

MONTANA BOARD OF REGENTS

LEVEL I REQUEST FORM

Item No.: 124-2801-R0904 Date of Meeting: September 23-24, 2004
Institution: Montana State University - Northern
Program Title: Diesel Technology B.S. - Field Maintenance Option

Level I proposals are those that may be approved by the Commissioner of Higher Education or the Commissioner's designee. The approval of such proposals will be conveyed to the Board of Regents at the next regular meeting of the board. The institution must file the request with the Office of the Commissioner of Higher Education by means of a memo to the Deputy Commissioner.

A. Level I action requested (check all that apply): Level I proposals include campus initiatives typically characterized by (a) minimal costs; (b) clear adherence to approved campus mission; and (c) the absence of significant programmatic impact on other institutions within the Montana University System and Community Colleges.

- 1. Re-titling existing majors, minors, options and certificates; (e.g. from B.S. in Mechanized Agriculture to B.S. in Agricultural Operations Technology);
- 2. Eliminating existing majors, minors, options and certificates via a Program Termination Checklist;
- 3. Adding new minors or certificates where there is a major;
- 4. Departmental mergers and name changes;
- 5. Program revisions; and
- 6. Distance delivery of previously authorized degree programs.

Level I with Level II documentation: With Level II documentation circulated to all campus chief academic officers in advance, the Commissioner or designee may propose additional items for inclusion in the Level I process. For these items to move forward, the Commissioner or designee must reach consensus with the chief academic officers. When consensus is not achieved, the Commissioner or designee will move the item to the Level II review process.

- 1. Options within an existing major of degree;
- 2. Eliminating organizational units within larger institutions such as departments, divisions and colleges or schools *with the exception of the five Colleges of Technology where changes require Board action;*
- 3. Consolidating existing programs and/or degrees.

C. Temporary Certificate or A.A.S. degree programs: Certificate or Associate of Applied Science Degree Programs may be submitted as Level I proposals, with memo and backup documentation, when they are offered in cooperation with and/or at the request of private or public sector partners and the decision point to offer the program is not consistent with the regular Board of Regents program approval process. Level I approval for programs under this provision will be limited to two years. Continuation of a program beyond the two years will require the normal program approval process as Level II Proposals.

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All other Certificate or Associate Degree programs may be placed on submission at any Board of Regents meeting. They will be placed on action agendas at subsequent meetings. All campuses agree to insure that all other campuses receive program information well in advance of submission.

Specify Request:

Approval for Montana State University- Northern to offer an option in Field Maintenance for the Bachelor of Science degree in Diesel Technology.

This option provides students the opportunity to focus on courses in welding, metallurgy, fabrication and structure repair rather than the broadfield option in diesel technology that focuses on diesel engine maintenance. The option was recommended by MSU-Northern's industrial advisory boards to enhance career and placement opportunities for students in diesel technology. This integrated option in field maintenance draws heavily on courses currently being taught in the welding, automotive, civil engineering, and industrial technology programs.

MONTANA BOARD OF REGENTS

Level I Program Change Request

Institution: Montana State University - Northern
Program Title: Diesel Technology B.S. - Field Maintenance Option

1. How does this program advance the campus' academic mission and fit priorities?

For two years, the Diesel Technology Advisory Board and current employers of Northern's diesel graduates have requested that Northern add a field maintenance option to the Bachelors degree in Diesel Technology. This integrated option draws heavily on course work already being taught in the welding, automotive, civil engineering, and industrial technology programs.

2. How does this program fit the Board of Regents' goals and objectives?

The option in Field Maintenance will enhance the employability of graduates in a way that is cost free, in that it will not create new courses or modify the structure of any existing degree program at Montana State University – Northern.

3. How does this program support or advance Montana's needs and interests?

This option addresses the needs expressed by the industry both nationally and within the State. The diesel program at MSU-Northern has a 100% placement rate, and currently does not produce enough graduates needed by the industry.

