2026 – 2027

PROGRAM GUIDE

ADVANCED MANUFACTURING CLUSTER



ALABAMA STATE DEPARTMENT OF EDUCATION
CAREER AND TECHNICALEDUCATION
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The Manufacturing cluster provides the knowledge and skills to equip students for careers in additive manufacturing, industrial maintenance, electronics, manufacturing, precision machining, and robotics. These courses include significant technical depth, engineering concepts and terminology. The Manufacturing cluster provides a safe and appropriate setting for student exploration and achievement. Students gain knowledge and skills through an active, structured, and stimulating environment coordinated with simulated workplace learning experiences. The Manufacturing cluster learning environment utilizes a variety of physical space to stimulate development of effective cognitive and psychomotor skills. Students experience a wide range of hands-on activities based on authentic representations of expectations found in the workplace. Theory and concepts are taught in proportion to the need for strong application opportunities with emphasis on timely learning experiences that facilitate the transition to skills attainment. Safety, proper tool use, and adherence to procedures are integral components for all student learning experiences.

**Courses highlighted in yellow are shared with other clusters. See "Shared Courses" table on page 9 for additional details.

Career Pathway Program	**Additive Manufacturing Program** **(Must teach three courses from this program list within two years)** Additive Manufacturing is based upon Computer-Aided-Design and 3-D Printing. This program provides students with the knowledge of Introduction, Intermediate, and Advanced Drafting Design Technology, Three-Dimensional Solid Modeling and Engineering Applications and the skill to be successful in the Mechanical and Technical Design fields.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
21106G1033	Advanced Drafting Design	• Alabama Certified Employee (ACE) • Autodesk AutoCAD Certified User • Autodesk Fusion Certified User • Autodesk Inventor Certified User • NC3 Festo Introduction to CAD • Solid Edge Certified Associate Level 1 • SolidWorks CAD Design Associate	• CAD Designer • Mechanical Designer • Technical Designer
13997G1003	Career Pathway Project in Manufacturing		
13997G1001	CTE Lab in Manufacturing		
21002G1001	Engineering Design Applications		
21106G1023	Intermediate Drafting Design		
21106G1013	Introduction to Drafting Design		
21004G1001	Introduction to Engineering Design		
13001G1000	Introduction to Manufacturing		
17049G1000	Safety and Health Regulations		
21107G1012	Three-Dimensional Solid Modeling I		
21107G1022	Three-Dimensional Solid Modeling II		
13998G1050	Internship in Manufacturing		

Career Pathway Program	**Electronics Program** **(Must teach three courses from this program list within two years)** The electronics program covers a variety of topics including Electrical Theory; Electronic Components; Soldering-Desoldering and Tools; Block Diagrams-Schematics-Wiring Diagrams; Cabling; Power Supplies; Test Equipment and Measurements; Safety Precautions; Mathematics and Formulas; Electronic Circuits; Series and Parallel; Amplifiers; Interfacing of Electronics Products, Digital Concepts and Circuitry; Computer Electronics; Computer Applications; Audio & Video Systems; Optical Electronics; Basic Telecommunications; and Technician Work Procedures. Students will be prepared to earn entry level credentials recognized by the Electronics Technicians Association (ETA).		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
17106G1002	Alternating Current	• Alabama Certified Employee (ACE) • Electronics Technicians Association – Basic AC • Electronics Technicians Association – Basic Analog • Electronics Technicians Association – Basic DC • Electronics Technicians Association – Basic Digital • Electronics Technicians Association – Comprehensive • Electronics Technicians Association – Student Electronics Technician • MSSC – Certified Production Technician (CPT) (Each module will count as a CRI) – Safety – Quality Practices & Measurement – Manufacturing Processes & Production – Maintenance Awareness • NCCER Core (module 6 is an elective and is not required for CRI) • NC3 FESTO – Fundamentals of Industrial Wiring • NC3 Snap-On Starret Precision Measurement Instruments Certification • Skills for Success – Machine Operator Technician	• Electrical, Electronic, & Electromechanical Assemblers, Except Coil Winders, Tapers, & Finishers • Electronics Engineering Technician • Electronics Installer • Electronics Repair Technician
13997G1003	Career Pathway Project in Manufacturing		
13997G1001	CTE Lab in Manufacturing		
17104G1003	Digital Electronics		
17106G1001	Direct Current		
20101G1033	Electronics and Control Systems		
21009G1005	Embedded Arduino Controls		
13001G1000	Introduction to Manufacturing		
21009G1001	Introduction to Robotics		
21009G1002	Robotics Applications		
17049G1000	Safety and Health Regulations		
17106G1003	Semiconductors		
13998G1050	Internship in Manufacturing		

Career Pathway Program	**Industrial Maintenance Electrical & Instrumentation Program** **(Must teach three courses from this program list within two years)** Industrial maintenance is divided into two distinct pathways, electrical and instrumentation and mechanical. Industrial maintenance technicians are needed in every industry that uses machinery, from automotive assembly plants to computer manufacturers. Not only do they repair and maintain electrical instruments and equipment, but they also install and dismantle them. Every time a new appliance leaves a factory, or a new car rolls off the line, a skilled industrial maintenance technician played a role in producing it. This program aligns with NCCER standards and covers topics such as Fasteners and Anchors, Process Mathematics, Pneumatic Controls, Oxyfuel Cutting, Introduction to Piping Components, and Laser Alignment.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
13997G1003	Career Pathway Project in Manufacturing	• Alabama Certified Employee (ACE) • FANUC CERT – Handling Tool Operations and Programming • MSSC – Certified Production Technician (CPT) (Each module will count as a CRI) -Safety -Quality Practices & Measurement -Manufacturing Processes & Production -Maintenance Awareness • NCCER Core (module 6 is an elective and is not required for CRI) • NCCER Industrial Maintenance E&I Level 1 • NC3 FESTO – Applied Fluid Power • NC3 FESTO – Applied Mechanical Systems • NC3 FESTO – Applied PLCs – Siemens/Allen Bradley & Applied Smart Sensors • NC3 FESTO – Applied Robotics • NC3 FESTO – Fundamentals of Fluid Power – Hydraulics/Pneumatics • NC3 FESTO – Fundamentals of Industrial Wiring Systems • NC3 FESTO – Fundamentals of Mechanical Systems • NC3 FESTO – Fundamentals of Robotics • NC3 FESTO – Introduction to CAD • NC3 Snap-On/Starret Precision Measurement Instruments Certification • SACA Certified Industrial 4.0 Associate I – Basic Operations • Skills for Success – Electrical Helper • Skills for Success – Forklift Operator • Skills for Success – Machine Operator Technician	• Industrial Maintenance Electrical Repair Technician • Industrial Maintenance Instrumentation Repair Technician • Miscellaneous Assemblers & Fabricators
13997G1001	CTE Lab in Manufacturing		
13303G1001	Industrial Maintenance Electrical & Instrumentation I		
13303G1002	Industrial Maintenance Electrical & Instrumentation II		
13303G1003	Industrial Maintenance Electrical & Instrumentation III		
13001G1000	Introduction to Manufacturing		
17049G1000	Safety and Health Regulations		
13998G1050	Internship in Manufacturing		

