

DATE: July 10, 2014

TO: Chief Academic Officers, Montana University System

FROM: Neil Moisey, Deputy Commissioner for Academic, Research, & Student Affairs
John Cech, Deputy Commissioner for Two-Year & Community College Education

RE: Level I Approvals and Announcements

This memorandum is intended to inform you of the Level I changes in academic programs that have been approved in the Office of the Commissioner of Higher Education since the May 2014 meeting of the Board of Regents. It also includes announcements that may be of interest to the Board. Any comments regarding items below must be received by the Office of the Commissioner of Higher Education no later than **June 11, 2014**. If you have any questions, we would be happy to answer them with the help of our colleagues in academic affairs. Comments and questions should be directed to Elizabeth Baker, Assistant to the Deputy Commissioners.

OCHE Approvals

Montana State University-Bozeman:

- Request for authorization to change the name of the Minor in Industrial and Management Systems Engineering
[ITEM # 164-2001+C0714](#) | [Level I Request Form](#) | [Curriculum Proposal](#)

Helena College University of Montana

- Request for authorization to retitle Accounting and Business Technology AAS and CAS
[ITEM # 164-1901+C0714](#) | [Level I Request Form](#)

Campus Approval of Certificates

The University of Montana-Missoula:

- Request for authorization to add a Tier 1 Welding Program
[ITEM # 164-1009+C0714](#) | [Level I Request Form](#) | [Curriculum Proposal Form](#) | [Attachment #1](#)
- Request for authorization to add a Tier 1 Welding Program
[ITEM # 164-1010+C0714](#) | [Level I Request Form](#) | [Curriculum Proposal Form](#) | [Attachment #1](#)

Montana Tech of the University of Montana:

- Request for authorization to add a Welding Technology Professional Certificate
[ITEM # 164-1501+C0714](#) | [Level I Request Form](#) | [Curriculum Proposal Form](#)
- Request for authorization to add a Machining Technology Professional Certificate
[ITEM # 164-1502+C0714](#) | [Level I Request Form](#) | [Curriculum Proposal Form](#)

Helena College University of Montana:

- Request for authorization to revise two existing and add four new Accounting and Business Technology Certificates
[ITEM # 164-1902+C0714](#) | [Level I Request Form](#)

ITEM 164-2001+C0714

Request for authorization of a name change from Minor in Industrial and Management Systems Engineering to Minor in Engineering Management

THAT

The minor approved in March, entitled minor in Industrial and Management Systems Engineering, be renamed (error correction) to minor in Engineering Management.

EXPLANATION

The curriculum proposal attached to the March agenda item (#162-2009-R0314) requested approval for a new minor entitled Engineering Management, however there was a simultaneous request for a program name change to Industrial and Management Systems Engineering. On the Regents' agenda, the name of the minor was inadvertently switched with the name of the program.

ATTACHMENTS

Level I Request Form

Curriculum Proposal (unchanged from March 2014)

Item Number: 164-2001+C0714

Meeting Date: July 10, 2014

Institution: Montana State University

CIP Code: 14.3501

Program Title: Minor in Engineering Management

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 for Academic and Student Affairs, by no later than five weeks prior to the final posting date for the next scheduled meeting of the Board. The Deputy Commissioner will review the proposal and respond to the proposing campus with any questions or concerns within one week, allowing the proposing campus one week to respond before the Item is posted for the BOR scheduled meeting.

X A. Level I (place an X for 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. For Level I actions on degree programs or certificates, the process must begin when the proposing campus posts its intent on the MUS academic planning web site.

- 1. Re-titling existing majors, minors, options and certificates**
- 2. Adding new minors or certificates where there is a major** (Submit with completed Curriculum Proposals Form)
- 3. Adding new minors or certificates where there is an option in a major** (Submit with completed Curriculum Proposals Form)
- 4. Departmental mergers and name changes**
- 5. Program revisions** (Submit with completed Curriculum Proposals Form)
- 6. Distance or online delivery of previously authorized degree or certificate programs**
- 7. Placement of program into moratorium** (No Program Termination Checklist at this time – document steps taken to notify students, faculty, and other constituents and include this information on checklist at time of termination if not reinstated)
- 8. Filing Notice of Intent to Terminate/Withdraw existing majors, minors, options, and certificates** (No Program Termination Checklist at this time)
- 9. Terminate/withdraw existing majors, minors, options, and certificates** (Submit with completed Program Termination Checklist)

___ B. Level I with Level II documentation:

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

___ 1. Options within an existing major or degree (Submit with completed Curriculum Proposals Form);

___ 2. Eliminating organizational units within larger institutions such as departments, divisions and colleges or schools with the exception of the Colleges of Technology where changes require Board action (Submit with completed Curriculum Proposals Form)

___ 3. Consolidating existing programs and/or degrees (Submit with completed Curriculum Proposals Form)

___ 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.

All other Level I 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.

___ D. Campus Certificates

Although certificate programs of 29 credits or fewer may be implemented by the individual campuses without approval by the board of regents, those certificates do need to be reported to the office of the commissioner of higher education and listed on the Montana University System's official degree and program inventory. These Level I proposals will be listed as information items at the next regular meeting of the board.

Specify Request:

The curriculum proposal attached to the March agenda item (#162-2009-R0314) requested approval for a new minor entitled Engineering Management, however there was a simultaneous request for a program name change to Industrial and Management Systems Engineering. On the Regents' agenda the name of the minor was inadvertently switched with the name of the program.

We are asking for approval to change the name of the minor approved in March 2014 to Engineering Management as requested in the curriculum proposal.

1. Overview

The four-year degree program in Industrial Engineering (IE) was established in 1923, one of the first academic programs in the country in this emerging field. By the 1940's, the field was well-established, and in 1950 the undergraduate Industrial Engineering program at MSU received accreditation by the Accreditation Board of Engineering and Technology (ABET). The program has maintained continuous accreditation since that time.

In 1967, the program name was changed to "Industrial and Management Engineering" to reflect the breadth of the field and the applicability of Industrial Engineering tools in many management functions of industrial, primarily manufacturing, operations. In 2000, ABET significantly modified its accreditation criteria, known at the time as EC2000. When the Industrial and Management Engineering program applied for accreditation renewal in 2003 under the new criteria, the College was informed that the program would need to be accredited under two sets of program specific criteria, Industrial Engineering and Engineering Management, if it wanted to retain the program name. Upon inspection of the curriculum relative to the new criteria, the faculty determined that the program easily met the Industrial Engineering criteria, but would not necessarily meet the Engineering Management criteria. Given the extreme late notice, the decision was made to change the name of the major to Industrial Engineering rather than risk losing accreditation. A request for name change to the Board of Regents was fast-tracked through the university approval system and approved at the September 2003 Board of Regents meeting.

The graduate program, which is not accredited by ABET, retained its name. Students still earn a Master of Science degree in Industrial and Management Engineering.

Since 2003, the IE program has experienced significant turnover in faculty. The currently faculty mix supports a stronger emphasis in the design of systems to effectively manage organizations. During the 2011-2012 academic year, the faculty conducted a major modernization of the Industrial Engineering curriculum to reflect the strengths of the current faculty mix, and to better anticipate and support future trends in the field. The significantly enhanced curriculum was approved through the university's approval process, and has been incorporated into the 2012-2014 catalog. The IE program educational objectives and student outcomes have also been updated (see Appendix A).

In light of the significant curricular changes and revised student outcomes, and to adopt a program name that more accurately reflects the curricular content and broad applicability of the degree, the faculty of the Industrial Engineering program requests a name change to include "Management Systems" in the Bachelor of Science degree title. Furthermore, the faculty would like to make a portion of the upgraded curriculum available to students from other majors interested in management of technical organizations. Thus we also propose an undergraduate minor in Engineering Management.

2. Provide a one paragraph description of the proposed program. Be specific about what degree, major, minor or option is sought.

We request a name change for the Industrial Engineering major to "Industrial and Management Systems Engineering." Beginning with the 2014-16 catalog, students would earn a Bachelor of Science degree in Industrial and Management Systems Engineering. And, we propose a new non-teaching minor in Engineering Management consisting of 21 credits: 12 credits of required engineering management courses, one technical problem-solving elective and two management electives. The minor leverages only existing courses, and will be available only to non-majors.

3. Need

A. To what specific need is the institution responding in developing the proposed program?

The name change in 2003 back to Industrial Engineering for the undergraduate degree, after three-and-a-half decades with “management” in the name, was unfortunate in a number of aspects. The field of Industrial Engineering has continued to broaden beyond its origins in manufacturing, particularly in the last two decades. Today, industrial engineers are employed across broad sectors of the economy, including transportation, finance, government, education and healthcare sectors to name a few. Our own graduates reflect this trend since only about 45% of current MSU graduates move into manufacturing for their first position. Primarily, industrial engineers analyze existing organizational systems, and design improved ways of producing goods or providing services that maximize value to customers while minimizing waste. Due to the broad applicability of industrial engineering tools, most industrial engineering graduates have job titles that are something other than “Industrial Engineer,” including process engineer, project engineer, process improvement specialist, systems engineer, or project manager. It is therefore critical from both student recruitment and marketing standpoints that the degree name accurately reflects not only the curriculum, but also the career prospects for someone with this educational background.

B. How will students and any other affected constituencies be served by the proposed program?

Students will be positively impacted by having a degree name that is inherently more marketable across a broader spectrum of organizations. The word “industrial” continues to speak to the traditional manufacturing base which still employs many industrial engineering graduates. At the same time, because the existing degree name greatly limits the perceived market, “management systems” will speak to sectors in which industrial engineering as a field is perhaps not well-known but where the skills and knowledge of the field are highly applicable. At the same time, the modernized degree title will accurately reflect the fast career path into management of many of our graduates. The term “engineering” connotes the technical, analytical and problem-solving skills associated with persons with an engineering background.

At the same time, when MSU students are looking for a major, they will more readily associate the degree name with the curricular content. It is anticipated that this will help prospective students associate the degree with appropriate career aspirations.

Finally, potential employers will be attracted by the degree and/or minor as increasingly employers of engineers are looking for graduates with the capability and interest to combine analytical and technical skills with business or management knowledge.

