



**Internal Program Review
Self-Study Report**

Program Name
Diesel Technology

Credentials Offered
Associate of Applied Science Diesel Technology: 72 semester credits

Self-Study Completed by:
Rick Purcell, Faculty
Derrick Hauer, Faculty

Date Completed:
September 30, 2014

A. Introduction

Diesel Technology prepares students to enter various segments of the diesel repair industry as an entry-level technician. This includes, but is not limited to, the agricultural, the industrial equipment, and the heavy-duty diesel truck repair industry. This program provides comprehensive training in maintenance, diagnosis, and repair of related electrical/electronic systems, mobile hydraulic systems, manual and hydraulic drive trains, brakes, air systems, diesel engines, general maintenance, alignment and undercarriages, HVAC, and transport refrigeration systems as used in equipment common to the diesel repair industry.

Potential employers include agriculture and truck dealerships, truck fleets, mining companies, construction companies, oil companies, farms and ranches, and independent truck repair shops.

B. Alignment with mission, strategic goals and core themes.

Helena College Mission

Helena College University of Montana, a comprehensive two-year college, provides access to and support of lifelong educational opportunities to our diverse community

Diesel Technology Program Mission Statement

The Helena College UM Diesel Technology Program mission and purpose is to provide its students with educational experiences that create a framework from which they can pursue a career in the industry as well as the skills for a possible placement or continuation of their educational goals.

The Diesel Technology Program Mission aligns with the Helena College-UM Mission through the provision of access to educational opportunities throughout the College service area. The Diesel Technology Program prepares entry-level technicians diesel engine maintenance, diagnosis, and repair.

Helena College 2012-22 Strategic Goals

1. Partner for Student Success Integrate Assessment/Planning
2. Attain Excellence
3. Support the Community
4. Advance the Institution
5. Develop Resources

Diesel Technology Program Goals

1. Create a plan to integrate student acquisition of the CDL license as part of the entrance or exit requirements to the program.
2. Collaborate with business, industry, and the community as partners to provide a quality learning experience that gives graduates the best opportunity to gain employment
3. Solicit input from our constituents including, students, graduates, advisory board members, business, industry, faculty, staff, and administration concerning the operation and improvement of the program and career tracks which align with industry standards

4. Assess student and program performance through the use of outcomes assessment, Program Review and Evaluation Process, job placement rates, employer and graduate surveys
5. Increase enrollment through recruiting efforts including; business, industry, government, professional organizations, and high schools

Diesel Technology Program goals are perfectly aligned with Helena College-UM Strategic Goals and Core Themes. This alignment is illustrated in the Goals/Core Themes crosswalk below:

Helena College Strategic Goals	Diesel Technology Program Goal Alignment
Partner for Student Success	Increase enrollment through recruiting efforts including; business, industry, government, professional organizations, and high schools
Integrate Assessment & Planning	Assess student and program performance through the use of outcomes assessment, Program Review and Evaluation Process, job placement rates, employer and graduate surveys
Attain Excellence	Solicit input from our constituents including, students, graduates, advisory board members, business, industry, faculty, staff, and administration concerning the operation and improvement of the program and career tracks which align with industry standards
Support the Community	Collaborate with business, industry, and the community as partners to provide a quality learning experience that gives graduates the best opportunity to gain employment
Advance the institution	
Develop Resources	Collaborate with business, industry, and the community as partners to provide a quality learning experience that gives graduates the best opportunity to gain employment

Helena College-UM Core Theme Alignment with Diesel Technology Program

- **Provide Access and Support: High quality educational activities and programs important to achieving student success**
 - Premier Montana 2-year program in Diesel Technology
 - Rigorous Program of Study
 - Curriculum aligns with industry standards
 - The Helena College-UM Diesel Technology Program is one of five Associate of Applied Science Degree offerings in Diesel Technology in Montana.
- **Demonstrate Academic Excellence: Integrity, quality and reliability in all academic and non-academic programming**
- **Strengthen the Community: Meeting regional workforce needs, strengthening employee knowledge and skills, providing a bridge to additional educational attainment, and serving as a facilitator for cultural enrichment**

- The Diesel Technology Program strengthens the community by preparing students to meet local, regional, state and national workforce needs.

Potential employers

The need for highly skilled diesel technicians has grown consistently and will continue to do so until through 2022. Based on this trend, it is anticipated that the need will continue to grow beyond 2022. The Montana Department of Labor reports the need for diesel technicians. Potential regional employers of program graduates includes, agriculture and truck dealerships, truck fleets, mining companies, construction companies, oil companies, farms and ranches, and independent truck repair shops.

