

Montana University System
PROGRAM REVIEW

Institution: **Montana State University Northern**

Program Years: **2014-15**

List of the programs reviewed:

Agriculture Programs

- A.A.S. Agricultural Technology
- B.S. Agricultural Operations Technology
- Applied Agriculture Minor

Business Programs

- B.S. Business Technology [see Note]
- B.S. Business Administration
- Program of Study in Business

Engineering Program

- B.S. Civil Engineering Technology

Welding Programs

- C.A.S. Welding Technology

Native American Studies Program

- Minor in Native American Studies

Note: The Business Technology degree was replaced by our Business Administration degree in AY 2008-09.

Decision(s) concerning the future of the program(s), based on the program review criteria established at the campus:

See the attached detailed individual Program Review summaries.

Rationale or justification for the decision based on the program review process established at the campus. Include graduation numbers and student majors for each of the last seven (7) years for every program under review.

See the attached detailed individual Program Review summaries.

Institution:

Montana State University-Northern

Program Years:

Spring Semester of 2008 to Spring Semester of 2015

List of the programs reviewed:

Agricultural Technology (A.A.S.)

&

Agricultural Operations Technology (B.S.)

&

Applied Agriculture Minor

Decision(s) concerning the future of the program(s), based on the program review criteria established at the campus:

It is recommended that the **agricultural technology (A.A.S.) degree** and the **agricultural operations technology (B.S.) degree** and the **applied agriculture minor** continue to be offered and sustained at MSU-Northern. They are very viable programs that complement the campus mission, have a good and steady enrollment, have a long history of serving many students and the agricultural community and are essential to the growth and employment needs of the community, state and the region the campus serves.

Rationale or justification for the decision based on the program review process established at the campus. Include graduation numbers and student majors for each of the last seven (7) years for every program under review.

Program History & Description

The agriculture technology programs at Montana State University-Northern (MSU-N) have a long and successful history of preparing students for careers in agriculture. MSU-N currently offers a two-year Associate of Applied Science (A.A.S.) degree in agricultural technology, an applied agriculture minor and a four-year agricultural operations technology (AOT) Baccalaureate of Science (B.S.) degree.

The purpose of MSU-N's agriculture technology programs is to offer several instructional and educational degree opportunities to those interested in careers in agriculture, to those currently engaged in agricultural production and to agribusiness and agricultural agencies that assist and serve the largest industry in the region and Montana.

Agriculture Technology (A.A.S.)

The agriculture technology associate of science degree features agriculture science, business and agricultural technology courses. Freshman courses include studies in introductory animal and plant science, agricultural marketing and economics, farm and ranch management and agricultural computing. Sophomore courses include more advanced courses in soil science, crop production, livestock management, feeds and feeding, forage and range management and pest management. Students successfully completing the agriculture technology degree acquire a well rounded knowledge base in production agriculture, agriculture technology and agribusiness. Students graduating from the degree either manage or own farms or ranches, or work in agribusiness or with private and government agencies.

This degree also has the benefit and flexibility of being structured so students can easily transfer into the agriculture operation's technology (AOT) degree. A number of students have started out with the 2-year agriculture technology degree, found success in college, and then moved on to the 4-year AOT degree which offers expanded career options.

Applied Agriculture Minor

The applied agriculture minor was approved by the Montana Board of Regents in October of 1990. This minor was co-developed by MSU-Northern and Montana State University faculty and administration. The minor is designed to complement four-year non-agricultural degree majors with courses and a knowledge base in the agricultural sciences and applied agricultural technologies. One of the excellent and popular examples is business technology majors complementing their business degree, with the applied agriculture minor. This allows business and other majors to broaden their career opportunities, become more employable in the agricultural industry and work in agri-business, agricultural marketing, agricultural lending, government agencies and farm and ranch production.

Agriculture Operation's Technology

The agriculture operation's technology (AOT) degree was implemented in the fall of 1998. The AOT four-year degree is designed to prepare well-rounded students for careers in a number of different areas related to agriculture. The AOT program can be easily moved into by students finishing the agriculture technology A.A.S. degree. The degrees have been designed to allow a 2 + 2 format and students completing the A.A.S. degree have the first two years of the AOT degree completed as well. The AOT degree is characterized by featuring a combination of applied agricultural sciences, business and management skills and experience with a variety of agricultural technologies. This degree is well liked and in demand by the agriculture industry and employers benefit by gaining graduates with a wide agriculture background leading to success in the very diverse field of agriculture. A number of agriculture career options are available to AOT graduates, including returning to the farm or ranch.

Regional Program Support

Montana State University-Northern at Havre is located in the heart of the Golden Triangle, which is noted for being the bread basket of the state. Agriculture is the dominant industry in the local area as well as the state and nation. Hill, Chouteau, Blaine and Liberty county, rank very high in spring wheat, winter wheat, barley, oats, canola, safflower, canola and cattle and hay production. A number of area agribusinesses support the region's large agriculture production base and producers. Equipment dealers, seed and fertilizer dealers, agricultural lending agencies and many other retail agri-businesses are available for internships for students

and also serve as guest speakers and many have supported the program with equipment and resources. The Havre location is ideally suited for excellence in post-secondary agricultural education.

Several agriculture related government agencies also base out of the Havre area and support MSU-Northern's agricultural technology program. The Bureau of Land Management (BLM), Farm Services Agency (FSA), Conservation District and others employ students and graduates from the program and also hire students for cooperative education placements and part-time jobs. Another resource that complements the agriculture technology program is the Northern Agricultural Research Center (NARC), which is located seven miles southwest of Havre. A number of scientists and technicians engage in active crop and livestock research at the NARC and the research center employs a number of MSU-Northern's agriculture students each year. The NARC also hosts class field trips and tours for various agriculture technology classes offered at MSU-N. Scientists at NARC have served as guest lecturers to agriculture technology classes at MSU-N.

The Havre Area Chamber of Commerce Agribusiness Committee is a very active group that has assisted MSU-Northern's agriculture technology program. They see the value of post-secondary agriculture in the local area and have, over the years, provided approximately \$25,000.00 in scholarships to MSU-Northern agriculture students.

