websites to communicate with existing and potential customers, track transactions, and collaborate with colleagues. This pathway will prepare students to enter the workforce ready to participate as leaders in various careers and further their education.

BEST PRACTICE COURSES
Complete (4) four credits:

- **110110** Computer Literacy **OR** **060112** Digital Literacy
- **110251** Computational Thinking
- **110801** Web Page Development
- **110809** JavaScript
- **110804** Website Design and Production
- **110213** Design for the Internet
- **110917** Internet Technologies
- **110918** Computer Science Co-op* **OR** **110919** Computer Science Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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CONSTRUCTION TECHNOLOGY

AIR CONDITIONING TECHNOLOGY CAREER PATHWAYS

BUILDING CONSTRUCTION TECHNOLOGY CAREER PATHWAYS

CONSTRUCTION CARPENTRY TECHNOLOGY CAREER PATHWAYS

ELECTRICAL TECHNOLOGY CAREER PATHWAYS

HEAVY EQUIPMENT SCIENCES CAREER PATHWAYS

MASONRY TECHNOLOGY CAREER PATHWAYS

PLUMBING TECHNOLOGY CAREER PATHWAYS

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Construction Technology - Kentucky Department of Education

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AIR CONDITIONING TECHNOLOGY CAREER PATHWAYS

Construction TRACK Youth Apprenticeship CIP 46.0000.99

Environmental Control System Technician CIP 47.0201.05

Construction TRACK Youth Apprenticeship CIP 46.0000.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Environmental Control System Technician CIP 47.0201.05

This pathway prepares individuals to apply technical knowledge and skills to repair, install, service and maintain the operating condition of heating, air conditioning, and refrigeration systems. The pathway includes instruction in diagnostic techniques, the use of testing equipment and the principles of mechanics, electricity, and electronics related to the repair of heating, air conditioning and refrigeration systems.

BEST PRACTICE COURSES
Complete (4) four credits:

- **460828** Refrigeration Fundamentals
- **460817** HVAC Electricity
- **460826** Electrical Components
- **460820** Heating and Humidification
- **460880** Air Conditioning Co-op*

Completing the above four (4) courses will allow the student to take the “Kentucky Journeyman HVAC Mechanic” exam. After successfully completing the exam, the student will attain 750 of the 3000 hours of “On the Job Training” (OJT) required by regulation 815 KAR 8:030 Section 3.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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BUILDING CONSTRUCTION TECHNOLOGY CAREER PATHWAYS

Construction TRACK Youth Apprenticeship CIP 46.0000.99

Residential Maintenance Carpenter Assistant CIP 46.0401.01

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Construction TRACK Youth Apprenticeship CIP 46.0000.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Residential Maintenance Carpenter Assistant CIP 46.0401.01

This pathway prepares individuals to apply technical knowledge and skills to keep a building functioning and to service a variety of structures, including commercial and industrial buildings and mobile homes. Includes instruction in the essential maintenance and repair skills required to service building systems, such as air conditioning, heating, plumbing, electrical, major appliances, and other mechanical systems.

BEST PRACTICE COURSES
Complete two (2) credits:

- **460241** Introduction to Building and Construction Technology
- **460220** Residential Maintenance Carpentry

Choose two (2) credits from the following:

- **460818** Residential HVAC Maintenance
- **460222** Residential Interior Maintenance
- **460114** Residential Maintenance Masonry
- **460333** Residential Maintenance Wiring
- **460516** Residential Maintenance Plumbing
- **460229** Co-op (Building Construction Technology)* **OR** **460232** Internship (Building Construction Technology)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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CONSTRUCTION CARPENTRY TECHNOLOGY CAREER PATHWAYS

Commercial Carpentry TRACK Pre-Apprenticeship CIP 46.0201.99

Construction Architectural Engineering CIP 15.0101.02

Construction TRACK Youth Apprenticeship CIP 46.0000.99

Residential Carpenter Assistant CIP 46.0201.02

Structural Engineering CIP 14.0803.00

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Commercial Carpentry TRACK Pre-Apprenticeship CIP 46.0201.99

The Commercial Carpentry TRACK is designed as a pre-apprenticeship pathway for students to have the opportunity to enter a postsecondary Registered Apprenticeship training program after graduation while still potentially earning credit for classes taken that relate to the apprenticeship.

Students must complete the four-course sequence and pass the end-of-program assessment (students can be enrolled in the 4th course to take the assessment) to receive the industry certification. In addition, students must either complete eight KYSAFE eTraining modules (click on the green TRACK tab and complete the 8 pre-selected modules) or attain the OSHA 10 or 30 card. The student is to be enrolled in the pathway in TEDS and adhere to deadlines for TEDS and CTE End of Program (EOP) assessments. Upon completion, the student will receive a pre-apprenticeship industry certification issued by the Kentucky Division of Apprenticeship by submitting a transcript and the Skilled Trades TRACK Completion Form. Participating partners will recognize this certification for an interview and possible credit upon acceptance. Credit is at the discretion of the training organization.

Please visit the Carpentry TRACK website for more information or a list of participating organizations.

BEST PRACTICE COURSES
Complete (4) four credits

- **460201** Introduction to Construction Technology
- **460212** Floor and Wall Framing
- **460213** Ceiling and Roof Framing
- **460214** Site Layout and Foundations

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Construction Architectural Engineering CIP 15.0101.02

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. This pathway prepares individuals to apply engineering principles and technical skills to support architects, engineers and planners in designing and developing buildings, urban complexes, and related systems. Includes instruction in design testing procedures, building site analysis, model building and computer graphics, structural systems testing, analysis of prototype mechanical and interior systems, report preparation, basic construction and structural design, architectural rendering, computer-aided drafting (CAD), layout and designs, architectural blueprint interpretation, building materials, and basic structural wiring diagramming.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210223** Civil Engineering
- **210140** Architectural Design
- **210141** Building Construction Technologies

Choose (2) two credits from the following:

- **460201** Introduction to Construction Technology
- **460213** Ceiling and Roof Framing
- **460212** Floor and Wall Framing

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Construction TRACK Youth Apprenticeship CIP 46.0000.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Residential Carpenter Assistant CIP 46.0201.02

This pathway prepares individuals to apply technical knowledge and skills to layout, cut, fabricate, erect, install, and repair wooden structures and fixtures using hand and power tools. The pathway includes instruction in technical mathematics, framing, construction materials and selection, job estimating, blueprint reading, foundations and roughing-in, finish carpentry techniques, and applicable codes and standards.

BEST PRACTICE COURSES
Complete (4) four credits:

- **460201** Introduction to Construction Technology
- **460212** Floor and Wall Framing
- **460213** Ceiling and Roof Framing
- **460219** Exterior and Interior Finish (1 credit) **OR** **460217** Construction Prints (.5 credit) **AND** **499930** Industrial Safety (.5 credit)
- **460242** Co-op* (Carpentry)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Structural Engineering CIP 14.0803.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. This pathway prepares individuals to apply engineering principles and technical skills to support architects, engineers and planners in designing and developing buildings, urban complexes, and related systems. It includes instruction in design testing procedures, building site analysis, model building and computer graphics, structural systems testing, analysis of prototype mechanical and interior systems, report preparation, basic construction and structural design, architectural rendering, architectural-aided drafting (CAD), layout and designs, architectural blueprint interpretation, building materials, and basic structural wiring diagramming.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210223** Civil Engineering
- **210141** Building Construction Technologies

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **460201** Introduction to Construction Technology
- **460218** Construction Forms
- **460214** Site Layout and Foundations

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ELECTRICAL TECHNOLOGY CAREER PATHWAYS

Construction Electrical TRACK Pre-Apprenticeship CIP 46.0302.99

Construction TRACK Youth Apprenticeship CIP 46.0000.99

Electrical Construction Engineering CIP 15.0303.00

Industrial Electrician Assistant CIP 46.0302.02

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Construction Electrical TRACK Pre-Apprenticeship CIP 46.0302.99

The Electrical TRACK is designed as a pre-apprenticeship pathway for students to have the opportunity to enter a postsecondary Registered Apprenticeship training program after graduation while still potentially earning credit for classes taken that relate to the apprenticeship.

Students must complete the four-course sequence and pass the end-of-program assessment (students can be enrolled in the 4th course to take the assessment) to receive the industry certification. In addition, students must either complete eight KYSAFE eTraining modules (click on the green TRACK tab and complete the 8 pre-selected modules) or attain the OSHA 10 or 30 card. The student is to be enrolled in the pathway in TEDS and adhere to deadlines for TEDS and CTE End of Program (EOP) assessments. Upon completion, the student will receive a pre-apprenticeship industry certification issued by the Kentucky Division of Apprenticeship by submitting a transcript and the Skilled Trades TRACK Completion Form. Participating partners will recognize this certification for an interview and possible credit upon acceptance. Credit is at the discretion of the training organization.

Please visit the Electrical TRACK website for more information or a list of participating organizations.

BEST PRACTICE COURSES
Complete (4) four credits:

- **460312** Electrical Construction I
- **460313** Electrical Construction II
- **460316** Circuits I
- **460319** Circuits II **OR** **460331** Electrical Motor Controls

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Construction TRACK Youth Apprenticeship CIP 46.0000.99

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The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Electrical Construction Engineering CIP 15.0303.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. This pathway prepares individuals to apply technical knowledge and skills to install, operate, maintain, and repair electric apparatus and systems such as residential, commercial, and industrial electric power wiring, DC and AC motors, controls, and electrical distribution panels. It includes instruction in the principles of electronics and electrical systems, wiring, power transmission, safety, industrial and household appliances, job estimation, electrical testing and inspection, and applicable codes and standards.

BEST PRACTICE COURSES
Complete (4) four credits:

- **210221** Engineering I
- **210232** Electrical/Electronics Engineering
- **460316** Circuits I
- **460319** Circuits II

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Industrial Electrician Assistant CIP 46.0302.02

This pathway prepares individuals to apply technical knowledge and skills to install, operate, maintain, and repair electric apparatus and systems in residential, commercial, and industrial electric power wiring, DC and AC motor controls, and electrical distribution panels. The pathway includes instruction in the principles of electronics and electrical systems, wiring, power transmission, safety, industrial and household appliances, job estimation, electrical inspecting and inspection, and applicable codes and standards. Instruction includes the principles of electronics and electrical systems, wiring, power transmission, safety industrial and household appliances, job estimation, electrical testing and inspection, and applicable codes and standards.

BEST PRACTICE COURSES
Complete (4) four credits:

- **460312** Electrical Construction I
- **460316** Circuits I
- **460331** Electrical Motor Controls
- **460325** Rotating Machinery Electrical Motor Controls **OR** **460323** Rotating Machinery
- **460345** Co-op* (Electrical)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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HEAVY EQUIPMENT SCIENCES CAREER PATHWAYS

Construction Heavy Equipment TRACK Pre-Apprenticeship CIP 49.0202.99

Construction TRACK Youth Apprenticeship CIP 46.0000.99

Heavy Equipment Sciences CIP 49.0202.01

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Construction Heavy Equipment TRACK Pre-Apprenticeship CIP 49.0202.99

The Heavy Equipment TRACK is designed as a pre-apprenticeship pathway for students to have the opportunity to enter a postsecondary Registered Apprenticeship training program after graduation while still potentially earning credit for classes taken that relate to the apprenticeship.

Students must complete the four-course sequence and pass the end-of-program assessment (students can be enrolled in the 4th course to take the assessment) to receive the industry certification. In addition, students must either complete eight KYSAFE eTraining modules (click on the green TRACK tab and complete the 8 pre-selected modules) or attain the OSHA 10 or 30 card. The student is to be enrolled in the pathway in TEDS and adhere to deadlines for TEDS and CTE End of Program (EOP) assessments. Upon completion, the student will receive a pre-apprenticeship industry certification issued by the Kentucky Division of Apprenticeship by submitting a transcript and the Skilled Trades TRACK Completion Form. Participating partners will recognize this certification for an interview and possible credit upon acceptance. Credit is at the discretion of the training organization.

Please visit the Heavy Equipment TRACK website for more information or a list of participating organizations.