4. How will this program contribute to economic development in Montana? (Note projected annual economic impact both regionally and statewide.)

The median starting salary for diesel mechanics is \$40,000 per year. In addition, the U.S. Bureau of Labor predicts a 14% increase in new job opportunities for diesel mechanics by 2010. MSU-Northern continues to develop strong industry relationships (state, national and international) for its diesel program. This option is driven by the demands of these partners (especially Kiewit).

5. What is the program's planned capacity?

| | NA | FTE students |
|-----------------------|---|--------------|
| • Break-even point? | NA | FTE students |
| • Enrollments / year? | Approximately 5 new enrollments per year. The primary purpose of this option is to provide an alternative and a broader-based curriculum for students currently enrolled in the program | |
| • Graduates / year? | 33 (current average/year for the entire diesel program) | |
| • MT jobs / year? | 30 (does not reflect out-of-state placements) | |

6. Resource Allocation:

| | |
|-------------------------|---|
| • Total program budget? | \$ 5,280 (operating – State allocated)* |
| • Faculty FTE? | 03.5* |
| • Staff FTE? | .5* |

**Figures designate the budget allocation and personnel assigned to the existing diesel program. No additional budget or personnel will be used to offer the field maintenance option.*

7. Does this program require new resources? Yes No

If yes, what is the amount? \$ _____

8. How will the campus fund the program?

Course costs and other support are already part of current course and/or program offerings. The campus currently offers courses/programs in welding, automotive, civil engineering, and industrial technology. Therefore, no additional faculty, facilities, or equipment are requested as part of this proposal.

9. If internal reallocation is necessary, name the sources.

Not necessary.

**Montana State University – Northern
College of Technical Sciences**

Program Description

- 1. Briefly describe the proposed new program. Please indicate if it is an expansion of an existing program; a new program; cooperative effort with another institution, business or industry; or an on-campus or off-campus program. Attach any formal agreements established for cooperative efforts.**

The Diesel Technology Bachelor of Science degree with a Field Maintenance option is a modification of the current Diesel degree, which is currently configured as a broadfield degree. Some courses providing depth of knowledge in diesel maintenance and shop operation were eliminated, and courses providing additional welding, machining and metal fabrication were added. The modification provides students with additional skills and knowledge required for field maintenance technicians, but does not increase the number of faculty needed to deliver the program.

- 2. Summarize a needs assessment conducted to justify the proposal. Please include how the assessment plan was developed or executed and the data derived from this effort.**

Needs assessment consisted of a series of focus group meetings with industry leaders and representatives of companies that hire graduates of the MSUN diesel technology program. Industry leaders expressed a strong interest in several options for diesel technicians. In response to these industry requests, a diesel core, a diesel broadfield and the need for a field maintenance option were identified by the faculty.

- 3. Explain how the program relates to the Role and Scope of the institution as established by the Board of Regents.**

The program represents technical education as demanded by Montana business and industry.

- 4. Please state what effect, if any, the proposed program will have on the administrative structure of the institution. Also indicate the potential involvement of other departments, divisions, colleges, or schools.**

The proposed program provides an interdisciplinary approach to curriculum delivery within two existing areas of the College of Technical Sciences, Diesel Technology and Metals Technology. No change in administrative structure is required.

5. Describe the extent to which similar programs are offered in Montana, the Pacific Northwest, and the states bordering Montana. How similar are these programs to the one proposed.

No program in Diesel Technology with an emphasis in Field Maintenance exists in Montana, the Pacific Northwest or in states bordering Montana.

6. Please name any accrediting agency/ies or learned society/ies that would be concerned with the particular program herein proposed. How has this program been developed in accordance with criteria developed by said accrediting body/ies or learned society/ies?

The Diesel Technology program is certified by NATEF; the proposed program is also designed to meet Association of Equipment Dealer criteria.

7. Prepare an outline of the proposed curriculum showing course titles and credits. Please include any plans for expansion of the program during its first three years.

