HIGHER EDUCATION COORDINATING COMMISSION
3225 25th Street SE, Salem, OR 97302
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Docket Item:

Community College Approval: Chemeketa Community College, Associate of Applied Science in Diesel Technology within 47.0605 – Diesel Mechanics Technology/Technician.

Summary:

Chemeketa Community College proposes a new Associate of Applied Science in Diesel Technology. Higher Education Coordinating Commission (HECC) staff completed a review of the proposed program. After analysis, HECC staff recommends approval of the degree as proposed.

Staff Recommendation:

The HECC recommends the adoption of the following resolution:
RESOLVED, that the Higher Education Coordinating Commission approve the following degree: AAS in Diesel Technology.

Chemeketa Community College seeks the Oregon Higher Education Coordinating Commission's approval to offer an instructional program leading to an Associate of Applied Science in Diesel Technology.

Program Summary

The diesel technician repairs and maintains diesel powered trucks and agricultural equipment and their support systems.

This program is designed to prepare students for entry-level positions in diesel service technology. Training is varied to give students a broad understanding and background in the different phases of the diesel service industry. Students may have additional cost for tools and books.

It is an industry-specific two-year associate degree program with required internship hours. It is designed to prepare individuals to become qualified diesel service technicians. Students learn how to work on many types of diesel equipment including agricultural, construction, forestry, semi-truck and earth moving equipment. The Diesel Technology Program combines technical and academic education with real world experience through internships that are within the program. Students learn about engine fundamentals, machine hydraulics, fuel systems, electrical systems, transmissions, torque converters, undercarriage, final drives and more. During the internships, students have the opportunity to experience a future career firsthand through on-the-job training focused area of their choice.

Upon completion of the program, students will earn a Diesel Technology Associate of Applied Science Degree.

Program Outcomes

Students completing the Diesel Technology degree should be able to:

- Demonstrate and use industry safety standards.
- Demonstrate math skills using formulas to find force, pressure, area, and volume.
- Use diagnostic simulators to diagnose and troubleshoot system components.
- Demonstrate troubleshooting, maintenance and repair procedures for fuel systems and transmissions.
- Demonstrate troubleshooting, maintenance and repair procedures for brake systems and components.
- Demonstrate troubleshooting, maintenance and repair procedures for powertrain systems and hydraulics.
- Demonstrate troubleshooting, maintenance and repair procedures for electrical systems.
- Demonstrate troubleshooting, maintenance and repair procedures including: testing, disassembly, failure analysis, assembly and operation using industry standard tooling and equipment, to diagnose diesel electrical systems and components found on highway trucks, off

highway vehicles and stationary applications including construction equipment, agriculture equipment, marine applications, truck equipment and power generation.

1. ***Describe the need for this program by providing clear evidence***.

According to Qualityinfo.org, there are several reasons that this program is needed. First, there are plenty of jobs. In the Mid-Valley region, there were 566 people employed in this industry with 62 job openings per year. Second, students can receive a living wage where entry wages are approximately $37,400/year with average wages of $53,400/year. Third, students with postsecondary education are more of an advantage of jobs than those students with only a high school diploma.

Salem-Keizer schools is looking to offer a couple of Diesel Technology classes for students as part of their CTE program. This can provide a pipeline of students who can come to Chemeketa after graduation to get the full AAS degree.

Members of the Diesel Technology Advisory Committee is wanting graduates of the current program to graduate as quickly as possible because the jobs are there now. We can clearly send out enough students every year for the demand of jobs that are being projected between now and 2029.

2. ***Does the community college utilize systemic methods for meaningful and ongoing involvement of the appropriate constituencies?***

The college uses a range of sources to establish ongoing partnerships with its community constituencies. Some of these partnerships include: Northwest Commission on Colleges and Universities, the State Board of Education, Community College Workforce Development, employment advisory boards, student placement organizations, and licensing boards for appropriate occupations.

The Diesel Technology AAS program was approved in April 29, 2021 by the Chemeketa Community College's Curriculum Committee and then approved by Chemeketa Community College's Board of Education in June 23, 2021.

Chemeketa Community College has partnerships with local high schools to offer courses in their schools for college credit. These courses will prepare students for entry into the program soon after graduating. Other required and general education courses will be valuable in preparation for entrance into the program and the workforce.