PAS

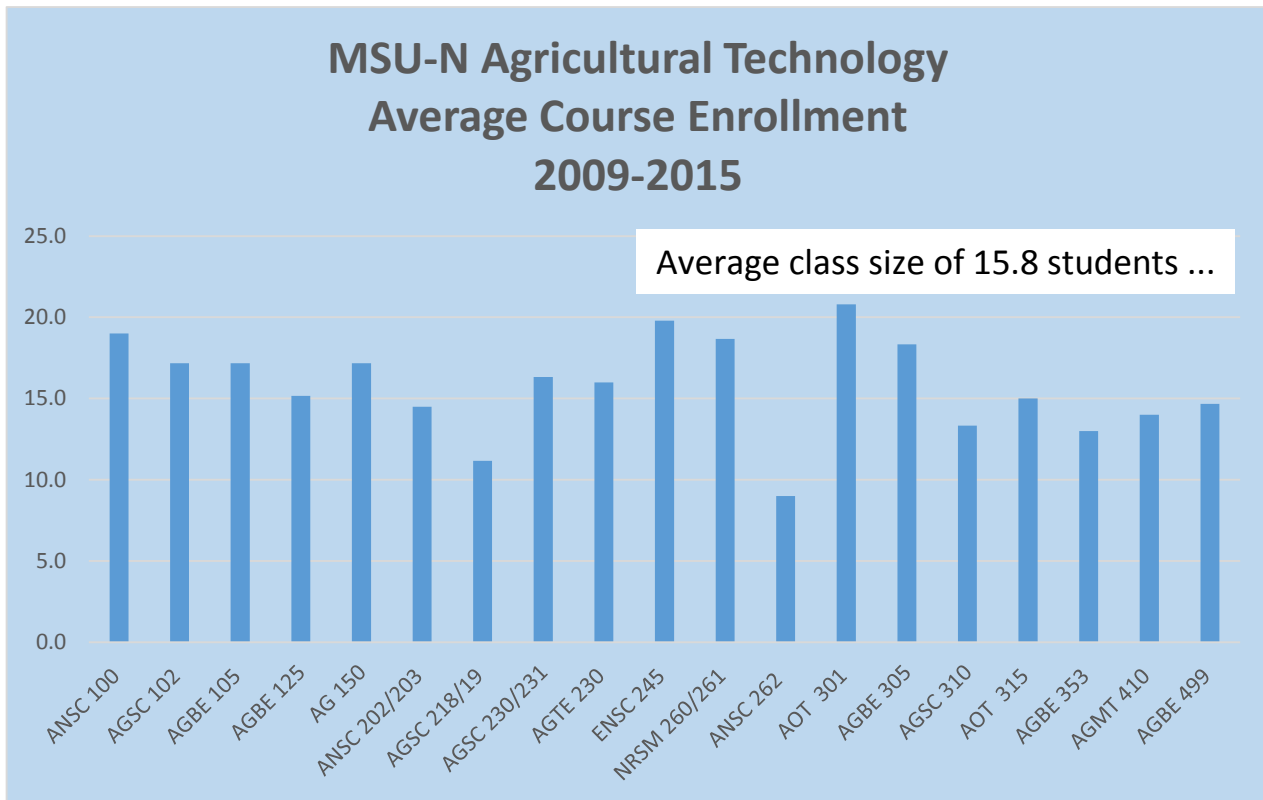
MSU-Northern has had an active Postsecondary Agriculture Student (PAS) organization since 1982. The local chapter is affiliated with the National Postsecondary Agriculture Student organization. PAS provides postsecondary agriculture students with opportunities for individual growth, leadership and career preparation. PAS aspires to be the premier leadership and career development organization serving college agriculture students.

MSU-Northern's PAS chapter has been active over the years and the chapter has attended many national conferences and has won awards in crop and livestock science and in leadership events. MSU-Northern's PAS chapter has also had a cow herd for a number of years. The Montana registered brand is "PAS". The cattle are run on a contract share basis with a Hi-Line rancher and former PAS member. Income from the sale of calves has been used to help fund PAS activities and primarily assist with national conference trips.

Student Numbers

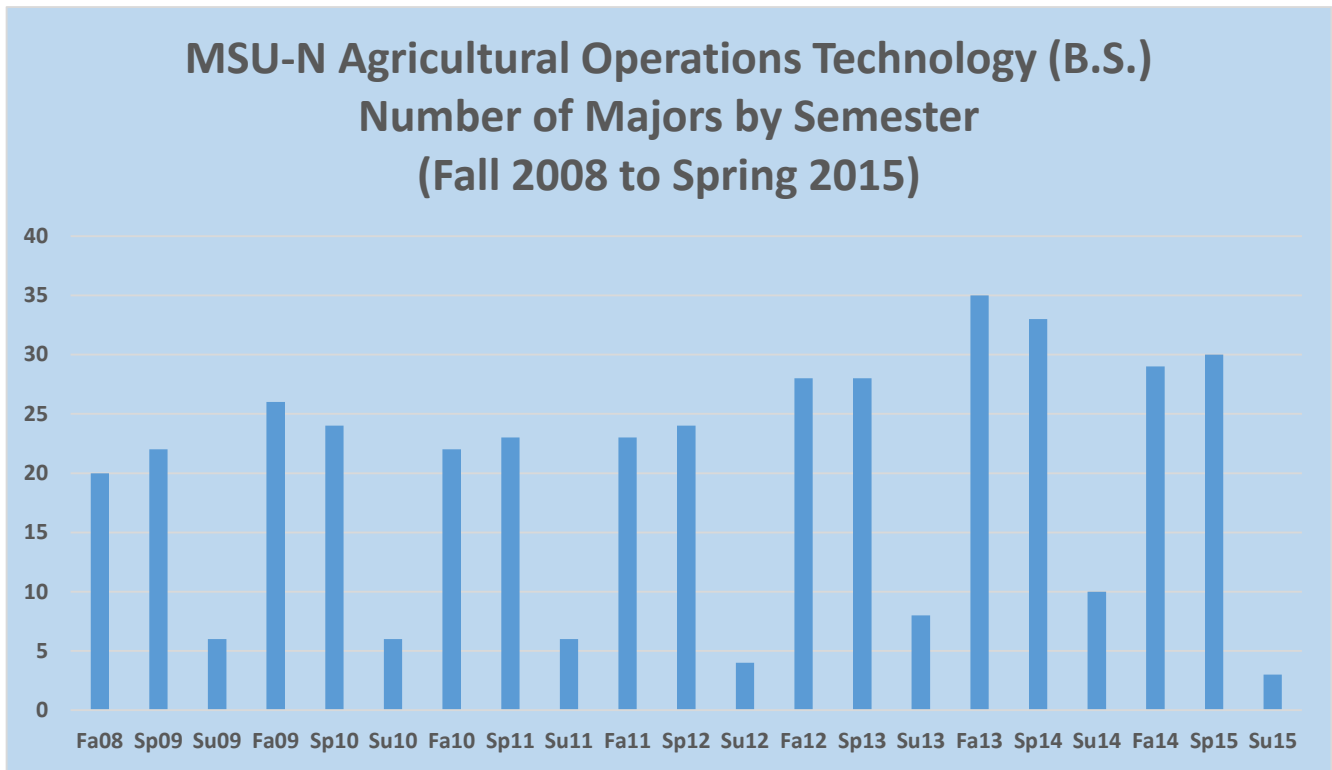
Enrollment in MSU-Northern's agriculture technology degree programs has been strong. The below chart (figure 1) shows the average number of students enrolled in all of the agriculture classes offered on this campus. The average class size since 2008 is 15.8 students. This is a very good indicator of a healthy program with attractive course offerings.

