

BACHELOR OF APPLIED SCIENCE IN DIESEL TECHNOLOGY

PROGRAM PROPOSAL FORMS C AND D

Submitted January 13, 2014

By

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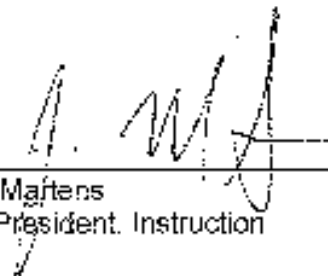


Form C: Cover Sheet for New Degree Program Proposal

Program Information

Program Name: Diesel Technology
Institution Name: Centralia College
Degree: BAS Diesel Technology
Level: Bachelor
Type: Applied Science
CIP Code: 47.0505

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1/13/14

Date

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Form D: Bachelor of Applied Science in Diesel Technology

Abstract

Centralia College is proposing a Bachelor of Applied Science – Diesel Technology (BASD) degree designed to enhance the technical and managerial skills of students who have completed a CTE degree in diesel technology. The program builds upon a well-established two year program the college has offered for more than 25 years and that has successfully placed its students in well-paying jobs (1) as well as providing them the grounding necessary to be successful in existing baccalaureate programs (2), primarily the baccalaureate in diesel technology offered at Montana State University-Northern.

The college has developed a curriculum that articulates well with existing associate-level diesel technology programs; that includes program outcomes that demonstrate baccalaureate level attainment in both technical and managerial areas of study; that includes significant general education; that clearly defines the course work required at the associate level; and that includes upper-division course work that provides the means of achieving the program outcomes.

The curriculum includes BAS 315 (Ethics) and BAS 350 (Managerial Statistics), courses that have already been developed and taught as a part of the college's Bachelor in Applied Science Management (BASM) program. The BASD also borrows heavily from the assessment and evaluation plan developed for the BASM.

The college will add one additional faculty member in each of the first two years of operation. It has also planned for additional part-time faculty members to provide for lab coverage and for faculty release time for curriculum and program development as well as training. All upper division technical faculty members will hold at least a bachelor's degree (the norm for these programs), will be experienced in industry, and will meet the requirements set forth in relevant sections of WAC 131-16.

Criteria for admission to the BASD have been developed to ensure students entering the program have the necessary general and technical education to be successful and to select the top students from the qualified pool.

Surveys completed as a part of the needs assessment for this program indicate the majority of students interested in this program preferred a traditional day schedule. Within the constraints of this initial program focus, the college has made plans to accommodate and attract the widest possible range of qualified students. Moreover, since the nearest institution offering a comparable program is located in Montana, the BASD offers a local option for place-bound students.

The college has a variety of student services available to all students and has made plans for providing services unique to the BASD student. The existing BASM program has provided the college experience in financial aid and advising at the upper-division level.

Plans have been made for the remodeling to accommodate the expansion of the diesel program to include the BASD. The college has committed \$410,000 to fund the expansion and an additional \$140,000+ for start-up and first year tuition shortfall. Starting in the second year of operation, the program is projected to be self-sustaining. The budget includes planning for equipment and technology and other program specific instructional resources.

Program-specific accreditation will not be sought and is not seen as important to the professional standing of its graduates.

Graduate programs in diesel technology are rare if not non-existent. Students may be qualified for entry into programs in business or management. No articulations have yet been developed.

Input was sought from three experts: two have responded at this time. They have made recommendations that have been incorporated into the present version of the proposal, but comments were overall quite complimentary.

<p><i>Criterion 1</i> Curriculum demonstrates baccalaureate level rigor.</p>	<p><u>Standard</u> Describe curriculum including: (1) program learning outcomes; (2) program evaluation criteria and process; (3) course preparation needed by students transferring with a technical associate degree; (4) general education components; and (5) course work needed at junior and senior levels in the BAS.</p>
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The curriculum for the proposed BASD is shown on the educational planner in Appendix A. Note that the last two years will be 105 credit hours and the total four years will require 211 hours minimum. The 300- and 400- level courses offered in the BASD are designed to build upon the education the students have already achieved in an associate-level degree in diesel or heavy equipment technology. Students enrolled in the BASD will experience coursework that relates to contemporary industry technology that simply cannot be covered in the two years of an associate level diesel technology program. Students will engage in lectures, labs, and web-enhanced classes. Online and DVD-based training programs and certification materials will be used to supplement face-to-face lecture and lab courses.

The BASD program will include two management courses that have been developed and taught as a part of the Centralia College Bachelor of Applied Science in Management program. These courses are BASM 315 (Ethics) and BASM 350 (Managerial Statistics).

Program Learning Outcomes

Graduates of the BASD program will have demonstrated they can:

Technical

- Analyze and evaluate data collected from component failures, hydraulic systems, and complex electrical circuits.
- Interact appropriately and professionally with customers and employees.
- Explain the operation of complex systems including: computerized engine and transmission controls used for fuel efficiency and emissions control; regenerative hybrid technologies used to capture energy; multi-fuel technologies to save fuel costs.
- Apply theories and skills taught in the classroom in a shop environment.
- Create shop procedures that reflect industry standards and maintain compliance with regulations set by governing agencies.
- Apply the principles of tribology in the analysis of engine efficiency, life, and maintenance costs.
- Analyze test results from oil, coolant, fuel, or failure analysis.

Managerial

- Implement the practices, policies, and leadership to efficiently operate a fleet or repair facility.
- Apply fundamental principles of human resource management, accounting, and ethics.
- Employ effective oral, written, and analytical communication appropriate to organizational settings including personnel situations and in large and small group discussions.
- Distinguish between management and leadership, and differentiate among the varieties of styles and roles of management and be able to identify the most appropriate in a given situation.
- Create , manage and participative effectively in teams.

Program Evaluation Criteria and Process

In order to ensure that the Centralia College BASD curriculum will meet the needs of industry employers, a BASD advisory board will be created. This board will have some overlap to the current Diesel technology Advisory Board in terms of corporations represented, but will be comprised of individuals knowledgeable about the latest technologies in use as well as the hiring of the senior-level technicians and of those employees targeting management positions. The advisory board will have representatives from Cummins Northwest, NC Machinery, Modern Machinery, Pacific Power Products, Kenworth, Freightliner, and the Papè Group.

Faculty from other institutions will also be consulted for review of curriculum. There is an existing annual meeting of BAS diesel program leaders from Pittsburg State University, Ferris State University as well as associate program leaders from Southern Illinois University, Weber State, and Colorado State, Pueblo. Centralia College has been invited to join this group which

focuses on improvements in curriculum and programs to meet the now rapidly evolving industry needs.

In addition to traditional student surveys and class observations, BASD will receive the same attention to assessment that has been put into place with BASM using capabilities of the Learning Management System, Canvas. Course objectives from all 18 BASM courses are linked to stated program outcomes and to the Centralia College Learning Themes. Further, graded activities within each course are linked to specific course objectives. Data extracted from Canvas is then analyzed using Excel and the result is a quantified determination of how well students are achieving program outcomes. The same type of closed loop improvement process will be used to continuously strengthen BASD to the important benefit of the students.

Minimum Entry Requirements

- An associate degree in diesel technology or diesel mechanics from a regionally accredited college or university with a GPA of 2.5 or higher,
- Completion of the following courses with at least a 2.0 grade:
 - One of the following: ENGL 101, ENGL 102 or ENGL 235.
 - One of the following: MATH& 107, MATH& 146 or MATH& 141.

General Education Requirements

Communication (10 credits)		Credits
ENGL 101	College-level Communication	5
Entrance requirement		
ENGL 235	Composition/Technical Writing	5
Humanities (10 credits)		
HUM	Humanities elective	5
BAS 315	Ethics	5
Social Science (10 credits)		
ECON	Economics elective	5
PSYC	Psychology elective	5
Mathematics (10 credits)		
MATH	College-level Math	5
Entrance requirement		

BAS 350	Managerial Statistics	5
Natural Science (10 credits)		
PHYS 110	Physics: Non Science Major w/lab	5
DET 400	Materials Science of Fuels and Lubes with Lab	5
Additional General Education in one of the above areas		5
Subtotal		55

- A total of 55 general education credits is proposed for the BASD program including ENGL& 101 and a quantitative-skills designated college-level mathematics course.
- BASD is designed with selected management-related courses since about one-half of the graduates are expected to pursue supervisory or management roles upon graduation.
- BASD includes eleven upper division courses focused on diesel and related technologies.
- The BASD program will require 105 credit hours beyond those required in a typical associate of technical arts degree in diesel technology.