With respect to the engineering management minor, numerous reports have concluded that the engineer of the 21st century must have a broader skill set, one inclusive of business knowledge and strong interpersonal communication skills.¹ Thus, engineering students will benefit from the opportunity to broaden their education to better prepare themselves for engineering in the 21st century. Students in other technical majors may also benefit from the topics addressed in the Engineering Management minor.

C. What is the anticipated demand for the program? How was this determined?

At present, Industrial Engineering has about 85 majors. This is down from the peak of 120 majors in 2003 when the program name change went into effect. We believe the steady decline in majors has been influenced by the inherent marketing challenges of the current degree name. With the change, we expect a steady increase back to approximately 120 majors.

The engineering management minor will be available to all majors other than I&MSE majors, pending approval of the name change and minor. We estimate that approximately 10% of all other engineering majors would be interested in the program, and that about half of those will actually pursue the minor. Therefore, we expect 20-30 minors per year.

4. Institutional and System Fit

A. What is the connection between the proposed program and existing programs at the institution?

The name change concerns only the Industrial Engineering program on the MSU-Bozeman campus. No other comparable programs exist within the MUS.

The proposed minor consists primarily of Industrial Engineering coursework that is specifically related to engineering management plus several electives courses from the College of Business and the Departments of Psychology and Sociology. The proposed program has been discussed with leadership of these programs and their support provided. A number of courses in the minor are already listed as electives in other engineering and technology degrees as well as the leadership fellows certificate at MSU.

B. Will approval of the proposed program require changes to any existing programs at the institution? If so, please describe.

Currently, the Industrial Engineering program is housed within the Department of Mechanical and Industrial Engineering of the College of Engineering at MSU. The proposed degree name change will require that all catalog information, websites, and print materials be updated to reflect the new program name. We would request a change in the rubric used for our courses from EIND to EIMS (“Engineering: Industrial & Management Systems”). Otherwise, no impact to the department or to other programs is expected.

¹ See: National Academy of Engineering, The Engineer of 2020: Visions of Engineering in the New Century, The National Academies Press, 2004.

- C. Describe what differentiates this program from other, closely related programs at the institution (if appropriate).

Currently, there is no minor focused on engineering management at the MSU-Bozeman campus. The College of Business offers a minor in Business Administration, which bears some similarity to the proposed minor. Requirements of the Business Administration minor are:

BUSINESS ADMINISTRATION MINOR

Students seeking a minor in business administration must complete the following courses.

	Credits
<i>Take one of the following:</i>	
<u>BMGT 205</u> --Professional Communication Fundamentals	3
<u>WRIT 201</u> --College Writing II	3
<u>WRIT 221</u> --Intermediate Tech Writing	3
<u>ACTG 201</u> --Principles of Fin Acct	3
<u>ACTG 202</u> --Principles of Managerial Accounting	3
<u>BMGT 335</u> --Management and Organization*	3
<u>BMKT 325</u> --Principles of Marketing*	3
<u>BFIN 322</u> --Business Finance*	3
<u>BGEN 361</u> --Principles of Business Law*	3
<u>ECNS 202</u> --Principles of Macroeconomics	3
<u>ECNS 204IS</u> --Microeconomics	3
<u>STAT 216Q</u> --Introduction to Statistics	3
	30

*Of the four required courses denoted with an *, three must be taken in residence at MSU.

The business minor exposes students to a broad range of business functions, including accounting, marketing, and finance. The proposed minor focuses more narrowly on effective administration of the engineering or operations functions of an organization, and is designed to specifically equip engineers and other technically trained individuals to assume leadership roles within their organization. While the two minors share concepts, they have only one elective course in common.

- D. How does the proposed program serve to advance the strategic goals of the institution?

The proposed changes support the vision of Montana State University through their effort to promote greater understanding of the human aspects of complex problem solving. The changes align to strategic goals as follows:

The changes are expected to increase enrollment of students in Industrial and Management Systems Engineering which will directly improve metric A.1.1 and positively influence:

- MSU's goal of preparing students for careers and future study:
 - In recent years, Industrial Engineering graduates have achieved some of the highest

- pass rates of the Fundamentals of Engineering Exam in the College (100% S12). More students in the program will directly influence Metric L.1.1
- For the past two academic years, graduates have achieved nearly 100% placement in careers or graduate school. More students in the program will directly influence both metrics L.3.1 and L.3.2.
- MSU's student engagement goal - The current IE curriculum includes one service learning designated course and three courses in the leadership fellows program. The minor requires two of these courses, helping to drive deeper student engagement and improve metrics E.1.3 and E.3.1 – 2.
- MSU's Stewardship Goal – Recent senior capstone projects in IE have included efforts to streamline campus projects with OpenMSU (positive impact to metric S.3.2) and work with MSU's Sustainability Center to dramatically increase campus recycling collections (positive impact to metric S.4.2). Increasing enrollments in the program will enable greater leverage of these resources in similar areas.

The creation of the minor in Engineering Management will promote MSU's integration goal – A growing minor in Engineering Management promotes increased work across disciplines, improving metric I.2.2

- E. Describe the relationship between the proposed program and any similar programs within the Montana University System. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and if no efforts were made, explain why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement(s) as part of the documentation.

No comparable program exists within the MUS.

5. Program Details

- A. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog or other publications. NOTE: In the case of two-year degree programs and certificates of applied science, the curriculum should include enough detail to determine if the characteristics set out in Regents' Policy 301.12 have been met.

The degree name change requires no changes to the present curriculum,² which is presented in Appendix B. For comparison, the curriculum from the 2010-2012 catalog is shown in Appendix C to illustrate the extent of curricular changes made for the 2012-2014 catalog.

The draft catalog description for the Engineering Management minor follows.

² See: <http://www.montana.edu/wwwcat/programs/mie.html#ime>

ENGINEERING MANAGEMENT MINOR (non-teaching)

The Mechanical and Industrial Engineering Department within the College of Engineering offers a non-teaching minor in Engineering Management. The field of Engineering Management is focused on the managerial, financial and systems level aspects of engineering problem solving. Students are required to complete 21 credits for the minor by taking a core group of four courses and selecting an additional three elective courses. Students completing the minor will find themselves better prepared to successfully work in a technical leadership capacity.

The Engineering Management minor is not available to Industrial & Management Systems Engineering majors. Students earn the minor by completing the following courses:

Required Pre-Requisite Courses

One of the following

EGEN 350	Applied Engineering Data Analysis
EIND 354	Engineering Probability and Statistics I

One of the following

M 166Q	Calculus for Technology II
M 172Q	Calculus II

Recommended Core Elective Courses

One or more of the following:

BGEN 242D	Introduction to International Business
PSYX 101IS	Introductory Psychology
SOCI 101IS	Introduction to Sociology

Required Courses (12 credits)

EGEN 325	Engineering Economic Analysis
EIND 300	Engineering Management & Ethics
EIND 373	Production Inventory Cost Analysis
EIND 434	Project and Engineering Management

Technical Problem Solving Elective (pick one, 3 credits)

EIND 455	DOE For Engineers
EIND 457	Regression & Multivariate Analysis for Engineers
EIND 458	Production and Engineering Management
EIND 477	Quality Assurance

Managerial Problem Solving Elective Courses (pick two, 6 credits)

BMGT 329	Human Resources Management
BGEN 361	Principles of Business Law
BMGT 406	Negotiation/Dispute Resolution
BMGT 420	Leadership and Motivation
BMGT 464	International Management
ECNS 309	Managerial Economics
EIND 425	Technology Entrepreneurship
PSYX 360	Social Psychology

PSYX 461	Indust & Organiz Psych
PSYX 481	Judgment & Decision Making
SOCI 345	Sociology of Organizations
SOCI 370	Sociology of Globalization

- B. Describe the planned implementation of the proposed program, including estimates of numbers of students at each stage.

Changes are targeted for the 2014-2016 catalog. Students graduating under the 2012-2014 or earlier catalogs will receive degrees in Industrial Engineering. Students graduating under the 2014-2016 catalog will receive degrees in Industrial and Management Systems Engineering. The Engineering Management minor will become available starting in Fall 2014.

6. Resources

- A. Will additional faculty resources be required to implement this program? If yes, please describe the need and indicate the plan for meeting this need.

The proposed name change will require faculty and staff time to update catalog descriptions, brochures, and other paperwork as well as to work with the Registrar in implementing the new course rubric. This will occur during the 2013-2014 academic year as part of the service requirement of the Program Coordinator, in time for implementation in Fall 2014. We anticipate the first graduates under the new degree name will be in Spring 2015.

Faculty and staff resources will also be required to administer the new minor, including advising students and certifying degree applications. It is anticipated that the efficiencies associated with DegreeWorks will mitigate the additional amount of workload required. Based upon recent experience with existing minors, we anticipate that approximately 0.10 FTE would be required in the first 1-2 years, reverting to 0.05 FTE once the minor is established. This, too, will be part of the service requirement of the Program Coordinator.

As course enrollments grow from these changes additional teaching resources may be required at some time in the future. If applicable, those resources will be obtained through existing procedures for obtaining instructional resources.

- B. Are other, additional resources required to ensure the success of the proposed program? If yes, please describe the need and indicate the plan for meeting this need.

Administrative staff support will also be required to answer student questions, process paperwork, locate alternative classrooms should enrollments increase sufficiently to require larger classroom space, process catalog updates, and generally support the program. It is anticipated that a net increase of approximately one person-hour per week will be required.

7. Assessment

How will the success of the program be measured?

Assessment of the new I&MSE degree will use the existing systems in place for the Industrial Engineering

program, which has been continuously accredited since 1950. The senior accreditation officer of the Accreditation Board of Engineering and Technology (ABET) advised us of the following with respect to accreditation of the new degree name:

- The EAC Executive Committee has decided that when the word “systems” is added to the degree name, the lead society will remain the same and the systems engineering program criteria are not invoked.
- There is a distinct possibility that having “management” in the degree title with engineering will invoke the engineering management criteria
- The next review cycle for the IE program is scheduled for 2015-2016. If we have no graduates under the new name until 2015, then the College can make the name change request as part the Request for Evaluation. No special review need be requested.
- We should get the new name approved through the university’s approval process, then submit a name change request to ABET.