BEST PRACTICE COURSES
Complete (3) three credits:

- **460201** Introduction to Construction Technology
- **460403** Heavy Highway Construction Equipment Repair
- **460404** Heavy Equipment Operation

Choose (1) one credit from the following:

- **460499** Special Topics - Heavy Equipment
- **499925** Basic Troubleshooting
- **499935** Commercial Driver License

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Construction TRACK Youth Apprenticeship CIP 46.0000.99

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The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Heavy Equipment Sciences CIP 49.0202.01

The Heavy Equipment Sciences program will prepare students for construction jobs, infrastructure projects (roads, bridges, and ports, otherwise called non-building construction), and mining and timber operations. A trained and experienced equipment operator provides the necessary skills for any project that requires moving and transporting heavy materials or that demands any earthmoving.

BEST PRACTICE COURSES
Complete (3) three credits:

- **460201** Introduction to Construction Technology
- **460403** Heavy Highway Construction Equipment Repair
- **460404** Heavy Equipment Operation

Choose (1) one credit from the following:

- **460499** Special Topics - Heavy Equipment
- **499925** Basic Troubleshooting
- **499910** Industrial Education Co-op*
- **499935** Commercial Driver License

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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MASONRY TECHNOLOGY CAREER PATHWAYS

Bricklayer Assistant CIP 46.0101.01

Construction TRACK Youth Apprenticeship CIP 46.0000.99

Masonry TRACK Pre-Apprenticeship CIP 46.0101.99

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Bricklayer Assistant CIP 46.0101.01

This program prepares individuals to apply technical knowledge and skills in laying and setting exterior brick, concrete block, hard tile, marble and related materials, using trowels, levels, hammers, chisels, and other hand tools. Instruction includes technical mathematics, blueprint reading, structural masonry, decorative masonry, foundations, reinforcement, mortar preparation, cutting and finishing, and applicable codes and standards.

BEST PRACTICE COURSES
Complete (4) four credits from the following:

- **460112** Introductory Masonry
- **460116** Intermediate Masonry
- **460113** Advanced Masonry
- **499930** Industrial Safety (.5 credit course) **AND** **499920** Basic Blueprint Reading (.5 credit course)
- **460119** Concrete Finishing
- **460180** Co-op* (Masonry) **OR** **460183** Internship (Masonry)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Construction TRACK Youth Apprenticeship CIP 46.0000.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Masonry TRACK Pre-Apprenticeship CIP 46.0101.99

The Masonry TRACK is designed as a pre-apprenticeship pathway for students to have the opportunity to enter a postsecondary Registered Apprenticeship training program after graduation while still potentially earning credit for classes taken that relate to the apprenticeship.

Students must complete the four-course sequence and pass the end-of-program assessment (students can be enrolled in the 4th course to take the assessment) to receive the industry certification. In addition, students must either complete eight KYSAFE eTraining modules (click on the green TRACK tab and complete the 8 pre-selected modules) or attain the OSHA 10 or 30 card. The student is to be enrolled in the pathway in TEDS and adhere to deadlines for TEDS and CTE End of Program (EOP) assessments. Upon completion, the student will receive a pre-apprenticeship industry certification issued by the Kentucky Division of Apprenticeship by submitting a transcript and the Skilled Trades TRACK Completion Form. Participating partners will recognize this certification for an interview and possible credit upon acceptance. Credit is at the discretion of the training organization.

Please visit the Masonry TRACK website for more information or a list of participating organizations.

BEST PRACTICE COURSES
Complete (4) four credits:

- **460112** Introductory Masonry
- **460116** Intermediate Masonry
- **460113** Advanced Masonry
- **499930** Industrial Safety (.5 credit course) **AND** **499920** Basic Blueprint Reading (.5 credit course)

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PLUMBING TECHNOLOGY CAREER PATHWAYS

Construction TRACK Youth Apprenticeship CIP 46.0000.99

Plumber Assistant CIP 46.0501.02

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Construction TRACK Youth Apprenticeship CIP 46.0000.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Plumber Assistant CIP 46.0501.02

This pathway prepares individuals to practice as licensed plumbers by applying technical knowledge and skills to layout, assemble, install, and maintain piping fixtures and systems for steam, natural gas, oil, hot water, heating, cooling, drainage, lubricating, sprinkling, and industrial processing systems in home and business environments. It includes instruction in source determination, water distribution, waste removal, pressure adjustment, fundamental physics, technical mathematics, blueprint reading, pipe installation, pumps, welding and soldering, plumbing inspection, and applicable codes and standards.

BEST PRACTICE COURSES
Complete (2) two credits:

- **460511** Introduction to Plumbing
- **460513** Basic Plumbing Skills

Choose (2) two credits from the following:

- **460512** Plumbing Systems
- **460514** Bathroom Install
- **460515** Kitchen Install
- **460518** Co-op* (Plumbing) **OR** **460521** Internship (Plumbing)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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EDUCATION AND TRAINING

EDUCATION AND TRAINING CAREER PATHWAYS

Teaching and Learning CIP 13.0101.00

Teaching and Learning TRACK Youth Apprenticeship 13.0101.99

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Teaching and Learning Career Pathway - Kentucky Department of Education

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Teaching and Learning CIP 13.0101.00

This pathway focuses on the general theory and practice of learning and teaching, the basic principles of educational psychology, the art of teaching, the planning and administration of educational activities, school safety and health issues, and the social foundations of education.

BEST PRACTICE COURSES
Complete (3) three credits:

- **331030** The Learning Community
- **331031** The Learner-Centered Classroom
- **331032** The Professional Educator

Choose (1) one credit from the following:

- **331033** Collaborative Clinical Experience
- **331034** Principles of Career and Technical Education

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Teaching and Learning TRACK Youth Apprenticeship 13.0101.99

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The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

Existing Education Co-ops*:

- **200210** Co-op*: Early Childhood Education
- **200291** Co-op*: Fundamentals of Teaching

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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ENGINEERING TECHNOLOGY

ENERGY CAREER PATHWAYS

ENGINEERING CAREER PATHWAYS

ENGINEERING HYBRID CAREER PATHWAYS

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Engineering Technology Education - Kentucky Department of Education

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ENERGY CAREER PATHWAYS

Energy Management CIP 15.0503.02

Sustainability and Energy Application Technician CIP 15.0503.01

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Energy Management CIP 15.0503.02

Entry-level positions in the energy production industry include renewable energy sales, LEED consultants, alternative energy consultants, and residential audits. Energy Management graduates can also find employment in the growing fields of energy audit, energy consulting, and facilities management. Employment opportunities are expected to be the greatest in metropolitan areas.

BEST PRACTICE COURSES
Complete (4) four credits:

- **210245** Energy I: Energy Industry Basics
- **210246** Energy II: Power Generation and Distribution
- **210247** Energy III: Emerging Technologies in Energy
- **210248** Energy IV: Sustainability Management

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Sustainability and Energy Application Technician CIP 15.0503.01

This pathway prepares students to apply engineering principles and technical skills in support of engineers and other professionals engaged in developing energy-efficient systems or monitoring energy use. The content includes activities to develop knowledge and skill in but is not limited to the study of power systems and the kinds and sources of energy, repair, service, and maintenance of small internal-combustion engines used on portable power equipment such as generators, electrical motors, generators, and wind turbines. The content and activities will also include studying safety and leadership skills.

BEST PRACTICE COURSES
Complete (2) two credits:

- **210341** Foundations of Energy
- **210242** Introduction to Alternative Energy

Choose (2) two credits from the following:

- **210243** Alternative Energy
- **210244** Global Energy Issues
- **210142** Power and Energy Equipment Technology
- **210330** Engineering Co-op* **OR 210331** Engineering Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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ENGINEERING CAREER PATHWAYS

Aerospace Engineering CIP 14.0201.01

Automation Engineering CIP 15.0613.00

Civil Engineering CIP 14.0801.00

Electrical/Electronics Engineering CIP 14.1001.00

Engineering Design CIP 15.1302.00

Engineering TRACK Youth Apprenticeship CIP 15.0000.99

Mechanical Engineering CIP 14.3501.00

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Aerospace Engineering CIP 14.0201.01

This pathway prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of aircraft, space vehicles, and their systems; applied research on flight characteristics; and the development of systems and procedures for the launching, guiding, and controlling of air and space vehicles. Aerospace engineers primarily design aircraft, spacecraft, satellites, and missiles. In addition, they test prototypes to ensure they function according to design.

BEST PRACTICE COURSES
Choose (1-2) one - two credits from the following:

- **210226** Introduction to Aerospace and Aviation
- **210221** Engineering I
- **210222** Engineering II

Complete (1) one credit:

- **210229** Aerospace Engineering

Choose (1-2) one - two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **210232** Electrical/Electronics Engineering
- **210117** Advanced Design Applications
- **210251** Unmanned Aircraft Systems
- **210110** Engineering Capstone
- **210330** Engineering Co-op* **OR 210331** Engineering Internship
- **331034** Principles of Career and Technical Education
- **110701** AP Computer Science A **OR 110711** AP Computer Science Principles **OR 110251** Computational Thinking

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Automation Engineering CIP 15.0613.00

This pathway prepares individuals to apply scientific and mathematical principles to the design, development, and implementation of automated and robotic systems. The pathway includes instruction in materials science and engineering, manufacturing processes, process engineering, assembly and product engineering, robotic systems design, and manufacturing competitiveness. Automation Engineers plan manufacturing practices by researching and developing tools, processes, machines, and equipment to integrate the facilities and systems for producing quality products with the optimal capital expenditure.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **210221** Engineering I
- **210222** Engineering II

Choose (2-3) two – three credits from the following:

- **332001** Introduction to 3D Printing Technology
- **210135** Industrial Engineering
- **210225** Manufacturing Engineering
- **210230** Mechatronics Engineering
- **210238** Robotics Engineering
- **210239** Robotics Automation and Design
- **210117** Advanced Design Applications
- **210251** Unmanned Aircraft Systems
- **210110** Engineering Capstone
- **210330** Engineering Co-op* **OR 210331** Engineering Internship
- **331034** Principles of Career and Technical Education
- **110701** AP Computer Science A **OR 110711** AP Computer Science Principles **OR 110251** Computational Thinking

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Civil Engineering CIP 14.0801.00

This pathway generally prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of structural, loadbearing, material moving, transportation, water resource, material control systems, and environmental safety measures. Civil engineers design, build, supervise, operate, and maintain construction projects and systems in the public and private sectors, including roads, buildings, airports, tunnels, dams, bridges, and water supply and sewage treatment systems.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **210221** Engineering I
- **210222** Engineering II

Complete (1) one credit:

- **210223** Civil Engineering

Choose (1-2) one – two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **210241** Introduction to Geographical Information Systems (GIS)
- **210117** Advanced Design Applications
- **210251** Unmanned Aircraft Systems
- **210250** Environmental Engineering
- **210110** Engineering Capstone
- **210330** Engineering Co-op* **OR 210331** Engineering Internship
- **331034** Principles of Career and Technical Education
- **110701** AP Computer Science A **OR 110711** AP Computer Science Principles **OR 110251** Computational Thinking

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Electrical/Electronics Engineering CIP 14.1001.00

This pathway prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of electrical electronic-related systems and their components. Electrical engineers design, develop, test, and supervise electrical equipment manufacturing, such as electric motors, electrical controls, instrumentation, HMI Interfaces, PLCs, industrial controls, and power generation equipment. Electrical engineers design, develop, test, and supervise electrical equipment manufacturing, such as electric motors, radar and navigation systems, communications systems, and power generation equipment. Electronics engineers design and develop electronic equipment, including broadcast and communications systems like portable music players and Global Positioning System (GPS) devices.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **210221** Engineering I
- **210222** Engineering II

Complete (1) one credit:

- **210232** Electrical/Electronics Engineering

Choose (1-2) one – two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **210117** Advanced Design Applications
- **210251** Unmanned Aircraft Systems
- **210110** Engineering Capstone
- **210330** Engineering Co-op* **OR 210331** Engineering Internship
- **331034** Principles of Career and Technical Education
- **110701** AP Computer Science A **OR 110711** AP Computer Science Principles **OR 110251** Computational Thinking

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Engineering Design CIP 15.1302.00

This pathway is designed for students interested in the various disciplines of engineering. The course sequence will allow students to develop critical thinking skills and an understanding of engineering concepts. Students then apply these skills in conjunction with the multi-step engineering design process to solve real-world problems. Includes instruction in two-dimensional and three-dimensional engineering design software, solid modeling, and engineering animation to solve real-world problems.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **210221** Engineering I
- **210222** Engineering II
- **210138** Technical Design I
- **210108** Technical Design II

Choose (2-3) two – three credits from the following:

- **332001** Introduction to 3D Printing Technology
- **210241** Introduction to Geographical Information Systems (GIS)
- **210140** Architectural Design
- **210141** Building Construction Technologies
- **210117** Advanced Design Applications
- **210251** Unmanned Aircraft Systems
- **210250** Environmental Engineering
- **210110** Engineering Capstone
- **210330** Engineering Co-op* **OR 210331** Engineering Internship
- **331034** Principles of Career and Technical Education
- **110701** AP Computer Science A **OR 110711** AP Computer Science Principles **OR 110251** Computational Thinking

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Engineering TRACK Youth Apprenticeship CIP 15.0000.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Mechanical Engineering CIP 14.3501.00

This pathway prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of physical systems used in manufacturing and end-product systems for specific uses, including machine tools, jigs and other manufacturing equipment; stationary power units and appliances; engines; self-propelled vehicles; housings and containers; hydraulic and electric systems for controlling movement; and the integration of computers and remote control with operating systems. Mechanical Engineers design, develop, build, and test mechanical and thermal sensors and devices, including tools, engines, and machines.