Upper Division Coursework

	Credits
DET 300 Survey of Business Management	5
DET 310 Electrical III-Advanced Circuits and T/S	5
DET 320 Exhaust After-treatment/Regulations	5
DET 330 Hydraulics II-Advanced Fluid Systems	5
DET 340 Combustion Engine Fuels	5
DET 350 Applied Failure Analysis	5
DET 360 Power Generation and Maintenance	5
• Fleetguard Level One Certification	
• Fleetguard Level Two Certification	
DET 400 Materials science of Fuels and Lubes with Lab	5
DET 410 Regulatory Issues	5
DET 420 Metallurgy and Fabrication	5
DET 430 Shop/Fleet Management	5
DET 440 Hybrid Drives Electric/Hydraulic	5
DET 450 Industry Internship	5
Subtotal	65

Course descriptions with course outcomes are included in Appendix B.

<p><i>Criterion 2</i> Qualified faculty.</p>	<p><u>Standard</u> <i>Provide a profile, including education credentials, of anticipated faculty (full-time, part-time, regular, and continuing) that will support the program for each year (junior and senior). Include faculty needed to cover the technical course work, general education courses and electives. In addition, provide the total faculty FTE allocated to the program.</i> <i>Faculty and administrators responsible for technical courses must meet certification requirements for professional and technical administrators and instructors in the Washington Administrative Code.</i></p>
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Program Faculty and Staff

Current Centralia College Diesel Equipment Technology staff will teach courses in both the BASD and the associate program. Centralia College will hire one additional full-time faculty member prior to the launch of the BASD program. Depending upon enrollment, Centralia College expects to hire an additional full-time instructor prior to the second year of the BASD.

Faculty hired to teach in the BASD will meet the normal qualifications for vocational education instructors as defined by the SBCTC. Faculty members teaching upper-division technical course work will possess a bachelor's degree or higher and have demonstrated expertise and provided credentials in the diesel and heavy equipment industry. Faculty members teaching GURs will possess a master's degree.

When applicable, Centralia College will make use of qualified part-time faculty.

Current Diesel Faculty Profiles

Faculty Name	Credentials
Fay, Jake	<p><u>Degrees</u> A.T.A. Diesel Tech Centralia College B.S. Diesel Montana State University – Northern</p> <p><u>Industry Certifications</u> Washington State Vocational Education Certification Journeyman Cummins Engine Technician Cummins 2013 ISB/ISL/ISX CM2350 Qualification Cummins 2010 ISX/ISL/ISC/ISB Qualification Detroit Diesel Series 60 Major Repair Mercedes MBE 4000 Major Repair Fundamentals of Power Generation NEC 2008 Familiarization Power Generation RCW and WAC Familiarization Fleetguard Level One Fluid Filtration Air Brake and ABS Troubleshooting Counterbalanced Forklift Trainer Rough Terrain Telehandler Trainer</p>
Conrad, Jacob	<p><u>Degrees</u> A.T.A. Diesel Tech Centralia College B.S. Diesel Montana State University – Northern</p> <p><u>Industry Certifications</u> Washington State Vocational Education Certification John Deere Level Two Certified Technician Cummins Exhaust After-treatment Maintenance Allison AED Maintenance John Deere Articulated Dump Truck Advanced Tech John Deere 4WD Loader Advanced Tech John Deere Crawler Tech NEC 2008 Familiarization Power Generation RCW and WAC Familiarization Air Brake Systems Operation and Maintenance Air Brake and ABS Troubleshooting Clutch Adjustment and Installation EPA 609 Air Conditioning Counterbalanced Forklift Trainer Rough Terrain Telehandler Trainer</p>

Faculty Professional Development

Due to the in-depth level of education required to instruct upper division courses, continual professional development will be required of all faculty members teaching in BASD. Anticipated certification options are listed below:

- ICML (International Council of Machinery Lubrication) MLT (Machinery Lubrication Technician) Certification

- ICML (International Council of Machinery Lubrication) MLA (Machinery Lubrication Analyst) Certification
- Fluid Power Society Mobile Technician Certification
- Any current Caterpillar, Cummins, Detroit, John Deere, Komatsu, or other relevant training courses.

New certifications are developed annually to accommodate new technology being used in the industry and relevant training will be made available to BASD faculty.

Management Faculty Profiles

Faculty Name	Credentials	Courses	Status
MacNamara, Atara	PhD, Social Psychology; MS, Social Psychology; BA, Psychology	BAS 350 Managerial Statistics	F C*
Mitchler, Sharon	ABD, English (in dissertation, spring 2014 graduation); MA, English; MA, Humanities; BA, English – Minor, Secondary Education	BAS 315 Ethics	F C*
Smejkal, Connie	MS, Management; BS, Applied Management	BAS 300 Foundations of Management	F C

F full-time

C vocational certification

C* vocationally certifiable

<p>Criterion 3</p> <p>Selective admissions process, if used for the program, consistent with an open door institution.</p>	<p><u>Standard</u></p> <p><i>Describe the selection and admission process. Explain efforts that will be used to assure that the program serves as diverse a population as possible.</i></p>
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Admission

As part of a cohort model, the college will initially accept 24 students into the program and from the fourth year forward, admit 30 students annually in the fall quarter operating with the cohort model that has been highly effective in BASM. Given feedback from students as well as the experience with BASM at Centralia College and indeed the experience across the set of BAS programs, a two-year track will be offered. Application forms will be available on the college Web site and will be submitted electronically.

To be considered for admission the student must:

- Have an earned associate or higher degree in diesel technology from a regionally accredited college or university with a 2.5 or higher GPA.
- Have successfully completed each of these required courses with a minimum 2.0 grade:
 - English 101 – English Composition (5 credits).

- College-level math course for which intermediate algebra is a prerequisite (5 credits).
- Submit a personal essay/statement to include, but not limited to, previous experience, career goals, application of the degree to career advancement.
- Submit a resume.
- Submit transcripts from previous colleges.
- Submit two non-family references.

Admission will be merit based and competitive. Additional consideration will be given for:

- Successful completion with a 2.0 GPA, or higher of
 - English 102 – Research and Argumentation (5 credits) or English 235 – Technical Writing (5 credits).
 - Speech 110 – Principles of Speech Communications (5 credits) or Speech 220 – Theory and Practice of Public Speaking (5 credits).
- Evidence of six or more months of full-time equivalent work in diesel technology.

The admission process will be conducted by a committee that includes the BASM executive director and at least one faculty member from the BASD who instructs one or more of the core diesel technology courses. Candidates will be screened against the minimum admission requirements. It is anticipated that the number of academically qualified applicants will exceed space availability. In this situation the selection committee will follow the process below to reduce the pool to the target enrollment.

Merit-Based Screening Process:

- A thorough review of each application, including transcripts, admissions forms, essays, resumes, and other available documentation.
- Quantified ratings of each applicant by each member of the selection committee based upon predetermined specific dimensions. These dimensions will include the number of recommended classes taken (English and speech), and may include relevant work experience, strength of the personal statement, and diversity of work experience. See Appendix D for proposed rubric.
- Review and discussion of the ratings of each applicant by the committee. Where significant disagreement exists regarding ratings for an applicant, the committee will review the applicant's data and reach a consensus.
- Identification of the top candidates, based on the ratings, sufficient to fill available spaces. A waiting list of candidates also will be developed in case not all of those selected subsequently enroll in the program.
- Students, who wish to take only one course per quarter, may be allowed to register for that course if the student meets the minimum admissions criteria and there is space available. This decision will be made each quarter and only on a space available basis with the approval of the respective faculty member and the BAS executive director.

The following actions will take place to assure as diverse a population as possible:

- Recruit people of color and other traditionally under-represented populations who are Centralia College graduates or graduates from nearby community colleges.
- Engage in targeted marketing, working with the Latino Unidos, the Diversity Committee, and organizations serving underrepresented populations in our community and at nearby colleges.
- Work with industry and professional organizations to develop additional strategies to attract a diverse student body from workers in their employment ranks.
- Regularly assess recruitment/retention efforts with regard to under-represented populations and continually monitor the level of participation and report to the Board of Trustees through annual monitoring reports.
- Work with Centralia College Foundation to create scholarships to support diverse students in the BASD program.

Selection of students for the BAS programs is the responsibility of the Associate Dean, BAS programs. A screening committee comprised of the Associate Dean, the BAS program coordinator, and one of more program faculty members is formed, as necessary, to carry out the process described above.

Serving Place-bound Working Adults

Surveys conducted at schools offering diesel technology programs and at employers of the graduates of these programs indicated a strong majority of those interested in the BASD program preferred a full-time day program. Although this would not seem to address the issue of place-bound students, the program provides students without full-time jobs an opportunity to pursue a bachelor's degree without having to relocate out of state (Havre, Montana).

The program will use traditional face-to-face instruction with a mix of lecture and lecture-laboratory sessions. The courses will be Web-enhanced and will use the Canvas LMS to organize content and provide a platform for reading, discussion threads, industry provided materials, recorded lectures, and team projects.

The college will continue to conduct interest surveys and if demand is evident, will endeavor to offer the program in alternative modalities and times as appropriate.

Prior Learning Assessment

For the purposes of this section, "prior learning" means the knowledge and skills gained through formal and informal work and life experience and through military training. In accordance with ESSHB 1795, section 28, passed by the Washington State Legislature, the HECB convened a work group to determine processes for awarding prior learning experience. Centralia College plans to adopt these protocols for all of its programs including this Bachelor of Applied Science in Diesel Technology Degree.