Figure 1:



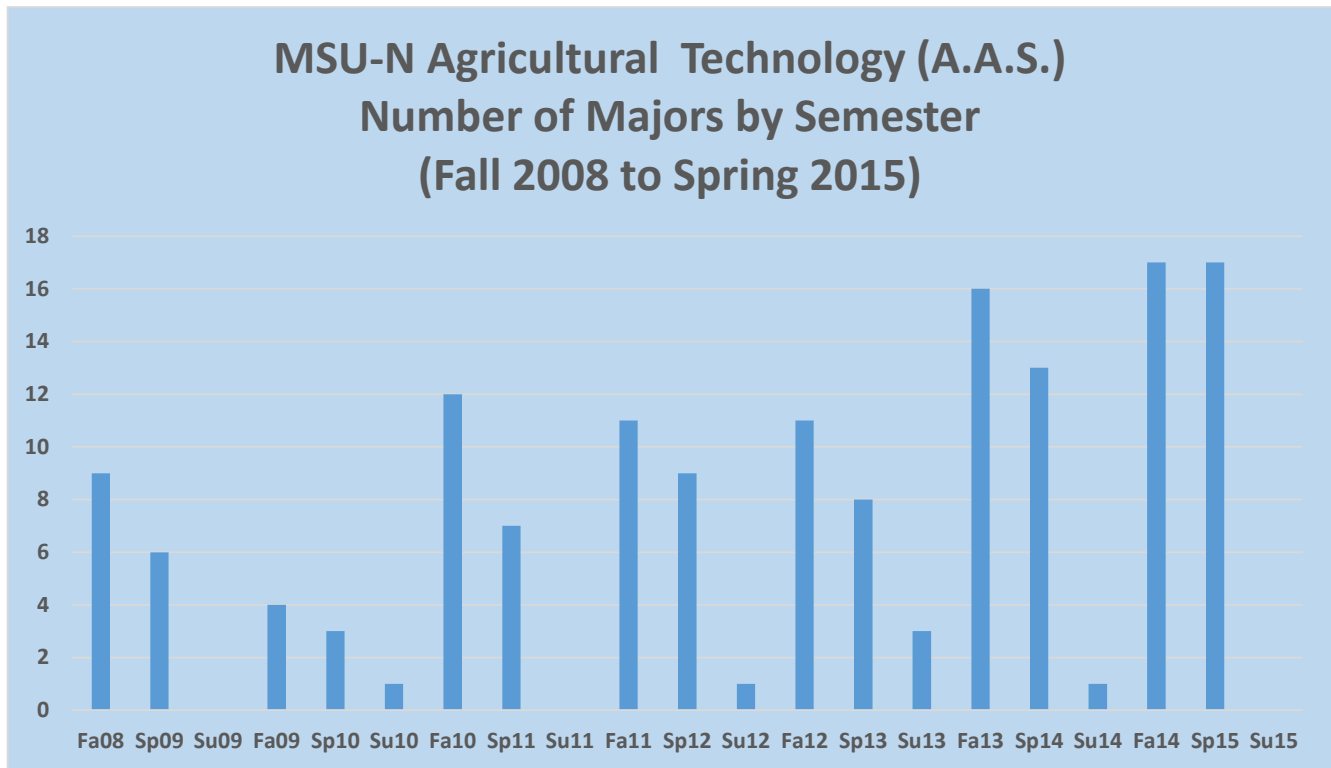
The number of majors enrolled by semester is another indicator of program health. Figure 2 can be found on the next page and it shows the number of AOT (B.S.) majors enrolled in each semester since the fall of 2008. The number of enrolled majors by semester shows a gradual increase in number of majors since fall semester of 2008. The average number of majors enrolled per semester has been over 26. It is notable that the number of majors enrolled between the fall and spring semesters does not change much. This is an excellent indicator of good retention.

Figure 2:



The number of agriculture technology (A.A.S.) majors enrolled in each semester since the fall of 2008, are displayed on the next page as figure 3. The numbers show a strong increase over the past six years. Program faculty have recently noticed more interest by students in the agriculture technology (A.A.S.) degree. This is positive and graduation numbers in the degree should increase because of this trend.

Figure 3:



There is some migration of students between the agriculture technology (A.A.S.) degree and the agricultural operations technology (B.S.) degree. Some students start out with the two-year degree, find success and transfer into the four-year degree. A few students start with the four-year degree and for family or personal or financial reasons, decide to quit school and finish with the two-year degree. The 2+2 concept has been very good and has added flexibility for those students that have their plans change. They can wind up with a degree, rather than just coursework.

While it appears that there is a declining enrollment in the number of associate degree agriculture majors each spring semester, and increasing enrollment in bachelor degree agriculture majors in the spring semester; much of the difference is probably due to the fact that students entered as associate degree students in the fall semester and then switched to the bachelor degree in the spring semester. This is reflected by agriculture faculty that note individual student names in their classes don't change much from fall semester to spring semester.

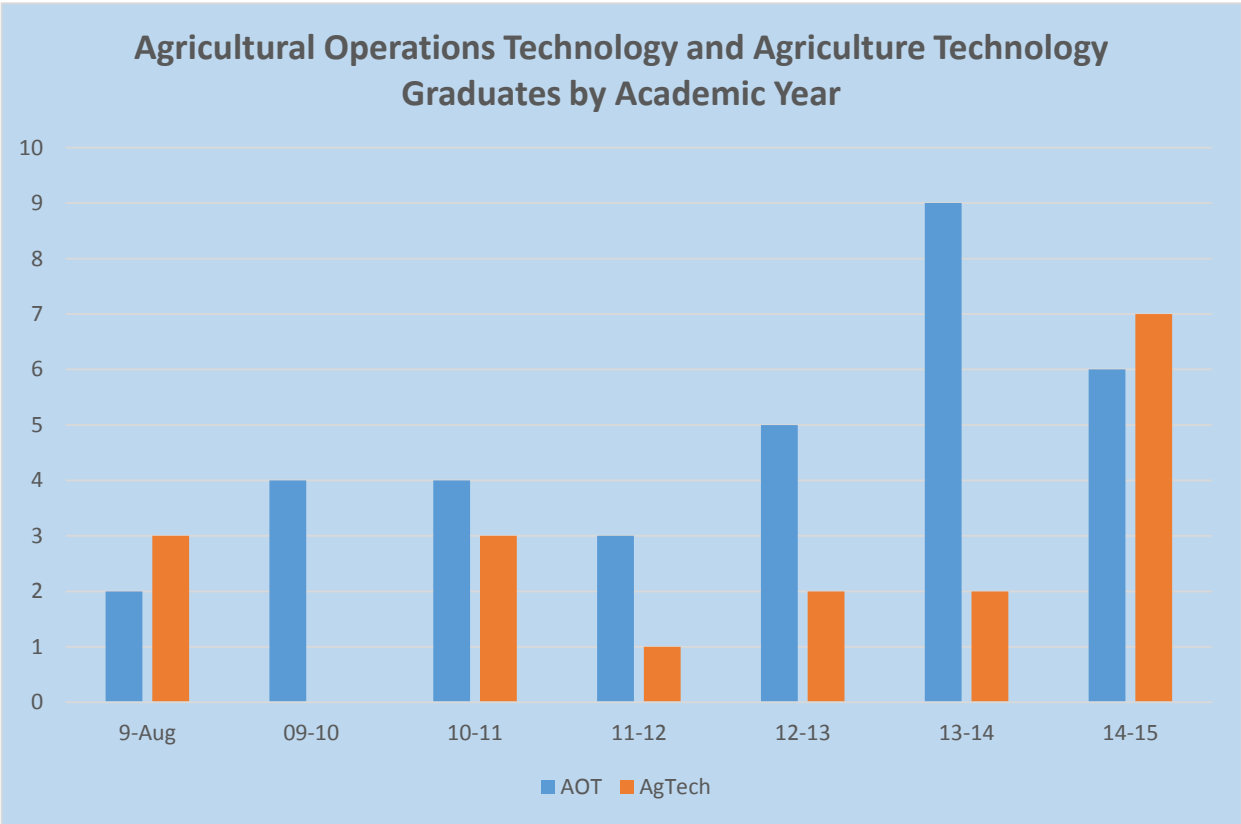
It is noteworthy that the agriculture degree programs have few retention issues. When students leave the agriculture degree programs, it is mainly due to failing grades. Occasionally, a few students begin their agriculture studies at MSU-Northern because it is close to home or for financial reasons. They may ultimately want to transfer to Montana State University to finish their degree. Also, the program often gains a few majors who started at MSU or some other institution but come to MSU-Northern to finish their agriculture degree.