Career Pathway Program	**Industrial Maintenance Mechanical Program** **(Must teach three courses from this program list within two years)** Industrial maintenance is divided into two distinct pathways, electrical and instrumentation and mechanical. Industrial maintenance technicians are needed in every industry that uses machinery, from automotive assembly plants to computer manufacturers. Not only do they repair and maintain electrical instruments and equipment, but they also install and dismantle them. Every time a new appliance leaves a factory, or a new car rolls off the line, a skilled industrial maintenance technician played a role in producing it. This program aligns with NCCER standards and covers topics such as Fasteners and Anchors, Process Mathematics, Pneumatic Controls, Oxyfuel Cutting, Introduction to Piping Components, and Laser Alignment.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
13997G1003	Career Pathway Project in Manufacturing	• Alabama Certified Employee (ACE) • FANUC CERT – Handling Tool Operations and Programming • MSSC – Certified Production Technician (CPT) (Each module will count as a CRI) – Safety – Quality Practices & Measurement – Manufacturing Processes & Production – Maintenance Awareness • NCCER Core (module 6 is an elective and is not required for CRI) • NCCER Industrial Maintenance E&I Level 1 • NC3 FESTO – Applied Fluid Power • NC3 FESTO – Applied Mechanical Systems • NC3 FESTO – Applied PLCs – Siemens/Allen Bradley & Applied Smart Sensors • NC3 FESTO – Applied Robotics • NC3 FESTO – Fundamentals of Fluid Power – Hydraulics/Pneumatics • NC3 FESTO – Fundamentals of Industrial Wiring Systems • NC3 FESTO – Fundamentals of Mechanical Systems • NC3 FESTO – Fundamentals of Robotics • NC3 FESTO – Introduction to CAD • NC3 Snap-On/Starret Precision Measurement Instruments Certification • SACA Certified Industrial 4.0 Associate I – Basic Operations • Skills for Success – Electrical Helper • Skills for Success – Forklift Operator • Skills for Success – Machine Operator Technician	• First Line Supervisors of Mechanics, Installers and Repairers • First Line Supervisors of Production and Operating Workers • Industrial Maintenance Mechanical Repair Technician • Maintenance and Repair Workers General • Pipefitting Technician
13997G1001	CTE Lab in Manufacturing		
13303G1004	Industrial Maintenance Mechanical I		
13303G1005	Industrial Maintenance Mechanical II		
13303G1006	Industrial Maintenance Mechanical III		
13001G1000	Introduction to Manufacturing		
17049G1000	Safety and Health Regulations		
13998G1050	Internship in Manufacturing		

Career Pathway Program	**Modern Manufacturing Program** **(Must teach three courses from this program list within two years)** Modern Manufacturing is designed to prepare students for entry level positions in manufacturing. These courses align with MSSC and NCCER standards which include modular courses for: Safety, Quality, Production and Maintenance.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
13997G1003	Career Pathway Project in Manufacturing	• Alabama Certified Employee (ACE) • FANUC CERT – Handling Tool Operations and Programming • MSSC – Certified Production Technician (CPT) (Each module will count as a CRI): – Safety – Quality Practices & Measurement – Manufacturing Processes & Production – Maintenance Awareness • NCCER Core (module 6 is an elective and is not required for CRI) • NC3 FESTO – Applied Fluid Power • NC3 FESTO – Applied Mechanical Systems • NC3 FESTO – Applied PLCs – Siemens/Allen Bradley & Applied Smart Sensors • NC3 FESTO – Applied Robotics • NC3 FESTO – Fundamentals of Fluid Power – Hydraulics/Pneumatics • NC3 FESTO – Fundamentals of Industrial Wiring Systems • NC3 FESTO – Fundamentals of Mechanical Systems • NC3 FESTO – Fundamentals of Robotics • NC3 FESTO – Introduction to CAD • NC3 Snap-On/Starret Precision Measurement Instruments Certification • NC3 Tormach CNC Fundamentals • SACA Certified Industrial 4.0 Associate I – Basic Operations • Skills for Success – Electrical Helper • Skills for Success – Forklift Operator • Skills for Success – Machine Operator Technician	• First Line Supervisors of Production and Operating Workers • Maintenance & Repair Workers, General • Manufacturing Operations Manager • Manufacturing Operations Technician • Miscellaneous Assemblers & Fabricators
13001G1000	Introduction to Manufacturing		
13002G1013	Manufacturing I: Safety		
13002G1023	Manufacturing II: Quality		
13002G1033	Manufacturing III: Production		
13002G1043	Manufacturing IV: Maintenance		
17049G1000	Safety and Health Regulations		
13998G1050	Internship in Manufacturing		

Career Pathway Program	**Modern Manufacturing Center of Excellence Program** **(Must teach three courses from this program list within two years)** Modern Manufacturing Center of Excellence is designed to prepare students for entry level positions in manufacturing. These courses align with ACE, OSHA 10, and SACA standards which include modular courses for: Employability Skills, Safety, Tool Management, and Principles in Manufacturing.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
13101G1061	**Basics of Manufacturing COE 1 – Required Foundation Course**	• Alabama Certified Employee (ACE) • SACA Certified Industry 4.0 Associate I – Basic Operations • Skills for Success – Basics of Logistics • Skills for Success – Forklift Operator • Skills for Success – Forklift Operator Fundamentals • Skills for Success – Machine Operator Technician • Skills for Success – Operator Tech Automotive • Skills for Success – Skid Steer Operator	• First Line Supervisors of Production and Operating Workers • Maintenance & Repair Workers, General • Manufacturing Operations Manager • Manufacturing Operations Technician • Miscellaneous Assemblers & Fabricators
13101G1062	Basics of Manufacturing COE 2		
13101G1063	Basics of Manufacturing COE 3		
13101G1064	Basics of Manufacturing COE 4		
13997G1003	Career Pathway Project in Manufacturing		
13997G1001	CTE Lab in Manufacturing		
13998G1050	Internship in Manufacturing		

***NOTE**: LEAs must contact Mrs. Tiffany Poe at Modern Manufacturing COE, tiffany@mmcoe.com, for additional information prior to utilizing any of the course codes listed above, as it does require commitment to the conditions in a MOU and participation in mandatory training provided by the provider.