Centralia College will adhere to the 25 percent credit limit as defined by the NWCCU and the SBCTC.

Criterion 4 Appropriate student services plan.	<u>Standard</u> <i>Describe services that will be needed by the students admitted to the degree program and the college plan for providing those services. Include a description of financial aid services and academic advising for students admitted into the program.</i>
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As a community college, one of Centralia College’s strengths is the variety of student-focused support services that help students achieve success in accomplishing their goals. Since initial BASD program will only include day-time classes the student services already in place at Centralia College provided by the Admissions/Registrar and the Financial Aid Department combined with those services that mirror what has been done for the BASM students will be employed to create a “high-touch” service set similar to that provided by high quality baccalaureate institutions.

- The BAS executive director and program coordinator also act as mentors and coaches for the BAS students as a continuation of the relationships built during the enrollment process.
- Student advising, retention and success: The BASD faculty responsible for the core diesel technology courses will act as the advisors for the BASD students. The program will have several electives and therefore the advisors will assist students with their educational planning and progress toward degree completion. Each student will have an individualized schedule and advising plan. Students can use degree planning worksheets to assess their progress. Student retention and student success are top college priorities. Centralia College was commended by the NWCCU accrediting association in October, 2010: “The College is to be commended for its student-centered focus toward retention and success as exemplified in the faculty-led advising model.” Students appreciate and respond to having a specific person they can go to for assistance. Program faculty will work with students who need additional assistance to develop personalized student success strategies.

Initial program planning for students will take place in a group setting as part of their initial mandatory orientation. Students will be introduced to all of the student and academic support services available to them as part of this orientation.

Credentials evaluation: Credentials evaluators will evaluate transcripts from accredited institutions. They will evaluate incoming students for compliance with admission requirements and student records for all degree requirements when students near graduation. The college’s credentials evaluators, in consultation with program faculty, will evaluate all transfer or prior learning requests for core courses.

Additional Student Services.

- Center for Disability Services (CDS): The CDS provides accommodations for students with documented disabilities. It provides course materials in alternate formats, reduced-

distraction testing, adaptive technology aids, and assists faculty in providing appropriate accommodations.

- Financial aid: The Financial Aid Office prepares and disburses federal, state, and institutional aid for all Centralia College students. Students can monitor the process of their applications online. Eligible students will be able to apply for student employment.
- TRiO: Students who are first-generation college, low-income, or have a documented disability receive academic and personal support. Services include tutoring, study skills, and advocacy. Mentoring will be available evenings. The Department of Education has approved extension of this program to all bachelor's degree students who fit eligibility criteria who were previous participants in TRiO as an associate student.
- Veteran's Administration programs: The Veterans Affairs Office assists all eligible veterans, reservists, dependents, and VA chapter 31 students. Upon approval by the NWCCU, Centralia College will seek, and it is anticipated will be given, the ability to distribute VA funds to eligible students enrolled in the BASD program.
- Tutoring: On-campus tutoring services are available for mathematics, statistics, English, and accounting. Online tutoring is available 24 hours a day, seven days a week. See <https://www.etutoring.org/login.cfm?institutionid=193> and <http://owl.waol.org/>.
- eLearning support: An orientation will be included for first-year students and ongoing technical support will be provided. This orientation will address skill building in using online course materials and technology. Technical assistance will be made available to students via online access, email, telephone, and in-person.
- Internet access: The college has computer labs, staffed with assistants, which are available Monday through Friday during the day and Monday through Thursday through 8 p.m. It is noted, however, that students increasingly use personal laptops and the college's widely available Wi-Fi in lieu of the labs. The campus is Wi-Fi enabled. Students are given their own email accounts and have access to the campus Wi-Fi network continuously.
- Library support: The library has a two-pronged vision in support of the college mission. One, provide access to information and technology resources that support teaching and enhance student learning. And, two, foster an environment in which students acquire the information literacy skills and computer competencies that support independent inquiry and lifelong learning. To fulfill this vision, the library provides multiple services for students, faculty, and staff. These include development and maintenance of collections in support of the college curriculum, information literacy instruction, reference service, circulation services, course reserves, inter-library loan, instructional equipment, student technology support, college archives, and copyright guidance. Library instruction and collection development is conducted by professional librarians, each with a specific liaison area in the college's academic and technical programs. A librarian has been designated as the single point of contact for the BASD students regarding use of library resources.

The library's collections consist of both print and online resources. The monograph collection alone includes over 70,000 titles, half of which are in e-book collections. The library collections budget to support the BASD degree includes initial funding to augment the current monograph collection and purchase additional online databases. An example of an important addition to the library for support of BASD is a subscription to the Mitchell1 online database of diagnostic and repair information.

In addition to collections, the library provides instruction and reference support. Reference service is available 24/7 through a state and national cooperative. Professional librarians, including librarians in university settings, assist in providing this service.

<p>Criterion 5 Commitment to build and sustain a high quality program.</p>	<p><u>Standard</u> Provide a financial plan for the first five years of program operation. This plan should include (1) types of funds to be used to support the program; (2) projected program expenses; (3) appropriate facilities to be used; (4) equipment, technology, and instructional resources needed for the program. Document the college’s ability to sustain the program over time.</p>
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Below are tables and brief descriptions illustrating the financial plan for Centralia College’s proposed BASD program. This table has been generated based on the financial needs required for the program to be successful. The Board of Trustees has made the startup of BASD a priority as well as the commitment to supplying needed facilities for the space and equipment training investments.

Table 2 Projected Program Revenue

	Startup					
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Projected Enrollment	-	24	45	49	52	54
Tuition	-	161,489	302,792	329,706	349,892	363,350
Lab Fees	-	10,800	20,250	22,050	23,400	24,300
Total Revenue	0	172,289	323,042	351,756	373,292	387,650
Total Expenses	516,787	208,573	285,839	294,572	303,063	311,317
Net Revenue	(516,787)	(36,287)	37,203	57,184	70,229	76,333

1. Tuition
 Tuition projections are based on a rate of \$2,242.90 for 15-credit hours in a quarter. Since we are not anticipating a tuition increase next year, we have left the tuition with a zero increase in each year to conservatively reflect revenue expectations. Once the BASD is established and at full enrollment, it will generate a reserve sufficient to support the direct expected investments to sustain a high quality program.
2. Lab Fees (\$150 per quarter per student)
 Lab fees will be assessed to students based upon the consumables used in each course. These consumables will include not only typical fuels and lubricants but also

intellectual and curricular materials from key industry manufacturers. These fees will support course supplies, not generate net revenue for the college.

Table 3 Projected Program Expenses

		Startup					
		2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
1.	Tuition	-	161,489	302,792	329,706	349,892	363,350
2.	Lab Fees	-	10,800	20,250	22,050	23,400	24,300
Total Revenue		0	172,289	323,042	351,756	373,292	387,650
3.	Program Director - 33%	28,686	29,547	30,433	31,346	32,287	33,255
4.	Program Coordinator - 50%	26,897	27,703	28,535	29,391	30,272	31,180
5.	Faculty	-	63,690	131,685	135,635	139,704	143,896
6.	Stock Room Attendant	-	8,562	17,638	18,168	18,713	19,274
7.	Instructional Tech	-	11,067	22,798	23,482	24,187	24,912
8.	Library Services	-	5,000	5,000	5,000	5,000	5,000
9.	Program Development & Review	5,204	5,204	2,500	2,500	2,500	2,500
10.	Faculty Development/Training	10,000	10,000	5,000	5,000	5,000	5,000
11.	Marketing/Recruiting	8,000	1,500	1,500	1,500	1,500	1,500
12.	Office Supplies	1,500	500	500	500	500	500
13.	Consumable Supplies	-	10,800	20,250	22,050	23,400	24,300
14.	Safety/Hazard Compliance	-	10,000	10,000	10,000	10,000	10,000
15.	Equipment & Tooling	25,000	25,000	10,000	10,000	10,000	10,000
16.	External Reviews	1,500	-	-	-	-	-
17.	Facilities Expansion	410,000	-	-	-	-	-
Total Expenses		516,787	208,573	285,839	294,572	303,063	311,317
BASD Net Revenue		-516,787	-36,284	37,203	57,184	70,229	76,333

Facilities, Equipment, Technology, and Instructional Resources

The financial plan assumes the following:

- The program director devotes one-third time (33 percent each year), with 3 percent/year increase.