In accordance with this advice, we will apply for accreditation of the new degree in the next accreditation cycle of ABET, scheduled for Fall 2015. That Request for Evaluation will include the new degree name. We will request evaluation under the Industrial Engineering program criteria, but will also be prepared to be evaluated under the Engineering Management program criteria. It is expected that the program will remain fully accredited.

The minor will initially be assessed by enrollment growth, then later (after year 4) by job placement and regular faculty review.

8. Process Leading to Submission

Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.

- | | |
|------------|--|
| Nov. 2012 | Industrial Engineering faculty vote unanimously to seek a degree name change to “Industrial and Management Systems Engineering.” |
| Dec. 2012 | Accreditation Board contacted about prospective name change. We were informed that if no degrees are awarded before Spring 2015, that we could apply for accreditation of the new degree name in the normal cycle and not have to request a special review since we are due for an accreditation review in Fall 2015. |
| Dec. 2012 | Faculty benchmarked other degrees accredited under the same or similar name. Several programs bear the name “Industrial and Management Engineering” or similar, but none with the exact degree name. MSU would be unique in this regard. |
| April 2013 | Level I proposal reviewed by the Industrial Engineering faculty, and unanimously approved. The engineering management minor was reviewed by the Dean and representative faculty in the College of Business, and received their enthusiastic support to participate in an interdisciplinary project. The minor was also reviewed by the department heads of psychology and sociology, and received their support. |
| May 2013 | Level I proposed reviewed by Mechanical and Industrial Engineering department head, and received approval. The Dean of the College of Engineering reviewed and authorized the proposal to move forward. The proposal was sent to the entire faculty of the M&IE |

department for comment.

- June 2013 Accreditation Board contacted via email to confirm the process for name change. Response received and proposal updated accordingly.
- Sept 2013 Final review by the IE faculty and M&IE Department Head. Minor updates made based on this review and feedback from prior reviews. Submitted to the College Curriculum Committee.

APPENDIX A: Industrial Engineering Mission, Objectives and Outcomes

The mission of the Mechanical & Industrial Engineering Department is to serve the State of Montana, the region, and the nation by providing outstanding leadership and contributions in knowledge discovery, student learning, innovation and entrepreneurship, and service to community and profession. The Department's vision is to be a leader in discovery, learning, innovation, and service through a focus on core competencies, multi-disciplinary collaborations, and investment in the Departmental community. Within that context, the Industrial Engineering faculty has established the mission statement, objectives, and program outcomes stated below.

IE Program Mission

The mission of the undergraduate program in Industrial Engineering is to produce graduates well grounded in both classical and current industrial engineering knowledge and skills consistent with the land-grant mission of MSU. Graduates will be prepared to be productive citizens and contributors to the economic well-being of employers.

IE Program Educational Objectives

Industrial Engineering graduates will:

- I. Utilize industrial and management systems engineering tools and knowledge in their chosen career paths;
- II. Employ effective communication;
- III. Work in multidisciplinary professional teams;
- IV. Engage in life-long learning, including post-graduate education for some graduates;
- V. Contribute to industry and society, including involvement in professional and other service activities;
- VI. Design, manage, improve, and integrate systems across a broad range of organizations; and
- VII. Participate in ethical leadership in design and operational activities that contribute to their organization and community.

IE Student Outcomes

Students completing the Industrial Engineering program will demonstrate:

- (a) an ability to apply knowledge of mathematics, science, and engineering;
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data;
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- (d) an ability to function on multidisciplinary teams ;
- (e) an ability to identify, formulate, and solve engineering problems from a systems perspective;
- (f) an understanding of professional and ethical responsibility;
- (g) an ability to communicate effectively;
- (h) the broad education necessary to understand the systems level impact of engineering solutions in a global, economic, environmental, and societal context;
- (i) a recognition of the need for, and an ability to engage in life-long learning;
- (j) a knowledge of contemporary issues;
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
- (l) an ability to design, develop, implement, and improve integrated systems that include people, materials, information, equipment and energy; and
- (m) an understanding of the systems used to effectively organize and deploy resources in production, service and other technological environments.

APPENDIX B

Industrial Engineering Curriculum, 2012-2014 catalog

Freshman Year	F S	Junior Year	F S
<u>CHMY 141</u> --College Chemistry I	4	<u>EGEN 310</u> --Intro to Engineering Design	3
Take one of the following:		<u>EGEN 325</u> --Engineering Economic Analysis	3
<u>CLS 101US</u> --College Seminar	3	<u>EIND 300</u> --Engineering Management & Ethics	3
<u>COM 110US</u> --Public Communication	3	<u>EIND 354</u> --Engineering Probability & Statistics I	3
<u>WRIT 101W</u> --College Writing I*	3	<u>EIND 364</u> --Principles of Operations Research I	3
<u>EIND 101</u> --Intro to Industrial Engineering	1	<u>EIND 371</u> --Intro to Computer Integrated Manufacturing	3
<u>EIND 142</u> --Intro to Systems Engineering	2	<u>EIND 410</u> --Interaction Design	2
<u>M 171Q</u> --Calculus I	4	<u>EIND 413</u> --Ergonomics & Human Factors Eng	3
<u>M 172Q</u> --Calculus II	4	Take one of the following:	
<u>EMEC 103</u> --CAE I - Engr Graphics Communication	2	<u>EIND 455</u> --DOE for Engineers	3
<u>PHSX 220</u> --Physics I	4	<u>EIND 457</u> --Regression Multivariate Analysis for Eng	3
University Core Elective	3 3	<u>EIND 464</u> --Principles of Operations Research II	3
	16 17	Industrial Engineering Cognate Elective**	3
			15 17
Sophomore Year	F S	Senior Year	F S
<u>CSCI 111</u> --Programming with Java I	4	<u>EIND 422</u> --Intro to Simulation	3
<u>EMAT 251</u> --Materials Structures and Properties	3	<u>EIND 434</u> --Project & Engineering Management	3
<u>EGEN 201</u> --Engineering Mechanics-Statics	3	<u>EIND 442</u> --Facility/Material Handling Systems Design	3
<u>EGEN 205</u> --Mechanics of Materials	3	<u>EIND 458</u> --Production & Engineering Management	3
<u>EIND 313</u> --Work Design & Analysis	3	<u>EIND 499R</u> --Capstone: Industrial Engineering Design	3
<u>ETME 215</u> --Manufacturing Processes	3	<u>EIND 477</u> --Quality Assurance	3
<u>M 273Q</u> --Multivariable Calculus	4	<u>EGEN 488</u> --Fundamentals of Engineering Exam	0
<u>M 221</u> --Linear Algebra	3	Engineering Core Elective	3
<u>PHSX 222</u> --Physics II	4	Industrial Engineering Cognate Electives**	3 3
University Core Elective	3	University Core Elective	3
	17 16		15 15

*Students exempt from MSU writing requirement may substitute WRIT 221.

**See [IE Cognate Policy](#) for details.

A minimum of 128 credits is required for graduation; 42 of these credits must be in courses numbered 300 or above.

APPENDIX C

Industrial Engineering 2012-2014 Catalog
Credit Reductions and Additions
SummarySheet

Course Area/Title	Current	Cr	Proposed	Cr	Credit Reduction	Credit Addition
Professional Practice / Management	EIND300	2	EIND300	3		+1
Engineering Statistics	EIND355	1			-1	
Operations Research	EIND264	3	EIND464	3	-3	+3
Totals					-4	+4

Writing	WRIT101W	3	WRIT101W or WRIT221 ¹	3	-	-
Math	M274	4	M221	3	-1	
Electrical Engineering	EELE250	4			-4	
Human Centered / Engineering Design			EIND410	2		+2
Human Factors / Ergonomics			EIND413	3		+3
Engineering Statistics	EIND454	3	EIND455 ² or EIND457 ³	3	-3	+3
Multidisciplinary Engineering Design			EGEN310	3		+3
Professional Electives	Category B	3	Eng. Science	3	-	-
	Cat. A & C	9	Cognate Elec.	9	-9	+9
University Core	Core 2.0	15	Core 2.0	12	-3	
Totals					-20	+20

1 – Only students who are exempt from MSU writing requirements may substitute WRIT221 for WRIT101W.

2 – New course, co-convened with existing EIND554 course. Offered alternate years, beginning S13.

3 – New course. Offered alternate years, beginning S14.

Industrial Engineering Curriculum, 2010-2012 catalog

ITEM 164-1901+C0714

Request for authorization of Helena College-UM to re-title Accounting and Business Technology AAS and CAS

THAT

The Board of Regents of Higher Education authorizes the Helena College University of Montana revise its Associate of Applied Science degree and Certificate of Applied Science degrees in the business track as a result of active participation with the state-wide “Tuning” discussions and for ease of alignment for articulation to 4-year degrees.

EXPLANATION

The Accounting and Business Technology program is revising its AAS and CAS (in both accounting and business) to include a common core of classes and the student choice of 6-12 credits in specific advising areas: Human Resource Management, Small Business Management, Management Information Systems, Bookkeeping, Finance, and Accounting Information Systems.

The proposed retitle change affects the business track only to represent the broad discipline. The accounting track titles will remain the same.

Accounting and Business Technology	
Former Title	Proposed Title
Small Business Management Technology AAS	Business Technology AAS
Small Business Entrepreneurship CAS	Entrepreneurship CAS

ATTACHMENTS

Level I Request Form

Item Number: 164-1901+C0714

Meeting Date: June 10, 2014

Institution: Helena College

CIP Code: (see description below)

Program Title: Re-titling Accounting and Business Technology AAS and CAS

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 for Academic and Student Affairs, by no later than five weeks prior to the final posting date for the next scheduled meeting of the Board. The Deputy Commissioner will review the proposal and respond to the proposing campus with any questions or concerns within one week, allowing the proposing campus one week to respond before the Item is posted for the BOR scheduled meeting.

X A. Level I (place an X for 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. For Level I actions on degree programs or certificates, the process must begin when the proposing campus posts its intent on the MUS academic planning web site.

