



Overview of Competency-Based Education (CBE)

Competency-based education (CBE) is an approach to learning that focuses on the demonstration of specific skills or competencies rather than the completion of specific courses or time spent in a classroom. In CBE, learners progress through a program by mastering these predetermined competencies at their own pace, regardless of how long it takes. This model allows for more personalized learning experiences, as students can advance as soon as they demonstrate proficiency in each competency, rather than being held back or rushed by a fixed academic calendar.

CBE awards credit for prior learning. Students can demonstrate their current level of knowledge and potentially earn credit for competencies already mastered.

Course content includes online lectures, quizzes, exams, and assessments combined with student-scheduled lab time. The first component is always safety. Lab time is supervised by a knowledgeable instructor who provides on-demand instruction and guidance as students complete lab activities.

CBE classes are one (1) credit hour each, and most courses can be completed in as few as four weeks; however, students may utilize the full 16-week semester to complete the course.

Key features of competency-based education include:

- **Clear Learning Objectives:** Competencies are clearly defined and aligned with desired learning outcomes.
- **Self-Paced Progression:** Students advance based on their ability to demonstrate mastery of each competency rather than by completing a set amount of time in a course.
- **Flexible Learning Pathways:** Learners have flexibility in how they acquire and demonstrate competencies, whether through traditional coursework, project-based learning, internships, or other experiences.
- **Personalized Support:** CBE often involves personalized learning plans and ongoing support from instructors or mentors to help students achieve their learning goals.
- **Assessment of Mastery:** Assessment is focused on measuring mastery of specific competencies rather than overall performance in a course or program.
- **Credentialing:** Students earn credentials, such as certificates or degrees, based on the competencies they have mastered rather than the completion of a predetermined set of course

Parkland Competency-Based Education (CBE) Courses

Electrical: Each Course is 15 contact hours and 1 credit hour.

ELX 110 Introduction to Electrical Fundamentals and Theories:

Introduction to the electrical field, career outlook, and opportunities as well as electrician roles and levels of expertise. Basic electrical theory regarding the nature of electricity; electrical quantification such as voltage, current, resistance, and power; and the rules that determine how these work with one another within a circuit. Prerequisite: placement out of MAT 060

ELX 111 Electrical Safety, Regulations, and Tooling:

Introduction to electrical tools, their selection, care and proper use. Best safe work practices; governing agencies responsible for their oversight. Individual responsibility in the workplace in context with electrical safety. Prerequisite: credit in ELX 110; placement out of MAT 060

ELX 112 NEC Introduction, Definitions, Requirements, and Enclosures:

Introduction to the National Electric Code (NEC); history, structure of the NEC code book, and common electrical definitions. Electrical equipment including boxes, fittings, and devices; rules that govern their installation. Prerequisites: credit in ELX 111; placement out of MAT 060

ELX 113 Conductors, Cables, Wireways, and Math for the Trades:

Conductor identification, sizing, color coding, and types; conduit types, sizing, and general installation guidelines. Prerequisites: credit in ELX 112; placement out of MAT 060

ELX 114 Electrical Formulae, Measurements, and Meters:

Branch circuit wiring; general lighting circuits, small-appliances circuits, protection devices, and 240-volt circuit design and assembly in both new construction and existing installs and renovations. Circuit analysis in context with load distribution, estimating total loads, and instruments for individual electrical measurements. Prerequisites: credit in ELX 113; placement out of MAT 060

ELX 115 Electrical Lighting Technology and Practices:

Electrical lighting types, wiring practices, and lighting practices (photometrics); energy-saving practices and technologies gaining popularity in older buildings, homes, and new installations. Prerequisites: credit in ELX 114; placement out of MAT 060

ELX 116 HVACR Principles and Practices:

Heating and air conditioning systems, their operation, and their installation and maintenance; schematic reading, troubleshooting, and newer technologies gaining popularity in older buildings, homes and new installations. Prerequisites: credit in ELX 115; placement out of MAT 060

ELX 117 Blueprints, Circuits, Feeders, and Taps:

Continued electrical blueprint reading and writing, electrical circuit wiring standards, Transformers, feeders, and taps; Industrial and higher-level wiring considerations. Prerequisites: credit in ELX 116; placement out of MAT 060

Parkland Competency-Based Education (CBE) Courses

ELX 118 Motors, Generators, Industrial Applications, and Troubleshooting:

Alternating and direct-current motors, their power distribution systems, control mechanisms, and overload/overcurrent protection. Motor troubleshooting tools, techniques, and procedures.