BEST PRACTICE COURSES
Choose (1-2) one – two credits from the following:

- **210221** Engineering I
- **210222** Engineering II

Choose (1-2) one – two credits from the following:

- **210238** Robotics Engineering
- **210118** Mechanical Engineering

Choose (1-2) one – two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **210232** Electrical/Electronics Engineering
- **210117** Advanced Design Applications
- **210251** Unmanned Aircraft Systems
- **210110** Engineering Capstone
- **210330** Engineering Co-op* **OR 210331** Engineering Internship
- **331034** Principles of Career and Technical Education
- **110701** AP Computer Science A **OR 110711** AP Computer Science Principles **OR 110251** Computational Thinking

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ENGINEERING HYBRID CAREER PATHWAYS

Additive Manufacturing CIP 15.1307.00

Automotive Engineering CIP 15.0803.00

Computerized Manufacturing and Machining (CMM) Engineering CIP 48.0510.00

Construction Architectural Engineering CIP 15.0101.02

Design Engineering CIP 15.1304.00

Electrical Construction Engineering CIP 15.0303.00

Fabrication Engineering CIP 14.1901.00

Industrial Maintenance Engineering CIP 14.4101.00

Structural Engineering CIP 14.0803.00

Welding Engineer CIP 15.0614.00

Wood Manufacturing Engineering CIP 03.0509.00

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Additive Manufacturing CIP 15.1307.00

A program that prepares individuals to apply technical knowledge and skills in using three-dimensional (3D) computer technology to create technical illustrations and models used in manufacturing, design, production, and construction. Includes instruction in 3D computer-aided design (CAD), 3D printing, 3D model design and construction, and 3D scanning.

BEST PRACTICE COURSES
Choose (3) three credits:

- **332001** Introduction to 3D Printing Technology
- **332002** Engineering Mechanics for 3D Printing
- **332003** Additive Manufacturing Applications

Choose (1) one credit from the following:

- **210110** Engineering Capstone
- **480179** Special Problems (CAD)
- **110226** Project-Based Programming
- **210331** Engineering Internship
- **210330** Engineering Co-op*
- **480142** Co-op* I (CAD)
- **480145** Internship (CAD)
- **110918** Computer Science Co-op*
- **110919** Computer Science Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Automotive Engineering CIP 15.0803.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. This pathway prepares individuals to apply engineering principles and technical skills in support of engineers and other professionals engaged in developing, manufacturing and testing self-propelled ground vehicles and their systems. It includes instruction in vehicular systems technology, design and development testing, prototype and operational testing, inspection and maintenance procedures, instrument calibration, test equipment operation and maintenance, and report preparation.

BEST PRACTICE COURSES
Complete (4) four credits:

- **210221** Engineering I
- **210232** Electrical/Electronics Engineering
- **470507** Automotive Maintenance and Light Repair Section A
- **470509** Automotive Maintenance and Light Repair Section B

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Computerized Manufacturing and Machining (CMM) Engineering CIP 48.0510.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. CMM Engineers design, develop and run programs that direct machines to cut and shape metal or plastic for airplanes, automobiles and other industrial machines. CMM Engineers use blueprints and three-dimensional computer designs to create programs that produce precisely cut products.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210118** Mechanical Engineering
- **210135** Industrial Engineering
- **210225** Manufacturing Engineering

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **470913** Fundamentals of Machine Tools-A
- **470914** Fundamentals of Machine Tools-B
- **470915** Manual Programming

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Construction Architectural Engineering CIP 15.0101.02

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. This pathway prepares individuals to apply engineering principles and technical skills to support architects, engineers and planners in designing and developing buildings, urban complexes, and related systems. Includes instruction in design testing procedures, building site analysis, model building and computer graphics, structural systems testing, analysis of prototype mechanical and interior systems, report preparation, basic construction and structural design, architectural rendering, computer-aided drafting (CAD), layout and designs, architectural blueprint interpretation, building materials, and basic structural wiring diagramming.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210223** Civil Engineering
- **210140** Architectural Design
- **210141** Building Construction Technologies

Choose (2) two credits from the following:

- **460201** Introduction to Construction Technology
- **460213** Ceiling and Roof Framing
- **460212** Floor and Wall Framing

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Design Engineering CIP 15.1304.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. Design Engineers have a working knowledge of mechanical parts and computer-aided design (CAD) software such as AutoCAD, Autodesk Inventor, or Solidworks. Mechanical designers begin a project by meeting with project managers, engineers, and clients to understand the needs and requirements for a new product or mechanical system. For example, designers working on a project to create an automobile engine may consult engineers regarding which structural materials to use or clients regarding engine efficiency requirements. Once materials and specifications have been determined, designers use CAD (computer-aided design) software to plan and develop models.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210222** Engineering II
- **210138** Technical Design I
- **210108** Technical Design II

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **480110** Introduction to Computer-Aided Drafting
- **480113** Engineering Graphics
- **480135** Mechanical Design
- **480136** Parametric Modeling

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Electrical Construction Engineering CIP 15.0303.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. This pathway prepares individuals to apply technical knowledge and skills to install, operate, maintain, and repair electric apparatus and systems such as residential, commercial, and industrial electric power wiring, DC and AC motors, controls, and electrical distribution panels. It includes instruction in the principles of electronics and electrical systems, wiring, power transmission, safety, industrial and household appliances, job estimation, electrical testing and inspection, and applicable codes and standards.

BEST PRACTICE COURSES
Complete (4) four credits:

- **210221** Engineering I
- **210232** Electrical/Electronics Engineering
- **460316** Circuits I
- **460319** Circuits II

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Fabrication Engineering CIP 14.1901.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. Fabrication Engineers design parts to engineering specifications to develop metal parts and interior metal structures. Fabrication Engineers work with Sheet Metal Technicians to develop complex geometrical parts. The Fabrication Engineer directly supports the manufacturing industry in designing, fabricating, modifying and developing metal assemblies, components and sub-assemblies.

BEST PRACTICE COURSES
Complete (2) two credits:

- **210221** Engineering I
- **210222** Engineering II

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **480816** Metal Trade Information and Metals
- **480813** Parallel Line Layout
- **480817** Sheet Metal 1-A
- **480818** Sheet Metal 1-B

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Industrial Maintenance Engineering CIP 14.4101.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. Electrical Engineers apply electrical theory and related knowledge to diagnose and modify developmental or operational electrical machinery, electrical control equipment, and circuitry in industrial or commercial plants and laboratories. Electrical Engineers experiment with motor-control devices, switch panels, transformers, generator windings, solenoids, and other electrical equipment and components according to engineering data and knowledge of electrical principles.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210232** Electrical/Electronics Engineering
- **210230** Mechatronics Engineering
- **210225** Manufacturing Engineering
- **210135** Industrial Engineering

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **470348** Industrial Maintenance Electrical Motor Controls
- **470322** Industrial Maintenance Electrical Principles
- **470330** Industrial Maintenance of PLC's

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Structural Engineering CIP 14.0803.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. This pathway prepares individuals to apply engineering principles and technical skills to support architects, engineers and planners in designing and developing buildings, urban complexes, and related systems. It includes instruction in design testing procedures, building site analysis, model building and computer graphics, structural systems testing, analysis of prototype mechanical and interior systems, report preparation, basic construction and structural design, architectural rendering, architectural-aided drafting (CAD), layout and designs, architectural blueprint interpretation, building materials, and basic structural wiring diagramming.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210223** Civil Engineering
- **210141** Building Construction Technologies

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **460201** Introduction to Construction Technology
- **460218** Construction Forms
- **460214** Site Layout and Foundations

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Welding Engineer CIP 15.0614.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. Welding Engineers design and develop metal components for products for the pipeline, automotive, boiler-making, shipbuilding, aircraft and mobile home industries. Welding Engineers must know about cutting processes and gas metal arc welding procedures to develop these industrial processes efficiently.

BEST PRACTICE COURSES

Choose (2) two credits from the following:

- **210221** Engineering I
- **210222** Engineering II
- **210138** Technical Design I
- **210108** Technical Design II

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **480505** Blueprint Reading for Welding
- **480501** Cutting Processes and Lab
- **480522** Gas Metal Arc Welding and Lab
- **480521** Shielded Metal Arc Welding (SMAW) and Lab

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Wood Manufacturing Engineering CIP 03.0509.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. Wood Manufacturing Engineers design and create interior cabinets and wood products for homes and businesses. Wood Manufacturing Engineers consult with clients and cabinetmakers to cut, shape wood, prepare surfaces, and form a completed product.

BEST PRACTICE COURSES
Complete (2) two credits:

- **210221** Engineering I
- **210225** Manufacturing Engineering

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **480731** Cabinet Making Technology
- **480725** CAD for Wood Technology
- **480721** Furniture Technology
- **480716** Lumber Grading and Drying
- **480740** Wood Product Manufacturing
- **480733** Advanced Wood Processing

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FAMILY AND CONSUMER SCIENCES

FAMILY AND CONSUMER SCIENCES EDUCATION CAREER PATHWAYS

Consumer and Family Services CIP 19.0403.00

Consumer and Family Services TRACK Youth Apprenticeship CIP 19.0403.99

Culinary and Food Services CIP 12.0500.00

Culinary and Food Services TRACK Youth Apprenticeship CIP 12.0500.99

Early Childhood Education CIP 13.1210.00

Early Childhood Education TRACK Youth Apprenticeship CIP 13.1210.99

Fashion and Interior Design CIP 50.0407.00

Food Science and Dietetics CIP 51.3199.00

Fundamentals of Teaching CIP 13.1308.00

Hospitality, Travel, Tourism and Recreation CIP 52.1910.00

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Family and Consumer Sciences Education - Kentucky Department of Education

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Consumer and Family Services CIP 19.0403.00

The Consumer and Family Services pathway helps students develop knowledge and skills that span a broad range of Family and Consumer Sciences content areas and are central to career areas involving human services, consumer services, consumer protection, advising, education and training, and social and community services.