- 1. Re-titling existing majors, minors, options and certificates**
- 2. Adding new minors or certificates where there is a major** (Submit with completed Curriculum Proposals Form)
- 3. Adding new minors or certificates where there is an option in a major** (Submit with completed Curriculum Proposals Form)
- 4. Departmental mergers and name changes**
- 5. Program revisions** (Submit with completed Curriculum Proposals Form)
- 6. Distance or online delivery of previously authorized degree or certificate programs**
- 7. Placement of program into moratorium** (No Program Termination Checklist at this time – document steps taken to notify students, faculty, and other constituents and include this information on checklist at time of termination if not reinstated)
- 8. Filing Notice of Intent to Terminate/Withdraw existing majors, minors, options, and certificates** (No Program Termination Checklist at this time)
- 9. Terminate/withdraw existing majors, minors, options, and certificates** (Submit with completed Program Termination Checklist)

B. Level I with Level II documentation:

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

1. Options within an existing major or degree (Submit with completed Curriculum Proposals Form);

2. Eliminating organizational units within larger institutions such as departments, divisions and colleges or schools with the exception of the Colleges of Technology where changes require Board action (Submit with completed Curriculum Proposals Form)

3. Consolidating existing programs and/or degrees (Submit with completed Curriculum Proposals Form)

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.

All other Level I 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.

D. Campus Certificates

Although certificate programs of 29 credits or fewer may be implemented by the individual campuses without approval by the board of regents, those certificates do need to be reported to the office of the commissioner of higher education and listed on the Montana University System's official degree and program inventory. These Level I proposals will be listed as information items at the next regular meeting of the board.

Specify Request:

The Accounting and Business Technology program area proposes to revise its Associate of Applied Science degree and Certificate of Applied Science degrees in the business track as a result of active participation with the state-wide "Tuning" discussions and for ease of alignment for articulation to 4-year degrees.

The Accounting and Business Technology program is revising its AAS and CAS (in both accounting and business) to include a common core of classes and the student choice of 6-12 credits in specific advising areas: Human Resource Management, Small Business Management, Management Information Systems, Bookkeeping, Finance, and Accounting Information Systems.

The proposed retitle change affects the business track only to represent the broad discipline. The accounting track titles will remain the same.

Accounting and Business Technology		
Former Title	Proposed Title	CIP
Small Business Management Technology AAS	Business Technology AAS	52.0201 (was 52.0703)
Small Business Entrepreneurship CAS	Entrepreneurship CAS	52.0701

ITEM 164-1009+C0714

Request for authorization Missoula College –UM to offer a Tier 1 Welding Program - SWAMMEI

THAT

The Board of Regents of Higher Education authorizes the Missoula College-UM to offer a Tier 1 Welding Program.

EXPLANATION

Colleges participating in SWAMMEI Tier I Welding have agreed to teach to a common set of learning outcomes. These learning outcomes are well aligned with the NCCER Core and Level I industry-recognized-credential, providing students an opportunity to earn these credentials as part of their course of study. The SWAMMEI Tier I Welding program serves as entry-level training for students pursuing an occupation in welding or welding fabrication. Great Falls College serves as the lead institution for SWAMMEI’s welding strategy. Students that complete a SWAMMEI Tier I welding program will be provided a College certificate of completion and a NCCER Level I professional certificate.

ATTACHMENTS

- Level I Request Form
- Curriculum Proposal Form
- Attachment #1: Curriculum

Item Number: 164-1009+C0714

Meeting Date: July 10, 2014

Institution: Missoula College-UM

CIP Code: 48.0508

Program Title: SWAMMEI Tier I Welding Program

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 for Academic and Student Affairs, by no later than five weeks prior to the final posting date for the next scheduled meeting of the Board. The Deputy Commissioner will review the proposal and respond to the proposing campus with any questions or concerns within one week, allowing the proposing campus one week to respond before the Item is posted for the BOR scheduled meeting.

A. Level I (place an X for 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. For Level I actions on degree programs or certificates, the process must begin when the proposing campus posts its intent on the MUS academic planning web site.

- 1. Re-titling existing majors, minors, options and certificates**
- 2. Adding new minors or certificates where there is a major** (Submit with completed Curriculum Proposals Form)
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- 4. Departmental mergers and name changes**
- 5. Program revisions** (Submit with completed Curriculum Proposals Form)
- 6. Distance or online delivery of previously authorized degree or certificate programs**
- 7. Placement of program into moratorium** (No Program Termination Checklist at this time – document steps taken to notify students, faculty, and other constituents and include this information on checklist at time of termination if not reinstated)
- 8. Filing Notice of Intent to Terminate/Withdraw existing majors, minors, options, and certificates** (No Program Termination Checklist at this time)
- 9. Terminate/withdraw existing majors, minors, options, and certificates** (Submit with completed Program Termination Checklist)

B. Level I with Level II documentation:

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

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

 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.

All other Level I 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.

 X D. Campus Certificates

Although certificate programs of 29 credits or fewer may be implemented by the individual campuses without approval by the board of regents, those certificates do need to be reported to the office of the commissioner of higher education and listed on the Montana University System's official degree and program inventory. These Level I proposals will be listed as information items at the next regular meeting of the board.

Specify Request:

Colleges participating in SWAMMEI Tier I Welding have agreed to teach to a common set of learning outcomes. These learning outcomes are well aligned with the NCCER Core and Level I industry-recognized-credential, providing students an opportunity to earn these credentials as part of their course of study. Students that complete a SWAMMEI Tier I welding program will be provided a College certificate of completion and a NCCER Level I professional certificate.

1. Overview

SWAMMEI is a \$25 million dollar grant project funded by the US Department of Education that helps 13 Montana Colleges augment and enhance occupational training in 8 distinct occupational areas. The grant specifies that colleges will adopt “stacked credentials” to serve students in these specific occupational training programs. Stacked credential programs are comprised of industry-driven tiers of training (typically aligning with a semester’s worth of training). Each tier is designed to be commensurate with developing a complete set of skills, considered to add value to potential employees by employers. When possible, tiers have also been aligned with completion of industry-recognized credentials (e.g. NCCER Level I for welding). Students completing tiers can choose to enter the workforce upon completion of a tier or continue their education by continuing into additional training tiers. After completion of each tier students will earn a professional certificate from participating colleges and will have had the opportunity to earn industry-recognized credentials as well. The overall intent is to enhance labor market payoffs for students by reducing the amount of time in training and increasing documentation of student’s competencies prior to completion of a two-year degree.

Colleges engaged in SWAMMEI have agreed to identify common learning outcomes that students will gain in order to complete each tier. Upon completion of articulation agreements, students will gain an opportunity to seamlessly transfer between consortium member colleges into subsequent training tiers.

In some cases, adoption of the stacked credential model is possible with small tweaks to existing CAS and AAS curricula – in essence, providing more off-ramps and on-ramps into these programs. Some courses are also being converted into online formats to allow students in remote areas of the state to participate.

The SWAMMEI Tier I Welding program serves as entry-level training for students pursuing an occupation in welding or welding fabrication. Great Falls College serves as the lead institution for SWAMMEI’s welding strategy. The strategy also includes the following 2-year colleges within the MUS: Bitterroot College, City College, Dawson Community College, Flathead Valley Community College, Gallatin College, Helena College, Highlands College and Missoula College. Fort Peck Community College and Little Big Horn College are also participating in this strategy through the grant.

2. Provide a one paragraph description of the proposed program. Be specific about what degree, major, minor or option is sought.

Colleges participating in SWAMMEI Tier I Welding have agreed to teach to a common set of learning outcomes. These learning outcomes are well aligned with the NCCER Core and Level I industry-recognized-credential, providing students an opportunity to earn these credentials as part of their course of study. Students that complete a SWAMMEI Tier I welding program will be provided a College certificate of completion and a NCCER Level I professional certificate.

3. Need

A. To what specific need is the institution responding in developing the proposed program?

The SWAMMEI grant is aimed at enhancing labor market payoffs for students by reducing the amount of time they spend in training in order to become qualified for jobs in industry. The college is responding by creating additional off-ramps and on-ramps into existing welding programs by adopting

a stacked credential model. The stacked credential model provides students a certificate/professional certificate upon successful completion of each Tier of training which prepares them for entry-level work that requires some post-secondary training.

B. How will students and any other affected constituencies be served by the proposed program?

All SWAMMEI partners have worked closely (and will continue to work closely) with business partners to ensure that training programs align with workforce demands. This outreach should enhance the fit of our students with local businesses. Students gain from efficient programs that employers have participated in creating and condoning. Students also gain the benefit of additional options for continuing their education or going straight into employment.

C. What is the anticipated demand for the program? How was this determined?

Overall, it is anticipated that 587 students are likely to be engaged in Tier I training prior to fall semester of 2016 (515 at MUS college campuses). These numbers were derived during development of the SWAMMEI project with each colleges providing best-guess estimates based upon historical enrollment data. Missoula College anticipates serving 22 students per year based upon historical demand in our programs.

4. Institutional and System Fit

A. What is the connection between the proposed program and existing programs at the institution?

The SWAMMEI stacked credential approach essentially breaks our existing AAS program into 4 certificate components. By completing multiple tiers a student will be completing very similar curricular work and expectations as in existing programs.

B. Will approval of the proposed program require changes to any existing programs at the institution? If so, please describe.

No. It provides students additional opportunities but does not change or limit existing opportunities.

C. Describe what differentiates this program from other, closely related programs at the institution (if appropriate).

This program creates a shorter term training program that prepares students for entry-level jobs in the industry (i.e. Welders helper). Existing programs train students for higher paying wages in that same industry but with no current off ramp prior to completion of the degree program.

D. How does the proposed program serve to advance the strategic goals of the institution?

This program is well aligned with the workforce demand of local employers. This alignment should help increase completion and placement rates of program completers. The mission of Missoula College is to create a comprehensive, accessible, student-center learning environment that fosters individual growth, facilitates workforce development and provides a foundation for advanced academic achievement. A workforce development strategic plan goal is to develop and market Missoula College certificates and short-term training opportunities for all student groups.