The applied agriculture minor remains as an attractive minor on our campus. This minor fills a need for those students with a connection to agriculture and are pursuing a non-agriculture minor. The number of students graduating with the applied agriculture minor has been steady over the past several years.

Number of Graduates

Figure 4 is a chart showing the number of graduates from both the agricultural technology (A.A.S.) degree and the four-year agricultural operations technology (B.S.) degree. There has been some variation in the numbers graduating each academic year. However, the data and chart indicate the numbers are improving.

Figure 4:



Innovation & Uniqueness

MSU-Northern's agricultural degree programs are unique in several ways.

- The program offers the only applied agriculture minor in the region
- The degrees offer students a diverse course offering that prepares a well-rounded major with both crop and livestock knowledge
- The degrees are a unique combination of agricultural sciences, agribusiness and agricultural technologies
- The degrees are characterized by "applied" and "real-world" structure
- They are offered in a very agriculture based area with excellent agricultural education resources
- The degrees are tailored for both those wishing to return to a farm/ranch and for those wishing to work for businesses and agencies that are agriculture in nature

Placement & Industry Demand

A recent report released in May of 2015 by the United States Department of Agriculture (USDA) reports the following:

*...tremendous demand for recent college graduates with a degree in agricultural programs with an estimated **57,900 high-skilled job openings annually** in the food, agriculture, renewable natural resources, and environment fields in the United States. However, there is only an average of 35,400 new U.S. graduates with a bachelor's degree or higher in agriculture related fields, 22,500 short of the jobs available annually.*

From: <http://agsci.psu.edu/futurestudents/careers/in-the-media/outlook>

USDA secretary, Tom Vilsack nicely summed up the career outlook for college graduates in a May 11, 2015 press release by saying:

"There is incredible opportunity for highly-skilled jobs in agriculture," said Secretary Vilsack. "Those receiving degrees in agricultural fields can expect to have ample career opportunities. Not only will those who study agriculture be likely to get well-paying jobs upon graduation, they will also have the satisfaction of working in a field that addresses some of the world's most pressing challenges. These jobs will only become more important as we continue to develop solutions to feed more than 9 billion people by 2050."

From: <http://nifa.usda.gov/press-release/one-best-fields-new-college-graduates-agriculture>

Agriculture is the largest industry in the state, region and nation. The U.S. Government Bureau of Economic Analysis indicates that approximately seventeen million jobs are in the agriculture industry in the United States. Over three hundred career opportunities exist for students interested in a career in agriculture. MSU-Northern's agricultural technology degree offerings prepare students for careers in this huge industry of agriculture. Employment opportunities will continue to increase for those providing and marketing food and agriculture consumer products. Continued growth in world population, globalization and increasing demand for food and agriculture services will provide students for a variety of employment opportunities. MSU-Northern's agriculture graduates are sought by employers because of their rural upbringing, work ethic and the agricultural education they have received.

Another trend is the advancement of increasingly sophisticated agricultural equipment. Students trained in utilizing technologies of the agricultural industry will have a number of career opportunities available for them. More and more use of GPS and GIS and the continued sophistication of computer applications and hardware and agricultural machinery used by agribusinesses and agricultural producers are creating numerous and excellent employment opportunities for our graduates.

Summary

The agricultural operations technology (B.S.) degree and the agriculture technology (A.S.) degree as well as the applied agriculture minor remain very viable degrees on this campus. These agriculture degree programs have good enrollments, are critical to the local and area economies and have a strong history of helping this university fulfill its mission. These degrees and the minor must continue to serve the agriculturally rich local, state and regional area by providing quality graduates necessary to support a vibrant and growing food, fiber and bio-fuel industry. Career opportunities for these agriculture graduates are very bright as agriculture gears up to provide our expanding world's population with food and fiber.

Program review prepared by MSU-Northern faculty members:

**Thomas M. Welch
&
William H. Danley**

October 16, 2015

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Institution: **MSU – Northern**

Program Years: **2008 - 2014**

List of the programs reviewed:

Business Technology B.S., Business Administration B.S., and Program of Study in Business

Decision(s) concerning the future of the program(s), based on the program review criteria established at the campus:

Majors by Academic Year							
	2008 - 2009	2009- 2010	2010- 2011	2011- 2012	2012- 2013	2013- 2014	Current
Business Technology B.S.	58	26	13	8	3	2	1
Business Administration B.S.	54	83	89	96	119	123	109
Program of Study in Business (A.S.)	10	12	21	16	13	14	29

Enrollment remains strong. The current year drop in Business Administration majors may be attributed to enforcement of the policy requiring that any student needing remedial classes to become college-ready, be initially placed in the A.S. degree. Note that the Business Technology degree was replaced by our Business Administration degree during the 2008-2009 AY.

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Graduates by Academic Year							
	2008 - 2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	Current
*Business Technology B.S.	0	0	8	3	2	0	0
Business Administration B.S.	14	18	3	11	19	18	20
Program of Study in Business (A.S.)	7		11	4	3	2	4

*Note: The Business Technology major was subsumed by the Business Administration degree in 2008-2009 AY.

Current (2014) Graduate Survey data indicates the following:

93% of our Business Administration graduates are employed full time.

80% of our Business Administration graduates are employed within Montana.

87% of our Business Administration graduates are working in their field.

100% of our A.S. graduates are employed full time.

100% of our A.S. graduates are employed within Montana.

100% of our A.S. graduates are employed in a related field.

Rationale or justification for the decision based on the program review process established at the campus. Include graduation numbers and student majors for each of the last seven (7) years for every program under review.

Based on our strong enrollment numbers, successful completions, and strong employment of graduates, along with the fact that the vast majority of our graduates remain within the state of Montana, benefiting the Montana economy, we believe that this program is not only viable, but vital. Additionally, the Business Administration program is in an enviable position to be able to develop synergies with other technology

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programs at MSU-Northern, including Diesel, Automotive, Plumbing, Electrical, Community Leadership, Industrial Technology, Health Promotion, Applied Agriculture, and Criminal Justice.

The department has also began offering the Business Administration B.S. and the Program of Study online. This program has been well-received on-campus, but requires additional marketing to two-year schools in Montana and southern Canada.

Articulation agreements have either been completed, or are anticipated to be completed this year, with all two-year programs and tribal colleges in the state, as well as with Medicine Hat College in Canada.

Recommendations:

1. Continue to grow the program at the Havre campus with target recruiting in two-year schools and Tribal colleges in Montana and southern Alberta.
2. Reinstate face-to-face classes in Great Falls in order to attract students from that geographic area.
3. Continue to integrate the business program with other technology majors on the Havre campus and online.
4. Replace current faculty vacancy to support continued growth on the Havre campus, MSU-Northern at the MSU-Great Falls campus, and online. Currently, all business faculty are in overload, which severely limits our ability to respond to, primarily, increases in online enrollment, and given the time-commitment to teaching and advising, time available for recruiting is severely limited.