Collaboration with workforce and economic development partners assists the college to build a skilled and trained workforce ready to enter their fields immediately upon completion of the program. The Diesel Technology department that will be offering this Diesel Technology AAS has an advisory committee composed of professionals from across the Willamette Valley:

- Bart Bishop, Peterson Cat, Salem OR
- Brad Ramseyer, McCoy Freightliner, Brooks OR
- Patrick Thomas, McCoy Freightliner, Salem and Portland, OR
- Randy Sheldon, Peterson Cat, Salem OR
- Rich Smith, McCoy Freightliner, Salem OR
- Aaron Hiatt, Papé, Salem OR
- Jose Robinson, TEC, Wilsonville OR

3. ***Is the community college program aligned with appropriate education, workforce development, and economic development programs?***

   The courses for this program have been approved by the advisory committee so that students are fully prepared for the workforce.

   The program courses are:

   - DSL110: Diesel Engine Diagnosis and Repair
   - DSL111: Diesel Technology Introduction to Electrical and Electronics
   - DSL120: Diesel Technology Introduction to Fuels
   - DSL121: Diesel Technology HVAC Repair and Diagnosis
   - DSL130: Diesel Technology Introduction to Hydraulics
   - DSL131: Diesel Technology Heavy Duty Powertrains
   - DSL210: Diesel Technology Heavy Duty Brakes
   - DSL211: Diesel Technology Heavy Duty Suspensions and Steering
   - DSL220: Diesel Technology Automatic and Powershift Transmissions
   - DSL221: Diesel Technology Advanced Fuels
   - DSL230: Diesel Technology Advanced Hydraulics
   - DSL231: Diesel Technology Advanced Engine Diagnostic

   These courses were approved by the advisory committee on March 9, 2021.

   Chemeketa's Diesel Technology program will lead to employable skills at the end of the program. Individuals in this field earn an annual wage of $53,405 per year and starting wages at $37,400 per year (qualityinfo.org), therefore it will allow these students to enter the workforce in a family-wage career.

4. ***Does the community college program lead to student achievement of academic and technical knowledge, skills, and related proficiencies?***

   The design of the program is a 97 credit hour approved Associate of Applied Science degree. The primary audience for this program are students who wish to focus on repair diesel engines. The learner

outcomes for each course provide a range of skills to allow graduates to pursue employment in this industry:

DSL110: Diesel Engine Diagnosis and Repair (6)

- Analyze and determine the problem and implement the correct repair of diesel engines, components, and systems.
- Conduct repairs in an ethical and professional manner, respecting industry safety and environmental guidelines.
- Communicate with co-workers, customers, management, and public in a professional and knowledgeable manner.

DSL111: Diesel Technology Introduction to Electrical and Electronics (6)

- Understand the relationships between voltage, current flow and resistance.
- Demonstrate the operation of basic electrical circuits (series, parallel, series-parallel).
- Demonstrate the appropriate skills required to correctly diagnose and repair electrical and electronic circuits, systems and power accessories.
- Identify correct industry repair and diagnostic procedures.
- Identify and locate common connector information.
- Demonstrate correct safety procedures.
- Demonstrate appropriate time management skills.

DSL120: Diesel Technology Introduction to Fuels (6)

- Apply diesel engine knowledge to diesel fuel injection systems functions and how they relate to engine operation and performance.
- Troubleshoot, evaluate and repair diesel fuel injection systems.
- Disassemble, test, and reassemble fuel injection components.
- Test diesel engines for fuel system malfunctions.
- Apply knowledge of diesel fuel, fuel injection systems, and how they relate to engine performance.
- Research and locate repair literature.
- Apply basic theory of diesel electricity, components, schematics, controls, and how they all relate to the fuel injection system.
- Diagnose and repair injector electrical circuits.
- Conduct repairs in an ethical and professional manner, respecting industry safety and environmental guidelines.
- Communicate with co-workers, customers, management and general public in a professional and knowledgeable manner.

DSL121: Diesel Technology HVAC Repair and Diagnosis (6)

- Analyze and determine the problem and implement the correct repair of diesel HVAC, components, and systems.

- Troubleshoot, evaluate and repair HVAC systems.
- Disassemble, test, and reassemble HVAC components.
- Research and locate repair literature.
- Apply basic theory of diesel electricity, components, schematics, controls, and how they all relate to the HVAC system.
- Conduct repairs in an ethical and professional manner, respecting industry safety and environmental guidelines.
- Communicate with co-workers, customers, management and general public in a professional and knowledgeable manner.