4. The program coordinator spends one-half time (50 percent each year) on BASD, with 3 percent/year increase. This is further divided among department staff (25 percent BAS and 25 percent Workforce).
5. Faculty (67percent FT, 33 percent adjunct first year and two at 67 percent FT, 67 percent adjunct subsequent years) with 3 percent/year increases.
 - The BASD will require two full-time faculty members for the diesel-specific courses. Both instructors currently teaching in the associate program each have eight years industry experience, a B.S. in diesel technology, and numerous industry-related certifications. The current faculty have a wide range of knowledge and will teach the BASD courses. The financial plan allows for initially one full-time position at the inception of the program in the fall of 2014 and the addition of a second full-time instructor in the fall of 2015.
 - Due to the high demand and generous wages currently in the diesel field, it is not feasible to expect to find qualified adjunct faculty to teach the upper division courses.
6. Stock Room Attendant (25 percent first year and 50 percent subsequent years) with 3 percent/year increase, 10-month position.
 - BASD courses will require that students have access to the tool room for more hours each day than what is required for the associate program. This will require the funding of a full-time tool room attendant. Funding will be split 50/50 between the associate program and the BASD.
7. Instructional Tech (25 percent first year and 50 percent subsequent years) with 3 percent/year increase, 10-month position.
 - With more student hours in the diesel lab, additional lab aides will be necessary to ensure that students are working in a safe manner and executing tasks properly. Funding will be split 50/50 between the associate program and BASD.
8. Library Services.
 Online resources from original equipment manufacturers (OEM) are available, but at an annual subscription fee and will be added to the library collection. These fee services have not been incorporated into many of the two year programs based on their costs. The additional cost for the Mitchell1 diagnostic program is included.
9. Program Development & Review.
 - Qualified current diesel faculty will collaborate to develop BASD curriculum. Faculty members that develop a course will be compensated \$750 for each course developed and successfully taken through Instructional Council as per Centralia College policies. All 12 new diesel upper division courses will be developed by Centralia College faculty.
 - Centralia College will pay \$375 per course for any course that requires extensive modifications and approval from Instructional Council. It is assumed that many courses will require some level of modification after being instructed the first time as well as number of modifications due to the rapidly changing technological environment in this industry.
10. Faculty Development/Training.
 Due to the concepts and technology that will be taught in the BASD, it will be necessary for current faculty to receive additional training prior to the launch of the program. Faculty will be expected to attend training courses, factory schools, or conferences deemed relevant to the BASD courses that they each will be teaching. For instance:

- Professor Fay is taking a sabbatical to attend Idaho State University College of Technology to receive additional Power Generation Training.
- Professor Conrad will attend additional Failure Analysis Training through Paper Machinery.
- Professor Fay will pursue certification as a Machinery Lubrication Analyst (MLA).
- Professor Conrad will attend additional training courses from Pacific Power Products and Eaton, pertaining to hybrid and electric propulsion systems.

Faculty teaching in the BASD will be required to maintain their certifications and attend new relevant training opportunities as they arise. The college will also be responsible for any registration fees, lodging, and/or mileage expenses incurred for the necessary training.

11. Marketing/Recruiting.

The BASD is looking to attract students from throughout the Pacific Northwest and beyond. Recruiting will be vital to the enrollment of the program. Assigned faculty and/or college representatives will be needed to travel, recruit, and advertise for the BASD.

12. Office Supplies.

13. Consumable Supplies such as diesel fuel and oil covered by lab fees.

14. Safety/Hazard Compliance. Ongoing costs for equipment and related focused on safety, health and environment.

15. Equipment and Tooling

- Fluid analysis instrumentation and microscopes will be required to support the BASD courses titled “Fuels, Lubes, and Filtration” and “Failure Analysis.”
- As the program grows there will be a continual need for the acquisition of new equipment and tooling in order to keep current with new technology introduced into the industry.

The oil, fuel, coolant, and failure analysis laboratory will require specific instrumentation including Fourier Transform Infrared (FT-IR) Spectrometer, Plasma Optical Emission Spectrometer, and an Enerac model 700AV exhaust emissions tester. Although this equipment can be costly, during our research Centralia College has been able to locate affordable used units online and through Department of Enterprise Services. These instruments will enable students to test used oil for heavy metal contamination and glycol contamination, diesel fuel for contamination, and internal combustion engine exhaust emissions.

16. External Review.

Centralia College will request the review of the proposed curriculum by other institutions of higher education that offer similar degrees.

17. Facilities Expansion.

The BASD program will require additional classroom, laboratory and analysis space. The total space added via remodeling will be approximately 6,000 square feet. Those newly remodeled spaces will be used for the following upper-division courses:

- DET 310 Electrical III – Advanced Circuits and T/S
- DET 320 Exhaust After treatment/Regulations
- DET 330 Hydraulics II – Advanced Fluid Systems
- DET 340 Combustion Engine Fuels
- DET 350 Applied Failure Analysis

- DET 360 Power Generation and Maintenance
- DET 400 Materials science of Fuels and Lubes with Lab
- DET 410 Regulatory Issues
- DET 430 Shop/Fleet Management
- DET 440 Hybrid Drives – Electric/Hydraulic

Diesel shop – 4,500 square foot shop facility with sufficient compressed air, lighting, power, emergency wash station, data access, and ventilation to support the above courses.

Classroom – Minimum 30 student capacity (college standard is 25-square feet per student for a total of 750 square feet), compressed air, emergency wash station, hard floor covering, power, data access, and all instructional/teaching technology required by college standards to support courses.

Oil, coolant, fuel, and failure analysis laboratory – 400-square foot lab to house testing equipment, concrete floor, ventilation, data access, power, emergency wash station, HVAC (instrumentation equipment generates heat), to support courses.

Tool and supply room – sufficient size (currently estimated at 600-square feet) and location to accommodate consolidation of support for both upper- and lower-division courses.

The college has identified space across the service yard from the current program and is in the process of re-assigning the current programs to accommodate renovating the space to house the BASD program. The space was originally built to house the farm equipment repair program (discontinued) and currently is used for Civil Engineering Technology (CET) and Criminal Justice (CJ) programs. The floor space is concrete, with the original overhead door framing and exhaust vents still in place. If needed, there is additional space in the service yard that has similar characteristics (i.e. overhead doors, cement floors) utilized by the Facilities Department that could be renovated for BASD needs. The initial estimate for renovating the CET and CJ space is \$410,000 (infrastructure only, not including program specific equipment). The college will provide this through a combination of local and capital funds.

<p><i>Criterion 6</i> Program specific accreditation.</p>	<p><u>Standard</u> <i>Indicate whether the institution will seek specialized program accreditation. If so, describe plans for accreditation and identify appropriate accrediting body.</i></p>
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The only nationally recognized program accreditation that might apply is that of the Associated Equipment Distributors (AED). The organization is focused on the construction industry and is generally not recognized as important by our diesel advisory board. This position will be reviewed several years after startup.

<p><i>Criterion 7</i> Pathway options beyond baccalaureate degree.</p>	<p><u>Standard</u> Describe opportunities and articulation agreements for the place-bound BAS graduates to continue their education onto a graduate (Master's) degree program.</p>
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At present, the diesel services and related industries employ few personnel with masters or doctoral degrees and EMSI data indicate that under 1 percent of those currently employed in the relevant SOC codes hold a master's or higher degree (Economic Modeling Specialists International [EMSI], 2013). However, this is changing.

For those who will obtain a BASD because their personal interest is management, some graduates will certainly pursue an MBA or similar degree upon completion of the BASD. The universities that currently have BAS diesel programs report that about five percent of recent graduates have chosen to pursue a master's degree. The master's degrees that are most commonly pursued are the MBA or the MPA. These two degrees are available in several modalities. WGU offers an MBA that provides the normal flexibilities of the WGU on-line approach which fits working and place-bound students so well. There are already over seventy individuals in Lewis County, including three Centralia College employees, enrolled at WGU. City University of Seattle offers a 100 percent online MBA as well as in-class at their Tacoma campus. For those able to commute, in addition to CityU, MBA programs are also available at Saint Martin's in Olympia, Brandman in Lacey and UW-Tacoma. Saint Martin's offers an MBA with classes that meet once per week and another approach for working students has classes in the evenings twice a week. A locally popular MPA is offered by The Evergreen State College. With municipal transit and public school districts often operating significant fleets of diesel and now the far more complex diesel-electric hybrid vehicles, the combination of the BASD and a MPA would position an individual well for senior management in such a public sector agency.

<p><i>Criterion 8</i> External expert evaluation of program.</p>	<p><u>Standard</u> The institution will select two external experts to review the program. External experts should come from a university level institution, i.e. departmental professor, academic dean or department head. The expert should be a practitioner/instructor from within the content area of the proposal. In a separate document, provide copies of external evaluators' reports or letters. Summarize the institution's responses and subsequent modifications to the proposal based upon evaluator's recommendations. Attach a short bio of the evaluators.</p>
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The following selected reviewers represent two of the three existing accredited baccalaureate programs in diesel technology. See completed reviews in Appendix C.

- Wane Boysun is an associate professor in Automotive Technology and Agricultural Mechanics at Montana State University-Northern in Havre, Montana.
- Bob Schroer is an Assistant Professor in Automotive Technology and the Diesel/Heavy Equipment Coordinator for Pittsburg State University in Pittsburg, Kansas.