Career Pathway Program	**Robotics and Automated Manufacturing Program** **(Must teach three courses from this program list within two years)** The Robotics and Automated Manufacturing program covers a variety of topics including Computer Automation, Design, and Production, as well as Introduction to Robotics, Robotics Application, Electronics and Control Systems. Students will be prepared to earn entry level credentials recognized by the Electronics Technicians Association (ETA), MSSC, and NCCER.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
13997G1003	Career Pathway Project in Manufacturing	• Alabama Certified Employee (ACE) • Autodesk – AutoCAD Certified User • Autodesk – Inventor Certified User • Electronics Technicians Association – Basic AC • Electronics Technicians Association – Basic Analog • Electronics Technicians Association – Basic DC • Electronics Technicians Association – Basic Digital • Electronics Technicians Association – Comprehensive • Electronics Technicians Association – Student Electronics Technician • FANUC CERT – Handling Tool Operations and Programming • MSSC – Certified Production Technician (CPT) (Each module will count as a CRI) – Safety – Quality Practices & Measurement – Manufacturing Processes & Production – Maintenance Awareness • NCCER Core (module 6 is an elective and is not required for CRI) • NC3 FESTO – Applied Fluid Power • NC3 FESTO – Applied Mechanical Systems • NC3 FESTO – Applied PLCs – Siemens/Allen Bradley & Applied Smart Sensors • NC3 FESTO – Applied Robotics • NC3 FESTO – Fundamentals of Fluid Power – Hydraulics/Pneumatics • NC3 FESTO – Fundamentals of Industrial Wiring Systems • NC3 FESTO – Fundamentals of Mechanical Systems • NC3 FESTO – Fundamentals of PLCs Siemens/Allen Bradley & Fundamentals of Smart Sensors • NC3 FESTO – Fundamentals of Robotics • NC3 Snap-On/Starret Precision Measurement Instruments Certification • NC3 Tormach CNC Fundamentals • SACA Certified Industrial 4.0 Associate I – Basic Operations • Solid Edge Certified Associate Level 1 • SolidWorks CAD Design Associate • Skills for Success – Electrical Helper • Skills for Success – Forklift Operator • Skills for Success – Machine Operator Technician	• Automation Technician • Controls Engineer • Electronic Technician • Industrial Maintenance • Programmable Logic Controller Technician • Woodworking Machine Setters, Operators, & Tenders, Except Sawing
13997G1001	CTE Lab in Manufacturing		
21010G1001	Computer Integrated Automation		
21010G1002	Computer Integrated Design		
21010G1003	Computer Integrated Production		
20101G1033	Electronics and Control Systems		
13001G1000	Introduction to Manufacturing		
21009G1001	Introduction to Robotics		
21009G1002	Robotics Application		
21010G1004	Robotics and Automation		
17049G1000	Safety and Health Regulations		
13998G1050	Internship in Manufacturing		

Career Pathway Program	*SREB AC Automated Materials Joining Technology (Must teach three courses from this program list within two years.) Automated Materials Joining Technology allows students to use a project-based learning approach. Students will explore materials joining and forming methods, computer-aided design and automated systems that transform design concepts into fully developed products. Materials become more complex in chemical composition and structure, and the usefulness of many new materials is dependent upon improvements in joining science and technology.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
13997G1003	Career Pathway Project in Manufacturing	• Alabama Certified Employee (ACE) • MSSC – Certified Production Technician (CPT) (Each module will count as a CRI): – Safety – Quality Practices & Measurement – Manufacturing Processes & Production – Maintenance Awareness • NCCER Core (Module 6 is an elective and is not required for CRI) • NC3 Tormach CNC Fundamentals • Skills for Success – Forklift Operator • Skills for Success – Machine Operator Technician	• PLC Automation Technician • Process Controls Engineer
13997G1001	CTE Lab in Manufacturing		
17049G1000	Safety and Health Regulations		
13104G1013	SREB Advanced Concepts in Materials Joining		
13104G1012	SREB Applications in Automated Materials Joining		
13104G1011	SREB Introduction to Automated Materials Joining		
13104G1014	SREB Projects in Automated Materials Joining		
13998G1050	Internship in Manufacturing		
***NOTE:** LEAs must contact SREB for additional information prior to utilizing any of the course codes listed above, as it does require commitment to the conditions in a MOU and participation in mandatory training provided by the provider.			

Career Pathway Program	*SREB AC Energy and Power Program (Must teach three courses from this program list within two years) Energy and Power program allows students to understand various means of power generation and distribution with topics that include turbines, motor/generator sets, renewable and non-renewable energy generation, and electrochemical systems. Students will also gain knowledge and skills about single and multiple phase generation and distribution systems, transformers, and high voltage AC and DC systems.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
13997G1003	Career Pathway Project in Manufacturing	• Alabama Certified Employee (ACE) • Autodesk AutoCAD Certified User • Autodesk Fusion Certified User • Autodesk Inventor Certified User • NCCER Core (Module 6 is an elective and is not required for CRI) • NC3 Tormach CNC Fundamentals • Skills for Success – Machine Operator Technician • Solid Edge Certified Associate Level 1 • SolidWorks CAD Design Associate	• Civil Engineer • Electrical Engineer • Environmental Scientist/Specialist • Project Engineer
13997G1001	CTE Lab in Manufacturing		
17049G1000	Safety and Health Regulations		
21049G1000	SREB Advanced Science and Engineered Systems		
21049G1025	SREB Electronics and Control Systems		
20101G1013	SREB Energy and Power Foundations		
20101G1023	SREB Energy Transmission and Distribution		
13998G1050	Internship in Manufacturing		
***NOTE:** LEAs must contact SREB for additional information prior to utilizing any of the course codes listed above, as it does require commitment to the conditions in a MOU and participation in mandatory training provided by the provider.			