BEST PRACTICE COURSES
Choose (4) credits from the following:

- **200113** FCS Essentials **OR** **200161** FCS Essentials Health (.5 credit)
- **201010** Money Skills **OR** **201011** Financial Literacy for Mathematics **OR** **201015** Consumer Economics within Social Studies
- **200171** Relationships (.5 or 1 credit)
- **200226** Middle to Late Lifespan Development (.5 or 1 credit)
- **200441** Foods and Nutrition
- **200173** Parenting (.5 or 1 credit)
- **200191** Co-op*: Consumer and Family Services
- **200192** Internship: Consumer and Family Services

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Consumer and Family Services TRACK Youth Apprenticeship CIP 19.0403.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Culinary and Food Services CIP 12.0500.00

The Culinary and Food Service Pathway addresses a skill set necessary for success in the culinary and food service industries. The courses in this pathway will help students develop skills in early career ladder positions and promote continuing education at the postsecondary level, preparing for careers associated with restaurants, institutional food service, hospitality, catering, and food and beverage operations.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **200441** Foods and Nutrition
- **200442** Advanced Foods and Nutrition (.5 or 1 credit)
- **200411** Culinary Arts I
- **200412** Culinary Arts II
- **200113** FCS Essentials **OR** **200161** FCS Essentials Health (.5 credit)
- **200409** Co-op*: Culinary Arts
- **200478** Internship: Culinary Arts

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Culinary and Food Services TRACK Youth Apprenticeship CIP 12.0500.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

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BEST PRACTICE COURSES
Choose (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Early Childhood Education CIP 13.1210.00

The Early Childhood Education pathway will address a skill set necessary for success in early childhood education so that individuals can teach students from infancy through eight years (grade three), depending on the school system or state regulations. This pathway is targeted at individuals preparing for careers related to early childhood education, such as those associated with childcare, teaching, community-based children's programs, social services or counseling for children, and after-school programs.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **200223** Early Lifespan Development
- **200261** Child Development Services I
- **200262** Child Development Services II
- **200113** FCS Essentials **OR** **200161** FCS Essentials Health (.5 credit)
- **331020** Principles of Teaching
- **200171** Relationships (.5 or 1 credit)
- **200173** Parenting (.5 or 1 credit)
- **200210** Co-op*: Early Childhood Education
- **200201** Internship: Early Childhood Education

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Early Childhood Education TRACK Youth Apprenticeship CIP 13.1210.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Choose (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Fashion and Interior Design CIP 50.0407.00

The Fashion and Interior Design pathway will address a skill set necessary for success in the fashion industry and a career in the residential housing and furnishings industry. This pathway targets individuals interested in pursuing careers in the following areas: retail and wholesale buying, apparel and textile development and production, fashion and textile design, and visual merchandising, as well as public and private sector housing programs, residential property and facility management, real estate, retail home furnishings, or home decorating and staging.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **200113** FCS Essentials
- **200821** Fashion and Interior Design I
- **200825** Fashion and Interior Design II
- **200826** Fashion and Interior Design III
- **201010** Money Skills **OR** **201011** Financial Literacy for Mathematics
- **200810** Co-op*: Fashion and Interior Design
- **200801** Internship: Fashion and Interior Design

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Food Science and Dietetics CIP 51.3199.00

The Food Science and Dietetics pathway addresses competencies and a skill set necessary for success as a pre-professional in a career focusing on food science. It will facilitate employment in early career ladder positions and promote continuing education at the postsecondary level in career areas involving food science, food safety, food quality, food technology, or food preservation and packaging.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **200441** Foods and Nutrition
- **200442** Advanced Foods and Nutrition (.5 or 1 credit)
- **200415** Nutritional Food Science **OR** **200416** Nutritional Food Science (Interdisciplinary)
- **200414** Fundamentals of Dietetics
- **200113** FCS Essentials **OR** **200161** FCS Essentials Health (.5 credit)
- **010702** Food Science and Technology
- **200491** Co-op*: Food Science and Dietetics
- **200492** Internship: Food Science and Dietetics

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Fundamentals of Teaching CIP 13.1308.00

The Fundamentals of Teaching pathway will facilitate employment in early career ladder positions and promote continuing education at the postsecondary level, preparing for careers associated with education and training in public and private school programs, elementary, middle, and secondary schools, after-school programs, higher education, nonprofit, and corporate settings.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **200223** Early Lifespan Development
- **200226** Middle to Late Lifespan Development (.5 or 1 credit)
- **331020** Principles of Teaching
- **200199** FCS Leaders at Work
- **200113** FCS Essentials
- **200171** Relationships (.5 or 1 credit)
- **200291** Co-op*: Fundamentals of Teaching
- **200292** Internship: Fundamentals of Teaching

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Hospitality, Travel, Tourism and Recreation CIP 52.1910.00

The Hospitality, Travel, Tourism and Recreation career pathway prepares individuals to provide services in the hospitality and leisure fields. Includes instruction in hospitality operations, customer sales, marketing techniques, assistance operations and techniques, essential office management, sports, recreation and equipment management, and food and beverage services. The Hospitality, Travel, Tourism and Recreation career pathway is a hybrid pathway that consists of courses within Family and Consumer Sciences Education and Marketing Education. It blends two program areas to help students explore technical skills in the industry.

BEST PRACTICE COURSES
Choose (3) three credits from the following:

- **080910** Principles of Hospitality **OR 200610** Principles of Hospitality
- **080716** Marketing Principles
- **200641** Specialized Services in Hospitality
- **080717** Marketing Applications
- **080911** Travel and Tourism Marketing
- **200442** Advanced Foods and Nutrition

Choose (1) one credit from the following:

- **080310** Principles of Entrepreneurship
- **200441** Foods and Nutrition **OR 200113** FCS Essentials
- **200601** Internship: Hospitality, Travel, Tourism and Recreation
- **200690** Co-op*: Hospitality, Travel, Tourism and Recreation
- **080708** Marketing Education Internship
- **080707** Marketing Education Co-op*
- **081121** Sports and Event Marketing
- **060109** Ethical Leadership

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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HEALTH SCIENCE

HEALTH SCIENCE CAREER PATHWAYS

Allied Health CIP 51.0000.01

Biomedical Sciences CIP 26.0102.00

Clinical Medical Assisting CIP 51.0801.00

Dental Assisting CIP 51.0601.01

EKG Technology/Technician CIP 51.0902.01

Emergency Medical Technology/Technician CIP 51.0904.01

Healthcare TRACK Youth Apprenticeship CIP 51.9900.99

Medical Administrative Assisting CIP 51.0710.00

Patient Care Technician CIP 51.1614.00

Pharmacy Technician CIP 51.0805.01

Phlebotomy Technician CIP 51.1009.01

Pre-Nursing CIP 51.2699.01

Veterinary Assistant CIP 51.0808.00

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Health Science Education - Kentucky Department of Education

Quick Navigation Page

Allied Health CIP 51.0000.01

This pathway is a general, introductory, undifferentiated, or joint pathway in health services occupations that prepares individuals for either entry into specialized training programs or various concentrations in the allied health area. Includes instruction in the basic sciences, research and clinical procedures, and aspects of the subject matter related to various health occupations.

BEST PRACTICE COURSES
Choose (3) three credits:

- **170111** Principles of Health Science
- **170141** Emergency Procedures (.5 credit) **AND** **170131** Medical Terminology (.5 or 1 credit)
- **170501** Allied Health Core Skills

Choose (1) one credit from the following:

- **170167** Body Structures and Functions **OR** **302631** Anatomy (Science course)
- **170143** Introduction to Public Health
- **170169** Medical Math (.5 or 1 credit)
- **170503** Co-op* (Allied Health)
- **170550** Internship: Allied Health
- **170908** Introduction to Behavioral Health

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

Biomedical Sciences CIP 26.0102.00

This pathway focuses on the integrative scientific study of biological issues related to health and medicine or a program in one or more of the biomedical sciences that is undifferentiated as to the title. Includes instruction in any basic medical sciences at the research level, biological science research in biomedical facilities, and general studies encompassing various biomedical disciplines.

BEST PRACTICE COURSES
Complete (4) four credits:

- **170701** Principles of Biomedical Science
- **170702** Human Body Systems
- **170703** Medical Interventions
- **170704** Biomedical Innovations
- **170708** Internship: Biomedical Science

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Clinical Medical Assisting CIP 51.0801.00

Under physicians' supervision, this pathway prepares individuals to provide medical office administrative services and perform clinical duties, including patient intake and care, routine diagnostic and recording procedures, pre-examination and examination assistance, and administering medications and first aid. Includes instruction in basic anatomy and physiology; medical terminology; medical law and ethics; patient psychology and communications; medical office procedures; and clinical diagnostic, examination, testing, and treatment procedures.

BEST PRACTICE COURSES
Choose (4) four credits:

- **170111** Principles of Health Science
- **170141** Emergency Procedures (.5 credit) **AND** **170131** Medical Terminology (.5 or 1 credit)
- **170169** Medical Math (.5 or 1 credit)
- **170580** Medical Assisting Clinical Procedures
- **170581** Co-op*: Medical Assisting
- **170582** Internship: Medical Assisting

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Dental Assisting CIP 51.0601.01

This pathway prepares individuals to provide patient care, take dental radiographs (x-ray photographs), prepare patients and equipment for dental procedures, and discharge office administrative functions under the supervision of dentists and dental hygienists. It includes instruction in medical recordkeeping, general office duties, reception and patient intake, scheduling, equipment maintenance and sterilization, basic radiography, pre- and post-operative patient care and instruction, chairside assisting, taking tooth and mouth impressions, and supervised practice.

BEST PRACTICE COURSES
Choose (3) three credits:

- **170111** Principles of Health Science
- **170141** Emergency Procedures (.5 credit) **AND** **170131** Medical Terminology (.5 or 1 credit)
- **170552** Internship: Dental Assistant

Choose (1) one credit from the following:

- **170167** Body Structures and Functions **OR** **302631** Anatomy
- **170169** Medical Math (.5 or 1 credit)
- **170501** Allied Health Core Skills

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EKG Technology/Technician CIP 51.0902.01

This pathway prepares individuals, under the supervision of physicians and nurses, to administer EKG (Electrocardiogram) and ECG (Electrocardiogram) diagnostic examinations and report results to the treatment team. Includes instruction in basic anatomy and physiology, the cardiovascular system, medical terminology, cardiovascular medications and effects, patient care, EKG (Electrocardiogram) and ECG (Electrocardiogram) administration, equipment operation and maintenance, interpretation of cardiac rhythm, patient record management, and professional standards and ethics.

BEST PRACTICE COURSES
Choose (3) three credits:

- **170111** Principles of Health Science
- **170141** Emergency Procedures (.5 credit) **AND** **170131** Medical Terminology (.5 or 1 credit)
- **170555** EKG Technician

Choose (1) credit from the following:

- **170167** Body Structures and Functions **OR** **302631** Anatomy
- **170169** Medical Math (.5 or 1 credit)
- **170549** Internship: EKG

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Emergency Medical Technology/Technician CIP 51.0904.01

This pathway prepares individuals, under the remote supervision of physicians, to recognize, assess, and manage medical emergencies in prehospital settings and to supervise ambulance personnel. Includes instruction in introductory, intermediate, and advanced EMT procedures; emergency surgical procedures; medical triage; rescue operations; crisis scene management and personnel supervision; equipment operation and maintenance; patient stabilization, monitoring, and care; drug administration; identification and preliminary diagnosis of diseases and injuries; communication and computer operations; basic anatomy, physiology, pathology, and toxicology; and professional standards and regulations.

This pathway requires an agreement with the Kentucky Board of Emergency Medical Services.

BEST PRACTICE COURSES
Choose (4) four credits:

- **170111** Principles of Health Science
- **170141** Emergency Procedures (.5 credit) **AND** **170131** Medical Terminology (.5 or 1 credit)
- **461022** Emergency Medical Technician (EMT)
- **461023** EMS Training

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Healthcare TRACK Youth Apprenticeship CIP 51.9900.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Medical Administrative Assisting CIP 51.0710.00

This pathway prepares individuals, under the supervision of office managers and other professionals, to perform routine administrative duties in a medical, clinical, or health care facility/system office environment. Includes instruction in general office skills, data processing, office equipment operation, principles of medical record-keeping and business regulations, medical/clinical office procedures, and communications skills.

BEST PRACTICE COURSES
Complete (4) four credits:

- **170111** Principles of Health Science
- **170141** Emergency Procedures (.5 credit) **AND** **170131** Medical Terminology (.5 or 1 credit)
- **170920** Medical Office Procedures
- **170922** Internship: Medical Administrative Assistant

Choose (1) one credit from the following:

- **170169** Medical Math (.5 or 1 credit) or **170199** Leadership Dynamics

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Patient Care Technician CIP 51.1614.00

This pathway prepares individuals for admission to a professional program in nursing. This pathway focuses on caring for patients in an acute care setting.

BEST PRACTICE COURSES
Complete (3) three credits:

- **170111** Principles of Health Science
- **170141** Emergency Procedures (.5 credit) **AND** **170131** Medical Terminology (.5 or 1 credit)
- **170502** Acute Care Basic Skills

Choose (1) one credit from the following:

- **170167** Body Structures and Functions **OR** **302631** Anatomy (Science course)
- **170169** Medical Math (.5 or 1 credit)
- **170505** Co-op* (Patient Care Technician)
- **170504** Internship: Patient Care Technician
- **170908** Introduction to Behavioral Health

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Pharmacy Technician CIP 51.0805.01

Under pharmacists' supervision, this pathway prepares individuals to prepare medications, provide patients with related assistance, and manage pharmacy clinical and business operations. Includes instruction in medical and pharmaceutical terminology, principles of pharmacology and pharmaceutics, drug identification, pharmacy laboratory procedures, prescription interpretation, patient communication and education, safety procedures, record-keeping, measurement and testing techniques, pharmacy business operations, prescription preparation, logistics and dispensing operations, and applicable standards and regulations.