The reviewers were all quite pleased to see the inclusion of the general education-related courses as that will lead to a “more well-rounded” graduate as Mr. Boysun stated. Mr. Schroer noted that more than half of their BAS diesel graduates are now directly entering supervisory positions or management development programs. The proposed BASD program design was well-received and specific recommendations for change and our responses are as follows:

Mr. Schroer

- Suggested the use of a “portfolio of competencies” and judgment made on those competencies separate from course grades and program GPA. We will work with Mr. Schroer to understand exactly how this process works at Pittsburg State.
- Suggested that the program enrollment GPA requirement of 2.0 may be too low given the program rigor. We have raised the minimum cumulative GPA to 2.5. It is anticipated that the GPAs of enrollees will be quite a bit higher.
- Suggested that the fuels course address compressed natural gas (CNG) and that is planned.
- Suggested that several dynamometers be added to the equipment list. We agree that a chassis dynamometer would be a very useful addition and have augmented our proposed budget to include that item.
- Noted that the AED certification is considered valuable for his program and suggested that we consider that expenditure for the future depending upon which industry segments the graduates tend to be employed. That will be done.

Mr. Boysun

- Noted the rigorous program with over 200 hours for the baccalaureate degree, but insisted that an internship should be strongly considered. We have made some changes and added a five-credit internship as our advisory committee also greatly values that activity. We now have a rigorous program of over 200 hours.
- Also noted that we need to plan for the constant acquisition of equipment as the entire industry is moving to increased complexity to achieve tougher standards for both fuel usage and emissions. The equipment list and budget have been enhanced as a result of this input.
- Wanted to make sure that Centralia College is committed to the ongoing training for the faculty that will be required for them to stay current. That commitment is real and is reflected in the fact that assistant professor Fay is on sabbatical winter 2014 to study power generation at Idaho State University.
- Suggested that we should reconsider the number of students that can be effectively educated in a lab setting for the upper-division courses in terms of not only Montana State University-Northern standards, but the industry standards as well. Reconsideration has been made and the decision is to now limit the upper-division lab classes to 15 students. The remodeling that is planned will provide enough additional space to support this more intense approach with a lower student to instructor ratio for these upper division courses.

- Mr. Boysun also noted that the students from the associate degree program at Centralia College who enroll in the MSU-N diesel BAS are among the best prepared and he has a high regard for the faculty at Centralia College.



Appendix A

Diesel Technology

ASSOCIATE IN APPLIED SCIENCE

Students will need to purchase tools for class.
See a diesel instructor for tool list.

<u>Fall Quarter, First Year</u>		<u>Credits</u>
CNT 117	Windows OS	2
DET 100	Shop Skills	2
DET 101	Shop Skills Lab	4
DET 125	Power Transmissions	3
DET 126	Power Transmissions Lab	4
MATH 095	Basic Math*	5
		15-20

*Compass scoring below college level student will be required to take MATH 095 prior to MATH 116

<u>Winter Quarter, First Year</u>		<u>Credits</u>
DET 110	Electric Systems I Theory	3
DET 111	Electric Systems I Lab	4
DET 130	Mobile Hydraulics Theory	2
DET 131	Mobile Hydraulics Lab	5
MATH 116	Industrial Mathematics	5
		19

<u>Spring Quarter, First Year</u>		<u>Credits</u>
ENGL 105	English in the Workplace	5
DET 120	Engine I Theory	3
DET 121	Engine I Lab	5
WELD 151	Welding Theory for Mechanics	3
WELD 152	Welding Procedures for Mechanics	5
		21

<u>Fall Quarter, Second Year</u>		<u>Credits</u>
DET 200	Electric Systems II Theory	2
DET 201	Electric Systems II Lab	4
DET 215	Preventive Maintenance Theory	1
DET 216	Preventive Maintenance Lab	2
DET 220	Engine II Theory	2
DET 221	Engine II Lab	4
HLTH 145	Safety & Fitness	3
		18

<u>Winter Quarter, Second Year</u>		<u>Credits</u>
BTEC 191	Coop Work Exp Seminar	1
DET 210	Power Transmissions II Theory	1
DET 211	Power Transmissions II Lab	2
DET 225	Heavy Duty Chassis Theory	4
DET 226	Heavy Duty Chassis Lab	6
H R 110	Human Relations-Workplace	5
		19

<u>Spring Quarter, Second Year</u>		<u>Credits</u>
DET 230	Practical Applications Theory	3
AND		
DET 231	Practical Application Lab	5
OR		
DET 190	Cooperative Work Experience	8
DET 235	Mobile HVAC Theory	2
DET 236	Mobile HVAC Lab	4
		14

Credits Total 106-111

BACHELOR IN APPLIED SCIENCE

Entrance Requirements for Bachelor Program:

- An associate degree in diesel technology or diesel mechanics from a regionally accredited college or university
- Complete the following courses with at least a 2.0 grade:
 - Choose one: ENGL 101 or ENGL 102 or ENGL 235 **
 - Choose one: MATH 107 or MATH 146 or MATH 151 **

<u>Fall Quarter, First Year</u>		<u>Credits</u>
DET 320	Exhaust After Treatment/Regulations	5
DET 310	Electrical III-Advanced Circuits and T/S	5
DET 300	Survey of Business Management	5
		15

<u>Winter Quarter, First Year</u>		<u>Credits</u>
DET 330	Hydraulics II-Advanced Fluid Systems	5
DET 340	Combustion Engine Fuels	5
BAS 315	Ethics**	5
PHYS 110	Physics: Non Science Major with Lab**	5
		20

<u>Spring Quarter, First Year</u>		<u>Credits</u>
DET 350	Applied Failure Analysis	5
DET 360	Power Generation and Maintenance	5
ECON xxx	Economics Elective**	5
		15

<u>Summer Quarter, Second Year</u>		<u>Credits</u>
DET 450	Internship	5

<u>Fall Quarter, Second Year</u>		<u>Credits</u>
DET 400	Materials Science of Fuels and Lubes With Lab**	5
DET 410	Regulatory Issues	5
PSYC xxx	Psychology Elective**	5
XXX	GER Elective***	5
		20

<u>Winter Quarter, Second Year</u>		<u>Credits</u>
DET 420	Metallurgy and Fabrication	5
DET 430	Shop/Fleet Management	5
ENGL 235	Technical Writing**	5
		15

<u>Spring Quarter, Second Year</u>		<u>Credits</u>
DET 440	Hybrid Drives Electric/Hydraulic	5
BAS 350	Managerial Statistics**	5
HUM xxx	Humanities Elective**	5
		15

**Meets General Education Requirements (GER)

***Choose one GER from: Communication Skills, Math, Humanities, Natural Sciences, or Social Sciences

Credits Total 105

The Bachelor in Applied Science in Diesel program is currently seeking approval from the Washington State Board of Community Colleges and the Northwest Commission on Colleges and Universities, an institutional accrediting body recognized by the Council of Higher Education Accreditation and the Secretary of the United States Department of Education.

Appendix B

COURSE DESCRIPTIONS

DET 300 *Business management*

Explores key aspects of effective business management including organizational structure, leadership, decision-making, communications, human resource and financial management.

DET 310 *Electrical III (C)*

Provides a look into current microprocessor-based vehicle control systems, diagnostic systems, and circuitry. Topics include telematics and multiplexed circuit diagnostics.

DET 320 *Exhaust After-treatment and Regulations (C)*

Examines diesel oxidation catalysts, diesel particulate filters, selective catalytic reduction. In addition to passive, active, and stationary regeneration strategies.

Explores the historical, present and expected future requirements and regulations concerning diesel exhaust emissions and how those regulations are achieved.

DET 330 *Hydraulics II (C)*

Studies the application of complex hydraulics systems with an emphasis on troubleshooting and system design.

DET 340 *Combustion Engine Fuels (C)*

Examines a variety of alternative power sources used in internal combustion engines including diesel fuel, bio-diesel, gasoline, ethanol, propane, and CNG fueled engines.

DET 350 *Metallurgy and Fabrication*

Focuses on various types of steel and non-ferrous metals respective strengths and other key attributes regarding how those materials are repaired and components using those metals are designed and fabricated.

DET 360 *Power Generation and Maintenance*

Examines the theory, application, and maintenance of equipment and controls used in on-site power generation. Content will cover power generation systems that run in a variety of commercial, industrial, and personal applications.

DET 400 *Materials science of Fuels and Lubes with Lab (C) (G)*

Studies the tribology of automotive and industrial equipment fuels, coolants, lubricants and additives. Samples of each will be taken and examined to

comprehend the chemical breakdown processes, the contaminants that are involved and the consequences for engines and transmissions.

DET 410 ***Regulatory Issues***

Studies the requirements set forth by OSHA, MSHA, and the EPA relating to diesel fueled automotive and industrial equipment. Content to include current laws, preferred practices and case studies of industrial accidents.

DET 420 ***Applied Failure Analysis***

Identifies initial failures, progressive damage and appropriate documentation with a focus on root cause analysis and correction actions.