**Bachelor of Science Degree
DIESEL TECHNOLOGY**

| | |
|--|-----------|
| GENERAL EDUCATION CORE | 31 |
| DIESEL CORE | |
| TECH 100 Industrial Safety and Waste Management | 2 |
| METL 140 Intro to Welding & Cutting | 3 |
| ATDI 134 Auto/Diesel Electrical/Electronic System I | 4 |
| DIES 115 Intro to Diesel Fuel Systems | 4 |
| DIES 204 Introduction to Hydraulics and Pneumatics | 2 |
| DIES 214 Intro to Hydraulics and Pneumatics Lab | 2 |
| DIES 216 Heavy Duty Power Trains | 4 |
| ATDI 264 Auto/Diesel Electrical/Electronic Systems II | 4 |
| ATDI 265 Heating and Air Conditioning | 4 |
| DIES 262 Diesel Engine Diagnosis & Repair | 2 |
| DIES 272 Diagnosis of Diesel Engine & Repair Lab | 4 |
| TSCI 304 Fuels and Lubricants | 3 |
| DIES 314 Hydraulics and Pneumatics II | 4 |
| DIES 373 Diesel Shop Practices | 4 |
| ATDI 384 Auto/Diesel Electronics Applications | 4 |
| ATDI 400 Shop Procedures | 2 |
| DIES 440 Advanced Fuel Systems | 4 |
| DIES 434 Current Model Year Technology | 3 |
| DIES 450 Diagnosis of Power Shifts & Heavy Duty Automatics | 4 |
| TOTAL | 63 |

Plus one of the following Diesel Technology Options:**Broadfield Diesel Technology Option**

| | |
|---|-----------|
| DIES 104 Introduction to Diesel Engines | 3 |
| DIES 114 Introduction to Diesel Engines Lab | 3 |
| METL 155 Machining Processes | 3 |
| DIES 219 Heavy Duty Chassis | 4 |
| ATDI 257 Automatics | 4 |
| METL 260 Repair and Maintenance Welding | 3* |
| DIES 420 Diesel Shop Management | 2 |
| <i>Selectives</i> | 4 |
| TOTAL | 26 |

Diesel Technology Field Maintenance Option

| | |
|---|-----------|
| DIES 104 Introduction to Diesel Engines | 3 |
| DIES 114 Introduction to Diesel Engines Lab | 3 |
| METL 150 Shielded Metal Arc Welding | 3 |
| METL 154 Gas Arc Welding Processes | 3 |
| METL 155 Machining Processes | 3 |
| METL 260 Repair and Maintenance Welding | 3* |
| METL 285 Welding Certification I | 3 |
| METL 356 Welding Certification II | 2 |
| METL 357 Welding Certification III | 3 |
| TOTAL | 26 |

TOTAL minimum credits required for degree **120**

***new course**

Course deleted from program: DIES 273, Diesel Shop Procedures (4)

**Course Descriptions for
Diesel Field Maintenance Option**

[All course descriptions (except METL 260) are existing courses within the current diesel program and/or welding departmental certificate program.]

DIES 104 Introduction to Diesel Engines (3)

Construction, operation, and repair of diesel engines; logical steps of procedure for engine reconditioning; installing and timing of fuel injection components. Emphasis will be placed on diesel engine component reconditioning, engine tune-ups, and use of special diagnostic tools.

DIES 114 Introduction to Diesel Engines Lab (3)

This course will give the student hands-on experience rebuilding diesel engines and components. The student will learn manufacturer's procedures on engine rebuilding and special tool usage.

METL 150 Shielded Metal Arc Welding (3)

A continuation of METL 140, additional training in welding horizontal, vertical and overhead positions of mild steel. Emphasis is placed on alloys on special applications. Introduction to techniques of welding mild steel. Mechanical properties of metals and types of joints are also covered. Prerequisites: METL 140 or consent of instructor.

METL 154 Gas Arc Welding Processes (3)

Setup and operation of equipment and control of welding variables, types of power sources, and characteristics of operation, shielding gases, filler materials, quality assurance, and weld defects in metal arc welding, gas tungsten arc welding and flux cored arc welding.