BEST PRACTICE COURSES
Complete (3) credits:

- **170111** Principles of Health Science
- **170141** Emergency Procedures (.5 credit) **AND** **170131** Medical Terminology (.5 or 1 credit)
- **170558** Pharmacy Technician

Choose (1) credit from the following:

- **170167** Body Structures and Functions **OR** **302631** Anatomy
- **170169** Medical Math (.5 or 1 credit)
- **170501** Allied Health Core Skills
- **170614** Pharmacological and Other Therapeutic Modalities
- **170561** Co-op* (Pharmacy Technician)
- **170562** Internship: Pharmacy Technician

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Phlebotomy Technician CIP 51.1009.01

This pathway prepares individuals, under the supervision of health care professionals, to draw blood samples from patients using a variety of intrusive procedures. Includes instruction in basic vascular anatomy and physiology, blood physiology, skin puncture techniques, venipuncture, venous specimen collection and handling, safety and sanitation procedures, and applicable standards and regulations.

BEST PRACTICE COURSES
Complete (3) three credits:

- **170111** Principles of Health Science
- **170141** Emergency Procedures (.5 credit) **AND** **170131** Medical Terminology (.5 or 1 credit)
- **170567** Medical Laboratory Aide (Phlebotomist)

Choose (1) one credit from the following:

- **170167** Body Structures and Functions **OR** **302631** Anatomy
- **170169** Medical Math (.5 or 1 credit)
- **170501** Allied Health Core Skills
- **170570** Internship: Phlebotomy Technician

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Pre-Nursing CIP 51.2699.01

This pathway prepares individuals for admission to a professional program in nursing. This pathway focuses on caring for residents in a long-term care facility.

BEST PRACTICE COURSES
Complete (3) three credits:

- **170111** Principles of Health Science
- **170141** Emergency Procedures (.5 credit) **AND** **170131** Medical Terminology (.5 or 1 credit)
- **170631** Medicaid Nurse Aide

Choose (1) one credit from the following:

- **170167** Body Structures and Functions **OR** **302631** Anatomy (Science course)
- **170169** Medical Math (.5 or 1 credit)
- **170601** Co-op* (Nursing)
- **170603** Internship: Pre-Nursing
- **170908** Introduction to Behavioral Health

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Veterinary Assistant CIP 51.0808.00

Under the supervision of veterinarians, veterinary technicians, laboratory animal specialists, and zoological professionals, this pathway prepares individuals to provide patient management, care, clinical procedures assistance, and owner communication. Includes instruction in animal nursing care, animal health and nutrition, animal handling, clinical pathology, radiology, surgical assisting, clinical laboratory procedures, office administration skills, patient and owner management, and applicable standards and regulations.

This program follows National Association of Veterinary Technicians in America (NAVTA) guidelines and offers students the opportunity for national certification as an approved Veterinary Assistant.

BEST PRACTICE COURSES
Complete (4) four credits:

- **170801** Principles of Veterinary Assisting
- **170802** Veterinary Assisting Skills
- **170803** Advanced Veterinary Assisting Skills
- **170804** Veterinary Assisting Internship
- **170880** Veterinary Medical Terminology

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JROTC / LAW AND PUBLIC SAFETY

JROTC CAREER PATHWAYS

U.S. Air Force JROTC CIP 28.0101.00
U.S. Army JROTC CIP 28.0301.00
U.S. Marine Corps JROTC CIP 28.0401.02
U.S. Navy JROTC CIP 28.0401.01
Course specific documents are available at the Kentucky Department of Education Program Area Page: JROTC - Kentucky Department of Education

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U.S. Air Force JROTC CIP 28.0101.00

This pathway introduces students to the theory and principles of aerospace science and leadership education. Air Force JROTC provides education in aviation history, the science of flight, cultural and world studies, space exploration, and management principles. Air Force JROTC engages students in practicing civic responsibility, communication, critical thinking, teamwork, health and wellness, financial literacy, and exploring career opportunities. Air Force JROTC provides STEM and leadership elective opportunities to reinforce learning outcomes. Programs are offered as adjuncts to regular high school instructional programs.

BEST PRACTICE COURSES
Complete (4) four credits:

- **580134** U.S. Air Force JROTC 1
- **580135** U.S. Air Force JROTC 2
- **580136** U.S. Air Force JROTC 3
- **580137** U.S. Air Force JROTC 4

Upon completion of a pathway, additional coursework to enhance student learning is encouraged. Credits earned in advanced or complementary courses "Beyond the Pathway" cannot be substituted for pathway courses to achieve concentrator or completer status.

- **580100** U.S. Air Force Drill and Ceremonies (.5 credit)
- **580101** U.S. Air Force Wellness (.5 credit)
- **580138** U.S. Air Force Honors Senior Project
- **580102** U.S. Air Force Aviation Honors Ground School (AHGS)

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U.S. Army JROTC CIP 28.0301.00

Army JROTC is a four-year sequence of courses in the Army Junior Reserve Officers' Training Corps (JROTC) high school program. This pathway's design focuses on developing better citizens by building skills in leadership, personal growth and behaviors, citizenship, decision-making, health and fitness, first aid, team building, service learning, and geography, all within a student-centered learning environment. It prepares high school students through Leadership, Education and Training (LET) for responsible leadership roles while making them aware of their rights, responsibilities, and privileges as American citizens. The program is a stimulus for promoting college and career readiness, and it provides instruction and rewarding opportunities that will benefit the student, community, and nation.

The Army JROTC program cooperates between the Army and the host school.

The Leadership Education Curriculum focuses on the development of cadet leadership skills, which are directly linked to the NOCTI *Leadership and Employability Skills* credential, earning students three college credits upon successful completion; covered topics include civic duty and citizenship, ethical behavior, sound values, good moral judgment, and U.S. National government.

BEST PRACTICE COURSES
Complete (3) three credits:

- **580240** U.S. Army JROTC LET 1
- **580241** U.S. Army JROTC LET 2
- **580242** U.S. Army JROTC LET 3

Choose (1) one credit from the following:

- **580243** U.S. Army JROTC LET 4 **OR** **580244** U.S. Army JROTC Leadership

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U.S. Marine Corps JROTC CIP 28.0401.02

This pathway introduces students to the theory and practice of naval science and life in the U.S. Marine Corps. It prepares them for cadet status (Junior ROTC or JROTC) or service as commissioned reserve or active-duty officers (Senior NROTC or ROTC). Programs are offered as adjuncts to regular high school or college instructional programs.

BEST PRACTICE COURSES
Complete (3) three credits:

- **580320** U.S. Marine Corps JROTC 1
- **580321** U.S. Marine Corps JROTC 2
- **580322** U.S. Marine Corps JROTC 3

Choose (1) one credit from the following:

- **580323** U.S. Marine Corps JROTC 4 **OR** **580324** U.S. Marine Corps JROTC Leadership

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U.S. Navy JROTC CIP 28.0401.01

This pathway introduces students to the theory and practice of naval science and life in the U.S. Navy. It prepares them for cadet status (Junior ROTC or JROTC) or service as commissioned reserve or active-duty officers (Senior NROTC or ROTC). Programs are offered as adjuncts to regular high school instructional programs.

BEST PRACTICE COURSES
Complete (3) three credits:

- **580310** U.S. Navy JROTC 1
- **580311** U.S. Navy JROTC 2
- **580312** U.S. Navy JROTC 3

Choose (1) one credit from the following:

- **580313** U.S. Navy JROTC 4 **OR** **580314** U.S. Navy JROTC Leadership

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LAW AND PUBLIC SAFETY CAREER PATHWAYS

Fire Science/Firefighting CIP 43.0203.00

Law Enforcement Services CIP 43.0107.00

Pre-Law Studies CIP 22.0001.00

Law and Public Safety TRACK Youth Apprenticeship CIP 43.9999.99

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Law and Public Safety - Kentucky Department of Education

Quick Navigation Page

Fire Science/Firefighting CIP 43.0203.00

Upon completing the fire science pathway, students will possess knowledge and skills to increase employability/advancement in the fire service. Topics and subjects covered are related to many job performance requirements found in NFPA 1001, Standard for Firefighter Professional Qualifications, Firefighter I level and NFPA 1072; Hazardous Materials Response Personnel Professional Qualifications, Awareness and Operations Levels. Basic First Aid, CPR, and proper utilization of an AED will also be covered in the scope of this pathway.

BEST PRACTICE COURSES
Complete (4) four credits:

- **461032** Basic Firefighting I / Introduction to Patient Care
- **461034** Basic Firefighting II / Hazardous Materials Awareness
- **461031** Basic Firefighting III / Hazardous Materials Operations
- **461036** Basic Firefighting IV
- **461063** Co-op*: Fire Service **OR** **461068** Internship: Fire Service

Upon completion of a pathway, additional coursework to enhance student learning is encouraged. Credits earned in Advanced or Complementary Coursework “Beyond the Pathway” may not be substituted for pathway courses to achieve Concentrator or Completer status.

- **461024** Emergency Medical Responder
- **461069** Special Topics: Fire Science

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Law Enforcement Services CIP 43.0107.00

Students participating in this pathway will learn the basics of our criminal justice system. They will explore our U.S. Constitution and see how it protects citizens and guides law enforcement. Students will also have opportunities to learn crime scene processing, apply criminal law, lead an investigation, dispatch service calls, provide primary emergency medical care and respond to disasters. Students are prepared for careers in law, law enforcement, homeland security, corrections, federal agencies, investigations, forensics, emergency services and similar fields.

BEST PRACTICE COURSES
Complete (2) two credits from the following:

- **461044** Foundations of Justice and Public Safety
- **461045** Law Enforcement

Choose (2) two credits from the following:

- **461043** Criminal Investigation and Forensics
- **461053** Constitutional and Criminal Law
- **461030** Emergency Management and Homeland Security
- **461037** Detention and Corrections
- **461011** Basic Telecommunications
- **461094** Internship: Public Services/Protective Services **OR** **461096** Co-op*: Public Services/Protective Services

Upon completion of a pathway, additional coursework to enhance student learning is encouraged. Credits earned in Advanced or Complementary Coursework “Beyond the Pathway” may not be substituted for pathway courses to achieve Concentrator or Completer status.

- **461099** Special Topics: Public Services/Protective Services

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Pre-Law Studies CIP 22.0001.00

Students will obtain skills in preparation for legal careers in private law firms, public law offices, courtrooms, mediation, and businesses. Instruction will cover legal vocabulary and writing, ethics, crimes, constitutional rights, the trial process, legal standards in investigations, effective and persuasive communication (oral and written), case and trial preparation, and the state and federal court systems.

BEST PRACTICE COURSES

Complete (4) four credits from the following:

- **461051** Introduction to Legal Studies
- **461020** Criminal Law
- **461019** Civil Law
- **461025** Advanced Constitutional and Criminal Law
- **461095** Internship: Pre-Law **OR** **461097** Co-op[*]: Pre-Law

Upon completion of a pathway, additional coursework to enhance student learning is encouraged. Credits earned in Advanced or Complementary Coursework “Beyond the Pathway” may not be substituted for pathway courses to achieve Concentrator or Completer status.

- **461052** Trial Advocacy
- **461098** Special Topics: Pre-Law

[*] Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Law and Public Safety TRACK Youth Apprenticeship CIP 43.9999.99

The Tech Ready Apprentices for Careers in Kentucky or TRACK Youth Apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education (OCTE) and the Kentucky Division of Apprenticeship to provide secondary students career pathway opportunities with employers offering Registered Apprenticeship programs. All hours worked can be counted towards the Registered Apprenticeship on-the-job training component and the CTE courses can be credited towards the Related Technical Instruction component. Click for more information about Registered Apprenticeship.

The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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MANUFACTURING TECHNOLOGY

COMPUTER-AIDED DESIGN (CAD) CAREER PATHWAYS

COMPUTERIZED MANUFACTURING AND MACHINING CAREER PATHWAYS

INDUSTRIAL MAINTENANCE TECHNOLOGY CAREER PATHWAYS

MANUFACTURING HYBRID CAREER PATHWAYS

METAL FABRICATION CAREER PATHWAYS

WELDING TECHNOLOGY CAREER PATHWAYS

WOOD MANUFACTURING CAREER PATHWAYS

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Manufacturing Technology - Kentucky Department of Education

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COMPUTER-AIDED DESIGN (CAD) CAREER PATHWAYS

Architectural Technology CIP 15.1301.03

Civil Designer CIP 15.1301.01

Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

Mechanical Designer CIP 15.1301.02

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Architectural Technology CIP 15.1301.03

Architectural technology utilizes mathematical and scientific principles to draw building layouts, including structural, HVAC, lighting, plumbing and electrical systems, while addressing functionality, safety and economic issues. Architectural drafters must be able to draw designs manually and through computer-aided drafting (CAD). Additional concerns are site considerations and building codes.