DET 430 ***Shop/Fleet Management***

Addresses the relationships between the repair facility and customers as well as internal shop relationships and the development of a strong customer service culture. Topics will include work flow and methods, shop layout, work ethics, effective communications and skills needed by effective supervisors and foremen.

DET 440 ***Hybrid, Electric, and Hydraulic Drives (C)***

Reviews current and emerging propulsion technologies including electric forklifts, diesel- electric propulsion and hydraulic accumulator drive systems.

DET 450 ***Internship***

Consists of work completed on the site of a maintenance/repair facility based upon a contractual agreement requiring specific attention to a project or problem that directly addresses BASD program outcomes.

“C” denotes courses that will produce industry recognized certificates showing student completion of OEM training.

“G” denotes courses that will meet state GUR requirements.

Appendix C

Robert Schroer
Assistant Professor
Automotive Technology Department
Pittsburg State University
Pittsburg, Kansas

Diesel Technology
Centralia College
BAS Diesel Technology

11 January 2022

Review of New Degree Program Proposal

First of all I would like to take this opportunity to congratulate those of you at Centralia College for having the motivation to see the need for a BASD degree program and for taking the initiative to undertake the process of making such a degree program a possibility.

Pittsburg State University has had a Bachelor of Applied Science (BAS) program in place for ten years. The Automotive Technology Department has four BAS degree programs as well as a Bachelor of Science Degree program. The four BAS degrees are, Automotive Power and Mechanics, Collision and Insurance Management, Diesel/Heavy Equipment, and Caterpillar Think Bigger. The Caterpillar Think Bigger BAS is an association with Caterpillar Inc. and their Think Big AAS program.

I would begin by saying that the BST and BAS Diesel/Heavy Equipment programs at PSU are not able to fill all of the industry request for graduates. The need for graduates with a bachelor degree in this field is greater than the educational programs across the country are able to fulfill. It is not uncommon for our industry partners that come to PSU to recruit new employees will very often hire graduates from our BST program with an emphasis in Service and Marketing Management who have not taken any Diesel/Heavy Equipment courses. The placements for our graduates in the D/HE field are traditionally in an entry level management position. A few of those graduates to take positions as technicians but the number is traditionally small. The companies that hire our graduates for example are, heavy construction contractors such as Kiewit, Granite, Crossland, Walsh, to manage their fleets of equipment. Trucking fleets, construction and agricultural dealers, truck dealers, railroads and locomotive manufactures, construction equipment manufacturers, agricultural equipment manufacturers, diesel engine manufactures, component manufacturers, all come seeking graduates to fill the ranks of their companies as entry level managers.

My point in talking about this is that while there is certainly a need for advanced level of technical training for the diesel industry due in no small part in the advancement in the technologies that the industry is employing, there is also a great need for personnel to be able to manage those technicians as well as be a part of the product support network that customers have come to expect from equipment manufacturers as well as dealer/distributors. The fact that a graduate holds a bachelor's degree opens up a multitude of employment possibilities that would otherwise not be available to a person with an AAS degree.

Appendix C – cont.

PSU annually during the summer will meet with faculty from Ferris State, Southern Illinois University, Weber State, and Colorado State, Pueblo to discuss our curriculum, program, and future developments. We all are in agreement that the industry we call diesel/heavy equipment is one of the most dynamic and opportunistic.

With this said, I feel that it is important that a BASD degree have a strong component in management. I do see that in the degree requirements there are multiple courses that will be delivered as part of the BASM program.

There is one area that I do not find in either the AAS or the BASD course listings and that is a communications course. As a foreman, supervisor, manager, or representative, communications whether oral or written is of extreme importance when dealing with technicians, supervisors, managers, or customers.

PSU has developed a capstone portfolio as a means of assessment and as a way to showcase specific student's competencies. The portfolio has seven competency areas that have been identified and developed in cooperation with our advisory committee. Those competency areas are; Management, Technical, Written Communications, Professional Employability, Safety, Oral Communications, and Team Work. The students have the ability during their time within the program to place artifacts within their portfolio. During their senior year their portfolios are assessed, as each item within their portfolio is given a point value. There is a minimum point value that the student must obtain in order to graduate with a bachelor's degree from PSU. A degree program that is at the bachelor level should be able to address the competency areas. I feel that when Centralia develops their advisory board, they too will find that these competency areas are as important to them as they are to our board.

PSU also utilizes Canvas LMS system on campus. This system allows students and faculty to interact in multiple methods outside of the classroom. Today's student does not communicate in the same manner as students just a mere decade ago. It is therefore important to be able to reach students in a way that they are accustomed to receiving information. Canvas is a system that allows us to do that in a very effective manner.

One item of note is related to the entrance requirement for the BASD program. The requirement that an incoming student have a minimum of 2.0 GPA may be set too low. If the program is seeking the higher level students who are able to be successful with the higher level of rigor in upper division courses a minimum of 2.5 GPA may be considered.

When I look at the General Education Requirements and the Upper Division Coursework a question comes to mind. DET 400, Materials science of Fuels and Lubes with Lab is shown as both Gen. Ed. And Upper Div. This appears as though it might be "double dipping". Would the student not be better served to offer another course in management or a course deemed important.

I know that you are going to seek additional faculty to fill positions within the BASD program. My question is about the departmental terminal degree. Is a bachelor's degree considered the terminal degree? In order to teach upper level courses, will you be requiring a master's degree as minimum degree? At present, at PSU, for a tenure-track Associate Professor position, a master's degree is required.

The Criteria 3 and 4 are both excellent and appear to be very well thought out and comprehensive.

In Criteria 6 the statement is made that there is no program specific accreditation for this occupational degree. There is one accreditation that I might suggest. At present PSU is undergoing the process of accreditation through this organization. The organization is the Associated Equipment Distributors (AED). The organization is focused on the construction industry but does have benefits for the program and students. Their web URL is; http://www.aednet.org/aed_foundation/school-accreditation-program.cfm

PSU at present offers several different master's degree programs which include a Master's of Science and a Master's of Business Administration among others. The number of students who

Appendix C – cont.

participate in these programs is small. Usually only several each year will pursue a master's degree. A greater number of students in our bachelor's degree program will seek a minor in business administration. This addition to their bachelor degree is appraised by many employers as worthwhile. The fact that PSU has an accredited College of Business on campus makes this option very easy to accomplish.

There are a couple of items for future consideration that I would like to include at this time. The first is consideration of a course that covers CNG/LNG fuel systems. Because of the disparity in price of diesel fuel vs. natural gas, natural gas will prove to provide a ROI for many users. This fact alone will be a driving force for this type of alternative fuel system. I know that you have included hybrids in your course offerings and this too is a very important segment of the industry. I do believe that natural gas will also be a large component of the industry and therefore could be included in future course offering.

The other item is dynamometer testing. Because many dealers, distributors and OEM's use dynamometer testing for many purposes, I believe students should be given exposure to the uses and safe operation of dynamometers. PSU utilized three different types of dynamometers. A transmission dynamometer which is capable of testing automatic as well as manual transmissions, which assures that students have been able to successfully repair or rebuild these units. Another dynamometer that we utilize is a chassis dynamometer, which can be used for performance testing, diagnostics as well as emissions testing. The third is an engine dynamometer which can do engine testing for power output, break in operation and emissions testing. This dynamometer can be reconfigured to perform tractor PTO testing as well. Because of the above rationale, we believe that having these tools and understanding their operation is important for students in our field.

I will at this point restate what I began with, and that is to congratulate all of you on the progression toward a very important and needed degree program. I hope in some small way that I have been able to help make this possible. Please let me know if there is any clarification or additional information that I might be able to forward.

Robert Schroer
Assistant Professor
Pittsburg State University

Robert L. Schroer

(Mr. Schroer provided a 14 page dossier. The following are excerpts)

Mr. Schroer has been on the faculty of Pittsburg State University since 2002 and has been the Automotive Technology Department, Diesel Heavy Equipment Coordinator, from the fall of 2008 to the present.

Non-university Professional Experiences

02/98 – 08/03 Joplin Freightliner, Joplin Missouri. Served as a class "A" technician and was certified in all areas of Medium/Heavy Duty Truck repairs. Maintained all shop diagnostic computers and software.

09/92 – 02/98 MidAmerican Truck Maintenance, Joplin Missouri. Started employment as Tractor Shop technician then advanced to Lead Technician, Shop Foreman and finally Tractor Shop Supervisor. The last position was responsible for managing 30 technicians and a fleet of 2,000 Class 8 semi tractors.

01/92 – 08/92 R&S Chevrolet, Joplin Missouri.

12/90 – 01/92 United Parcel Service, St. Louis, Missouri. Served as an Automotive Fleet Supervisor with the responsibility of supervising 11 technicians with the task of maintaining a fleet of 88 vehicles

Appendix C – cont.