METL 155 Machining Processes (3)

An introduction to machining. The student will become familiar with basic theory and operations performed on various manual and automated machine tools. Instruction includes the selection of speeds and feeds and the identification and conditioning of associated cutting tools

METL 260 Repair and Maintenance Welding (3)

Theory and practice in repair and maintenance of commonly used metals using oxygen fuel, shielded metal arc (SMAW), gas metal arc welding (GMAW), and gas tungsten arc (GTAW) welding processes. Students work on practice exercises and "live" projects.

METL 285 Welding Certification Procedures I (3)

Procedures and development of manual skills necessary to perform welds acceptable under a structural welding code.

METL 356 Welding Certification Procedures II (2)

Laboratory applications to be taken following METL 285.

METL 357 Welding Certification Procedures III (3)

Laboratory applications to be taken following METL 356.

Faculty and Staff Requirements

- 1. Please indicate, by name and rank, current faculty who will be involved with the program proposed herein.**

Diesel Core courses will be delivered by

Greg Clouse – Professor of Diesel Technology

Lynn Stilger – Associate Professor of Diesel Technology

Wane Boysun – Assistant Professor of Automotive Technology

Field Maintenance courses will be delivered by

Dr. Virgil Hawkinson – Professor of Metals Technology

- 2. Please project the need for new faculty over the first five years of the program. Include special qualifications or training. If present faculty are to conduct the program, please explain how they will be relieved from present duties.**

Currently no additional faculty is anticipated. In the event program demand increases beyond the capacity of current faculty numbers, additional faculty may be required.

- 3. Please explain the need for support personnel or other personnel expenditures.**

No other personnel costs are expected.

Capital Outlay, Operating Expenditures and Physical Facilities

- 1. Please summarize operating expenditure needs.**

All courses (except METL 360) that are part of this option are currently being offered within other degree programs. All equipment, labs and facilities are in place to support the courses necessary. Operating expenses for increased student enrollment may increase, but initial course projections are within the current capacity of the college.

- 2. Please evaluate library resources. Are they adequate for operation of the proposed program? If not, how will the library need to be strengthened during the next three years?**

Library resources to support the proposed degree are subsets of those required to support the current diesel technology and metals technology programs.

- 3. Please indicate special clinical, laboratory, and/or computer equipment that will be needed. List those pieces of equipment or computer hardware presently available in the department.**

Laboratory equipment to support diesel technology includes a 15,000 square foot laboratory facility (Ag Mechanics Building) with attendant equipment including diesel engines and test equipment. Welding and fabrication facilities include a 4,689 square foot welding lab and 4,000 square foot machining labs. Existing equipment is in place to support the program.

- 4. Please describe facilities and space required for the proposed program. Are current facilities adequate for the program? If not, how does the institution propose to provide new facilities?**

Current facilities and space are adequate for the new option. Increased enrollment in existing courses will improve space utilization in the current facilities and will further improve facilities currently under construction (the new Applied Technology Center on the Northern campus).

Evaluation of the Proposed Program

Please name faculty committees or councils that have reviewed and approved the program herein proposed.

The proposed curriculum and courses proposed for this degree program have been reviewed by the curriculum process at Montana State University Northern, which include the Welding Program faculty, College of Technical Sciences Faculty, MSU-Northern Academic Senate, Curriculum Committee, General Education Committee, and MSU-Northern Full Faculty.