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Institution: **Montana State University-Northern**

Program Years: **2015-2016 Academic Year**

List of the programs reviewed:

Engineering Technology: Civil Engineering Technology – BS

Decision(s) concerning the future of the program(s), based on the program review criteria established at the campus:

From the 2012-2013 Program Prioritization Review, the Civil Engineering Technology (CET) program was recommended to be grown or maintained.

COLLEGE OF TECHNICAL SCIENCES

Program	Dean/Chair	Academic Senate	Academic Council	Provost	Chancellor
1. Agricultural Operation's Technology, BS (B04) Fall 2011 majors = 23 Fall 2012 majors = 28 5 Year Average = 23.8	We recommend that this program be <u>maintained</u> .	AS recommends <u>growing</u> this program.	AC recommends <u>maintain</u> with potential to <u>grow</u> .	Provost recommends <u>maintaining</u> this program.	
2. Eng. Tech: Civil Engineering Technology, BS (B21) Fall 2011 majors = 31 Fall 2012 majors = 29 5 Year Average = 31.4	It is our recommendation that this program be <u>grown</u> .	AS senses this program should be <u>maintained</u> .	AC recommends <u>maintaining</u> with the potential for <u>growth</u> .	Provost recommends <u>maintaining</u> this program.	

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Rationale or justification for the decision based on the program review process established at the campus. Include graduation numbers and student majors for each of the last seven (7) years for every program under review.

Below is a quick narrative discussing the items listed in MSU-Northern's program review policy (i.e., 403.1 Program Review). The policy contains several items in an "Academic Scorecard." These items are discussed below in a narrative format, which is more appropriate for this review. Much of the data was compiled in a self-study of the 2014-2015 academic year for the program's accrediting agency, ABET. This document will be referred to throughout the narrative and will be a separate attachment.

1. STUDENTS

1.1. Program Enrollment and Graduates

Academic Year	Total Enrollment*	Bachelor's Degrees Awarded
2014-2015	27	3
2013-2014	20	2
2012-2013	29	6
2011-2012	33	5
2010-2011	43	8
2009-2010	29	1
2008-2009	18	1

*Includes full and part time students

The Civil Engineering Technology program enrollment shows a 3-year average of 25 undergraduate majors. In addition, the Civil Engineering Technology program graduates an average of 4 majors over the last three years.

2. QUALITY

2.1. Professional Association

The Engineering Technology: Civil Engineering Technology (CET) program is accredited by the Engineering Technology Accreditation Commission (ETAC) of the Accreditation Board for Engineering and Technology (ABET). Please refer to the 2014-2015 ABET Self-Study for additional information regarding the program's curriculum, objectives, and outcomes. The CET program has been accredited since 1998. This accreditation is nationally-recognized by engineering technology programs and allows MSU-Northern graduates to sit for the Fundamentals of Engineering (FE) Exam in Montana. This exam is a nationally-recognized benchmark for engineers pursuing licensure.

The FE Exam is an external measurement for the program's success. In comparison to other schools with similar technology programs, MSU-Northern graduates have done as well or better on the exam. Please see table below.

54%	MSU-Northern Pass Rate (using only first-time test takers, 2004-2014)
42%	National Technology Schools Pass Rate

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The Principles and Practice of Engineering (PE) Exam is another external measurement. MSU-Northern Graduates have a higher pass rate on the PE exam than the national average for graduates of similar programs. Please see table below. See Appendix K for raw data of the FE and PE Exam results.

41%	MSU-Northern Pass Rate (2005-2014)
32%	National Technology Schools Pass Rate

The Civil Engineering Technology program also participates in the Civil Engineering Club at MSU-Northern. Faculty members serve as advisors for the club and facilitate meetings and resources for the club. The club is recognized by the Montana State Chapter of the ASCE (American Society of Civil Engineers) and is trying to become a Student Chapter of the ASCE.

To maintain compliance, the CET program measures, evaluates, and records student learning outcomes on a biannual cycle. This review helps faculty find strengths and weaknesses in the program and requires them to address shortcomings in particular learning outcomes, that have been ABET and advisory board approved.

2.2. Faculty

Faculty maintain competency in the Civil Engineering field by consulting and performing research. One faculty member is licensed in Montana as a Professional Engineer and Professional Land Surveyor. He is currently performing consulting work related to construction and surveying. Another faculty member is pursuing his professional licensure in Montana and earned a PhD in Civil Engineering. He is performing research related to energy and water sustainability and has published in numerous peer-reviewed papers. See ABET Self-Study Appendix B for complete faculty vita.

2.3. Advisory Board

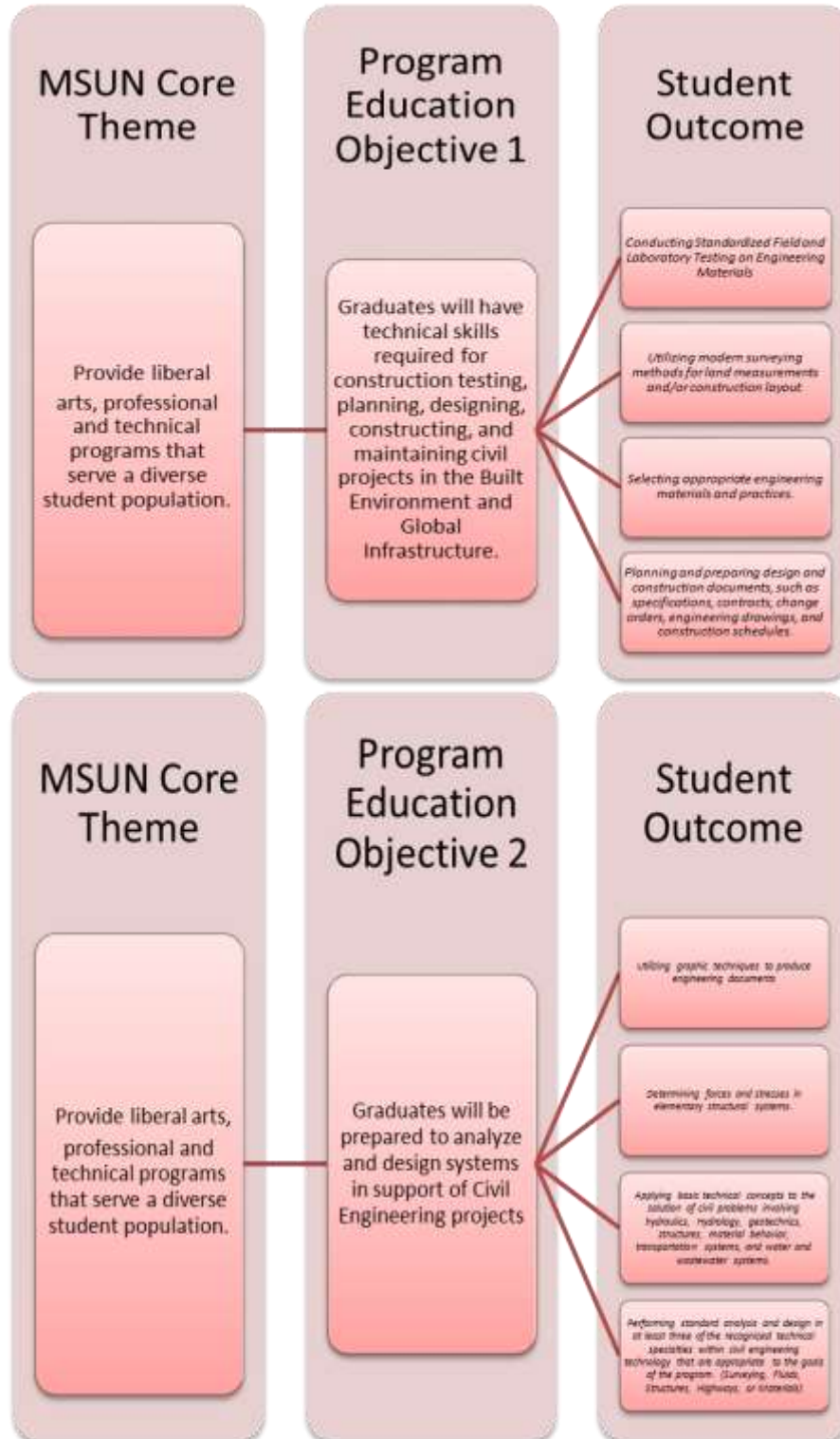
The Civil Engineering Technology program gathers recommendations and feedback about the program from its Industrial Advisory Board on an annual basis. Please see Appendix F of the ABET Self-Study for Meeting Minutes.