08/85 – 12/90 Downing Glass, Joplin, Missouri. Shop Supervisor **10/83 – 08/85** Cummins Mid-America, Joplin, Missouri. Truck repair shop

09/82 – 10/83 Steve Spicer Motors, Joplin, Missouri full line technician

06/82 – 09/82 Bill Lowe Auto Service, Joplin, Missouri. service technician

Plus six previous employers including the US Navy.

Licenses, Registrations and Certifications

- National Institute for Automotive Service Excellence (ASE), certified “Master Automotive Technician” and “Master Medium/Heavy Truck Technician”. Recertification due in Spring 2014 and Fall 2014.
- 1990 – Present; National Institute for Automotive Service Excellence, Certified for Refrigerant Recovery and Recycling.
- Pittsburg State University Technical Education Department, Competency Assessment in Diesel Mechanics
- 2001 – Present; Caterpillar Truck Engine Certified
- 2000 –Present; Allison Guild Transmission Certified
- 1995 – Present; Detroit Diesel Guild – DDC Series 60 Certified, MBE 900, MBE 4000 Certified, DD-13, DD-15
- 1990 – Cummins Medium and Heavy Duty Engine Certified
- 2013 – Cummins ISL – G, Natural Gas Engine Certified
- 2013 – Honda Civic GX, CNG, Certified
- 1985 – Certified DOT Inspector

Awards and Honors

1. 2012 – Exceptional Rating
2. 2010 – Outstanding Faculty
3. 2005 – Nominated for Phi Kappa Phi (PSU)
4. 2003 – Deans all “A” Honors

Membership in Academic, Professional and Scholarly Societies

5. 2005 – Present, Society of Automotive Engineers (SAE)

TEACHING

Courses Taught

<u>Number</u>	<u>Title</u>
AT 112	Engine Analysis
AT 300	Internship - Diesel
AT 310	Industrial Tour
AT 314	Manual Transmissions
AT 418	Failure Analysis
AT 511	Service Techniques
AT 611	Diesel Engine Fundamentals
AT 621	Advanced Diesel Engine
AT 630	On-Highway Systems
AT 654	Advanced Hydraulics
AT 403	Special Topics
AT 403-53	Special Topics Appendix C – cont.
AT 403-54	Special Topics – ASE Test Prep T3
AT 403-55	Special Topics – ASE Test Prep T4

Appendix C – cont.

Contribution to Course and Curriculum Development

The following courses have had either major improvements or complete new course development.

<u>Number</u>	<u>Title</u>
AT 112	Engine Analysis
AT 403-53	ASE Test Prep. T2
AT 403-54	ASE Test Prep. T3
AT 403-55	ASE Test Prep. T4
AT 418	Failure Analysis
AT 611	Diesel Engine Fundamentals
AT 621	Advanced Diesel Engines
AT 630	On-Highway Systems

AT 112 Engine Analysis was improved by a redesign of all presentations. These presentations were changed to include the latest in engine design used by automotive OEMs. Writing assignments were modified by the use of a more critical rubric.

AT 403-53, 54, and 55 are new one credit hour courses that were developed to improve student success when taking the Automotive Service Excellence (ASE) tests. All PowerPoint presentations were developed new as well as all assessments. The assessments were developed to mirror ASE tests. All of these tests were administered on Canvas.

AT 418 Failure Analysis was added to the Diesel Heavy Equipment Option area of the BST Automotive Technology Degree when the change was made to move from a 15 credit hour emphasis area to a 21 credit hour option area in 2005. This course had not previously been taught. A search was made for an existing textbook for the topic but none was found. It was necessary to develop all PowerPoint presentations, student supplements and course work. It was also necessary to acquire a substantial amount of failed material to use within the course to enhance student learning.

AT 611 Diesel Engine Fundamentals was improved by the updating and development of new PowerPoint presentations, and a new textbook edition for this course. An increased number of engine component parts were obtained for the course. Examples; Crankshafts, Camshafts, Pistons, Liners, Rings, Rocker assy. Injectors, Complete engines, Turbochargers, Etc.

AT 621 Advanced Diesel Engines was improved by the updating and development of new PowerPoint presentations, and a new textbook edition. An increased number of running engines were added to the Laboratory for students to experience a broader experience. Examples; Cummins ISX, Cummins QSM11, Cummins ISC, Caterpillar C15 ACERT, and Caterpillar 3126B. Two laptop computers were secured and Cummins, Caterpillar, and Detroit Diesel diagnostic software were licensed and added to the computers for student use. Two wireless communications adapters were obtained from Caterpillar for use with the computers in order to communicate with various Caterpillar equipment within the laboratory. Laboratory exercises were developed for use with the new engines so students could utilize the newest industry equipment.

AT 630 On-Highway was improved by the updating and development of new PowerPoint presentations and a new textbook edition for this course. An increased number of component parts were obtained to give the students an increased learning experience. Examples; two Rockwell axles, three Eaton transmissions, Wabco antilock brake components, three Eaton Clutches, and miscellaneous driveline components.

Appendix C - con't

Endeavors

Mr. Schroer is working as Co-PI on an NSF grant with Texas State Technical College in Waco, TX. The grant was written and accepted by NSF to develop curriculum for an Advance Certificate Program, for advanced studies in Hybrid, Light Duty Diesel, and Compressed Natural Gas system in the automotive industry. Mr. Schroer's portion of the grant is to develop the curriculum for the Compressed Natural Gas portion of the grant. The grant was awarded in June of 2012. When complete, the course work will enhance the learning of students at PSU in these three areas.

In 2010 to 2011, Mr. Schroer successfully co-organized the Baja SAE Kansas collegiate competition. The competition brought to Pittsburg State University, 87 teams from universities from across the United States and multiple foreign countries. The competition utilized the College of Technology facility for two days of static competition events such as technical inspection and design judging. The final two days of the competition was held on the University property located east of the COT. The event was able to utilize the expertise of multiple departments and students from across the University campus to assist in the operation of the event. The event will be returning to PSU in 2014, 2017, and 2020.

Appendix C – con't

To whom it may concern,

My name is Wane Boysun, and I am a Professor of Automotive, Diesel and Ag-Mechanics from Montana State University-Northern in Havre, Montana. I would like to start with some initial comments about Centralia's proposed BAS Diesel degree. After reviewing the included materials, it is apparent to me that the need, scope and goal of the program have been clearly demonstrated. It is also very evident that Centralia has focused considerable energy and detailed planning towards making the BASD degree a reality. Please accept this report as an unbiased review from a peer who has 17 years teaching experience at Montana State University – Northern as well as nearly 20 years of working within the light & heavy equipment and agriculture industry. I have spent the past week reviewing your proposed degree, and I share with you my comments as follows:

What do you like?

I am impressed with the inclusion of the managerial content imbedded within the general education core. The general education core, while not always viewed as a favorite among technical minded students, is incredibly important to the soft skills and ultimate outcome of the graduate's skill sets. I really like how Centralia is able to embed courses such as ENGL 235/Technical Writing, ECON/Economics elective, PSYC/Psychology elective, BAS 300/Foundations of Management and BAS 350/Managerial Statistics. I think these courses will help polish the graduates and will ultimately appeal to industry partners. Overall, I feel the proposed gen-ed core is tailored very well to the goal and mission of the BASD.

I think an internship is very important to the success of the degree. It is imperative that students in the program are required to experience industry as they are acquiring their degree. The growth of the students through an internship helps focus and engage student's participation in their degree. It also gives both the employer and student the opportunity to test drive each other before committing to a full time position.

I commend Centralia for the creation of BASD advisory board. It is extremely important to work with industry partners and to listen to their feedback so you can modify content within the degree. A BAS degree's outcomes are very different then an AAS, and therefore it is very important to work with industry to build a degree that will meet their needs. Without an active advisory board, higher education is simply guessing what is best for the students. I think you will find that this will be an extremely important component of your BASD.

I think the diesel faculty have done a good job including the various technical courses and content of 300 & 400 level diesel courses. I think these technical courses will help Centralia's students enhance their technical expertise as they head into industry.

The inclusion of additional general education faculty to teach managerial, statistics and ethics courses is a good idea. Students within the BASD program are able to work with experts within these fields, and share in multiple faculty experiences. I think this will lead to a well-rounded graduate.

Appendix C – con't

I think Centralia's admission process for the BASD is sound. It is important to pre-qualify participants to make sure they have the appropriate pre-requisites to ultimately take on the rigor of the BASD and achieve success within the program.

What is missing?

A more detailed shop space evaluation. The report states that an additional 3000 square feet will be added to the Diesel Technology program to handle the increased student load of the BASD. After consulting with faculty at Centralia, this is a misprint and is actually 4500 square feet of actual shop space as well as the inclusion of an oil analysis lab of 1000 square feet and additional classroom space of 1400 square feet. I'm not sure that this will be enough to handle the additional increase of the 50+ students forecasted to enroll in the BASD. Maybe it will be, but you may consider bolstering this area in your report to fully demonstrate that it will or will not be adequate.