- E. Describe the relationship between the proposed program and any similar programs within the Montana University System. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and if no efforts were made, explain why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement(s) as part of the documentation.**

The SWAMMEI program intentionally creates parallel program at participating institutions, based around a set of commonly-agreed-upon learning outcomes for each tier. This will allow seamless student transfer between colleges in this tiered system. Articulation agreements are still being developed within the grant's short implementation timeline, but there a common understanding among consortium members about the benefit for students of articulation between tiers.

5. Program Details

- A. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog or other publications. NOTE: In the case of two-year degree programs and certificates of applied science, the curriculum should include enough detail to determine if the characteristics set out in Regents' Policy 301.12 have been met.**

Attached is the Missoula College Welding Tier I Certification curriculum document

- B. Describe the planned implementation of the proposed program, including estimates of numbers of students at each stage.**

With approval from the Board of Regents, and pursuant to USDOL grant guidelines, implementation of the SWAMMEI Tier I Welding programs will begin Fall Semester of 2014. It is estimated that 18-22 students will enter the training program in fall. Subsequent tiers of the SWAMMEI program will be brought to the Board of Regents in time to allow students to continue seamlessly into subsequent tiers. Overall it is estimated that at least 515 students in the MUS or will enter welding training associated with the SWAMMEI project prior to Fall of 2016. Missoula College anticipates serving 22 students per year based upon historical demand in our programs.

6. Resources

- A. Will additional faculty resources be required to implement this program? If yes, please describe the need and indicate the plan for meeting this need.**

In most cases, SWAMMEI Tiers create an additional training option for students within current programs; and therefore, additional faculty resources are not required. In circumstances where SWAMMEI has catalyzed creation of new programs or where significant additional time and energy was anticipated by colleges, funds were included in the approved SWAMMEI budget for new (initially) grant-funded positions. To agree to common learning outcomes related to the SWAMMEI tiers, faculty have been asked to contribute time and travel (in some cases) to face-to-face meetings with other faculty. Travel has been reimbursed, to this point, through SWAMMEI grant funds.

B. Are other, additional resources required to ensure the success of the proposed program? If yes, please describe the need and indicate the plan for meeting this need.

Integration of industry recognized credentials into programs typically requires an institution and/or faculty to become accredited by the national association governing the credentials in this case the NCCER. It will cost each participating faculty roughly \$150 to gain NCCER training. This money will be covered by each college's SWAMMEI funds.

7. Assessment

How will the success of the program be measured?

As part of the SWAMMEI project, grant staff will track the following outcome measures for each program: annual graduation rate for all students by program; employment rate of program completers by program; employment retention rate of completers, one year following program completion, by program; average earnings of completers, one to three years following program completion, by program; transfer rate for program that have facilitating transfers as a substantial part of their mission; total number of participants employed at enrollment who receive a wage increase post-enrollment; total number of participants retained in employment after grant-funded program of study completion; total number of participants employed after grant-funded program of study completion; total number of participants enrolled in further education after grant-funded program of study completion; total number of participants earning credential; total number of participants completing credit hours; total number of participants still retained in their program of study or another TAACCCT-funded program; total number of participants who have completed a TAACCCT funded program, and; total unique participants served.

Success for grant purposes will be based upon the number of students enrolling in, completing, obtaining employment and retained in employment as per the outcome estimates included in our approved grant application.

For purposes of long-term success, the newer certificate program data will be compared to previous CAS/AAS completion-rate, placement-rate, wage-rate, employment-retention to assess if the new mechanism is leading to improved labor market outcomes for students.

8. Process Leading to Submission

Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.

During development of the SWAMMEI grant, significant work was done to engage local businesses across the state in conversations about their workforce needs and specific training that would help meet those workforce needs. Their input helped the state-wide SWAMMEI partners identify target occupations and training programs to include in the project. During development of the project, in the time available, the project's steering committee engaged faculty and administrators to identify college needs in order to deliver targeted training programs. College CEOs/Deans/Presidents were frequently involved in the project's direction.

After the grant's award as announced by USDOL, faculty at participating colleges from around the state met to discuss common learning outcomes. Outreach to business partners and other related businesses has continued with an intention to increase that engagement radically in the coming months through

grant-funded workforce navigators that will conduct more specific outreach.

These navigators also work very intimately with Montana Department of Labor One-Stop Centers in their local community. The navigators help identify and recruit individuals that would be well-served by grant-funded programs.

The USDOL grant mandates that grant-funded programs begin by fall of 2014. This timeline dictates a very aggressive approval process that frankly falls out of sync with MUS typical approval processes. In order to meet the \$25 million USDOL grant timeline colleges will submit their Level I approval with Level II documentation requests to UM Provost Office by May 19 and to the Board of Regents by May 30 to allow Regents to consider the requests during their July meeting. Colleges in Montana have worked through a fast-track approval process on their own campuses to accommodate USDOL's timeline. Subsequent to Board of Regents approval, approval requests will be forwarded to Northwest Commission on Colleges and Universities (NWCCU). NWCCU has been apprised of the grant, the potential influx of program approval requests and has expressed that they are prepared to assess these requests quickly with an expectation to response by late July or August 2014. New certificate programs will then be forwarded to US Department of Education to consider each program's eligibility for financial aid status. It is expected that USDOE will have responded by mid-fall.

The Missoula College program will not substantively change.

Welding Tier I Certification

Course Number	Title	Credits	Course Catalog Description
CAPP 120	Introduction to Computers	3	Introduction to computer terminology, hardware, and software, including wire/wireless communications and multimedia devices. Students utilize word processing, spread sheet, database, and presentation applications to create projects common to business and industry in a networked computing environment. Internet research, email usage, and keyboarding proficiency are integrated.
M 111	Technical Mathematics	3	Prereq., ALEKS placement ≥ 2 . Designed to provide the mathematical background necessary for success in the industrial areas. Topics covered include percent, ratio proportion, formula evaluation, basic algebra and geometry concepts, trigonometry, measurement, statistics, and graphing. Markdowns, inventory turnover, and other basic formulas. Credit does not count toward Associate of Arts or Baccalaureate degrees.
MCH 114	Related Metals Processes II	3	Instruction and use of drills, files, threads and threading processes, basic lathe, drill press, and band saw operation, including precision measuring instruments. Fasteners, layout procedures, and basic hand tools are covered.
WLDG 150	Welding Layout Techniques	2	Using practical layout techniques students develop basics for blueprint construction, layout on pipe and structural steel, and use of tools common to material layout.
WLDG 180	Shielded Metal Arc Welding	4	Theory and safe operation of shielded metal arc welding (SMAW) of carbon steel on plate and structural components in all positions to industry standards. Visual inspection and destructive testing used to determine acceptability based upon industry standards (American Welding Society Structural Welding Code-Steel). Power sources and electrodes are covered in depth. Materials are prepared using mechanical plate shears and thermal cutting techniques. Thermal cutting techniques are examined relative to theory of operation and safe practices. Processes used are oxy-fuel cutting, plasma arc cutting, and air carbon arc cutting. Theory and operation of oxyacetylene welding examined.
WLDG 205	Applied Metallurgy	4	Covers the manufacturing of iron and steel. Examination of physical and mechanical properties. Phase changes with the application of heating and cooling cycles. Ferrous crystal types and properties. Suggested welding procedures for low, medium, and high carbon steels, alloy steels, and cast iron.
	Total Credits	19	

4/2014

ITEM 164-1010+C0714

Request for Bitterroot College-UM to offer a Tier 1 Welding Program-SWAMMEI

THAT

The Board of Regents of Higher Education authorizes the Bitterroot College-UM to offer a Tier 1 Welding Program.

EXPLANATION

Colleges participating in SWAMMEI Tier I Welding have agreed to teach to a common set of learning outcomes. These learning outcomes are well aligned with the NCCER Core and Level I industry-recognized-credential, providing students an opportunity to earn these credentials as part of their course of study. The SWAMMEI Tier I Welding program serves as entry-level training for students pursuing an occupation in welding or welding fabrication. Great Falls College serves as the lead institution for SWAMMEI's welding strategy. Students that complete a SWAMMEI Tier I welding program will be provided a College certificate of completion and a NCCER Level I professional certificate.

ATTACHMENTS

Level I Request Form

Curriculum Proposal Form

Attachment 1: Curriculum

Item Number: 164-1010+C0714

Meeting Date: July 10, 2014

Institution: Bitterroot College-UM

CIP Code: 48.0508

Program Title: SWAMMEI Tier I Welding Program

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 for Academic and Student Affairs, by no later than five weeks prior to the final posting date for the next scheduled meeting of the Board. The Deputy Commissioner will review the proposal and respond to the proposing campus with any questions or concerns within one week, allowing the proposing campus one week to respond before the Item is posted for the BOR scheduled meeting.

 A. Level I (place an X for all that apply):

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- 1. Re-titling existing majors, minors, options and certificates**
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- 7. Placement of program into moratorium** (No Program Termination Checklist at this time – document steps taken to notify students, faculty, and other constituents and include this information on checklist at time of termination if not reinstated)
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- 9. Terminate/withdraw existing majors, minors, options, and certificates** (Submit with completed Program Termination Checklist)

B. Level I with Level II documentation:

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

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 X D. Campus Certificates

Although certificate programs of 29 credits or fewer may be implemented by the individual campuses without approval by the board of regents, those certificates do need to be reported to the office of the commissioner of higher education and listed on the Montana University System's official degree and program inventory. These Level I proposals will be listed as information items at the next regular meeting of the board.

Specify Request:

Colleges participating in SWAMMEI Tier I Welding have agreed to teach to a common set of learning outcomes. These learning outcomes are well aligned with the NCCER Core and Level I industry-recognized-credential, providing students an opportunity to earn these credentials as part of their course of study. Students that complete a SWAMMEI Tier I welding program will be provided a College certificate of completion and a NCCER Level I professional certificate.