Prerequisites: credit in ELX 117; placement in MAT 060

ELX 119 Industrial Electrical Work, NEC Review, Contracting, and Estimating:

Comprehensive review of electrical considerations unique to commercial and industrial applications; three-phase equipment and machine control devices including programmable logic controllers and instrumentation common to manufacturing. Introduction to the business side of electrical contracting and estimating; comprehensive National Electrical Code review. Prerequisites: credit in ELX 118;

placement out of MAT 060

Manufacturing: Each Course is 15 contact hours and 1 credit hour.

MFX 110 Industrial Mechanics Safety:

Safety organization, personal protective equipment, HazCom, confined spaces, electrical safety, fire safety, accident response, workplace ergonomics, and maintenance organization. Prerequisites:

placement into ENG 098, CCS 098, and MAT 059

MFX 130 Basic Pneumatics I:

Prepares learners to work intelligently in industry with pneumatic applications. Introduction to pneumatic power; key topics and skills in pneumatic power and safety, pneumatic circuits, and pneumatic schematics. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 131 Basic Pneumatics II:

Prepares learners to work intelligently in industry with pneumatic applications. Introduction of the principles of pneumatic pressure and flow, pneumatic speed control circuits. Pressure regulation, air filtration, how to connect pneumatic circuits, pneumatic cylinders, valves and actuators, a wide array of pneumatic applications, pressure and cylinder force, pneumatic leverage, pressure and volume, and air flow resistance. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 132 Intermediate Pneumatics I:

Builds on basic pneumatics skills to teach intermediate pneumatic components and system applications. Industry-relevant skills related to these new topics. Prerequisites: placement into ENG 098, CCS, 098, and MAT 059

MFX 133 Intermediate Pneumatics II:

Builds on basic pneumatics skills to teach intermediate pneumatic components and system applications. Industry-relevant skills related to these new topics, including air logic design, air filters, filter selection, filter maintenance, water removal techniques, air dryers, after-coolers, water traps, air lubricators, and component maintenance. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

Parkland Competency-Based Education (CBE) Courses

MFX 150 Basic Hydraulics I:

Introduction to hydraulic power use and application; skills and knowledge needed to apply hydraulics in modern industry. Key topics and skills in hydraulic power and safety, hydraulic circuits, hydraulic schematics, principles of hydraulic pressure and flow, and hydraulic speed control circuits, Pumps, and fluid friction. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 151 Basic Hydraulics II:

Introduction to hydraulic power use and application; development of skills and knowledge needed to apply hydraulics in modern industry. Key topics and skills in how to connect hydraulic circuits, hydraulic cylinders and valves (including needle valves), and a wide array of hydraulic applications. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 152 Intermediate Hydraulics I:

Builds on basic hydraulic skills, teaching hydraulic components and system applications. Industry-relevant skills related to new topics including operation, installation, performance analysis, and design. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 153 Intermediate Hydraulics II:

Builds on basic hydraulic skills, teaching hydraulic components and system applications. Industry-relevant skills related to new topics including operation, installation, performance analysis, and design. Remote pressure control, pump unloading circuits. P-port check valves, and accumulator sizing. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 170 Mechanical Drives I:

Introduction of mechanism concepts and their importance in industrial, commercial, and residential applications. Three common types of mechanisms and applications of each type/ Introduction to levers: force measurement; first, second, and third-class levers. Linkages, cams, and turnbuckles including friction and inclined plane concepts. Emphasis on pulley systems and gear drives including fixed pulleys, movable pulleys, and combination pulleys. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 171 Mechanical Drives II:

Introduction of mechanism concepts and their importance in industrial, commercial, and residential applications. Three common types of mechanisms and applications of each type. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 172 Mechanical Drives III:

Construction, operation, installation, and alignment of heavy-duty V-belt drives. Synchronous belt drives, and heavy-duty chain drives. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 173 Mechanical Drives IV:

Lubricant management, flange couplings, grid and gar couplings, and chain selection. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

Parkland Competency-Based Education (CBE) Courses

MFX 174 Mechanical Drives V:

Plain bearings, ball bearings, and roller bearings. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 175 Mechanical Drives VI:

Anti-friction bearing selection and maintenance; gaskets, seals, and advanced gear drives; and gear drive selection and maintenance. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

MFX 190 C-209 Pneumatics Certification:

Study material and review as needed; access to the C-209 Certification test. Prerequisites: credit in MFX 130, MFX 131, MFX 132, and MFX 133; placement into ENG 098, CCS 098, and MAT 059

MFX 191 C-210 Mechanical Certification:

Study material and review as needed; access to the C-210 Certification test. Prerequisites: credit in MFX 170, MFX 171, MFX 172, and MFX 173; placement into ENG 098, CCS 098, and MAT 059. Recommended: credit in MFX 174 and MFX 175

Welding: Each Course is 15 contact hours and 1 credit hour.

WLX 112 Introduction to Oxy-fuel Welding and Cutting:

Introductory theory and practice in oxyacetylene welding and cutting. Includes oxyacetylene fusion welding in the various positions on plate steel and manual oxyfuel cutting. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

WLX 113 Introduction to Oxy-fuel Brazing:

Introductory theory and practice in oxyacetylene brazing in the various positions on plate steel. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

WLX 114 Introduction to 6011 Arc Welding:

Introductory theory and practice in shielded metal arc welding. Includes shielded metal arc welding in all positions on plate steel with 6011 electrodes, with emphasis on skill development and plasma arc cutting. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

WLX 115 Introduction to 7018 Arc Welding:

Introductory theory and practice in shielded metal arc welding. Includes shielded metal arc welding in all positions on plate steel with 7018 electrodes, with emphasis on skill development. Prerequisites: placement into ENG 098, CCS 098, and MAT 059

WLX 116 Beginning Gas Metal Arc Welding I:

Beginning gas metal arc welding (GMAW). Gas metal arc equipment adjustments, metal transfer, and shielding gases. Skill development in all positions of welding on mild steel ranging from 1/8" to 16ga" steel and aluminum. Welding symbols and print reading. Prerequisites: credit or concurrent enrollment in WLD 110, WLD 111, or WLX 114 and WLX 115; placement into ENG 098, CCS 098, and MAT 059

Parkland Competency-Based Education (CBE) Courses

WLX 117 Beginning Gas Metal Arc Welding II:

Beginning gas metal arc welding (GMAW). Gas metal arc equipment adjustments, metal transfer, and shielding gases. Skill development in all positions of welding on mild steel ranging from 18 gauge to 22 gauge steel and aluminum. Welding symbols and print reading. Prerequisites: credit or concurrent enrollment in WLD 110, WLD 111, or WLX 114 and WLX 115; placement into ENG 098, CCS 098, and MAT 059

WLX 210 Advanced Gas Metal Arc Welding I:

Advanced gas metal arc welding (GMAW). Gas metal arc equipment adjustments, metal transfer, and shielding gases. Skill development in all positions of welding on mild steel ranging from 1/8" to 3/8" steel and aluminum. Welding symbols and print reading. Prerequisites: credit or concurrent enrollment in WLD 110, WLD 111, or WLX 114, WLX 115, WLX 116, and WLX 117 placement into ENG 098, CCS 098, and MAT 059

WLX 211 Advanced Gas Metal Arc Welding II:

Advanced gas metal arc welding (GMAW). Gas metal arc equipment adjustments, metal transfer, and shielding gases. Skills development in all positions of welding on mild steel ranging from 1/8" to 3/8" steel and aluminum. Welding symbols and print reading. Prerequisites: credit or concurrent enrollment in WLD 110, WLD 111, or WLX 114, WLX 115, WLX 116, and WLX 117 placement into ENG 098, CCS 098, and MAT 059