Career Pathway Program	*SREB AC Integrated Production Technologies Program (Must teach three courses from this program list within two years.) Integrated Production Technologies allows students to apply what they learn in physics, chemistry and biology to real-world projects using emerging, cutting-edge materials. Students will work on the frontiers of product development by applying nanotechnology to new areas of need. Students will reengineer existing products to reduce the energy and material costs required to produce them, invent new products, and create more durable and efficient products using automated computer-aided design and manufacturing programs.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
13997G1003	Career Pathway Project in Manufacturing	• Alabama Certified Employee (ACE) • FANUC CERT – Handling Tool Operations and Programming • MSSC – Certified Production Technician (CPT) (Each module will count as a CRI – Safety – Quality Practices & Measurement – Manufacturing Processes & Production – Maintenance Awareness • NCCER Core (module 6 is an elective and is not required for CRI) • NC3 FESTO – Applied Fluid Power • NC3 FESTO – Applied Mechanical Systems • NC3 FESTO – Applied PLCs – Siemens/Allen Bradley & Applied Smart Sensors • NC3 FESTO – Applied Robotics • NC3 FESTO – Fundamentals of Electricity – AC/DC • NC3 FESTO – Fundamentals of Fluid Power – Hydraulics/Pneumatics • NC3 FESTO – Fundamentals of Industrial Wiring Systems • NC3 FESTO – Fundamentals of Mechanical Systems • NC3 FESTO – Fundamentals of PLCs Siemens/Allen Bradley & Fundamentals of Smart Sensors • NC3 FESTO – Fundamentals of Robotics • NC3 Snap-On/Starret Precision Measurement Instruments Certification • SACA Certified Industry Associate 4.0 Associate I – Basic Operations • Skills for Success – Forklift Operator • Skills for Success – Machine Operator Technician	• Manufacturing Operations Manager • Manufacturing Operations Technician
13997G1001	CTE Lab in Manufacturing		
17049G1000	Safety and Health Regulations		
13104G1001	SREB Advanced Technology for Design and Production		
13104G1004	SREB Design for the Production of Advanced Products		
13104G1003	SREB Mechatronic Systems for Advanced Production		
13104G1002	SREB Systems of Advanced Technology		
13998G1050	Internship in Manufacturing		
***NOTE:** LEAs must contact SREB for additional information prior to utilizing any of the course codes listed above, as it does require commitment to the conditions in a MOU and participation in mandatory training provided by the provider.			

2026-2027 Subject and Personnel Codes
Advanced Manufacturing Cluster

Manufacturing Cluster Courses			
Course Number	**Course Name**	**Course Number**	**Course Name**
21106G1033	Advanced Drafting Design	13001G1000	Introduction to Manufacturing
17106G1002	Alternating Current	13203G1001	Introduction to Precision Machining
13101G1061	**Basics of Manufacturing 1 Center of Excellence – Required Foundation Course**	21009G1001	Introduction to Robotics
13101G1062	Basics of Manufacturing 2 Center of Excellence	13002G1013	Manufacturing I: Safety
13101G1063	Basics of Manufacturing 3 Center of Excellence	13002G1023	Manufacturing II: Quality
13997G1003	Career Pathway Project in Manufacturing	13002G1033	Manufacturing III: Production
13203G1004	Computer-Aided Design and Computer-Aided Manufacturing I	13002G1043	Manufacturing IV: Maintenance
13203G1005	Computer-Aided Design and Computer-Aided Manufacturing II	13203G1008	Milling and Surface Grinder I
21010G1001	Computer Integrated Automation	13203G1009	Milling and Surface Grinder II
21010G1002	Computer Integrated Design	21010G1004	Robotics and Automation
21010G1003	Computer Integrated Production	21009G1002	Robotics Applications
13203G1006	Computer Numerical Control (CNC) I	17049G1000	Safety and Health Regulations
13203G1007	Computer Numerical Control (CNC) II	17106G1003	Semiconductors
13204G1001	Coordinate Measuring Machine	13104G1013	SREB Advanced Concepts in Materials Joining
13997G1001	CTE Lab in Manufacturing	21049G1000	SREB Advanced Science and Engineered Systems
17104G1003	Digital Electronics	13104G1001	SREB Advanced Technology for Design and Production
20101G1033	Electronics and Control Systems	13104G1012	SREB Applications in Automated Materials Joining
21009G1005	Embedded Arduino Controls	13104G1004	SREB Design for the Production of Advanced Products
21002G1001	Engineering Design Applications	21049G1025	SREB Electronics and Control Systems
13303G1001	Industrial Maintenance Electrical & Instrumentation I	20101G1013	SREB Energy and Power Foundations
13303G1002	Industrial Maintenance Electrical & Instrumentation II	20101G1023	SREB Energy Transmission and Distribution
13303G1003	Industrial Maintenance Electrical & Instrumentation III	13104G1011	SREB Introduction to Automated Materials Joining
13303G1004	Industrial Maintenance Mechanical I	13104G1003	SREB Mechatronic Systems for Advanced Production
13303G1005	Industrial Maintenance Mechanical II	13104G1014	SREB Projects in Automated Materials Joining
13303G1006	Industrial Maintenance Mechanical III	13104G1002	SREB Systems of Advanced Technology
21106G1023	Intermediate Drafting Design	17109G1000	Telecommunications Cabling
13204G1004	Intermediate Lathe and Bench Work	21107G1012	Three-Dimensional Solid Modeling I
21106G1013	Introduction to Drafting Design	21107G1022	Three-Dimensional Solid Modeling II
21004G1001	Introduction to Engineering Design	13998G1050	Internship in Manufacturing
13204G1002	Introduction to Lathe		

Shared Courses			
Course Number	**Course Name**	**Cluster(s)**	**Required Year to Implement COS**
17049G1000	Safety and Health Regulations	Architecture and Construction Health Science Transportation, Distribution and Logistics	2022-2023

General Note: Course descriptions and content standards for most courses are located on the Alabama Department of Education website at: Alabama Achieves | Career and Technical Education | Courses of Study.

College and Career Readiness Indicator Course Matrix

Program Name	Additive Manufacturing	Electronics	Industrial Maintenance Electrical & Instrumentation	Industrial Maintenance Mechanical	Modern Manufacturing	Modern Manufacturing Center of Excellence
Foundation Course(s)	Introduction to Manufacturing	Introduction to Manufacturing	Introduction to Manufacturing	Introduction to Manufacturing	Introduction to Manufacturing	**Basics of Manufacturing COE 1**
Concentrator Course(s)	Advanced Drafting Design Engineering Design Applications Intermediate Drafting Design Introduction to Drafting Design Introduction to Engineering Design Safety and Health Regulations Three-Dimensional Solid Modeling I Three-Dimensional Solid Modeling II	Alternating Current Digital Electronics Direct Current Electronics and Control Systems Embedded Arduino Controls Introduction to Robotics Robotics Applications Safety and Health Regulations Semiconductors Telecommunications Cabling	Industrial Maintenance Electrical & Instrumentation I Industrial Maintenance Electrical & Instrumentation II Industrial Maintenance Electrical & Instrumentation III Safety and Health Regulations	Industrial Maintenance Mechanical I Industrial Maintenance Mechanical II Industrial Maintenance Mechanical III Safety and Health Regulations	Manufacturing I: Safety Manufacturing II: Quality Manufacturing III: Production Manufacturing IV: Maintenance Safety and Health Regulations	Basics of Manufacturing COE 2 Basics of Manufacturing COE 3
Capstone Course(s)	Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing	Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing	Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing	Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing	Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing	Basics of Manufacturing COE 4 Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing

Program Name	Precision Machining	Robotics and Automated Manufacturing	SREB AC Automated Materials Joining Technology	SREB AC Energy and Power	SREB AC Integrated Production Technologies
Foundation Course(s)	Introduction to Manufacturing	Introduction to Manufacturing			
Concentrator Course(s)	Computer-Aided Design and Computer-Aided Manufacturing I Computer-Aided Design and Computer-Aided Manufacturing II Computer Numerical Control (CNC) I Computer Numerical Control (CNC) II Coordinate Measuring Machine Drill Press Intermediate Lathe and Bench Work Introduction to Lathe Introduction to Precision Machining Milling and Surface Grinder I Milling and Surface Grinder II Safety and Health Regulations	Computer Integrated Automation Computer Integrated Design Computer Integrated Production Electronics and Control Systems Introduction to Robotics Robotics Application Robotics and Automation Safety and Health Regulations	Safety and Health Regulations SREB Advanced Concepts in Materials Joining SREB Applications in Automated Materials Joining SREB Introduction to Automated Materials Joining SREB Projects in Automated Materials Joining	Safety and Health Regulations SREB Clean Energy Application SREB Clean Energy Innovation SREB Clean Energy Strategies SREB Clean Energy Systems	Safety and Health Regulations SREB Advanced Technology for Design and Production SREB Design for the Production of Advanced Products SREB Mechatronic Systems for Advanced Production SREB Systems of Advanced Technology
Capstone Course(s)	Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing	Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing	Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing	Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing	Career Pathway Project in Manufacturing CTE Lab in Manufacturing Internship in Manufacturing

To meet the CCR Indicator as a CTE completer, a student must earn three (3.0) credits with the grade of a "C" or higher in CTE courses that are part of an approved CTE program of study. Additional requirements are outlined in Memorandum FY25-2048 Updates on Career and Technical Education Completer Status.

This matrix is intended for general guidance on the CCR completer status and is subject to change. For all CTE programming information, please refer to the CTE Cluster specific Program Guide. It contains a list of approved CTE programs, valid course numbers, approved Career Readiness Indicators (CRIs), and in demand occupations.

***Courses are listed in alphabetical order, not in sequential order.**

The STEM cluster course of study is designed to address the challenges of a changing, technological, diverse, and global society. Students develop their abilities to analyze, communicate, manage, and lead. The rigorous content standards contained in these courses require students to use creative and innovative, critical-thinking skills. Experiences should be project-based and require higher-order thinking, communication, management, and leadership skills.

**Courses highlighted in yellow are shared with other clusters. See "Shared Courses" table on page 17 for additional details.

Career Pathway Program	CTE Engineering Program **(Must teach three courses from this program list within two years.)** The CTE STEM curriculum should emphasize the integration of academics. To achieve the solution to a given problem, students must possess an adequate foundation in communication skills for reading, writing, speaking, listening, viewing, and presenting; knowledge and skills in mathematics, science, and social studies; and knowledge of current and emerging technologies.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
21002G1000	Applications of Engineering and Technology – Mathematics credit eligible	• Autodesk – AutoCAD Certified User • Autodesk – Fusion Certified User • Autodesk – Inventor Certified User • Autodesk – Revit Certified User • Certified OnShape Professional • Certiport Information Technology Specialist (ITS) – HTML & CSS • Certiport Information Technology Specialist (ITS) – Java • Certiport Information Technology Specialist (ITS) – JavaScript • Certiport Information Technology Specialist (ITS) – Python • Certiport Information Technology Specialist (ITS) – Software Development • Electronic Systems Associate – ESA 1 Direct Current • Electronic Systems Associate – ESA 2 Alternating Current • Electronic Systems Associate – ESA 3 Semiconductors Devices and Circuits • Electronic Systems Associate – ESA 4 Digital Devices and Circuits • FAA Part 107 • FANUC CERT – Handling Tool Operations and Programming • Microsoft Office – Access Expert 2019/O365 • Microsoft Office – Excel Expert 2019/O365 • NC3 FESTO – Applied Fluid Power • NC3 FESTO – Applied Mechanical Systems • NC3 FESTO – Applied PLCs Siemens/Allen Bradley & Applied Smart Sensors • NC3 FESTO – Applied Robotics • NC3 FESTO – Fundamentals of Fluid Power – Hydraulics/Pneumatics • NC3 FESTO – Fundamentals of Industrial Wiring Systems • NC3 FESTO – Fundamentals of Mechanical Systems • NC3 FESTO – Fundamentals of PLCs – Siemens/Allen Bradley & Fundamentals of Sensors • NC3 FESTO – Fundamentals of Robotics • NC3 FESTO – Introduction to CAD • NC3 Snap-On/Starret Precision Measurement Instruments Certification • NC3 Tormach CNC Fundamentals • Oracle Certified Associate (OCA) – Java Programmer • QuantHub - Applied Data Skills • SACA Certified Industrial 4.0 Associate I – Basic Operations • Solid Edge Certified Associate Level 1 • SolidWorks CAD Design Associate • Skills for Success – Drone Operator	• Aerospace Engineer/Tech • Aesthetics Specialist • Agricultural Engineers • Architectural Engineer/Tech • Bioengineers • Chemical Engineers • Civil Engineer/Tech • Control Systems Engineer/Tech • Computer Hardware Engineers • Drafters • Electrical Engineer/Tech • Electro-Mechanical Technicians • Engineer/Technician all Disciplines • Environmental Engineer/Specialist • Ergonomics Specialist • Industrial Engineer/Tech • Manufacturing Engineer/Tech • Materials Engineer/Tech • Mechanical Engineer/Tech • Petroleum Engineer/Tech • Robotics Engineer/Tech
21015G1000	Basic Programming for Engineers		
21047G1000	Capstone of Engineering and Technology		
21047G1001	Career Pathway Project in STEM		
21015G1001	Computer Engineering and Technology		
21997G1000	CTE Lab in STEM		
21014G1000	Environmental Engineering – Mathematics credit eligible		
21005G1000	Foundations of Engineering and Technology		
21009G1000	Robotic Systems		
21998G1050	Internship in STEM		