The Career Outlook: According to the Bureau of Labor Statistics employment of diesel mechanics is expected to grow 15 percent from 2010 to 2020, about as fast as the average for all occupations.

As more freight is shipped across the country, additional diesel-powered trucks will be needed. As a result, diesel mechanics will be needed to maintain and repair the nation's truck fleet. Demand for new workers in the freight trucking and automotive repair and maintenance industries is expected to drive overall diesel mechanic job growth.

Some older vehicles will need to be retrofitted and modernized to comply with environmental regulations, creating additional jobs for diesel mechanics.

Overall employment growth, however, may be dampened due to increasing durability of new truck and bus diesel engines. Continuing advances in repair technology, including computerized diagnostic equipment, also will result in fewer mechanics doing the same amount of work, further reducing demand for mechanics.

Job opportunities should be good for those who have completed formal postsecondary education and have strong technical skills, as employers sometimes report difficulty finding qualified workers.

Workers without formal training often require more supervision and on-the-job instruction than others—an expensive and time-consuming process for employers. Because of this, untrained candidates will face strong competition for jobs.

C. Alignment with community needs

The Diesel technology program has an advisory board which meets twice a year. The board consists of local employers as well as general managers from major truck manufacturers. These individuals are: Dave Broughton, Tri-State Truck & Equipment, Great Falls MT. Travis Sandau, I-State Truck Center, Missoula MT. Brent Otness, Torgerson’s, Great Falls MT. Bob Moe, Titan Machinery, Inc, West Fargo ND . Dave Garner, Mergenthaler Transfer & Storage, Helena MT. Jim Dusenberry, J&D Truck Repair, Helena MT. Brandon Delaney, Watkins & Shepard Trucking, Helena MT and Steve Burch, Helena Sand & Gravel, Helena MT.

This board helps guide curriculum in ways such as adding a new electronics class to better prepare students for current technology. This included advice on what would be taught as well as equipment requirements. Equipment was requested through the budget process and has been implemented. The addition of a safety class to include OSHA 10. The addition of a particular transmission type that would fit the needs of industry, were also acquired through the budget process. The addition of a welding class in the program. The board also reviews and presents feedback on our gen ed requirements. These are only some recent changes, and we feel every year there should be updates to meet the ever changing industry we provide employees for.

Due to high demand for highly skilled workers in diesel repair and maintenance, Helena College-UM meets the workforce development needs of the community by training technicians for entry-level employment. The Montana Department of Labor and Industry projects continued and steady Montana employment opportunities for graduates of this program from 2012 through 2022. (extracted from <http://www.ourfactsyourfuture.org/cgi/dataanalysis/occpriReport.asp?menuchoice=occpri>, September 29, 2014)

Occupation	Est Yr-Proj Yr	Estimated Employment	Projected Employment	Annual Growth Rate	Annual Openings due to Growth	Annual Openings due to Replacements	Total Annual Openings
Bus and Truck Mechanics and Diesel Engine Specialists	2012 - 2022	1,228	1,381	1.2	15	26	41

Occupations by Industry and Regions in Montana

Area	Industry	Occupation	Est Yr-Proj Yr	Estimated Employment	Annual Projected Employment	Numeric Change	Percent Change
Region 1	Transportation and Warehousing	Bus and Truck Mechanics and Diesel Engine Specialists	2012-2022	115	134	19	16.5
Region 2	Transportation and Warehousing	Bus and Truck Mechanics and Diesel Engine Specialists	2012-2022	93	109	16	17.2

Region 4	Transportation and Warehousing	Bus and Truck Mechanics and Diesel Engine Specialists	2012-2022	114	136	22	19.3
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D. Student participation and success

Helena College-UM enrolls 1,627 students with a full-time equivalent of 1,066. 789 of our students are full-time (48%); 277 of our students are part-time (52%). The breakdown of General Education to Technical to Trades and non-degree seeking is:

- General Education Students: 623 (38% of headcount)
- Technical Students: 453 (28% of headcount)
- Trades Students: 181 (11% of headcount)
- Non-Degree Seeking Students: 89 (5% of headcount)

Our students enroll from Lewis & Clark County at the rate of 75%; and from adjacent counties 12% (Broadwater, Jefferson, Cascade, Powell, and Meagher). The remainder of student enrollment comes from the rest of Montana (11%) and out-of-State/Western Undergraduate (2%).