1. Overview

SWAMMEI is a \$25 million dollar grant project funded by the US Department of Education that helps 13 Montana Colleges augment and enhance occupational training in 8 distinct occupational areas. The grant specifies that colleges will adopt “stacked credentials” to serve students in these specific occupational training programs. Stacked credential programs are comprised of industry-driven tiers of training (typically aligning with a semester’s worth of training). Each tier is designed to be commensurate with developing a complete set of skills, considered to add value to potential employees by employers. When possible, tiers have also been aligned with completion of industry-recognized credentials (e.g. NCCER Level I for welding). Students completing tiers can choose to enter the workforce upon completion of a tier or continue their education by continuing into additional training tiers. After completion of each tier students will earn a professional certificate from participating colleges and will have had the opportunity to earn industry-recognized credentials as well. The overall intent is to enhance labor market payoffs for students by reducing the amount of time in training and increasing documentation of student’s competencies prior to completion of a two-year degree.

Colleges engaged in SWAMMEI have agreed to identify common learning outcomes that students will gain in order to complete each tier. Upon completion of articulation agreements, students will gain an opportunity to seamlessly transfer between consortium member colleges into subsequent training tiers.

In some cases, adoption of the stacked credential model is possible with small tweaks to existing CAS and AAS curricula – in essence, providing more off-ramps and on-ramps into these programs. Some courses are also being converted into online formats to allow students in remote areas of the state to participate.

The SWAMMEI Tier I Welding program serves as entry-level training for students pursuing an occupation in welding or welding fabrication. Great Falls College serves as the lead institution for SWAMMEI’s welding strategy. The strategy also includes the following 2-year colleges within the MUS: Bitterroot College, City College, Dawson Community College, Flathead Valley Community College, Gallatin College, Helena College, Highlands College and Missoula College. Fort Peck Community College and Little Big Horn College are also participating in this strategy through the grant.

2. Provide a one paragraph description of the proposed program. Be specific about what degree, major, minor or option is sought.

Colleges participating in SWAMMEI Tier I Welding have agreed to teach to a common set of learning outcomes. These learning outcomes are well aligned with the NCCER Core and Level I industry-recognized-credential, providing students an opportunity to earn these credentials as part of their course of study. Students that complete a SWAMMEI Tier I welding program will be provided a College certificate of completion and a NCCER Level I professional certificate.

3. Need

A. To what specific need is the institution responding in developing the proposed program?

The SWAMMEI grant is aimed at enhancing labor market payoffs for students by reducing the amount of time they spend in training in order to become qualified for jobs in industry. The college is responding by creating additional off-ramps and on-ramps into existing welding programs by adopting

a stacked credential model. The stacked credential model provides students a certificate/professional certificate upon successful completion of each Tier of training which prepares them for entry-level work that requires some post-secondary training.

B. How will students and any other affected constituencies be served by the proposed program?

All SWAMMEI partners have worked closely (and will continue to work closely) with business partners to ensure that training programs align with workforce demands. This outreach should enhance the fit of our students with local businesses. Students gain from efficient programs that employers have participated in creating and condoning. Students also gain the benefit of additional options for continuing their education or going straight into employment.

C. What is the anticipated demand for the program? How was this determined?

Overall, it is anticipated that 587 students are likely to be engaged in Tier I training prior to fall semester of 2016 (515 at MUS college campuses). These numbers were derived during development of the SWAMMEI project with each colleges providing best-guess estimates based upon historical enrollment data. Bitterroot College anticipates serving 20 students per year based upon anticipated demand in the community and the historical demand for the Missoula College program.

4. Institutional and System Fit

A. What is the connection between the proposed program and existing programs at the institution?

The SWAMMEI stacked credential approach essentially breaks our existing AAS program into 4 certificate components. By completing multiple tiers a student will be completing very similar curricular work and expectations as in existing programs.

B. Will approval of the proposed program require changes to any existing programs at the institution? If so, please describe.

No. It provides students additional opportunities but does not change or limit existing opportunities.

C. Describe what differentiates this program from other, closely related programs at the institution (if appropriate).

This program creates a shorter term training program that prepares students for entry-level jobs in the industry (i.e. Welders helper). Existing programs train students for higher paying wages in that same industry but with no current off ramp prior to completion of the degree program.

D. How does the proposed program serve to advance the strategic goals of the institution?

This program is well aligned with the workforce demand of local employers. This alignment should help increase completion and placement rates of program completers. The mission of Bitterroot College is to connect a diverse rural community to a wide array of learning opportunities. We support student success, lifelong learning, and community engagement through responsive and accessible academics, workforce preparation, and enrichment programming. A workforce development strategic plan goal is to develop and market Bitterroot College certificates and short-term training opportunities for all student groups.

- E. Describe the relationship between the proposed program and any similar programs within the Montana University System. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and if no efforts were made, explain why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement(s) as part of the documentation.**

The SWAMMEI program intentionally creates parallel program at participating institutions, based around a set of commonly-agreed-upon learning outcomes for each tier. This will allow seamless student transfer between colleges in this tiered system. Articulation agreements are still being developed within the grant's short implementation timeline, but there a common understanding among consortium members about the benefit for students of articulation between tiers.

5. Program Details

- A. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog or other publications. NOTE: In the case of two-year degree programs and certificates of applied science, the curriculum should include enough detail to determine if the characteristics set out in Regents' Policy 301.12 have been met.**

Attached is the Bitterroot College Welding Tier I Certification curriculum document.

- B. Describe the planned implementation of the proposed program, including estimates of numbers of students at each stage.**

With approval from the Board of Regents, and pursuant to USDOL grant guidelines, implementation of the SWAMMEI Tier I Welding programs will begin Fall Semester of 2014. It is estimated that 18-22 students will enter the training program in fall. Subsequent tiers of the SWAMMEI program will be brought to the Board of Regents in time to allow students to continue seamlessly into subsequent tiers. Overall it is estimated that at least 515 students in the MUS or will enter welding training associated with the SWAMMEI project prior to Fall of 2016. Bitterroot College anticipates serving 20 students per year based upon anticipated demand in the community and the historical demand for the Missoula College programs.

6. Resources

- A. Will additional faculty resources be required to implement this program? If yes, please describe the need and indicate the plan for meeting this need.**

In most cases, SWAMMEI Tiers create an additional training option for students within current programs; and, therefore additional faculty resources are not required. In circumstances where SWAMMEI has catalyzed creation of new programs or where significant additional time and energy was anticipated by colleges, funds were included in the approved SWAMMEI budget for new (initially) grant-funded positions. To agree to common learning outcomes related to the SWAMMEI tiers, faculty have been asked to contribute time and travel (in some cases) to face-to-face meetings with other faculty. Travel has been reimbursed, to this point, through SWAMMEI grant funds.

B. Are other, additional resources required to ensure the success of the proposed program? If yes, please describe the need and indicate the plan for meeting this need.

Integration of industry recognized credentials into programs typically requires an institution and/or faculty to become accredited by the national association governing the credentials, in this case the NCCER. It will cost each participating faculty roughly \$150 to gain NCCER training. This money will be covered by each college's SWAMMEI funds.

7. Assessment

How will the success of the program be measured?

As part of the SWAMMEI project, grant staff will track the following outcome measures for each program:

Annual graduation rate for all students by program; employment rate of program completers by program; employment retention rate of completers, one year following program completion, by program; average earnings of completers, one to three years following program completion, by program; transfer rate for program that have facilitating transfers as a substantial part of their mission; total number of participants employed at enrollment who receive a wage increase post-enrollment; total number of participants retained in employment after grant-funded program of study completion; total number of participants employed after grant-funded program of study completion; total number of participants enrolled in further education after grant-funded program of study completion; total number of participants earning credential; total number of participants completing credit hours; total number of participants still retained in their program of study or another TAACCCT-funded program; total number of participants who have completed a TAACCCT funded program, and; total unique participants served

Success for grant purposes will be based upon the number of students enrolling in, completing, obtaining employment and retained in employment as per the outcome estimates included in our approved grant application.

For purposes of long-term success, the newer certificate program data will be compared to previous CAS/AAS completion-rate, placement-rate, wage-rate, employment-retention to assess if the new mechanism is leading to improved labor market outcomes for students.

8. Process Leading to Submission

Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.

During development of the SWAMMEI grant, significant work was done to engage local businesses across the state in conversations about their workforce needs and specific training that would help meet those workforce needs. Their input helped the state-wide SWAMMEI partners identify target occupations and training programs to include in the project. During development of the project, in the time available, the project's steering committee engaged faculty and administrators to identify college needs in order to deliver targeted training programs. College CEOs/Deans/Presidents were frequently involved in the project's direction.

After the grant's award as announced by USDOL, faculty at participating colleges from around the state

met to discuss common learning outcomes. Outreach to business partners and other related businesses has continued with an intention to increase that engagement radically in the coming months through grant-funded workforce navigators that will conduct more specific outreach.

These navigators also work very intimately with Montana Department of Labor One-Stop Centers in their local community. The navigators help identify and recruit individuals that would be well-served by grant-funded programs.

The USDOL grant mandates that grant-funded programs begin by fall of 2014. This timeline dictates a very aggressive approval process that frankly falls out of sync with MUS typical approval processes. In order to meet the \$25 million USDOL grant timeline colleges will submit their Level I approval with Level II documentation requests to UM Provost Office by May 19th and to Board of Regents by May 30th to allow Regents to consider the requests during their July meeting. Colleges have submitted programs through a fast-track approval process on their own campuses to accommodate USDOL's timeline. Subsequent to Board of Regents approval, approval requests will be forwarded to Northwest Commission on Colleges and Universities (NWCCU). NWCCU has been apprised of the grant, the potential influx of program approval requests and has expressed that they are prepared to assess these requests quickly with an expectation to response by late July or August 2014. New certificate programs will then be forwarded to US Department of Education to consider each program's eligibility for financial aid status. It is expected that USDOE will have responded by mid-fall.

The Missoula College program will not substantively change and provides this tiered program initiative as an informational item for the University of Montana-Missoula curriculum review process. Bitterroot College as a collaborating UM-M unit offers the Missoula College Welding program courses. Thus, both the Missoula College and Bitterroot College submit at the same time.