BEST PRACTICE COURSES
Complete (3) three credits:

- **480110** Introduction to Computer-Aided Drafting
- **480117** Introduction to Architecture
- **480116** Architectural Design

Choose (1) one credit from the following:

- **480127** Industrial Drafting Processes
- **480113** Engineering Graphics
- **470924** Advanced Dimensioning and Measurement
- **480179** Special Problems (CAD)
- **480112** Intermediate Computer-Aided Drafting
- **480145** Internship (CAD) **OR** **480142** Co-op* I (CAD)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Civil Designer CIP 15.1301.01

Civil Designers apply technical knowledge and skills to develop working drawings and electronic simulations in support of civil engineers, geological engineers, and related professionals. This pathway includes instruction in basic civil engineering principles, geological and seismographic mapping, machine drafting, computer-aided drafting (CAD), pipe drafting, survey interpretation, and blueprint reading.

BEST PRACTICE COURSES
Complete (3) three credits:

- **480110** Introduction to Computer-Aided Drafting
- **480112** Intermediate Computer-Aided Drafting
- **480104** Introduction to Surveying (For CAD) (.5-1 credit) **OR** **480113** Engineering Graphics

Choose (1) one credit from the following:

- **480127** Industrial Drafting Processes
- **480136** Parametric Modeling
- **480145** Internship (CAD)
- **480135** Mechanical Design
- **480142** Co-op* I (CAD)
- **480179** Special Problems (CAD)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

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The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

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Mechanical Designer CIP 15.1301.02

Mechanical designers have a working knowledge of mechanical parts and computer-aided design (CAD) software, such as AutoCAD and SolidWorks. Mechanical designers work with project managers, engineers, and clients to understand the needs and requirements for a new product or mechanical system. Once materials and specifications have been determined, designers begin using CAD software to plan and develop models.

BEST PRACTICE COURSES
Complete (3) three credits:

- **480110** Introduction to Computer-Aided Drafting
- **480136** Parametric Modeling
- **480113** Engineering Graphics

Choose (1) one credit from the following:

- **480135** Mechanical Design
- **480127** Industrial Drafting Processes
- **470924** Advanced Dimensioning and Measurement
- **480112** Intermediate Computer-Aided Drafting
- **480145** Internship (CAD) **OR** **480142** Co-op* I (CAD)
- **480179** Special Problems (CAD)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

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COMPUTERIZED MANUFACTURING AND MACHINING CAREER PATHWAYS

Computer Numerical Control (CNC) Operator CIP 48.0503.04

Machinist Operator CIP 48.0503.02

Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

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Computer Numerical Control (CNC) Operator CIP 48.0503.04

CNC operators monitor and operate CNC (computer numerically controlled) machines to cut metal and plastic parts for the manufacturing industry. They select and download CNC programs and perform test operations to ensure the product is made to specifications. The CNC operator may select and set all tools required to produce the final precision part to customer specifications.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **470913** Fundamentals of Machine Tools-A
- **470914** Fundamentals of Machine Tools-B
- **470915** Manual Programming
- **470925** CAD/CAM/CNC
- **470921** Blueprint Reading for Machinists
- **480110** Introduction to Computer-Aided Drafting
- **470924** Advanced Dimensioning and Measurement
- **470927** Conversational Editing and Subroutines
- **480112** Intermediate Computer-Aided Drafting
- **470926** Introduction to Conversational Programming
- **470929** Co-op* (Machine Tool) **OR 470932** Internship (Machine Tool)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

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Machinist Operator CIP 48.0503.02

Machine operators are responsible for producing precision machined parts. They measure parts with precision tools to ensure certain parts meet pre-determined quality and cosmetic standards. When parts have passed inspection, the parts go on to the next production phase. Machine operators are expected to meet production quotas. The level of documentation required varies, depending on the degree of precision needed for the finished product. Machine operators also need to keep track of the number of units that are scrapped due to various errors.

BEST PRACTICE COURSES
Complete (2) two credits:

- **470913** Fundamentals of Machine Tools – A
- **470914** Fundamentals of Machine Tools – B

Choose (2) two credits from the following:

- **470921** Blueprint Reading for Machinists
- **470911** Applied Machining I
- **470912** Applied Machining II
- **470915** Manual Programming
- **480110** Introduction to Computer-Aided Drafting
- **470922** Mechanical Blueprint Reading (.5 credit)
- **470928** Metrology/Control Charts (.5 credit)
- **470929** Co-op* (Machine Tool) **OR 470932** Internship (Machine Tool)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

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Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

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BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

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INDUSTRIAL MAINTENANCE TECHNOLOGY CAREER PATHWAYS

Electrical Technician CIP 47.0303.02

Maintenance Machinist CIP 47.0303.03

Maintenance Mechanic CIP 47.0303.01

Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

Welding Maintenance Technician CIP 47.0303.06

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Electrical Technician CIP 47.0303.02

Electrical technicians apply electrical theory and related knowledge to diagnose and modify developmental or operational electrical machinery, electrical control equipment, and circuitry in industrial or commercial plants and laboratories. They assemble and test experimental motor-control devices, switch panels, transformers, generator windings, solenoids, and other electrical equipment and components according to engineering data and knowledge of electrical principles.

BEST PRACTICE COURSES
Complete (3) three credits:

- **470322** Industrial Maintenance Electrical Principles
- **470348** Industrial Maintenance Electrical Motor Controls
- **470330** Industrial Maintenance of PLC's

Choose (1) one credit from the following:

- **499925** Basic Troubleshooting (.5 credit)
- **470301** Shop Management (.5 credit)
- **499920** Basic Blueprint Reading (.5 credit)
- **470321** Fluid Power
- **470328** Welding for Maintenance
- **470318** Maintaining Industrial Equipment
- **470351** Robotics and Automation (For Maintenance)
- **470308** Internship (Ind Maint) **OR** **470305** Co-op* I (Ind Maint)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Maintenance Machinist CIP 47.0303.03

Maintenance machinists set up and operate various machine tools and fit and assemble parts to fabricate or repair machine tools and maintain industrial machines, applying knowledge of mechanics, shop mathematics, metal properties, layout, and machining procedures. They observe, listen to and diagnose operating machinery or equipment to correct machine malfunction and determine the need for adjustment or repair.

BEST PRACTICE COURSES
Complete (3) three credits:

- **470921** Blueprint Reading for Machinists
- **470313** Fundamentals of Machine Tools – A (For Maintenance) (.5 - 1 credit)
- **470314** Fundamentals of Machine Tools – B (For Maintenance) (.5 - 1 credit)

Choose (1) one credit from the following:

- **470360** Applied Machining I (for Industrial Maint.)
- **470301** Shop Management (.5 credit)
- **499925** Basic Troubleshooting (.5 credit)
- **499920** Basic Blueprint Reading (.5 credit)
- **470318** Maintaining Industrial Equipment
- **470328** Welding for Maintenance
- **470322** Industrial Maintenance Electrical Principles
- **470308** Internship (Ind Maint) **OR** **470305** Co-op* I (Ind Maint)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

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Maintenance Mechanic CIP 47.0303.01

Maintenance Mechanics perform machine setup, troubleshooting, repairs and preventive maintenance service, including but not limited to mechanical, electrical, pneumatic and hydraulic systems for industrial production and processing machinery and equipment. They read and interpret equipment manuals and work orders to perform required maintenance and service and analyze and inspect equipment, structures, or materials to identify errors, problems or defects.

BEST PRACTICE COURSES
Complete (2) two credits:

- **470322** Industrial Maintenance Electrical Principles
- **470318** Maintaining Industrial Equipment

Choose (2) two credits from the following:

- **470321** Fluid Power
- **470348** Industrial Maintenance Electrical Motor Controls
- **470330** Industrial Maintenance of PLCs (Programmable Logic Controllers)
- **499925** Basic Troubleshooting (.5 credit)
- **470301** Shop Management (.5 credit)
- **499920** Basic Blueprint Reading (.5 credit)
- **470351** Robotics and Automation (For Maintenance)
- **470328** Welding for Maintenance
- **470313** Fundamentals of Machine Tools – A (For Maintenance) (.5 – 1 credit)
- **470316** Advanced Hydraulic Systems
- **470326** Advanced Pneumatic Systems
- **470360** Applied Machining I (for Industrial Maint.)
- **470361** Cooling and Dehumidification (for Industrial Maint.)
- **470358** Electrical Components (Ind. Maint.)
- **470314** Fundamentals of Machine Tools – B (For Maintenance)
- **470363** Heating and Humidification (for Industrial Maint.)
- **470365** HVAC Electricity (for Industrial Maint.)
- **470349** Refrigeration Fundamentals (For Maintenance)
- **470308** Internship (Ind Maint) **OR** **470305** Co-op* I (Ind Maint)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

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Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

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BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

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Welding Maintenance Technician CIP 47.0303.06

Welding Maintenance Technicians layout, fabricate, set up and weld metals in all positions. Welding Technicians must operate all types of welding equipment, apply safety first, and comply with all OSHA guidelines and regulations. They read blueprints, apply mechanical skills, calculate shop mathematics and know the metal properties to perform welding procedures to meet industry specifications. Additional skills that enhance employability opportunities are diagnosing operating machinery or equipment to correct machine malfunction and determine the need for adjustment or repair.

BEST PRACTICE COURSES
Complete (3) three credits:

- **470328** Welding for Maintenance
- **470354** Shielded Metal Arc Welding (For Maintenance)
- **470367** Gas Metal Arc Welding and Lab (Ind. Maint.)

Choose (1) one credit from the following:

- **499925** Basic Troubleshooting (.5 credit)
- **470322** Industrial Maintenance Electrical Principles
- **470318** Maintaining Industrial Equipment
- **470313** Fundamentals of Machine Tools – A (For Maintenance)
- **499920** Basic Blueprint Reading (.5 credit)
- **470301** Shop Management (.5 credit)
- **470308** Internship (Ind Maint) **OR** **470305** Co-op* I (Ind Maint)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

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MANUFACTURING HYBRID CAREER PATHWAYS

Additive Manufacturing CIP 15.1307.00

Computerized Manufacturing and Machining (CMM) Engineering CIP 48.0510.00

Design Engineering CIP 15.1304.00

Fabrication Engineering CIP 14.1901.00

Industrial Maintenance Engineering CIP 14.4101.00

Welding Engineering CIP 15.0614.00

Wood Manufacturing Engineering CIP 03.0509.00

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Additive Manufacturing CIP 15.1307.00

A program that prepares individuals to apply technical knowledge and skills in using three-dimensional (3D) computer technology to create technical illustrations and models used in manufacturing, design, production, and construction. Includes instruction in 3D computer-aided design (CAD), 3D printing, 3D model design and construction, and 3D scanning.

BEST PRACTICE COURSES
Choose (3) three credits:

- **332001** Introduction to 3D Printing Technology
- **332002** Engineering Mechanics for 3D Printing
- **332003** Additive Manufacturing Applications

Choose (1) one credit from the following:

- **210110** Engineering Capstone
- **480179** Special Problems (CAD)
- **110226** Project-Based Programming
- **210331** Engineering Internship
- **210330** Engineering Co-op
- **480142** Co-op* I (CAD)
- **480145** Internship (CAD)
- **110918** Computer Science Co-op
- **110919** Computer Science Internship

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Computerized Manufacturing and Machining (CMM) Engineering CIP 48.0510.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. CMM Engineers design, develop and run programs that direct machines to cut and shape metal or plastic for airplanes, automobiles and other industrial machines. CMM Engineers use blueprints and three-dimensional computer designs to create programs that produce precisely cut products.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210118** Mechanical Engineering
- **210135** Industrial Engineering
- **210225** Manufacturing Engineering

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **470913** Fundamentals of Machine Tools-A
- **470914** Fundamentals of Machine Tools-B
- **470915** Manual Programming

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Design Engineering CIP 15.1304.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. Design Engineers have a working knowledge of mechanical parts and computer-aided design (CAD) software such as AutoCAD, Autodesk Inventor, or Solidworks. Mechanical designers begin a project by meeting with the project manager, engineers, and clients to understand the needs and requirements for a new product or mechanical system. For example, designers working on a project to create an automobile engine may consult engineers regarding which structural materials to use or clients regarding engine efficiency requirements. Once materials and specifications have been determined, designers use CAD (computer-aided design) software to plan and develop models.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210222** Engineering II
- **210138** Technical Design I
- **210108** Technical Design II

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **480110** Introduction to Computer-Aided Drafting
- **480113** Engineering Graphics
- **480135** Mechanical Design
- **480136** Parametric Modeling

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Fabrication Engineering CIP 14.1901.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. Fabrication Engineers design parts to engineering specifications to develop metal parts and interior metal structures. Fabrication Engineers work with Sheet Metal Technicians to develop complex geometrical parts. The Fabrication Engineer directly supports the manufacturing industry in designing, fabricating, modifying and developing metal assemblies, components and sub-assemblies.

