

Heavy Equipment Operator AAS

Program Learning Outcomes (PLOs)	Measurable Student Learning Outcomes (MSLOs)- PLO Alignment							
	HEO121	HEO122	HEO127	HEO128	HEO221	HEO222	CET125	CET221
1. (Synthesis Level) Plan and explain a diesel related dilemma using effective critical thinking processes to problem solve. (CSLO-4)	✓						✓	
2. (Comprehension Level) Explain the importance of work safety, punctuality, and a team approach to develop and present class projects. (CSLO-2)	✓	✓				✓		
3. (Comprehension Level) Explain the importance of good listening, requesting clarification for total comprehension, and accurately carrying out both verbal and written instructions. (CSLO-3)			✓	✓				
4. (Comprehension Level) Read for comprehension detailed equipment manuals, technical support materials, and career-related information.		✓					✓	
5. (Application Level) Apply math/science computational concepts and principles to everyday living and to a career choice.		✓				✓	✓	✓
6. (Application Level) Adhere to safe work practices while operating, servicing, and repairing heavy equipment. (CSLO-3)	✓	✓	✓	✓	✓	✓		✓
7. (Application Level) Safely operate various types of heavy equipment to exacting specifications. (CSLO-3)	✓	✓				✓	✓	
8. (Synthesis Level) Perform in a safe and professional manner the preventive maintenance of heavy construction equipment. (CSLO-3)	✓	✓			✓	✓	✓	
9. (Synthesis Level) Analyze and explain the process to repair various malfunctions of heavy equipment and concisely report the problems. (CSLO-4)	✓		✓	✓	✓			
10. (Application Level) Demonstrate surveying and layout of construction projects related to earth moving. (CSLO-3)	✓				✓	✓		✓
11. (Comprehension Level) Explain the principles of approximating volumes of material that are related to moving, processing, and completing various construction projects. (CSLO-2)							✓	
12. (Synthesis Level) Record manpower and machine data used to analyze equipment cost and efficiency as applied to a construction project. (CSLO-3)		✓						
13. (Synthesis Level) Develop a resume focusing on the principles of applying for an operator position in the heavy equipment operator field.			✓	✓				
14. (Evaluation Level) Interpret documents used for the layout and construction of projects as related to shaping of earth, aggregates, and other such materials. (CSLO-2)	✓	✓						✓

Heavy Equipment Operator Level I Certificate

Program Learning Outcomes (PLOs)	Measurable Student Learning Outcomes (MSLOs)- PLO Alignment					
	CET125... OR... CET221	HEO121.... OR.....	HEO122	HEO127.... OR.....	HEO128	
1. (Synthesis Level) Model safe procedures in the workplace, per OSHA. (CSLO #2)			✓		✓	✓
2. (Comprehension Level) Explain the fundamentals of diesel engine and fuel system design and operation used in Heavy Equipment. (CSLO #2)		✓				
3. (Comprehension Level) Explain the fundamentals of hydraulic, electrical, and electronic systems used in Heavy Equipment. (CSLO #2 & #4)	✓	✓	✓	✓		
4. (Application Level) Operate Heavy Equipment in accordance with the operator's handbook. (CSLO #2 & #4)	✓	✓		✓		
5. (Comprehension Level) Explain the importance of work safety, punctuality, and a team approach to develop and present class projects. (CSLO #2)				✓		
6. (Application Level) Safely operate various types of heavy equipment to exacting specifications. (CSLO #2 & #4)				✓		
7. (Comprehension Level) List, locate, and explain safety rules to follow during the maintenance of heavy equipment. (CSLO 2&3)						
8. (Application Level) Apply tool safety rules and safe operating practices using safety equipment important to mechanics in the repair and reconditioning of heavy equipment. (CSLO 2 &3)						
9. (Synthesis Level) Employ safe lifting and blocking techniques during repair of heavy equipment, including cross-blocking a piece of heavy equipment, and list ten safety rules for repairing tires and demonstrate the removal, repair and replacement of one tire on a piece of heavy equipment. (CSLO 2,3,4)						
10. (Synthesis Level) List pre-start inspection steps for heavy equipment and perform pre-start inspections on five machines, including the correct jump start procedures for 12V and 24V electrical systems; identify the correct voltage of different pieces of heavy equipment; and perform correct jump starting of a 12V and a 24V piece of equipment. (CSLO 2,3,4)				✓		
11. (Comprehension level) Explain the power flow through a crawler-type tractor.						
12. (Application level) Demonstrate the procedures for servicing various pieces of equipment, including replacing a drive shaft, wiring, and a clutch.						
13. (Application/Mechanism level) Properly adjust a twin disc truck clutch.						
14. (Analysis/Evaluation level) Diagnose lighting, cranking, and charging electrical circuits faults.						

Heavy Equipment Operator Level II Certificate

Program Learning Outcomes (PLOs)	Measurable Student Learning Outcomes (MSLOs)- PLO Alignment					
	HEO121	HEO122	HEO127	HEO128	CET125	CET221
1. (Synthesis Level) Model safe procedures in the workplace, per OSHA. (CSLO 2)	✓	✓	✓	✓		✓
2. (Comprehension Level) Explain the fundamentals of diesel engine and fuel system design and operation used in heavy equipment. (CSLO 2)		✓			✓	
3. (Analysis Level) Diagnose and repair malfunctions related to diesel engines and fuel systems used in heavy equipment. (CSLO 4)	✓		✓			
4. (Comprehension Level) Explain the fundamentals of power train and chassis system design and operation used in heavy equipment. (CSLO 2)		✓		✓	✓	
5. (Analysis Level) Diagnose and repair malfunctions related to power train and chassis systems used in heavy equipment. (CSLO 4)			✓	✓		
6. (Comprehension Level) Explain the fundamentals of hydraulic, electrical, and electronic systems used in heavy equipment. (CSLO 2,4)		✓	✓		✓	
7. (Analysis Level) Diagnose and repair malfunctions related to hydraulic, electrical, and electronic systems used in heavy equipment. (CSLO 4)	✓		✓	✓		
8. (Application Level) Operate heavy equipment in accordance with the operator's handbook. (CSLO 2,4)	✓	✓		✓	✓	✓
9. (Application Level) Recondition heavy equipment in accordance with the manufacturer's service and repair manual. (CSLO 2,4)	✓	✓	✓	✓	✓	✓