Diesel Technology Program student enrollment history 2008-2013

	2008-09	2009-10	2010-11	2011-12	2012-13
Spring	26	35	43	40	42

Diesel Technology Program Student Retention

FY 2008/09	FY2009/10	FY2010/11	FY2011-12	FY2012-13	Five Year Average
85%	89%	76%	82%	92%	85%

From 2008 through 2013, the Diesel Technology program capacity has been an average of 85%. With a five-year average of 12 student completers, program completion rates are at 60%.

E. Student Learning Outcomes

Upon successful completion of this program, a student will be able to:

- Demonstrate the ability to safely work in a shop environment
- Demonstrate their work ethic and professionalism
- Demonstrate their understanding of diesel systems operation and function of components
- Demonstrate the ability to properly diagnose the system and perform the proper repairs
- Demonstrate their ability to work in a live shop environment by interacting with customers, diagnosing and repairing a multitude of failures, working well with other students and properly completing work orders

Assessment of student learning outcomes occurs within individual program courses and all student learning outcomes are assessed through an end-of-program assessment.

F. Curriculum

AAS Diesel Technology

Length of Program: 4 Semesters

Type of Program: Associate of Applied Science

Note: *In order to take the first semester of Diesel Technology courses, students must prove their skills in Mathematics, Reading Comprehension, and Writing with the following:*

Placement into READ070 or higher

Placement into WRIT121 or higher

Placement into M111T or higher

FIRST YEAR

Fall Semester

DST105	Shop Safety	2
DST110	Diesel Electrical and Electronics I	3
DST111	Diesel Electrical and Electronics II	2
DST142	Hydraulics	7
M111T	Technical Mathematics	3
WLDG101	Welding Fundamentals for Auto Tech/Diesel	1
Total Semester Credits		18

Spring Semester

DST145	Diesel Engine Repair	6
DST240	HD Manual Drive Trains	6
DST245	HD Hydraulic Drive Trains	4
WRIT121T	Introduction to Technical Writing	3
Total Semester Credits		19

SECOND YEAR

Fall Semester

DST200	Diesel Engine Performance	8
DST210	Diesel Maintenance Practices	3
DST255	HD Brakes and Undercarriage	7
Total Semester Credits		18

Spring Semester

DST130	Heating and Air Conditioning	7
DST265	Applied Lab Experience	8
HR100T	Human Relations	2
Total Semester Credits		17
TOTAL CREDITS		72

G. Faculty Profiles

Helena College UM employs two full-time diesel technology instructors.

Purcell, Rick
Diesel Technology
A.O.S., Universal Technical Institute
at Helena College since fall 2008

Hauer, Derrick
Diesel Technology
C.A.S., Helena College
at Helena College since Fall 2014

H. Fiscal and Physical Resources

College current fund support of the diesel technology program has been stable over the past five years. Infusions of budgetary support for Diesel Technology Program occurred when equipment maintenance and repair and purchase of new equipment was required.

FY2010/11	FY2011-12	FY2012-13	FY2013-14
33,055.00	40,477.00	49,592.00	37,305.00

The Diesel Technology Program was awarded funding through a US Department of Labor TAACCCT Grant in July 2013. Over \$1M has been allocated as an infusion of funding going toward the purchase of state of the art capital equipment, support of student success initiatives, curriculum development, purchase of learning simulators, certification systems, and one additional faculty position. The grant deliverables include collaboration with Montana State University-Northern to develop recognizable, stackable credentials delivered through hybrid learning—a combination of online and face-to-face instruction.

I. Recommendations and Preliminary Implementation Plan

1. Using industry standards, i.e. NATEF, and advisory committee input, update curriculum and skill development to include development of Commercial Driver’s License as part of, or prerequisite to the program.
2. Integrate student acquisition of industry-recognized credentials into the curriculum.
3. Increase instructor professional development through attendance at national educators’ conferences and institutes.
4. Build career awareness by partnering with industry partners, secondary schools and US Department of Labor Job Service.

J. Program Review Data Summary

See Program Review Data Summary in Section K.