DSL130: Diesel Technology Introduction to Hydraulics (6)

- Diagnose failures and research the failure symptoms in service manuals.
- Disassemble, inspect, reassemble, and test hydraulic components and understand the relationship between component failure and hydraulic system operation.
- Research new products hydraulic systems.
- Apply their knowledge of how hydraulic system operate.
- Work safely and the proper use of PPE's in all work areas.

DSL131: Diesel Technology Heavy Duty Powertrains (6)

- Disassemble, inspect, reassemble, and understand the power flow of transmissions.
- Remove, disassemble, reassemble, and install clutches.
- Repair and maintain power trains and their components.
- Diagnose failures and research the failure symptoms in service manuals.
- Work safely and the proper use of PPE's in all work areas.

DSL210: Diesel Technology Heavy Duty Brakes (6)

- Disassemble, inspect, reassemble, and understand components of air brake systems, truck foundation brakes, antilock brake systems.
- Use tools to properly repair and maintain brake systems.
- Diagnose failures and practice researching the failure symptoms in service manuals and other sources to research and diagnosis failures.
- Use protective gear and safe procedures in all work areas.
- Conduct repairs in an ethical and professional manner, respecting industry safety and environmental guidelines.
- Communicate with co-workers, customers, management, and public in a professional and knowledgeable manner.

DSL211: Diesel Technology Heavy Duty Suspension and Steering (6)

- Analyze and determine the problem and implement the correct repair of wheels and tires, and steering and suspension systems.

- Conduct repairs in an ethical and professional manner, respecting industry safety and environmental guidelines.
- Communicate with co-workers, customers, management, and public in a professional and knowledgeable manner.
- Students will learn how to disassemble, inspect, reassemble, and understand components of wheels and tires, steering systems, suspension systems, and fifth wheels.
- Students will learn how to use tools to properly repair and maintain steering systems, suspension systems, wheels, tires, and fifth wheels.
- Students will learn how to diagnose failures and practice researching the failure symptoms in service manuals and other sources to research and diagnosis failures.
- Students will learn use protective gear and safe procedures in all work areas.

DSL220: Diesel Technology Automatic and Powershift Transmissions (6)

- Conduct repairs in an ethical and professional manner, respecting industry safety and environmental guidelines.
- Communicate with co-workers, customers, management, and public in a professional and knowledgeable manner.
- Apply theory and applications of various torque converter designs.
- Apply their knowledge of the materials needed to properly repair and maintain heavy-duty power trains and their components.
- Diagnose failures and practice researching the failure symptoms in service manuals and other sources to research and diagnosis failures.
- Use protective gear and safe procedures in all work areas.
- Disassemble, inspect, reassemble and understand the power flow of heavy-duty on and off road automatic and power shift transmissions.

DSL221: Diesel Technology Advanced Fuels (6)

- Analyze and determine the problem and implement the correct repair of diesel engine fuel pumps, components, and their related systems
- Conduct repairs in an ethical and professional manner, respecting industry safety and environmental guidelines.
- Communicate with co-workers, customers, management, and public in a professional and knowledgeable manner.
- Apply fuel injection system knowledge to engine applications for maintenance and troubleshooting.
- Diagnose failures and practice researching the failure symptoms in service manuals and other sources to research and diagnosis failures.
- Apply fuel injection system knowledge to engine applications for maintenance and troubleshooting.
- Research and locate industry repair literature.

DSL230: Diesel Technology Advanced Hydraulics (6)

- Analyze and determine the problem and implement the correct repair of heavy equipment hydrostatic drives, hydraulics, advanced electrical diagnosis, components, and systems.
- Conduct repairs in an ethical and professional manner, respecting industry safety and environmental guidelines.
- Communicate with co-workers, customers, management, and public in a professional and knowledgeable manner.
- Apply hydraulic system knowledge to equipment applications for maintenance and troubleshooting.
- Diagnose failures and practice researching the failure symptoms in service manuals and other sources to research and diagnosis failures.
- Research and locate industry repair literature.
- Interpret and apply hydraulic schematics.