Welding Tier I Certification

Course Number	Title	Credits	Course Catalog Description
CAPP 120	Introduction to Computers	3	Introduction to computer terminology, hardware, and software, including wire/wireless communications and multimedia devices. Students utilize word processing, spread sheet, database, and presentation applications to create projects common to business and industry in a networked computing environment. Internet research, email usage, and keyboarding proficiency are integrated.
M 111	Technical Mathematics	3	Prereq., ALEKS placement ≥ 2 . Designed to provide the mathematical background necessary for success in the industrial areas. Topics covered include percent, ratio proportion, formula evaluation, basic algebra and geometry concepts, trigonometry, measurement, statistics, and graphing. Markdowns, inventory turnover, and other basic formulas. Credit does not count toward Associate of Arts or Baccalaureate degrees.
MCH 114	Related Metals Processes II	3	Instruction and use of drills, files, threads and threading processes, basic lathe, drill press, and band saw operation, including precision measuring instruments. Fasteners, layout procedures, and basic hand tools are covered.
WLDG 150	Welding Layout Techniques	2	Using practical layout techniques students develop basics for blueprint construction, layout on pipe and structural steel, and use of tools common to material layout.
WLDG 180	Shielded Metal Arc Welding	4	Theory and safe operation of shielded metal arc welding (SMAW) of carbon steel on plate and structural components in all positions to industry standards. Visual inspection and destructive testing used to determine acceptability based upon industry standards (American Welding Society Structural Welding Code-Steel). Power sources and electrodes are covered in depth. Materials are prepared using mechanical plate shears and thermal cutting techniques. Thermal cutting techniques are examined relative to theory of operation and safe practices. Processes used are oxy-fuel cutting, plasma arc cutting, and air carbon arc cutting. Theory and operation of oxyacetylene welding examined.
WLDG 205	Applied Metallurgy	4	Covers the manufacturing of iron and steel. Examination of physical and mechanical properties. Phase changes with the application of heating and cooling cycles. Ferrous crystal types and properties. Suggested welding procedures for low, medium, and high carbon steels, alloy steels, and cast iron.
	Total Credits	19	

4/2014

Welding Technology Program--Missoula College University of Montana

ITEM 164-1501+C0714

Request for Montana Tech to establish a Welding Technology Professional Certificate-SWAMMEI

THAT

In accordance with Montana University System Policy, the Board of Regents of Higher Education authorizes Highlands College of Montana Tech to establish a Welding Technology Professional Certificate.

EXPLANATION

Highlands College of Montana Tech will implement a 20 credit Welding Technology Professional Certificate beginning Fall 2014. The Welding Technology Professional Certificate is a stackable credential leading either to placement in the work force or continuation to the Certificate of Applied Science (CAS) in Welding Technology. This professional certificate represents Tier 1 of the Welding Technology CAS approved in the March, 2014 BOR meeting as part of the Strengthening Workforce Alignment in Montana's Manufacturing and Energy Industries (SWAMMEI) initiative.

ATTACHMENTS

Level I Request Form

Curriculum Proposal Form

Item Number: 164-1501+C0714

Meeting Date: July 10, 2014

Institution: Highlands College of Montana Tech

CIP Code: 48.0508

Program Title: Welding Technology Professional Certificate

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 for Academic and Student Affairs, by no later than five weeks prior to the final posting date for the next scheduled meeting of the Board. The Deputy Commissioner will review the proposal and respond to the proposing campus with any questions or concerns within one week, allowing the proposing campus one week to respond before the Item is posted for the BOR scheduled meeting.

 A. Level I (place an X for 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. For Level I actions on degree programs or certificates, the process must begin when the proposing campus posts its intent on the MUS academic planning web site.

- 1. Re-titling existing majors, minors, options and certificates**
- 2. Adding new minors or certificates where there is a major** (Submit with completed Curriculum Proposals Form)
- 3. Adding new minors or certificates where there is an option in a major** (Submit with completed Curriculum Proposals Form)
- 4. Departmental mergers and name changes**
- 5. Program revisions** (Submit with completed Curriculum Proposals Form)
- 6. Distance or online delivery of previously authorized degree or certificate programs**
- 7. Placement of program into moratorium** (No Program Termination Checklist at this time – document steps taken to notify students, faculty, and other constituents and include this information on checklist at time of termination if not reinstated)
- 8. Filing Notice of Intent to Terminate/Withdraw existing majors, minors, options, and certificates** (No Program Termination Checklist at this time)
- 9. Terminate/withdraw existing majors, minors, options, and certificates** (Submit with completed Program Termination Checklist)

B. Level I with Level II documentation:

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

1. Options within an existing major or degree (*Submit with completed Curriculum Proposals Form*);

2. Eliminating organizational units within larger institutions such as departments, divisions and colleges or schools with the exception of the Colleges of Technology where changes require Board action (*Submit with completed Curriculum Proposals Form*)

3. Consolidating existing programs and/or degrees (*Submit with completed Curriculum Proposals Form*)

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.

All other Level I 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.

X D. Campus Certificates

Although certificate programs of 29 credits or fewer may be implemented by the individual campuses without approval by the board of regents, those certificates do need to be reported to the office of the commissioner of higher education and listed on the Montana University System's official degree and program inventory. These Level I proposals will be listed as information items at the next regular meeting of the board.

Specify Request:

Highlands College of Montana Tech will implement a 20 credit Welding Technology Professional Certificate beginning Fall 2014. The Welding Technology Professional Certificate is a stackable credential leading either to placement in the work force or continuation to the Certificate of Applied Science (CAS) in Welding Technology. This professional certificate represents Tier 1 of the Welding Technology CAS approved in the March, 2014 BOR meeting as part of the Strengthening Workforce Alignment in Montana's Manufacturing and Energy Industries (SWAMMEI) initiative. Please see attachment with Welding Technology Professional Certificate identified.

WELDING TECHNOLOGY
CERTIFICATE OF APPLIED SCIENCE DEGREE

Note: The highlighted section below outlines the Tier 1 Welding Technology Professional Certificate

OUTCOMES: GRADUATES ARE PREPARED TO:

- Meet safety requirements.
- Produce welds in all positions that meet industry standards using the following process (es):
 - Shielded Metal Arc Welding (SMAW)
 - Flux Cored Arc Welding (FCAW)
 - Gas Metal Arc Welding (GMAW)
 - Make cuts that meet industry standards
- Understand the use of measuring instruments and their purpose.
- Understand power sources and current types.
- Interpret welding blueprints and weld symbols.
- Read, interpret, and produce solutions to applications at the introductory technical mathematics level.

ESTIMATED RESIDENT PROGRAM COST*:

Tuition and Fees	\$	3226
Application Fee	\$	30
Program Fees	\$	250
Tools/clothing	\$	varies
Books/Supplies	\$	500
TOTAL	\$	4,006+

***Fall 2014, MUS Student Health Insurance Premium may be changing.**

Welding Technology Program
Certificate of Applied Science Degree

Fall Entry Only

Course Number	Course Title	Credits	Semester Completed	Transfer or Waive	Grade
First Semester					
WLDG 105	Shop Safety	1			
WLDG 112	Cutting Processes	1			
WLDG 180	Shielded Metal Arc Welding (SMAW)	4			
WLDG 117	Blueprint Read & Welding Symbols	3			
WLDG 275	Gas Metal Arc Welding (GMAW)	4			
WLDG 187	Flux Core Arc Welding (FCAW)	4			
M 111 or M 90	Technical Math or Intro to Algebra	3 3			
	Credits (Fall)	20			
Second Semester					
WLDG 205	Applied Metallurgy	3			
WLDG 282	AWS Level I SENSE Certification	4			
WLDG 155	Design & Fabrication	4			
WLDG 140	Gas Tungsten Arc Welding (GTAW)	3			
WLDG 291	Special Topics	1			
PSYX 100 COMM 110	Introduction to Psychology or Interpersonal Communications	3			
WRIT 104 or WRIT 095	Workplace Communications or Developmental Writing	3 3			
	Credits (Spring)	21			
	Total Program Credits	41			

1. Overview

SWAMMEI is a \$25 million dollar grant project funded by the US Department of Labor that helps 13 Montana Colleges augment and enhance occupational training in 8 distinct occupational areas. The grant specifies that colleges will adopt “stacked credentials” to serve students in these specific occupational training programs. Stacked credential programs are comprised of industry-driven tiers of training (typically aligning with a semester’s worth of training). Each tier is designed to be commensurate with developing a complete set of skills, considered to add value to potential employees by employers. When possible, tiers have also been aligned with completion of industry-recognized credentials (e.g. NCCER Level I for welding). Students completing tiers can choose to enter the workforce upon completion of a tier or continue their education by continuing into additional training tiers/semesters. After completion of each tier/semester students will earn a professional certificate from participating colleges and will have had the opportunity to earn industry-recognized credentials as well. The overall intent is to enhance labor market payoffs for students by reducing the amount of time in training and increasing documentation of student’s competencies prior to completion of a degree.

Colleges engaged in SWAMMEI have agreed to identify common learning outcomes that students will gain in order to complete each tier. Upon completion of articulation agreements, students will gain an opportunity to seamlessly transfer between consortium member colleges into subsequent training tiers.

In some cases, adoption of the stacked credential model is possible with small tweaks to existing CAS and AAS curricula – in essence, providing more off-ramps and on-ramps into these programs.

The SWAMMEI Tier I Welding Technology program serves as entry-level training for students pursuing an occupation as welders.

2. Provide a one paragraph description of the proposed program. Be specific about what degree, major, minor or option is sought.

Colleges participating in SWAMMEI Tier I welding have agreed to teach to a common set of learning outcomes. These learning outcomes are well aligned with entry-level aspects of the NCCER industry-recognized-credentials, providing students an opportunity to earn credentials as part of their course of study. Students that complete a SWAMMEI Tier I Welding Technology Professional Certificate.

3. Need

A. To what specific need is the institution responding in developing the proposed program?

The SWAMMEI grant is aimed at enhancing labor market payoffs for students by reducing the amount of time they spend in training in order to become qualified for jobs in industry. The college is responding by creating additional off-ramps and on-ramps into existing machining programs by adopting a stacked credential model. The stacked credential model provides students a certificate/professional certificate upon successful completion of each Tier of training which prepares them for entry-level work that requires some post-secondary training.

B. How will students and any other affected constituencies be served by the proposed program?

All SWAMMEI partners have worked closely (and will continue to work closely) with business partners to ensure that training programs align with workforce demands. Students gain from efficient programs that employers have participated in creating and condoning. Students also gain the benefit of additional options for continuing their education.