I would like to see a shop equipment evaluation and implementation plan for the additional BASD students. I observed some money in the proposed budget for additional equipment, but make sure you have a detailed plan for what additional equipment you will need and how much this will cost. It becomes very challenging teaching 300 & 400 level coursework without sufficient technology in sufficient quantities. Perhaps Centralia has considered this, but I'm not sure I observed this in your plan. As a faculty member, I would be apprehensive if I was told I would be teaching the rigor of 300 & 400 level coursework without knowing I had sufficient equipment and trainers.

Perhaps at this point it is too soon to consider course, faculty and facility scheduling, but this becomes a daunting task when you include 300 & 400 level course in the same facility. It may not be required at this stage for your state board of higher education, but don't overlook this detail.

Your plan to put your two existing faculty teaching upper division courses is a good idea. One bit of advice is to try and fill the lower division courses with full time faculty instead of adjunct. You need dedication to the program. Also, it might be a good idea to still have your advanced instructors teach just one lower division course so they can stay in touch with 1st and 2nd year students. This builds a blended approach that also exposes lower division students to a total of 4 different instructors and gives them a taste of what they can expect in the BASD.

What should we make sure is heavily emphasized?

A pro-active faculty training model should be stressed. It appears that Centralia has recognized this fact as documented in the report, but for the viability of the 300 & 400 level coursework it is imperative to continually send instructors to relevant industry training. Diesel technology is rapidly evolving due to the surge of advanced technologies. Students will demand this technology content in the 300 & 400 level coursework, and you will need to make sure to keep your instructors trained to current industry levels. In order to do this, keep focusing on update training for your faculty. This will help ensure success of the technical content of the upper division diesel courses.

The role of the advisory board needs to be heavily emphasized. Plan on two or more meetings per year with your industry partners, and facilitate the meetings so you can listen and work with your advisory board partners. I believe this will be imperative to the success of your program.

A general thought I'd like to share from my experience is that the program will ultimately be as good as the faculty. The best laid plans will fall to the wayside if you don't fully support and/or recruit highly qualified faculty. "As go the faculty, so goes the program". The BASD program is a major commitment, and will require much endearment. I have personally observed programs that had sound curriculum spiral downward when qualified faculty left and the program was unable to fill these positions with adequate replacement faculty. You have two very qualified faculty members at the current time, but you will need to find two more very qualified individuals. This can be a real challenge in this field to recruit qualified individuals from industry.

Any other comments you wish to make?

The fall 2014 timeline is approaching rapidly. As mentioned at the beginning of this review, I admire the thought and effort put into the proposed BASD program. I think you have a sound plan, but there will a LOT of groundwork left to deal with upon approval by your state board of higher education. Keep the target in your sights.

I would just make the comment that due to the rigor of degree you may experience a higher dropout rate than 20%.

The presence of ethics, economics, psychology, and technical writing, and foundation of management in your degree is great, and I believe it will ultimately enhance the quality of your graduates.

Physics is great addition in the general education core, but from my experience, it is likely to be difficult for many students. Keep an eye on that course and make sure you have support for your students.

Being a faculty member myself, I'm not sure about the additional loads added to Centralia's faculty. I think it is essential to add 2 more instructors, but make sure 3 or 4 instructors can teach all the current and additional credits. Make all efforts to put your faculty in a position where they are not overloaded with credits to ensure a successful implementation of your BASD program.

Be aware of the challenges of teaching current technology. Curriculum changes rapidly because you are no longer teaching basic skills courses. I observed additional monetary support for the development of the 300 & 400 level curriculum, but be aware that this will constantly be evolving, and it takes substantial effort for faculty to stay on top of this.

You are planning on 24 students entering into the program the first year. I'm not sure if you are planning on holding lab sections with all 24 students? If so, 24 is a lot of students to take into a single lab, if that is your plan. Most industry training only accept 12-14 students due to the rigor of the content. It is very ambitious to try to develop and deliver a lab of this advanced content. Consider the fact that if industry is limiting their courses to 12-14 students, it is for a reason.

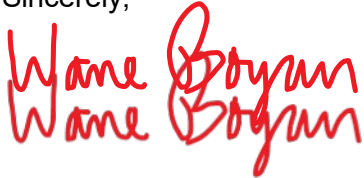
Appendix C – con't

I'm not sure the equipment budget as proposed in the report is sufficient for the growth of the BASD program. Diesel technology is an expensive endeavor, as you well know. If you are planning on having labs of 24 students, you will need multiple pieces of equipment/trainers, and I'm not sure you have enough resources budgeted for this. If you are going to share equipment from the AAS program, make sure you look at scheduling very closely to make sure the two degrees won't parasitize each other.

Conclusion

I have had the opportunity to work with Centralia College's Diesel Technology program for more than a decade, and have been consistently impressed with the quality of their students and faculty. I want to sincerely wish you the best of luck in your endeavor to offer a BASD program. I hope that as this process unfolds, we will continue to support and promote each other's programs for the betterment of the students, graduates and future industry leaders. If you have any questions about my review, please do not hesitate to contact me.

Sincerely,



Wane Boysun
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Professional Profile

Skilled professor of mobile technologies including automotive technology, diesel technology and agricultural mechanics technology.

Education

Master of Education, Vocational Education
Montana State University – Northern
1999

Bachelor of Science, Automotive Technology
Montana State University – Northern
1996

Bachelor of Science, Diesel Technology
Montana State University – Northern
1996

Academic/Teaching Experience

Professor, Automotive, Diesel and Ag-Mechanics Technology

- Promoted to Professor in 2013
- Promoted to Associate Professor in 2007
- Tenured in Automotive and Ag-Mechanics in 2005
- Promoted to Assistant Professor in 2002
- Hired as Instructor in 1997

Courses Taught/Developed

AGMT 120 – Forage Implements
AGMT 130 – Introduction to Agriculture Tractors
AGMT 205 – Introduction to Grain Harvesting
AGMT 210 – Tillage, Planting and Spraying Implements
ATDI 134 – Auto/Diesel Electrical/Electronic Systems I
ATDI 264 – Auto/Diesel Electrical/Electronic Systems II
ATDI 383 – Alternative Automotive Power Systems
ATDI 384 – Auto/Diesel Electrical/Electronics Systems III
ATDI 400 – Shop Procedures
AUTO 117 – Automotive Manual Powertrains
AUTO 128 – Engines
AUTO 152 – Diagnosis and Tune Up Lab
AUTO 357 – Advanced Power Trains
AUTO 408 – Current Trends in Mobility Technology (*Capstone Course)
AUTO 450 – Dynamometer Testing and Computer System Data Analysis
DIES 434 – Current Model Year Technology (*Capstone Course)
DIES 450 – Heavy Duty Powershifts
A&M 490 – Senior Seminar
EET 110 – Electronics Survey I
IT 111 – Industrial Safety/Waste Management
Montana Department of Transportation Automotive Update Workshop
Montana Department of Transportation Diesel Update Workshop
Montana Automotive Update Workshop
Cabin Fever Diesel Pickup Workshop
Cabin Fever Electronic Sensor Workshop
Case/New Holland MSU/TSA Tractors
Case/New Holland MXM/TM Tractors
Case/New Holland WDX Windrowers

Toyota Electrical Systems I
Toyota Electrical Systems II
Toyota Manual Powertrains

Teaching Interests

- Automotive Hybrid Vehicles
- Automotive Diesel Vehicles
- Electronic Systems
- Agriculture Equipment

Professional Training

1200+ Hours of Certified training including:
Certified Toyota Training
Certified Ford Training
Certified Case/New Holland Training
Certified Cummins Training
Certified Caterpillar Training
Certified Detroit Diesel Training

University Service

Committee Member, Admissions and Standards, 2007-Present
Senator, Academic Senate, 2005-2007
Committee Member, Appeals Committee, 2006
Chair, Curriculum Committee, 2005
Committee Member, Curriculum Committee, 2005
Committee Member, Instructional Research Committee, 1997-2003
Chapter Advisor, Society of Automotive Engineers, 1997-2001
Secretary, Faculty Union, 2002-2004

Work History

1992 – Rathert Fox Ford, Automotive Technician
1993-95 – G&B Toyota, Automotive Technician
1995 – NC Machinery, Diesel Technician
1996-97 – Rathert Fox Ford, Automotive and Diesel Technician
1998 – Tech Works, Owner, Automotive and Diesel Repair Facility
1999-2012 – Boysun Grain, Inc., Technician and Equipment Operator
2013-Present – Boysun Grain, Inc., President

Appendix D

BASD Admission Points Rubric used to assess those who meet all of the minimum requirements		
		Max. Points
	English 102 (research and augmentation)	5
	English 230 (technical writing)	5
	Speech 110 (Principles of Speech Communications)	5
	Speech 220 (Theory and Practice of Public Speaking)	5
	Diversity (breadth/depth of relevant work experience)	30
	Expected personal use of the BASD degree	25
	Perceived readiness to succeed in the BASD program	25
	Maximum Points	100