Career Pathway Program	**Greenpower Program** The Greenpower challenge – to design and build an electric car to race at Greenpower events. Students build age-appropriate kit cars according to regulations and then race them at motorsport venues around the state/country. The Greenpower challenge harnesses the excitement of motorsport to inspire more than 10,000 participants a year to excel in STEM.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
21047G1001	Career Pathway Project in STEM	• Autodesk AutoCAD Certified User • Autodesk Fusion Certified User • Autodesk Inventor Certified User • Autodesk Revit Certified User • Certified OnShape Professional • Certiport Information Technology Specialist (ITS) – HTML & CSS • Certiport Information Technology Specialist (ITS) – Java • Certiport Information Technology Specialist (ITS) – JavaScript • Certiport Information Technology Specialist (ITS) – Python • Certiport Information Technology Specialist (ITS) – Software Development • FAA Part 107 • FANUC CERT – Handling Tool Operations and Programming • Microsoft Office – Access Expert 2019/O365 • Microsoft Office – Excel Expert 2019/O365 • NC3 Tormach CNC Fundamentals • Oracle Certified Associate (OCA) – Java Programmer • QuantHub – Applied Data Skills • Solid Edge Certified Associate Level 1 • SolidWorks CAD Design Associate	• Aerospace Engineer/Tech • Aesthetics Specialist • Architectural Engineer/Tech • Civil Engineer/Tech • Control Systems Engineer/Tech • Electrical Engineer/Tech • Engineer/Technician all Disciplines • Environmental Scientist/Specialist • Ergonomics Specialist • Industrial Engineer/Tech • Manufacturing Engineer/Tech • Materials Engineer/Tech • Mechanical Engineer/Tech/Mgr. • Petroleum Engineer/Tech • Robotics Engineer/Tech
21997G1000	CTE Lab in STEM		
21105G1001	Greenpower F24 Eng Design & Race Ch I		
21105G1002	Greenpower F24 Eng Design & Race Ch II		
21105G1003	Introduction to Greenpower (HS)		
21105G0708	Introduction to Greenpower (MS)		
21998G1050	Internship in STEM		

Career Pathway Program	*Project Lead The Way (PLTW) Engineering Program (Must teach three courses from this program list within two years.) From launching space explorations to delivering safe, clean water to communities, engineers find solutions to pressing problems and turn their ideas into reality. PLTW Engineering empowers students to step into the role of an engineer, adopt a problem-solving mindset, and make the leap from dreamers to doers. The program's courses engage students in compelling, real-world challenges that help them become better collaborators and thinkers. Students take from the courses in-demand knowledge and skills they will use in high school and for the rest of their lives, on any career path they take.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
21049G1001	Advanced Manufacturing – PLTW	• Autodesk AutoCAD Certified User • Autodesk Fusion Certified User • Autodesk Inventor Certified User • Autodesk Revit Certified User • Certified OnShape Professional • Certiport Information Technology Specialist (ITS) – HTML & CSS • Certiport Information Technology Specialist (ITS) – Java • Certiport Information Technology Specialist (ITS) – JavaScript • Certiport Information Technology Specialist (ITS) – Python • Certiport Information Technology Specialist (ITS) – Software Development • Electronic Systems Associate – ESA 1 Direct Current • Electronic Systems Associate – ESA 2 Alternating Current • Electronic Systems Associate – ESA 3 Semiconductor Devices and Circuits • Electronic Systems Associate – ESA 4 Digital Devices and Circuits • FAA Part 107 • FANUC CERT – Handling Tool Operations and Programming • Geometric Dimensioning and Tolerancing (GD&T) Fundamentals • Mechanical Foundations and Coding and Computational Thinking with VEX V5 • Microsoft Office – Access Expert 2019/O365 • Microsoft Office – Excel Expert 2019/O365 • NC3 Tormach CNC Fundamentals • Oracle Certified Associate (OCA) – Java Programmer • QuantHub – Applied Data Skills • Solid Edge Certified Associate Level 1 • SolidWorks CAD Design Associate • Skills for Success – Drone Operator	• Aerospace Engineer/Tech • Aesthetics Specialist • Agricultural Engineers • Architectural Engineer/Tech • Bioengineers • Chemical Engineers • Civil Engineer/Tech • Control Systems Engineer/Tech • Computer Hardware Engineers • Drafters • Electrical Engineer/Tech • Electro-Mechanical Technicians • Engineer/Technician all Disciplines • Environmental Engineer/Specialist • Ergonomics Specialist • Industrial Engineer/Tech • Manufacturing Engineer/Tech • Materials Engineer/Tech • Mechanical Engineer/Tech • Petroleum Engineer/Tech • Robotics Engineer/Tech
21019G1000	Aerospace Engineering – PLTW		
21047G1001	Career Pathway Project in STEM		
21021G1000	Civil Engineering and Architecture – PLTW		
21022G1000	Computer Integrated Manufacturing – PLTW		
21997G1000	CTE Lab in STEM		
21023G1000	Digital Electronics – PLTW		
21026G1000	Engineering Essentials – PLTW		
21024G1000	Environmental Sustainability – PLTW		
21017G1000	Introduction to Engineering Design – PLTW – Mathematics credit eligible		
21025G1001	PLTW Capstone		
21018G1000	Principles of Engineering – PLTW – Science credit eligible		
21998G1050	Internship in STEM		

***NOTE:** This is a purchased curriculum. LEAs must contact PLTW for additional information prior to utilizing the course codes listed above with a PLTW suffix, as it does require submission of a signed copy of the Terms and Conditions, participation in mandatory training and payment of a participation fee to the provider.