FISCAL IMPACT AND BUDGET INFORMATION

I. PLANNED STUDENT ENROLLMENT

| | FY 06 FIRST YEAR HEADCOUNT | FY 07 SECOND YEAR HEADCOUNT | FY 08 THIRD YEAR HEADCOUNT |
|---|----------------------------------|-----------------------------------|----------------------------------|
| A. New Enrollment | 5 | 8 | 10 |
| B. Shifting Enrollment | 5 | 4 | 4 |
| GRAND TOTAL PLANNED STUDENT ENROLLMENT | 10 | 12 | 14 |

II. EXPENDITURES

| | FIRST YEAR FTE COST | SECOND YEAR FTE COSTS | THIRD YEAR FTE COSTS |
|--|------------------------|--------------------------|-------------------------|
| A. Personnel Cost | See Note 1 | See Note 1 | See Note 1 |
| 1. Faculty | See Note 1 | See Note 1 | See Note 1 |
| 2. Administrators | See Note 1 | See Note 1 | See Note 1 |
| 3. Adjunct Faculty | See Note 1 | See Note 1 | See Note 1 |
| 4. Graduate/Instr. Assts. | See Note 1 | See Note 1 | See Note 1 |
| 5. Research Personnel | See Note 1 | See Note 1 | See Note 1 |
| 6. Support Personnel | See Note 1 | See Note 1 | See Note 1 |
| 7. Fringe Benefits | See Note 1 | See Note 1 | See Note 1 |
| 8. Other | See Note 1 | See Note 1 | See Note 1 |
| Total Personnel FTE/ Costs | | | |
| B. Operating Expenditures | | | |
| 1. Travel | See Note 1 | See Note 1 | See Note 1 |
| 2. Prof. Services | See Note 1 | See Note 1 | See Note 1 |
| 3. Other Services | See Note 1 | See Note 1 | See Note 1 |
| 4. Communications | See Note 1 | See Note 1 | See Note 1 |
| 5. Utilities | See Note 1 | See Note 1 | See Note 1 |
| 6. Materials & Supplies | See Note 1 | See Note 1 | See Note 1 |
| 7. Rentals | See Note 1 | See Note 1 | See Note 1 |
| 8. Repairs & Maintenance | See Note 1 | See Note 1 | See Note 1 |
| 9. Materials & Goods for Manufacturing & Resale | See Note 1 | See Note 1 | See Note 1 |
| 10. Miscellaneous | See Note 1 | See Note 1 | See Note 1 |
| Total Operating Costs | See Note 1 | See Note 1 | See Note 1 |
| <i>Note 1: All costs associated with the Field Maintenance option in Diesel Technology are currently part of the University's personnel and operating budgets. The request for the new option represents no increase in these budget categories for at least five years.</i> | | | |

| C. Capital Outlay | FIRST YEAR FTE COST | SECOND YEAR FTE COST | THIRD YEAR FTE COST |
|---|--|---|--|
| 1. Library Resources | 0.00 | 0.00 | 0.00 |
| 2. Equipment | 0.00 | 0.00 | 0.00 |
| Total Capital Outlay | 0.00 | 0.00 | 0.00 |
| D. Physical Facilities | | | |
| Construction or major Renovation | 0.00 | 0.00 | 0.00 |
| E. Indirect Costs (overhead) | 0.00 | 0.00 | 0.00 |
| GRAND TOTAL EXPENDITURES | 0.00 | 0.00 | 0.00 |
| | | | |
| III REVENUE | | | |
| A. Source of Funds | | | |
| 1. Appropriated Funds- reallocation (see note) | Existing program operating at under capacity | Existing program operating at under capacity | Existing program operating at under capacity |
| 2. Appropriated Funds-New | \$0 | \$0 | \$0 |
| 3. Federal Funds | N/A | N/A | N/A |
| 4. Other Grants | N/A | N/A | N/A |
| 5. Fees (see note 2) | \$17,500 | \$24,500 | \$37,800 |
| 6. Other | N/A | N/A | N/A |
| Total Source of Funds | \$17,500 | \$24,500 | \$37,800 |
| B. Nature of Funds | | | |
| 1. Recurring | 0 | 0 | 0 |
| 2. Non- Recurring | 0 | 0 | 0 |
| GRAND TOTAL REVENUES | \$17,500 | \$24,500 | \$37,800 |

Note 2: Assumes \$3,500 per **new** FTE in tuition dollars.