BEST PRACTICE COURSES
Complete (2) two credits:

- **210221** Engineering I
- **210222** Engineering II

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **480816** Metal Trade Information and Metals
- **480813** Parallel Line Layout
- **480817** Sheet Metal 1-A
- **480818** Sheet Metal 1-B

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Industrial Maintenance Engineering CIP 14.4101.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. Electrical Engineers apply electrical theory and related knowledge to diagnose and modify developmental or operational electrical machinery, electrical control equipment, and circuitry in industrial or commercial plants and laboratories. Electrical Engineers experiment with motor-control devices, switch panels, transformers, generator windings, solenoids, and other electrical equipment and components according to engineering data and knowledge of electrical principles.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210232** Electrical/Electronics Engineering
- **210230** Mechatronics Engineering
- **210225** Manufacturing Engineering
- **210135** Industrial Engineering

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **470348** Industrial Maintenance Electrical Motor Controls
- **470322** Industrial Maintenance Electrical Principles
- **470330** Industrial Maintenance of PLCs

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Welding Engineering CIP 15.0614.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. Welding Engineers design and develop metal components for products for the pipeline, automotive, boiler-making, shipbuilding, aircraft and mobile home industries. Welding Engineers must know about cutting processes and gas metal arc welding procedures to develop these industrial processes efficiently.

BEST PRACTICE COURSES
Choose (2) two credits from the following:

- **210221** Engineering I
- **210222** Engineering II
- **210138** Technical Design I
- **210108** Technical Design II

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **480505** Blueprint Reading for Welding
- **480501** Cutting Processes and Lab
- **480522** Gas Metal Arc Welding and Lab
- **480521** Shielded Metal Arc Welding (SMAW) and Lab

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Wood Manufacturing Engineering CIP 03.0509.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. Wood Manufacturing Engineers design and create interior cabinets and wood products for homes and businesses. Wood Manufacturing Engineers consult with clients and cabinetmakers to cut, shape wood, prepare surfaces, and form a completed product.

BEST PRACTICE COURSES
Complete (2) two credits:

- **210221** Engineering I
- **210225** Manufacturing Engineering

Choose (2) two credits from the following:

- **332001** Introduction to 3D Printing Technology
- **480731** Cabinet Making Technology
- **480725** CAD for Wood Technology
- **480721** Furniture Technology
- **480716** Lumber Grading and Drying
- **480740** Wood Product Manufacturing
- **480733** Advanced Wood Processing

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METAL FABRICATION CAREER PATHWAYS

Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

Metal Fabrication TRACK Pre-Apprenticeship CIP 48.0506.99

Sheet Metal Technician CIP 48.0506.01

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Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

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BEST PRACTICE COURSES
Complete (4) four credits.

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Metal Fabrication TRACK Pre-Apprenticeship CIP 48.0506.99

The Metal Fabrication TRACK is designed as a pre-apprenticeship pathway for students to have the opportunity to enter a postsecondary Registered Apprenticeship training program after graduation while still potentially earning credit for classes taken that relate to the apprenticeship.

Students must complete the four-course sequence and pass the end-of-program assessment (students can be enrolled in the 4th course to take the assessment) to receive the industry certification. In addition, students must either complete eight KYSAFE eTraining modules (click on the green TRACK tab and complete the 8 pre-selected modules) or attain the OSHA 10 or 30 card. The student is to be enrolled in the pathway in TEDS and adhere to deadlines for TEDS and CTE End of Program (EOP) assessments. Upon completion, the student will receive a pre-apprenticeship industry certification issued by the Kentucky Division of Apprenticeship by submitting a transcript and the Skilled Trades TRACK Completion Form. Participating partners will recognize this certification for an interview and possible credit upon acceptance. Credit is at the discretion of the training organization.

BEST PRACTICE COURSES
Complete (4) four required credits

- **480817** Sheet Metal I-A MTF240
- **480818** Sheet Metal I-B MTF242
- **480819** Sheet Metal II-A MTF270
- **480820** Sheet Metal II-B MTF272

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Sheet Metal Technician CIP 48.0506.01

Sheet metal technicians create parts to the specifications required through line development and fabrication. Sheet metal is measured, and sheet metal patterns are cut and formed for the determined available space. Sheet metal technicians must have strong math skills to develop geometrical parts. The Sheet Metal Technician directly supports manufacturing to design, fabricate, modify, and evaluate parts, assemblies, components and sub-assemblies according to specifications.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **480816** Metal Trade Information and Metals
- **480813** Parallel Line Layout
- **480817** Sheet Metal I-A
- **480818** Sheet Metal I-B
- **480803** Co-op* I (Metal Fab) **OR** **480806** Internship (Metal Fab)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

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WELDING TECHNOLOGY CAREER PATHWAYS

Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

Welding TRACK Pre-Apprenticeship CIP 48.0508.99

Welder-Entry Level CIP 48.0508.01

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Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

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BEST PRACTICE COURSES
Complete (4) four credits.

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Welding TRACK Pre-Apprenticeship CIP 48.0508.99

The Welding TRACK is designed as a pre-apprenticeship pathway for students to have the opportunity to enter a postsecondary Registered Apprenticeship training program after graduation while still potentially earning credit for classes taken that relate to the apprenticeship.

Students must complete the four-course sequence (students can be enrolled in the 4th course to take the assessment) and pass the TRACK end-of-program assessment. In addition, students must either complete eight KYSAFE eTraining modules (click on the green TRACK tab and complete the 8 pre-selected modules) or attain the OSHA 10 or 30 card. The student is to be enrolled in the pathway in TEDS and adhere to deadlines for TEDS and CTE End of Program (EOP) assessments. Upon completion, the student will receive a pre-apprenticeship industry certification issued by the Kentucky Office of Apprenticeship by submitting a transcript and the Skilled Trades TRACK Completion Form. Participating partners will recognize this certification for an interview and possible credit upon acceptance. Credit is at the discretion of the training organization.

Please visit the Welding TRACK website for more information or a list of participating organizations.

BEST PRACTICE COURSES
Complete 4 (four) credits:

- **480501** Cutting Processes and Lab
- **480522** Gas Metal Arc Welding and Lab
- **480521** Shielded Metal Arc Welding (SMAW) and Lab
- **480528** SMAW Groove Welds with Backing Lab

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Welder-Entry Level CIP 48.0508.01

An entry-level welder demonstrates the ability to assist lead welders in fabricating steel and metal structures. Students must perform essential welding functions, calculate dimensions, and operate power equipment, grinders, and other tools. Students must be proficient in reading and interpreting basic blueprints and following work procedure specifications (WPS).

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **480505** Blueprint Reading for Welding (.5 – 1 credit)
- **480524** Basic Welding (.5 – 1 credit)
- **480523** Oxy-fuel Systems (.5 – 1 credit) **OR** **480501** Cutting Processes and Lab (.5 – 1 credit)
- **480521** Shielded Metal Arc Welding (SMAW) and Lab
- **480522** Gas Metal Arc Welding and Lab (.5 – 1 credit)
- **480533** GMAW Groove Lab
- **480528** SMAW Groove Welds with Backing Lab
- **480535** SMAW Open Groove Lab
- **480525** Gas Tungsten Arc Welding and Lab (.5 – 1 credit)
- **480538** Gas Tungsten Pipe Welding Pipe Lab A
- **480530** GTAW Groove Lab
- **480540** GMAW Pipe Lab A
- **480534** GMAW Aluminum Lab (.5 credit)
- **480536** Shielded Metal Arc Welding Pipe Lab A
- **480541** Co-op* I (Welding) **OR** **480544** Internship (Welding)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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WOOD MANUFACTURING CAREER PATHWAYS

Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

Wood Manufacturing CIP 48.0703.02

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Manufacturing TRACK Youth Apprenticeship CIP 48.0500.99

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The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

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Wood Manufacturing CIP 48.0703.02

Cabinet makers are specific types of woodworkers who create and install cabinets in bathrooms, kitchens, and other areas of homes or businesses. Typical duties of cabinet makers include designing custom cabinets, making cabinets, installing cabinetry, consulting with clients and other duties as needed. Cabinet makers are responsible for cutting and shaping wood, preparing surfaces and forming a completed product.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **480719** Technical Drawing and Blueprint Reading (.5 credit)
- **480720** Wood Finishing (.5 credit)
- **480740** Wood Product Manufacturing
- **480731** Cabinet Making Technology
- **480733** Advanced Wood Processing
- **480725** CAD for Wood Technology (.5 credit)
- **480721** Furniture Technology
- **480110** Introduction to Computer-Aided Drafting
- **480716** Lumber Grading and Drying
- **480711** Introduction to Panel Processing
- **480717** Millwork Technology
- **480741** Co-op* I (Wood) **OR** **480744** Internship (Wood)
- **332001** Introduction to 3D Printing Technology
- **210221** Engineering I

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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MEDIA ARTS

MEDIA ARTS CAREER PATHWAYS

Cinematography and Video Production CIP 09.0701.00

Graphic Design CIP 50.0401.00

Interactive Media CIP 10.0304.00

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Media Arts - Kentucky Department of Education

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Cinematography and Video Production CIP 09.0701.00

The Cinematography and Video Production pathway prepares students to communicate dramatic information, ideas, moods, and feelings by making and producing videos and cinematographic expressions. The pathway includes the theory of video, video technology and equipment operation, video production, video directing, video editing, cinematographic art, video and audio technique, and multimedia production. The pathway prepares students to function as staff, producers, directors, and managers of media programming and media organizations. Topics of study in this pathway include writing and editing; performing; media regulations, law, and policy; aesthetic meaning, appreciation, and analysis; construction, development, processing, modeling, simulation, and programming of audio and moving image programs and messages; transmission, distribution, and marketing; contextual, cultural and historical aspects, and considerations.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **480901** Introduction to Media Arts
- **480910** Video Studio Fundamentals
- **480911** Studio Directing and Performance
- **480912** Advanced Studio Production - Moving Images
- **480950** Media Arts Co-op* **OR 480951** Media Arts Internship

Upon completion of a pathway, additional coursework to enhance student learning is encouraged. Credits earned in Advanced or Complementary Coursework “Beyond the Pathway” may not be substituted for pathway courses to achieve Concentrator or Completer status.

- **480924** Special Topics – Cinematography / Video Production

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Graphic Design CIP 50.0401.00

The Graphic Design pathway prepares students to apply skills that focus on the principles and techniques for effectively communicating ideas/information and packaging products to business and consumer audiences both in digital and other formats. Topics of study in this pathway include aesthetic meaning, appreciation, and analysis; construction, development, processing, modeling, simulation and programming of interactive experiences; transmission, distribution and marketing; contextual, cultural and historical aspects and considerations.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **480901** Introduction to Media Arts
- **480920** Two-Dimensional Media Design
- **480921** Digital Imaging
- **480922** Advanced Production Design
- **480950** Media Arts Co-op* **OR 480951** Media Arts Internship

Upon completion of a pathway, additional coursework to enhance student learning is encouraged. Credits earned in Advanced or Complementary Coursework “Beyond the Pathway” may not be substituted for pathway courses to achieve Concentrator or Completer status.

- **480923** Special Topics – Graphic Design

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Interactive Media CIP 10.0304.00

The Interactive Media pathway prepares students to use computer applications and related visual and sound imaging techniques to manipulate images and information originating as video, still photographs, digital copy, soundtracks, and physical objects to communicate messages simulating real-world content. The pathway includes instruction in specialized camerawork and equipment operation and maintenance, image capture, computer applications, dubbing, and applications to specific commercial, industrial, and entertainment needs. Topics of study in this pathway include aesthetic meaning, appreciation and analysis; construction, development, processing, modeling, simulation, and programming of interactive experiences; transmission, distribution and marketing; contextual, cultural and historical aspects and considerations.