Career Pathway Program	*SREB AC Innovations in Science and Technology Program (Must teach three courses from this program list within two years.) Schools are challenged to better prepare students for a wide array of postsecondary options. The workforce of today and tomorrow demands a higher level of skill — people who grasp complex problems, understand technology and troubleshoot problems. Advanced Career (AC) answers both of these needs. By fusing a rigorous academic core with challenging project work and advanced technology in a career pathway program of study, AC courses give students a greater depth of knowledge and skills and prepare them for more options after high school.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
21047G1001	Career Pathway Project in STEM	• Autodesk AutoCAD Certified User • Autodesk Fusion Certified User • Autodesk Revit Certified User • Autodesk Inventor Certified User • Certified OnShape Professional • Certiport Information Technology Specialist (ITS) – HTML & CSS • Certiport Information Technology Specialist (ITS) – Java • Certiport Information Technology Specialist (ITS) – JavaScript • Certiport Information Technology Specialist (ITS) – Python • Certiport Information Technology Specialist (ITS) – Software Development • Electronic Systems Associate – ESA 1 Direct Current • Electronic Systems Associate – ESA 2 Alternating Current • Electronic Systems Associate – ESA 3 Semiconductor Devices and Circuits • Electronic Systems Associate – ESA 4 Digital Devices and Circuits • FAA Part 107 • FANUC CERT – Handling Tool Operations and Programming • Microsoft Office – Access Expert 2019/O365 • Microsoft Office – Excel Expert 2019/O365 • Oracle Certified Associate (OCA) – Java Programmer • Solid Edge Certified Associate Level 1 • SolidWorks CAD Design Associate	• Aerospace Engineer/Tech • Aesthetics Specialist • Architectural Engineer/Tech • Civil Engineer/Tech • Control Systems Engineer/Tech • Electrical Engineer/Tech • Engineer/Technician all Disciplines • Environmental Scientist/Specialist • Ergonomics Specialist • Industrial Engineer/Tech • Manufacturing Engineer/Tech • Materials Engineer/Tech • Mechanical Engineer/Tech/Mgr. • Petroleum Engineer/Tech • Robotics Engineer/Tech
21990G1002	Core Applications of Science and Technology – SREB AC		
21990G1004	Creativity and Innovations – SREB AC		
21997G1000	CTE Lab in STEM		
21990G1003	Impacts of Science and Technology – SREB AC		
21990G1001	The Nature of Science and Technology – SREB AC		
21998G1050	Internship in STEM		

***NOTE:** LEAs must contact SREB for additional information prior to utilizing any of the course codes listed above with a SREB suffix, as it does require commitment to the conditions in a MOU and participation in mandatory training provided by the provider.

Career Pathway Program	SREB AC Clean Energy Program **(Must teach three courses from this program list within two years)** Schools are challenged to better prepare students for a wide array of postsecondary options. The workforce of today and tomorrow demands a higher level of skill — people who grasp complex problems, understand technology, and troubleshoot problems. Advanced Career (AC) answers both needs. By fusing a rigorous academic core with challenging project work and advanced technology in a career pathway program of study, AC courses give students a greater depth of knowledge and skills and prepare them for more options after high school. Clean Energy is for students who want to apply their science and math skills and apply engineering processes as they tackle the world's energy needs within a green point of view.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**Workforce Careers**
18506G1014	**SREB AC – Clean Energy Systems – Required Foundation Course**	• Autodesk AutoCAD Certified User • Autodesk Fusion Certified User • Autodesk Inventor Certified User • Autodesk Revit Certified User • Certified OnShape Professional • Certiport Information Technology Specialist (ITS) – HTML & CSS • Certiport Information Technology Specialist (ITS) – Java • Certiport Information Technology Specialist (ITS) – JavaScript • Certiport Information Technology Specialist (ITS) – Python • Certiport Information Technology Specialist (ITS) – Software Development • Construction and Skilled Trade Assessment (CAST) • FAA Part 107 • FANUC CERT – Handling Tool Operations and Programming • Microsoft Office – Access Expert 2019/O365 • Microsoft Office – Excel Expert 2019/O365 • NCCER Core (Module 6 is an elective and not required for CRI) • NC3 Tormach CNC Fundamentals • Oracle Certified Associate (OCA) – Java Programmer • Solid Edge Certified Associate Level 1 • SolidWorks CAD Design Associate	• Control Systems Engineer/Tech • Electrical Engineer/Tech • Environmental Engineer/Specialist • Environmental Engineer/Tech
21047G1001	Career Pathway Project in STEM		
21997G1000	CTE Lab in STEM		
18506G1024	SREB AC – Clean Energy Application		
18506G1044	SREB AC – Clean Energy Innovations		
18506G1034	SREB AC – Clean Energy Strategies		
21998G1050	Internship in STEM		

Career Pathway Program	Middle School STEM Technologies Program STEM Technologies provide students with knowledge and processes needed to begin their attainment of technological literacy and awareness of careers in science, technology, engineering, and mathematics. Students gain knowledge and skills in the application, design, production, and assessment of products, services, and systems in a variety of areas.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
21052G0608	STEM Technologies I	N/A	• Aerospace Engineer/Tech • Aesthetics Specialist • Architectural Engineer/Tech • Civil Engineer/Tech • Control Systems Engineer/Tech • Electrical Engineer/Tech • Engineer/Technician all Disciplines • Environmental Scientist/Specialist • Ergonomics Specialist • Industrial Engineer/Tech • Manufacturing Engineer/Tech • Materials Engineer/Tech • Mechanical Engineer/Tech/Mgr. • Petroleum Engineer/Tech • Robotics Engineer/Tech
21052G0708	STEM Technologies II		
21052G0808	STEM Technologies III		

Career Pathway Program	*PLTW Middle School (PLTW Gateway) Program From launching space explorations to delivering safe, clean water to communities, engineers find solutions to pressing problems and turn their ideas into reality. PLTW Engineering empowers students to step into the role of an engineer, adopt a problem-solving mindset, and make the leap from dreamers to doers. The program's courses engage students in compelling, real-world challenges that help them become better collaborators and thinkers. Students take from the courses in-demand knowledge and skills they will use in high school and for the rest of their lives, on any career path they take.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
10099G6800	App Creators-PLTW	N/A	• Aerospace Engineer/Tech • Aesthetics Specialist • Architectural Engineer/Tech • Civil Engineer/Tech • Control Systems Engineer/Tech • Electrical Engineer/Tech • Engineer/Technician all Disciplines • Environmental Scientist/Specialist • Ergonomics Specialist • Industrial Engineer/Tech • Manufacturing Engineer/Tech • Materials Engineer/Tech • Mechanical Engineer/Tech/Mgr. • Petroleum Engineer/Tech • Robotics Engineer/Tech
21009G0708	Automation and Robotics – PLTW		
10099G6801	Computer Science for Innovators and Makers – PLTW		
21007G0708	Design and Modeling – PLTW		
21024G0708	Energy and the Environment – PLTW		
21019G0708	Flight and Space – PLTW		
21024G0608	Green Architecture – PLTW		
21023G0708	Magic of Electrons – PLTW		
14001G0608	Medical Detectives – PLTW		
21051G0708	Science and Technology – PLTW		
***NOTE:** This is a purchased curriculum. LEAs must contact PLTW for additional information prior to utilizing the course codes listed above with a PLTW suffix, as it does require submission of a signed copy of the Terms and Conditions, participation in mandatory training and payment of a participation fee to the provider.			