K. Appendix (Additional data or exhibits)
Program Review Data Summary

Helena College –
Diesel Technology
12/18/13

Program Review Data Summary								
Alignment with Community Needs (AAS/CAS Only)								
Data Definition:	Current MT	Projected MT	Current U.S.	Projected U.S.			Program Notes	Source
A. Provide the total number of projected job openings from related occupations for Montana and the U.S.	1,200 (2010)	1,320 (2020)	242,200 (2010)	277,400 (2020)			Bus and Truck Mechanics/Diesel Engine Specialists see also Mobile Heavy Equipment Mechanics	CareerOneStop/US Dept of Labor
B. Provide percent change in job openings for related occupations for Montana and the U.S.		+10%		+15%			See links for specific employ/wage data	CareerOneStop/US Dept of Labor
C. Provide the median hourly wage or annual salary for related occupations	\$17.86 hourly		\$20.35 hourly				Wage information as of 2012	CareerOneStop/US Dept of Labor
Data Definition:	Year 1 2009	Year 2 2010	Year 3 2011	Year 4 2012	Year 5 2013	5 Year Ave	Program Notes	Source
D. Provide 5 years of in-field job placement rates for all program graduates	*100% **70%	*60% **45%	*N/A **73%	*N/A **N/A	*N/A **N/A	*80% **63%	*HC Graduate Surveys 09-10 25% Average Response Rate **Perkins 4P1 Reports 09-11	Helena College Graduate Survey and/or OCHE Perkins Data Program Employer Contacts
E. Provide 5 years of transfer rates to 4-year colleges (AA/AS)								Institutional Research
Student Participation and Success								
Data Definition:	Year 1 08/09	Year 2 09/10	Year 3 10/11	Year 4 11/12	Year 5 12/13	5 Year Ave	Program Notes	Source
A. Provide program capacity (headcount)	40	40	40	40	40	40	1 st and 2 nd Year	Institutional Research
B. Provide 5 years of enrollment (unduplicated headcount)	26	35	43	40	42	37		Institutional Research
C. Provide 5 years of enrollment (FTE)	19	28	38	34	34	31	Total spring Desl course credits/15	Institutional Research
D. Annual percentage of program capacity	65%	87%	107%	100%	105%	93%	Enrollment/Program Capacity	Institutional Research
E. Provide 5 years of retention rates for full-time students	85%	89%	76%	82%	92%	85%	Entering students returning	Institutional Research
F. Provide 5 years of retention rates for part-time students	N/A	0%	33%	50%	66%	37%	the following fall semester	Institutional Research
G. Provide 5 years of successful program course completion rates.	100%/96%	96%/97%	97%/97%	97%/93%	99%/100%	98%/97%	Pass or C- or better each term	
H. Provide 5 years of graduation rates for full-time students <i>rate of students graduating within 150% of completion time</i>	65% Fall 06	75% Fall 07	77% Fall 08	65% Fall 09	53% Fall 10	46%	% entering students graduating with 3 years	Institutional Research
I. Provide 5 years of graduation rates for part-time students <i>rate of students graduating within 150% of completion time</i>	N/A Fall 06	N/A Fall 07	N/A Fall 08	0% Fall 09	33% Fall 10	5%	% entering students graduating with 3 years	Institutional Research
J. Provide 5 years of annual degree & certificate completions	11	11	12	13	14	12		Institutional Research
K. Provide 5 years of degree production rates – <i>proportion of degrees/certificates granted per 100 FTE enrollment</i>	58	39	31	38	41	41	# of completers per 100 FTE enrollment	Institutional Research
L. Provide 5 years of pass rates on occupation/industry specific licensing or certification exams (as applicable)	--	--	--	--	--	--		Program Records
M. For applied programs with program admission provide five years of student application totals	N/A	N/A	N/A	N/A	N/A	N/A		Program Records
N. For applied programs with program admission provide five years of students accepted totals	N/A	N/A	N/A	N/A	N/A	N/A		Program Records
Fiscal and Physical Resources								
Data Definition:	Year 1 08/09	Year 2 09/10	Year 3 10/11	Year 4 11/12	Year 5 12/13	5 Year Ave	Program Notes	Source
A. Provide 5 years of instructional cost/student (FTE)	\$7,556	\$6,328	\$5,369	\$5,484	\$6,029	\$6,153	HR + Operating/FTE	Institutional Research/Finance
B. Provide 5 years institutional expenditure/student (FTE)	\$7,367	\$6,872	\$6,024	\$6,328	\$7,473	\$6,813	Total Budget/FTE	MUS-OCHE
C. Provide 5 years of instructional cost/completion	\$13,051	\$16,108	\$17,004	\$18,959	\$14,641	\$15,953	HR+Operating/Pr Compl	Institutional Research
D. Provide 5 years institutional expenditure/completion	\$34,392	\$34,209	\$33,220	\$29,193	\$34,780	\$33,159	Total Budget/Inst Compl	MUS-OCHE
E. Provide 5 years of student program fees-fund balance(s)	\$1,540	\$2,273	\$2,740	\$2,730	\$2,100	\$2,335	Fees (H60280)	Finance/Program Records
F. Provide 5 years of student program fees-student costs	\$0	\$1,519	\$0	\$3,000	\$3,511	\$1,606	Fees (H60280)	Finance/Program Records