2.4. Student Satisfaction

Graduates of the CET program indicate that they have met the program objectives established by the Civil Engineering Technology Assessment Plan. These objectives are shown below. Please refer to the attached ABET Self-Study about the program objectives and outcomes. The student surveys regarding General Education, Employment, and Objectives can be found in Appendix J of the Self-Study.

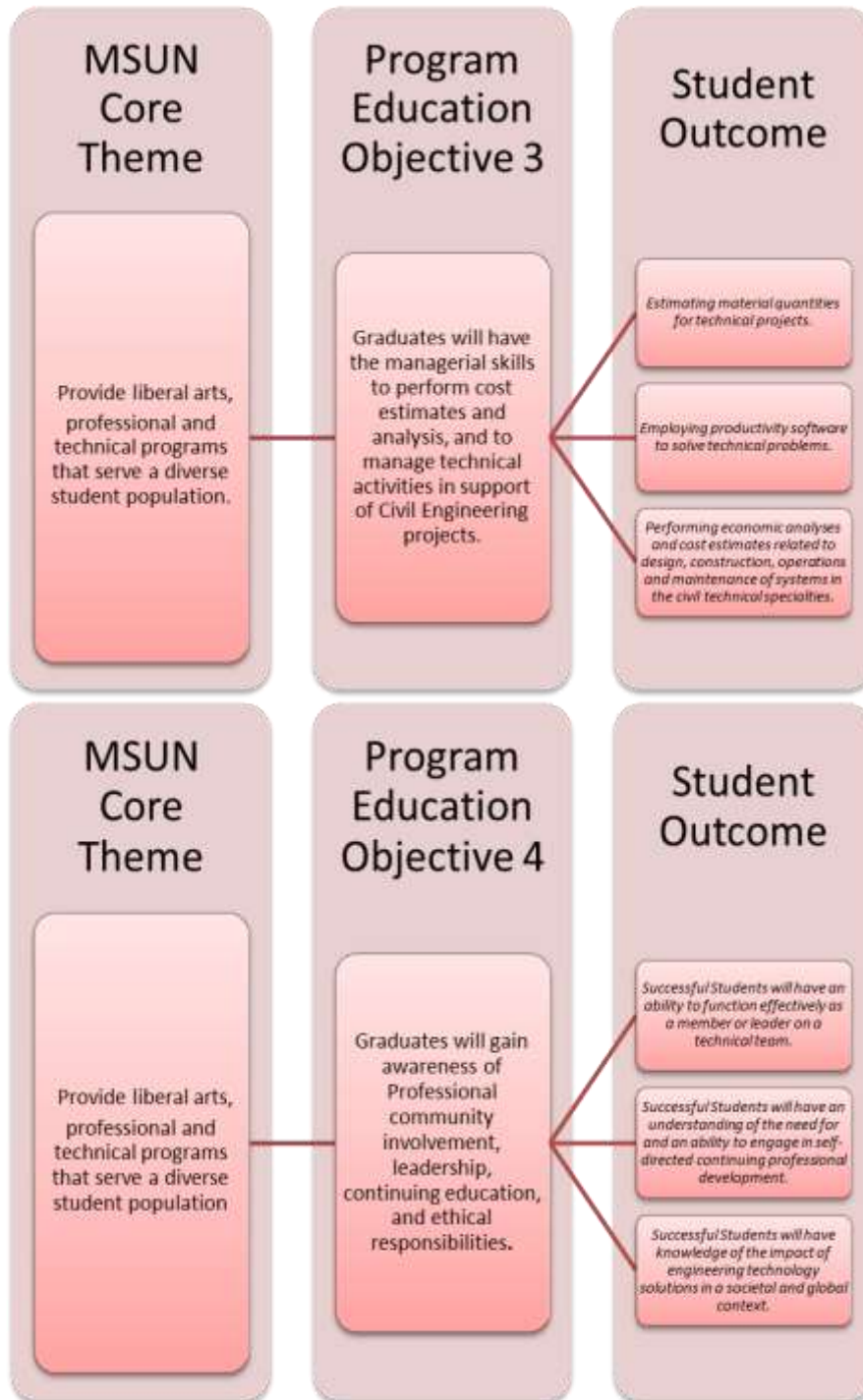
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3. INNOVATION AND UNIQUENESS

3.1. Uniqueness of the Program

This program is different from a standard Civil Engineering program at other institutions, due to the technology component of the degree. MSU-Northern's Civil Engineering Technology program focuses on the hands-on application of Civil Engineering. The CET program reinforces classroom concepts with laboratory experiences.

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Some of the classes with labs include Soils and Foundations, Surveying, Highway Design, Concrete Design, Steel Building Design, Physics, Chemistry, Introduction to CAD, Civil Drafting, and the integrating Capstone course. In addition to the lab experiences, students in the program experience Civil Engineering design elements that compliment a course’s lab component. Other institutions focus on the theoretical and design components of Civil Engineering, requiring additional Physics, Math and Chemistry, as well as Dynamics.

3.2. Innovation of the Program

The CET program at MSU-Northern prides itself in delivering coursework that are academically rigorous with provisions for hands-on applications via the laboratory component. The relatively low student-to-teacher ratio allows for a more individualized instruction based upon students’ learning needs. Each faculty allocates sufficient office hours within the week to accommodate students on their coursework questions and other academic concerns. The university has also established tutoring sessions, for CET students and others, to reinforce their quantitative skills. This is particularly appealing to CET students because of the Mathematics-intensive nature of the program’s higher-level courses. At certain times within the fall or spring semester, CET students have the opportunity to attend career fairs. The Student Success division at MSU-Northern assists students in polishing resumes and developing interviewing skills in preparation for these career fairs. Finally, the CET program periodically measures, evaluates, and records student learning outcomes as per ABET requirements.

4. PLACEMENT AND INDUSTRY DEMAND

Placement rates for MSU-Northern CET students are exemplary. In fact, for the 2014 graduate survey, 100% of the graduates obtained employment related to their field. The average salary for an entry-level CET graduate is the highest among all degree majors at MSU-Northern. The demand for workers with skills in CET is also quite high, as reflected by discussions of the faculty with industry. Internships also play a major role in the success of a CET student. Prior to graduation, most CET students have interned for an engineering company or consultancy firm within and outside of Montana.