Career Pathway Program	*We Build It Better Middle School Program This program, delivered through seven We Build It Better innovation kits, will introduce inventive technologies, expose students to techniques that help build new skill sets, provide hours of curriculum and activities, offer unique resources, and promote career awareness. Aimed at middle school students, the overall objective of the program is to weave 21st century work skills with higher level thinking skills such as measurement, product design, tools, electrical wiring, fiber optics and coding to encourage students to design inventions on their own.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**In Demand Occupations**
21052G6800	We Build It Better	N/A	• Aerospace Engineer/Tech • Aesthetics Specialist • Architectural Engineer/Tech • Civil Engineer/Tech • Control Systems Engineer/Tech • Electrical Engineer/Tech • Engineer/Technician all Disciplines • Environmental Scientist/Specialist • Ergonomics Specialist • Industrial Engineer/Tech • Manufacturing Engineer/Tech • Materials Engineer/Tech • Mechanical Engineer/Tech/Mgr. • Petroleum Engineer/Tech • Robotics Engineer/Tech
***NOTE:** This is a purchased curriculum. LEAs must contact WBIB for additional information prior to utilizing the course codes listed above, as it requires participation in mandatory training and purchase of specific training equipment.			

STEM Engineering Cluster Courses	
Course Number	**Course Name**
21013G1016	Advanced Aerospace Technology – SREB AC
21049G1001	Advanced Manufacturing – PLTW
21013G1001	Aeronautics Engineering Applications – SREB AC
21019G1000	Aerospace Engineering – PLTW
21002G1000	Applications of Engineering and Technology – Mathematics credit eligible
21013G1002	Astronautics Engineering Applications – SREB AC
21015G1000	Basic Programming for Engineers
21047G1000	Capstone of Engineering and Technology
21047G1001	Career Pathway Project in STEM
21021G1000	Civil Engineering and Architecture – PLTW
18506G1014	Clean Energy Systems – SREB AC
21015G1001	Computer Engineering and Technology
21022G1000	Computer Integrated Manufacturing – PLTW
21990G1002	Core Applications of Science and Technology – SREB AC
21990G1004	Creativity and Innovations – SREB AC
21997G1000	CTE Lab in STEM
21023G1000	Digital Electronics – PLTW
21026G1000	Engineering Essentials – PLTW
21014G1000	Environmental Engineering – Mathematics credit eligible
21024G1000	Environmental Sustainability – PLTW
21005G1000	Foundations of Engineering and Technology
21013G1015	Fundamentals of Aerospace Technology –SREB AC
21105G1001	Greenpower F24 Eng Design & Race Ch I
21105G1002	Greenpower F24 Eng Design & Race Ch II
21990G1003	Impacts of Science and Technology – SREB AC
21017G1000	Introduction to Engineering Design – PLTW – Mathematics credit eligible
21998G1050	Internship in STEM
21025G1001	PLTW Capstone
21018G1000	Principles of Engineering – PLTW – Science credit eligible
21009G1000	Robotic Systems
21990G1001	The Nature of Science and Technology – SREB AC
Middle School Courses	
10099G1001	App Creators – PLTW
21009G0708	Automation and Robotics – PLTW
10099G6801	Computer Science for Innovators and Makers – PLTW
21007G0708	Design and Modeling – PLTW
21024G0708	Energy and the Environment – PLTW
21019G0708	Flight and Space – PLTW
21024G0608	Green Architecture – PLTW
21105G0708	Introduction to Greenpower
21023G0708	Magic of Electrons – PLTW
14001G0608	Medical Detectives – PLTW
21051G0708	Science and Technology – PLTW
21052G0608	STEM Technologies I
21052G0708	STEM Technologies II
21052G0808	STEM Technologies III
21052G6800	We Build It Better

Shared Courses			
Course Number	**Course Name**	**Cluster(s)**	**Required Year to Implement COS**
10099G6800	App Creators – PLTW	Information Technology	2018-2019
10099G6801	Computer Science for Innovators and Makers – PLTW	Information Technology	2018-2019
21009G1000	Robotic Systems	Information Technology	2021-2022

General Note: Course descriptions and content standards for most courses are located on the Alabama Department of Education website at: Alabama Achieves | Career and Technical Education | Courses of Study.

College and Career Readiness Indicator Course Matrix

Program Name	CTE Engineering	Project Lead The Way (PLTW) Engineering	SREB AC Aerospace Engineering	SREB AC Innovations in Science and Technology
Foundation Course(s)	Foundations of Engineering and Technology	Engineering Essentials – PLTW	Fundamentals of Aerospace Technology – SREB AC	The Nature of Science and Technology – SREB AC
Concentrator Course(s)	Applications of Engineering and Technology Basic Programming for Engineers Computer Engineering and Technology Environmental Engineering Robotic Systems	Aerospace Engineering – PLTW Advanced Manufacturing – PLTW Civil Engineering and Architecture – PLTW Computer Integrated Manufacturing – PLTW Digital Electronics – PLTW Environmental Sustainability – PLTW Introduction to Engineering Design – PLTW Principles of Engineering – PLTW	Advanced Aerospace Technology – SREB AC Aeronautics Engineering Applications – SREB AC	Core Applications of Science and Technology – SREB AC Impacts of Science and Technology – SREB AC
Capstone Course(s)	Capstone of Engineering and Technology Career Pathway Project in STEM CTE Lab in STEM Internship in STEM	Career Pathway Project in STEM CTE Lab in STEM PLTW Capstone Internship in STEM	Astronautics Engineering Applications – SREB AC Career Pathway Project in STEM CTE Lab in STEM Internship in STEM	Career Pathway Project in STEM CTE Lab in STEM Creativity and Innovations – SREB AC Internship in STEM

Program Name	SREB AC Clean Energy Program	Greenpower
Foundation Course(s)	SREB AC – Clean Energy Systems	Introduction to Greenpower
Concentrator Course(s)	SREB AC – Clean Energy Application SREB AC – Clean Energy Innovations	Greenpower F24 Eng Design & Race Ch I Greenpower F24 Eng Design & Race Ch II
Capstone Course(s)	Career Pathway Project in STEM CTE Lab in STEM SREB AC – Clean Energy Strategies Internship in STEM	Career Pathway Project in STEM CTE Lab in STEM Internship in STEM

To meet the CCR Indicator as a CTE completer, a student must earn three (3.0) credits with the grade of a "C" or higher in CTE courses that are part of an approved CTE program of study. Additional requirements are outlined in FY25-2048 Updates on Career and Technical Education Completer Status.

This matrix is intended for general guidance on the CCR completer status and is subject to change. For all CTE programming information, please refer to the CTE Cluster specific Program Guide. It contains a list of approved CTE programs, valid course numbers, required prerequisite courses, approved Career Readiness Indicators (CRIs) and in demand occupations.

***Courses are listed in alphabetical order, not in sequential order.**