BEST PRACTICE COURSES
Choose (4) four credits from the following:

- **480901** Introduction to Media Arts
- **480902** Interactive Design
- **480903** Moving Image Animation
- **480904** Virtual Design
- **480950** Media Arts Co-op* **OR 480951** Media Arts Internship

Upon completion of a pathway, additional coursework to enhance student learning is encouraged. Credits earned in Advanced or Complementary Coursework “Beyond the Pathway” may not be substituted for pathway courses to achieve Concentrator or Completer status.

- **480925** Special Topics – Interactive Media

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TRANSPORTATION

AUTOMOTIVE EDUCATION CAREER PATHWAYS

COLLISION REPAIR TECHNOLOGY CAREER PATHWAYS

DIESEL/MEDIUM-HEAVY TRUCK TECHNOLOGY CAREER PATHWAYS

FLIGHT AND AVIATION CAREER PATHWAYS

Course specific documents are available at the Kentucky Department of Education Program Area Page:
Transportation Education - Kentucky Department of Education

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AUTOMOTIVE EDUCATION CAREER PATHWAYS

Automotive Maintenance and Light Repair Technician CIP 47.0604.01

Automobile Service Technology CIP 47.0604.02

Automotive Engineering CIP 15.0803.00

Automotive Technology TRACK Youth Apprenticeship CIP 47.0600.99

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Automotive Maintenance and Light Repair Technician CIP 47.0604.01

This pathway prepares individuals to apply technical knowledge and skills to repair, service, and maintain all types of automobiles. It includes instruction in brake systems, electrical systems, engine performance, engine repair, suspension and steering, automatic and manual transmissions and drive trains, and heating and air conditioning systems.

BEST PRACTICE COURSES
Complete (4) four credits from the following:

- **470507** Automotive Maintenance and Light Repair Section A
- **470509** Automotive Maintenance and Light Repair Section B
- **470511** Automotive Maintenance and Light Repair Section C
- **470513** Automotive Maintenance and Light Repair Section D
- **470501** Co-op* I (Auto)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Automobile Service Technology CIP 47.0604.02

This pathway prepares individuals to apply technical knowledge and skills to repair, service, and maintain all types of automobiles. It includes instruction in brake systems, electrical systems, engine performance, engine repair, suspension and steering, automatic and manual transmissions and drive trains, and heating and air conditioning systems.

BEST PRACTICE COURSES
Complete (4) four credits from the following:

- **470515** Automobile Service Technology Section A
- **470517** Automobile Service Technology Section B
- **470519** Automobile Service Technology Section C
- **470521** Automobile Service Technology Section D
- **470501** Co-op* I (Auto)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Automotive Engineering CIP 15.0803.00

This pathway provides the opportunity to blend Career and Technical Education (CTE) courses with Engineering courses to help students apply technical skills along with Science, Technology, Engineering, and Math (STEM) skills to solve real-world problems. This pathway prepares individuals to apply engineering principles and technical skills in support of engineers and other professionals engaged in developing, manufacturing, and testing self-propelled ground vehicles and their systems. It includes instruction in vehicular systems technology, design and development testing, prototype and operational testing, inspection and maintenance procedures, instrument calibration, test equipment operation and maintenance, and report preparation.

BEST PRACTICE COURSES
Complete (4) four credits:

- **210221** Engineering I
- **210232** Electrical/Electronics Engineering
- **470507** Automotive Maintenance and Light Repair Section A
- **470509** Automotive Maintenance and Light Repair Section B

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Automotive Technology TRACK Youth Apprenticeship CIP 47.0600.99

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The TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

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BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

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COLLISION REPAIR TECHNOLOGY CAREER PATHWAYS

Entry Level Collision Repair Painter CIP 47.0603.01

Entry Level Non-Structural Damage and Repair Technician CIP 47.0603.03

Automotive Technology TRACK Youth Apprenticeship CIP 47.0600.99

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Entry Level Collision Repair Painter CIP 47.0603.01

A program that prepares individuals to apply technical knowledge and skills to repair, reconstruct and finish automobile bodies, fenders, and external features. It includes instruction in damage repair, painting and refinishing techniques, and damage analysis and estimating.

Note: The courses listed in the Entry Level Collision Repair Painter Pathway also apply to schools using the **ICar** PDP-EE (Professional Development Program - Education Edition) Curriculum to teach the classes. The only exception for schools using the **ICar** Curriculum is that 470631 Introduction to Collision Repair is no longer an option and must be chosen over any other option listed. Programs using the **ICar** PDP-EE (Professional Development Program - Education Edition) Curriculum are eligible to test their students with the **ICar** Refinish Pro- Level 1 Exam. This Exam will meet the Valid Industry Certification requirements for this pathway. Students passing this exam will receive an **ICar** Refinish Platinum 1 Status Certificate.

BEST PRACTICE COURSES
Complete (3.5) three- and one-half credits from the following:

- **470639** Painting and Refinishing I
- **470640** Painting and Refinishing II
- **470645** Painting and Refinishing III
- **470628** Damage Analysis, Estimating and Customer Service (.5 credit)
- **470601** Co-op* I (Collision Repair)

Complete (.5) one-half credit from the following:

- **470647** Painting and Refinishing Special Projects (.5 credit) **OR** **470631** Introduction to Collision Repair (.5 credit)

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Entry Level Non-Structural Damage and Repair Technician CIP 47.0603.03

A program that prepares individuals to apply technical knowledge and skills to repair, reconstruct and finish automobile bodies, fenders, and external features. It includes instruction in damage repair, non-structural analysis, plastics and adhesives, and damage analysis and estimating.

Note: The courses listed in the Entry Level Non-Structural Damage and Repair Technician Pathway also apply to schools using the **ICar** PDP-EE (Professional Development Program - Education Edition) Curriculum to teach the classes. The only exception for schools using the **ICar** Curriculum is that 470631 Introduction to Collision Repair is no longer an option and must be chosen over any other option listed. Programs using the **ICar** PDP-EE (Professional Development Program - Education Edition) Curriculum are eligible to test their students with the **ICar** Non-Structural Pro-Level 1 Exam. This Exam will meet the Valid Industry Certification requirements for this pathway. Students passing this exam will receive an **ICar** Non-Structural Platinum 1 Status Certificate.

BEST PRACTICE COURSES
Complete (4) four credits from the following:

- **470633** Non-Structural Analysis and Damage Repair I
- **470644** Non-Structural Analysis and Damage Repair II
- **470649** Non-Structural Analysis and Damage Repair III
- **470628** Damage Analysis, Estimating and Customer Service (.5 credit)
- **470651** Non-Structural Analysis and Damage Repair Special Projects (.5 credit) **OR** **470631** Introduction to Collision Repair (.5 credit)
- **470601** Co-op* I (Collision Repair)

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Automotive Technology TRACK Youth Apprenticeship CIP 47.0600.99

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TRACK Youth Apprenticeship model consists of a minimum of 3 CTE credits related to the apprenticeship and a paid cooperative education placement (co-op*) with a designated employer partner. TRACK is its own career pathway, has designated CIP codes and results in an industry certification. To be enrolled, this TRACK agreement form must be submitted. Once the form is processed and approved, the student will be enrolled in a TRACK database. At the end of the school year, OCTE will then upload that information into TEDS when this TRACK completion form is submitted.

The specifics of the TRACK program vary, and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. For more information, please refer to the TRACK Process Document, Chapter 9 of the Work-Based Learning Manual for Youth Apprenticeship and the TRACK website.

BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

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DIESEL/MEDIUM-HEAVY TRUCK TECHNOLOGY CAREER PATHWAYS

Diesel Medium Heavy Truck Inspection, Maintenance, and Minor Repair Technician CIP 47.0605.07

Diesel Medium/Heavy Truck Service Technology Technician (TST) CIP 47.0605.08

Automotive Technology TRACK Youth Apprenticeship CIP 47.0600.99

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Diesel Medium Heavy Truck Inspection, Maintenance, and Minor Repair Technician CIP 47.0605.07

This program introduces the student to the tasks/standards included in Inspection, Maintenance, and Minor Repair (IMMR). The tasks included in the Inspection, Maintenance, and Minor Repair option are entry-level technician inspection tasks designed to introduce the student to correct procedures and practices of vehicle inspection in a teaching/learning environment. These courses will instruct the student in the principles, theories, and concepts of Medium/ Heavy Duty Diesel Truck Technology and include instruction in Diesel Engines, Brake Systems, Electrical/Electronic Systems, Suspension and Steering Systems, Drivetrains, Preventive Maintenance, and Engine Performance Systems.

BEST PRACTICE COURSES
Complete (4) four credits from the following:

- **470450** Diesel Medium/Heavy Duty Truck IMMR Section A
- **470451** Diesel Medium/Heavy Duty Truck IMMR Section B
- **470452** Diesel Medium/Heavy Duty Truck IMMR Section C
- **470453** Diesel Medium/Heavy Duty Truck IMMR Section D
- **470442** Co-op* I (Diesel)

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Diesel Medium/Heavy Truck Service Technology Technician (TST) CIP 47.0605.08

This program presents the theory, component identification, operation, diagnosis, and service and repair of Medium/Heavy Duty Truck Diesel Engines, Brake Systems, Electrical/ Electronic Systems, Suspension and Steering Systems, Drivetrain Systems, Engine Performance Systems, and Preventive Maintenance. The instruction will also include identifying and using appropriate tools and testing/measurement equipment required to accomplish specific tasks. The student will also locate and use current reference and training materials from accepted industry publications and resources and write industry-standard work orders.

BEST PRACTICE COURSES
Complete (4) courses from the following:

- **470460** Diesel Medium/Heavy TST Section A
- **470461** Diesel Medium/Heavy TST Section B
- **470462** Diesel Medium/Heavy TST Section C
- **470463** Diesel Medium/Heavy TST Section D
- **470442** Co-op* I (Diesel)

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Automotive Technology TRACK Youth Apprenticeship CIP 47.0600.99

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BEST PRACTICE COURSES
Complete (4) four credits.

A minimum of three (3) credits chosen from the partnering CTE program's course offerings that relate to the apprenticeship and a paid co-op*. For more information about co-op*, please see Chapter 8 of the Work-Based Learning Manual.

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FLIGHT AND AVIATION CAREER PATHWAYS

Aircraft Maintenance Technician CIP 47.0607.00

Flight and Aeronautics CIP 49.0102.00

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Aircraft Maintenance Technician CIP 47.0607.00

This pathway prepares individuals to apply technical knowledge and skills to repair, service, and maintain all aircraft components other than engines, propellers, avionics, and instruments. It includes instruction in the layout and fabrication of sheet metal, fabric, wood, and other materials into structural members, parts, and fittings, and replacement of damaged or worn parts such as control cables and hydraulic units.

To gain FAA work experience and training requirements, students must log hours and work with approved FAA-rated Airframe and Powerplant Technicians or Inspection Authorized persons.

BEST PRACTICE COURSES
Complete (3) three credits:

- **210226** Introduction to Aerospace and Aviation
- **210233** Aviation I
- **210139** Introduction to Aircraft Maintenance Technology

Complete (1) one credit from the following:

- **210240** Aviation Capstone
- **210330** Engineering Co-op* **OR 210331** Engineering Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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Flight and Aeronautics CIP 49.0102.00

Students will complete the first phase of aviation training leading to a commercial pilot license. They will gain technical knowledge and skills in the flying and navigation of commercial passenger and cargo, agricultural, public service, corporate aircraft flight systems and controls, flight crew operations and procedures, radio communications, navigation procedures and systems, airways safety and traffic regulations, and governmental rules and regulations pertaining to piloting aircraft.

BEST PRACTICE COURSES
Choose (1-2) one-two credits from the following:

- **210226** Introduction to Aerospace and Aviation
- **210233** Aviation I

Complete (1) one credit:

- **210234** Aviation II

Choose (1-2) one-two credits from the following:

- **210237** Commercial Aviation
- **210229** Aerospace Engineering
- **210251** Unmanned Aircraft Systems
- **210240** Aviation Capstone
- **210330** Engineering Co-op* **OR 210331** Engineering Internship

* Co-op can only be taken after the first four credits are earned, OR along with another course in the pathway, OR if the student is enrolled in an approved pre-apprenticeship program.

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