	Total		Total		Related		Other		Not Seeking		Continuing		Seeking		Employed in		Employed		Employed		Employed		Average
	Grads		Response		Degree Field		Employment		Employment		Ed/Military		Employment		in MT		Out of MT		Full Time		Part Time		Salary
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	
Civil Engineering Tech	3	2	67%	2	100%										2	100%			2	100%			\$50,000

5. RESOURCES

The program budget and financial support details can be found on Criterion 8: Institutional Support of the ABET Self-Study. Resources are primarily allocated by the legislature between the two university systems: Montana State University (MSU) and the University of Montana (UM). Within MSU, program dollars are allocated to MSU-Northern in which case, the average cost of educating a CET student is determined. Currently, there are two (2) FTE faculty at the CET department and the CET program requires 124 credits for graduation.

6. RELATIONSHIP TO MISSION

6.1. Program Objectives vs. Mission of the Institution

As indicated in Criterion 2: Program Educational Objectives of the ABET Self-Study, MSU-Northern has three (3) Core Themes derived from its Mission Statement. For each of this Core Theme, there are specific CET program objectives that support or align with it. These are:

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- 6.1.1. Provide liberal arts, professional, and technical programs that serve a diverse student population.
 - 6.1.1.1. CET Objective 1 - Graduates of the Civil Engineering program will have the technical and managerial skills necessary to enter careers in planning, design, construction, operation, or maintenance of the Built Environment and Global Infrastructure.
 - 6.1.1.2. CET Objective 2 - Graduates will be prepared to analyze and design systems in support of Civil Engineering projects.
 - 6.1.1.3. CET Objective 3 - Graduates will have the managerial skills to perform cost estimates and analysis and to manage technical activities in support of Civil Engineering projects.
 - 6.1.1.4. CET Objective 4 - Graduates will gain awareness of professional community involvement, leadership, continuing education, and ethical responsibilities.
- 6.1.2. Promote student-centered and culturally-enriched environment that fosters student success.
 - 6.1.2.1. CET Objective 4 - Graduates will gain awareness of professional community involvement, leadership, continuing education, and ethical responsibilities.
- 6.1.3. Partner with external entities to enhance and expand learning experiences.
 - 6.1.3.1. CET Objective 4 - Graduates will gain awareness of professional community involvement, leadership, continuing education, and ethical responsibilities.

6.2. Educational Planning and Programming

The student outcomes for the CET program are used for assessment. These outcomes are directly tied to ABET Criterion 3. Periodically, the program is evaluated in terms of its attainment of the established student outcomes. Results of this periodic assessment (i.e., ABET evaluation) will be used as inputs in Educational Planning and Programming at MSU-Northern. These student outcomes, with their associated ABET criterion, are shown below.

1. (ABET Criterion 3.B.a.) An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities.
2. (ABET Criterion 3.B.b.) An ability to select and apply knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.
3. (ABET Criterion 3.B.c.) An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes.
4. (ABET Criterion 3.B.d.) An ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives.
5. (ABET Criterion 3.B.e.) An ability to function effectively as a member or leader on a technical team.
6. (ABET Criterion 3.B.f.) An ability to identify, analyze, and solve broadly-defined engineering technology problems.
7. (ABET Criterion 3.B.g.) An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.

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8. (ABET Criterion 3.B.h.) An understanding of the need for and an ability to engage in self-directed continuing professional development.
9. (ABET Criterion 3.B.i.) An understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity.
10. (ABET Criterion 3.B.j.) Knowledge of the impact of engineering technology solutions in a societal and global context.
11. (ABET Criterion 3.B.k.) A commitment to quality, timeliness, and continuous improvement.
12. (ABET Program Criteria for Civil Engineering Technology a.) Utilize principles, hardware, and software that are appropriate to produce drawings, reports, quantity estimates, and other documents related to civil engineering.
13. (ABET Criterion 3.B.c.) Conduct standardized field and laboratory tests related to civil engineering.
14. (ABET Program Criteria for Civil Engineering Technology c.) Utilize surveying methods appropriate for land measurement and/or construction layout.
15. (ABET Program Criteria for Civil Engineering Technology d.) Apply fundamental computational methods and elementary analytical techniques in sub-disciplines related to civil engineering.
16. (ABET Program Criteria for Civil Engineering Technology e.) Plan and prepare documents appropriate for design and construction.
17. (ABET Program Criteria for Civil Engineering Technology f.) Perform economic analyses and cost estimates related to design, construction, operations and maintenance of systems associated with civil engineering.
18. (ABET Program Criteria for Civil Engineering Technology g.) Select appropriate engineering materials and practices.
19. (ABET Program Criteria for Civil Engineering Technology h.) Perform standard analysis and design in at least three sub-disciplines related to civil engineering.

Montana University System
PROGRAM REVIEW

Institution: Montana State University Northern

Program Years: 2008-2015

List of the programs reviewed:

Welding Certificate Program – CAS Welding Technology

Decision(s) concerning the future of the program(s), based on the program review criteria established at the campus:

1. Recommend keeping the welding certificate program to support the Hi-Line Communities and our welding advisory committee companies.
 - 1.1. See the Charts below
 2. Provide welding certificate majors (1 Year Program) with a priority sign up reserve of 10 student welding seats (in each welding class).
 - 2.1. See the Charts below.
 3. Recommend that students in welder certification courses be required to pay the fees to join the American Welding Society (or Canadian Welding Bureau), complete the qualification test, and fill out all required applications to become a certified welder.
 - 3.1. Recommend that the applicable forms be sold through the book store so that students may use their student aide.
 4. Recommend beginning the discussion with Great Falls College to formalize/solidify our informal working relationship.
 - 4.1. Begin with a memorandum of understanding which meets the One University System Goals.
 - 4.2. Include in the discussion to become a Canadian Welding Bureau subsidiary of Great Falls College.
 5. Recommend that the welding program facilities and record keeping comply with the AWS and CWB Accredited Test Facilities.
 6. Recommend that MSUN explore the possibility of becoming part of the RevUp Montana for the welding program. (NCCER)
 - 6.1. Stackable Credentials
 7. Recommend that we continue to improve the facilities.
 - 7.1. Include a designated grinding room.
 8. Recommend that a Welding Tool Kit be sold through the book store so that students may use their financial aid to purchase tools.
 9. Recommend that Pipe welding be included in the curriculum. (Per API 1104)
-

Montana University System
PROGRAM REVIEW

Rationale or justification for the decision based on the program review process established at the campus. Include graduation numbers and student majors for each of the last seven (7) years for every program under review.