DSL231: Diesel Technology Advanced Engine Diagnostic (6)

- Analyze and determine the problem and implement the correct repair of diesel engines.
- Conduct repairs in an ethical and professional manner, respecting industry safety and environmental guidelines.
- Communicate with co-workers, customers, management, and public in a professional and knowledgeable manner.
- Analyze and determine the problem and implement the correct repair of diesel engine components and systems.
- Diagnose failures and practice researching the failure symptoms in service manuals and other sources to research and diagnosis failures.
- Research and locate industry repair literature.

These courses lead to the following outcomes that students will be prepared to accomplish:

- Demonstrate and use industry safety standards.
- Demonstrate math skills using formulas to find force, pressure, area, and volume.
- Use diagnostic simulators to diagnose and troubleshoot system components.
- Demonstrate troubleshooting, maintenance and repair procedures for fuel systems and transmissions.
- Demonstrate troubleshooting, maintenance and repair procedures for brake systems and components.
- Demonstrate troubleshooting, maintenance and repair procedures for powertrain systems and hydraulics.
- Demonstrate troubleshooting, maintenance and repair procedures for electrical systems.
- Demonstrate troubleshooting, maintenance and repair procedures including: testing, disassembly, failure analysis, assembly and operation using industry standard tooling and equipment, to diagnose diesel electrical systems and components found on highway trucks, off highway vehicles and stationary applications including construction equipment, agriculture equipment, marine applications, truck equipment and power generation.

Learning will be ensured through the assessment of these program outcomes with the following methods:
Exams and labs
Instruction methods within this program will be face-to face. Students will have general education courses for the degree. Any general education courses may be provided in a face-to-face, a hybrid, or an online environment. Program course lectures provide various hands-on activities.
The college has a unit planning process that includes a program assessment on an annual basis. Student, faculty, advisory committee, and administrative collaboration is incorporated to ensure students are prepared with appropriate skills to enter the workforce and meet the requirements of Diesel Technology Associate of Science Degree.

5. ***Does the community college identify and have the resources to develop, implement, and sustain the program?***
The Northwest Commission on Colleges and Universities (NWCCU) accredits Chemeketa Community College.

The new program will have startup costs of $0.

Year 0: Total Revenue: $219,000 Total Expenditures: $168,809 Net Income (Deficit): $50,191

Year 1: Total Revenue: $439,800 Total Expenditures: $257,554 Net Income (Deficit): $182,246

Year 2: Total Revenue: $439,800 Total Expenditures: $257,554 Net Income (Deficit): $182,246

Year 3: Total Revenue: $439,800 Total Expenditures: $257,554 Net Income (Deficit): $182,246

The Diesel Technology Associate of Applied Science program has 1 full-time faculty positions and 0 classified staff along with numerous adjunct faculty who generally work full-time in the industry. The program has the flexibility to use general fund dollars to expand the adjunct workforce to teach additional courses in the degree and to offset full-time workload as needed.

Chemeketa Community College has begun programs over the last fifty years and has had the institutional support in hiring qualified and trained faculty to teach in all CTE programs.

This new program and its courses have been developed and approved by the employer-based advisory committee, as well as approved by the college's Curriculum Committee and Chemeketa Community College's Board of Education.

Faculty will regularly participate in professional development activities to stay current and up-to-date with industry changes and requirements, which will translate into the classroom learning environment.

The program will reside at Books Center of the Salem Campus.
The college has strong relationships with industry partners/employers and will continue to foster these relationships. This program has an employer-based advisory committee. The program will continue to work with local industry leaders and educational institutions to recruit students for this program.

Assurances

Chemeketa Community College has met or will meet the four institutional assurances required for program application.

1. *Access.* The college and program will affirmatively provide access, accommodations, flexibility, and additional/supplemental services for special populations and protected classes of students.
2. *Continuous Improvement*. The college has assessment, evaluation, feedback, and continuous improvement processes or systems in place. For the proposed program, there will be opportunities for input from and concerning the instructor(s), students, employers, and other partners/stakeholders. Program need and labor market information will be periodically re-evaluated and changes will be requested as needed.
3. *Adverse impact and detrimental duplication*. The college will follow all current laws, rules, and procedures and has made good faith efforts to avoid or resolve adverse *inter*segmental and *intra*segmental impact and detrimental duplication problems with other relevant programs or institutions.
4. *Program records maintenance and congruence*. The college acknowledges that the records concerning the program title, curriculum, CIP code, credit hours, etc. maintained by the Office are the official records and it is the college's responsibility to keep their records aligned with those of the Office. The college will not make changes to the program without informing and/or receiving approval from the Office.