1 & 2

	A	B	C	D	F	H	I	G	K	L
Welding Major Numbers (Welding C17)										
Year #	1	2	3	4	5	6	7	8	9	
Academic Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	
	-	-	-	-	-	-	-	-	-	
1	2008	2009	2010	2011	2012	2013	2014	2015	2016	
	-	-	-	-	-	-	-	-	-	
2	<i>Enrollment</i>	9	9	8	3	6	12	11	11	12
3	<i>Graduates</i>	6	2	9	3	6	8	3	10	N/A
4	<i>Total Graduates</i>	47								
TOTAL NUMBER OF STUDENTS ENROLLED IN ALL WELDING COURSES		157	132	160	194	223	246	215	253	104
Welder Qualification Records										
Welding Certifications Procedures Classes : WLDG 186 I, WLDG 356 II, WLDG 357 III										
Academic Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	
6	-	-	-	-	-	-	-	-	-	
	2008	2009	2010	2011	2012	2013	2014	2015	2016	
Enrollment	17	13	34	21	17	36	32	27	3	
7	Welder Qualification's Per the AWS D1.1		20	41	37	34		64	43	
8	<i>AWS Welder Certifications*</i>		0	0	0	0	0	0	See Note **	See Note : **
9	Non Welding Majors Represented (The numbers include dual majors)	10	11	28	20	9	29	24	16	3
10	Welding Majors	7	2	6	1	8	7	8	11	0
Data Corrections		Thanks to Matt DeLong for the updated data hi-lighted in yellow.								

- 11 * AWS QC7-93 Standard for Certified Welder (Note: contains the requirements for National Certification of Welders)
- Addendums
- AWS- QC7-93c,f, and g

Montana University System

PROGRAM REVIEW

** Welder Certification Line 8 Column K & L

The American Welding Society Accredited Test Facility from Great Falls College was present during academic year 2014-2015 and will conduct the qualification testing during the academic year 2015-2016. With Kyle Gillespie, AWS ATF, of GFCMSU running the qualification testing, students were and will be given the opportunity to earn National American Welding Society Welder Certification.

It is the student's responsibility to pay the membership fees and the certification application fees. Students in academic year 2014-2015 chose not to pay the fees.

3. The purpose of the welding certificate program is to meet the goals stated in the College mission statement by the following:

- Provide theoretical foundations and lab based experiential learning in welding
- Provide a certificate program in Welding Technology
- Support area employers with American Welding Society qualified/certified welders
- *Note: This includes exposure to Canadian Welding Bureau Certification and education which supports our Welding Advisory Companies that conduct work in Canada.*
- To provide opportunity for students to become certified welders through per the **AWS- QC7- 93 standard for certified welders.**
 - **Student Qualification Process (Records do not go into the National Data Base)**
 - Upon completion of training, students complete a welder qualification practical test
 - The qualification test is properly conducted by and AWS Accredited Test Facility representative (or at an accredited test facility. (Great Falls College MSU is the closest in Montana)
 - If the company only requires qualification, or the student does not need certification...
 - The student successfully completes the practical test per a WPS
 - The qualification is witnessed and verified by the AWS ATF Certified Welding Inspector.
 - **Student Welder Certification Process**
 - **(These records go into the American Welding Society National Data Base)**
 - Upon completion of training or through work experience, the student performs welder qualification per a Work Procedure Specification under the supervision of an ATF Certified Welder Representative. (Recommend that the forms be purchased through the book store so students can use their student aid)
 - Students must become a member of the American Welding Society (\$15.00)
 - Complete a welder qualification through an accredited test facility/or representative,(Great Falls College MSU, or Flathead Valley Community College are ATF's)
 - Submit the ATF CWI signed off application (\$35.00)
 - Students must renew their certifications every six months

Montana University System

PROGRAM REVIEW

- *If Certifications lapse, welders must requalify and submit the appropriate applications to the AWS.*
- *Support the international trade of the welding advisory committee companies.*

4. Recommend beginning the discussion with Great Falls College solidify our informal working relationship, beginning with a memorandum of understanding which meets the One University System Goals.

- Great Falls College is an American Welding Society and a Canadian Welding Bureau Accredited Test Facility. GFCMSU representative currently comes to our facility to give our students to become certified welders. Per the Standards, only Accredited Test Facilities can qualify welders for certification.
 - This will give MSUN and GFC the opportunity to officially share our rich and diverse institutional welding knowledge.
 - Our welding staff has currently received training and Certification through the Canadian Welding Bureau at the Great Falls College. (Great Falls College is a CWB Designated Training Center) This training gives MSUN the knowledge that our US companies are required to comply with when building welded products that are shipped to Canada.
 - Training included: Welding Supervisor and Certified Welding Inspector Level II. In addition to being American Welding Society Certified Welding Inspector, a faculty member has earned Canadian Welding Bureau Certified Welding Inspector Level II.
 - The other faculty member is working to earn the AWS CWI designation.

5. Recommend that the welding program facilities and record keeping comply with the AWS and CWB accredited Test Facilities.

This keeps MSUN aligned with the minimum National and International requirements for test facilities.

6. Recommend that the MSUN Welding Program explore the possibility of becoming part of RevUp Montana (NCCER)

1. Becoming part of RevUp Montana would give students the opportunity to earn stackable credentials. (This would be in addition to ACORN)
2. We are using the ACORN Welding curriculum for our welding foundation.
 - a. It is the National High School Welding Program of Canada.
 - b. ACORN gives our students the opportunity to be qualified, through training, to become Canadian Certified Welders

7. Recommend that we continue to improve the facilities.

1. Recent upgrades Include:
 1. The Metals Tech welding shop (room 101) exhaust system cost \$212,000, not including the A/E fee.
Other improvements to the welding shop (room 101) in the past two years includes:
 1. New paint - \$7,000
 2. New light fixtures \$9,549
2. Future facility improvement goals are:

Montana University System

PROGRAM REVIEW

- 2.1. Cold Storage.
- 2.2. Move all of the metallurgy testing equipment to the Foundry. The testing equipment will support all of the Metals and Technology programs.
- 2.3. Request a designated grinding room with air handling which would improve the teaching facilities and the air quality.

8. *Recommend that a Welding Tool Kit be sold through the book store so that students may use their financial aid to purchase tools.*

1. To benefit the student.

9. *Include API 1104 in the curriculum.* API 1104 code governs pipe welding. Currently, API 1104 Pipe welding is not in the curriculum.

10. Conclusion:

1. The ultimate goals of these recommendations are the following:
 - 1.1. Improve our student experience
 - 1.2. Support the MSUN Community
 - 1.3. Support our industry partners whom do business in the United States and Canada.
 - 1.4. Solidify our informal working relationship with Great Falls College (our closest partner)

Montana University System
PROGRAM REVIEW

Institution: Montana State University Northern

Program Years: 2014-2015

List of the programs reviewed:

Native American Studies – Minor

Decision(s) concerning the future of the program(s), based on the program review criteria established at the campus:

Maintain and grow

Rationale or justification for the decision based on the program review process established at the campus. Include graduation numbers and student majors for each of the last seven (7) years for every program under review.

The Native American studies minor has been a very popular minor for students enrolled in the B.S. in Community Leadership and B.S. in Liberal Studies and more recently in the B.S. in Criminal Justice. The minor has had one faculty as its advocate since it was developed. That position has been vacant for the last two years and thus enrollment has dropped. Recently a faculty member was hired and this new faculty member brings lots of enthusiasm and motivation to grow the program. The enrollment numbers recorded for the minor range from 1 student in fall of 2008 to 5 students in fall of 2014. The number of graduates identified for this minor is 1 each semester over the 7 years of the program review period.

Enrolled Students by Semester										
Minor	Code	200870	201370	201450	201470	201530	201550			
Native American Studies	M84	1	2	1	5	4	2			
Graduates by Semester										
Minor	Code	200930	200950	200970	201030	201170	201230	201250	201370	2014
Native American Studies	M84	1	1	1	1	1	1	1	1	1

The college and faculty believe this program has great potential and supports the mission of the institution.