C. What is the anticipated demand for the program? How was this determined?

Overall, it is anticipated that 226 students are likely to be engaged in Tier I training prior to fall semester of 2016. These numbers were derived during development of the SWAMMEI project with each college providing best-guess estimates based upon historical enrollment data. Highlands College anticipates serving 10 students per year, this is the maximum based on capacity of the facility.

4. Institutional and System Fit

A. What is the connection between the proposed program and existing programs at the institution?

Highlands College has already secured approval from the BOR for a CAS in Welding Technology. This professional certificate breaks that CAS into two professional certificates that can be stacked into one CAS. By completing multiple tiers a student will be completing very similar curricular work and expectations as in existing programs.

B. Will approval of the proposed program require changes to any existing programs at the institution? If so, please describe.

No. It provides students additional opportunities but does not change or limit existing opportunities.

C. Describe what differentiates this program from other, closely related programs at the institution (if appropriate).

This program creates a shorter term training program. Existing programs train students for higher paying wages in that same industry but with no current off ramp prior to completion of the degree program.

D. How does the proposed program serve to advance the strategic goals of the institution?

This program is well aligned with the workforce demand of local employers. This alignment should help increase completion and placement rates of program completers.

E. Describe the relationship between the proposed program and any similar programs within the Montana University System. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and if no efforts were made, explain why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement(s) as part of the documentation.

The SWAMMEI program intentionally creates parallel programs at participating institutions, based around a set of commonly-agreed-upon learning outcomes for each tier. This will allow seamless student transfer between colleges in this tiered system. Articulation agreements are still being

developed within the grant's short implementation timeline, but there is a common understanding among consortium members about the benefit for students of articulation between tiers.

5. Program Details

A. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog or other publications. NOTE: In the case of two-year degree programs and certificates of applied science, the curriculum should include enough detail to determine if the characteristics set out in Regents' Policy 301.12 have been met.

Course Number	Course Title	Credits
First Semester		
WLDG 105	Shop Safety	1
WLDG 112	Cutting Processes	1
WLDG 180	Shielded Metal Arc Welding (SMAW)	4
WLDG 117	Blueprint Read & Welding Symbols	3
WLDG 275	Gas Metal Arc Welding (GMAW)	4
WLDG 187	Flux Core Arc Welding (FCAW)	4
M 111	Technical Math	3
	Credits (Fall)	20

WLDG105 Shop Safety

Credits: 1 Prerequisites: Enrolled in Highlands College Welding Program

Safe work practices are paramount in all aspects of industrial work. Students will receive training in each piece of equipment using manufacturers' safety recommendations. Students will learn to identify and follow safe work practices as well as inspections of power equipment (portable and stationary), hand tools, and also demonstrate the safe and proper use of each tool.

WLDG112 Cutting Processes

Credits: 1 Prerequisites: Enrolled in Highlands College Welding Program

This course will examine the different cutting processes used in today's welding industry. The cutting processes examined in this course are Oxy Fuel, Plasma Arc, and Carbon Arc cutting. Hands on training will be administered throughout this course to ensure that proper technique and safety measures are met with all above mentioned cutting processes.

WLDG180 Shielded Metal Arc Welding

Credits: 4 Prerequisites: Enrolled in Highlands College Welding Program This course starts with a basic understanding of the stick welding process, including the concepts of basic electricity, filler metals, and applications. A hands-on welding experience is gained through multiple steps and exercises, using multiple welding filler metals and welding positions. An American Welding Society certification can be obtained at the end of the course.

WLDG 275 Gas Metal Arc Welding

4 cr. Offered Fall. Prereq., Enrolled in Highlands College Welding Program Theory and safe operation of Gas Metal Arc Welding (GMAW). Theory of flux core arc welding applied to GMAW. Primary focus on application, practical skill development, and producing welds that meet industry standards. Metals welded are low carbon steel, stainless steel, and aluminum. Short circuit arc and spray arc transfer used. Examination of gas and electrode selection.

WLDG 187 Flux Core Arc Welding

4 cr. Offered Fall. Prereq. Enrolled in Highlands College Welding Program. Theory, practice, and safe operation of flux core arc welding equipment. Coupons are welded in the flat, horizontal, and vertical positions to industry standards using a variety of welding electrodes, diameters, and power sources, which prepare students for welding qualification to the American Welding Society Structural Welding Code specifications.

WLDG117 Blueprint Reading and Weld Symbols

Credits: 3 Prerequisites: Enrolled in Highlands College Welding Program

This course covers the basics for understanding the reading of blueprints and shop drawings. The use of AWS welding symbols for blueprint reading is also covered.

M 111 Technical Mathematics

3 credits (Hrs: 3 Lec.)

This course presents basic mathematical topics as they are applied in a technical program. Topics covered include percent, ratio proportion, formula evaluation, basic algebra and geometry concepts, trigonometry and measurement are developed and integrated in a technical.

6. Resources

A. Will additional faculty resources be required to implement this program? If yes, please describe the need and indicate the plan for meeting this need.

In this case, SWAMMEI Tiers create an additional training option for students within our current program, and therefore additional faculty resources are not required.

B. Are other, additional resources required to ensure the success of the proposed program? If yes,

please describe the need and indicate the plan for meeting this need.

Integration of industry recognized credentials into programs typically requires an institution and/or faculty to become accredited by the national association governing the credentials, in this case NCCER credentials. There are costs associated with faculty becoming registered and credentialed with NCCER. These costs may be covered either by integrating fees into programs fees, upon BoR approval to do so, or will accrue to the student independent of course fees.

7. Assessment

How will the success of the program be measured?

As part of the SWAMMEI project, grant staff will track the following outcome measures for each program:

Annual graduation rate for all students by program; employment rate of program completers by program; employment retention rate of completers, one year following program completion, by program; average earnings of completers, one to three years following program completion, by program; transfer rate for program that have facilitating transfers as a substantial part of their mission; total number of participants employed at enrollment who receive a wage increase post-enrollment; total number of participants retained in employment after grant-funded program of study completion; total number of participants employed after grant-funded program of study completion; total number of participants enrolled in further education after grant-funded program of study completion; total number of participants earning credential; total number of participants completing credit hours; total number of participants still retained in their program of study or another TAACCCT-funded program; total number of participants who have completed a TAACCCT funded program, and; total unique participants served

Success for grant purposes will be based upon the number of students enrolling in, completing, obtaining employment and retained in employment as per the outcome estimates included in our approved grant application.

For purposes of long-term success, the newer certificate program data will be compared to previous CAS/AAS completion-rate, placement-rate, wage-rate, employment-retention to assess if the new mechanism is leading to improved labor market outcomes for students.

8. Process Leading to Submission

Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.

During development of the SWAMMEI grant, significant work was done to engage local businesses across the state in conversations about their workforce needs and specific training that would help meet those workforce needs. Their input helped the state-wide SWAMMEI partners identify target occupations and training programs to include in the project. During development of the project, in the time available, the project's steering committee engaged faculty and administrators to identify college needs in order to deliver targeted training programs. College CEOs/Deans/Presidents were frequently involved in the project's direction.

After the grant's award as announced by USDOL, faculty at participating colleges from around the state met to discuss common learning outcomes. Outreach to business partners and other related businesses

has continued with an intention to increase that engagement radically in the coming months through grant-funded workforce navigators that will conduct more specific outreach.

These navigators also work very intimately with Montana Department of Labor One-Stop Centers in their local community. The navigators help identify and recruit individuals that would be well-served by grant-funded programs.

The USDOL grant mandates that grant-funded programs begin by fall of 2014. This timeline dictates a very aggressive approval process that frankly falls out of sync with MUS typical approval processes. In order to meet the \$25 million USDOL grant timeline colleges will submit their Level I approval with Level II documentation requests to Board of Regents by April 18th to allow Regents to consider the requests during their May meeting. Colleges have run programs through a fast-track approval process on their own campuses to accommodate USDOL's timeline. Subsequent to Board of Regents approval, approval requests will be forwarded to Northwest Commission on Colleges and Universities (NWCCU). NWCCU has been apprised of the grant, the potential influx of program approval requests and has expressed that they are prepared to assess these requests quickly with an expectation to response by late July or August 2014. New certificate programs will then be forwarded to US Department of Education to consider each program's eligibility for financial aid status. It is expected that USDOE will have responded by mid-fall.

July 10, 2014

ITEM 164-1502+C0714

Request for Montana Tech to establish a Machining Technology Professional Certificate

THAT

In accordance with Montana University System Policy, the Board of Regents of Higher Education authorizes Highlands College of Montana Tech to establish a Machining Technology Professional Certificate.

EXPLANATION

Highlands College of Montana Tech will implement a 19 credit Machining Technology Professional Certificate beginning Fall 2014. The Machining Technology Professional Certificate is a stackable credential leading either to placement in the work force or continuation to the Certificate of Applied Science (CAS) in Machining Technology. This professional certificate represents Tier 1 of the Machining Technology CAS approved in the March, 2014 BOR meeting as part of the Strengthening Workforce Alignment in Montana's Manufacturing and Energy Industries (SWAMMEI) initiative.

ATTACHMENTS

Level I Request Form

Curriculum Proposal Form

Item Number: 164-1502+C0714

Meeting Date: July 10, 2014

Institution: Highlands College of Montana Tech

CIP Code: 48.0510

Program Title: Machining Technology Professional Certificate

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 for Academic and Student Affairs, by no later than five weeks prior to the final posting date for the next scheduled meeting of the Board. The Deputy Commissioner will review the proposal and respond to the proposing campus with any questions or concerns within one week, allowing the proposing campus one week to respond before the Item is posted for the BOR scheduled meeting.

 A. Level I (place an X for 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. For Level I actions on degree programs or certificates, the process must begin when the proposing campus posts its intent on the MUS academic planning web site.

- 1. Re-titling existing majors, minors, options and certificates**
- 2. Adding new minors or certificates where there is a major (Submit with completed Curriculum Proposals Form)**
- 3. Adding new minors or certificates where there is an option in a major (Submit with completed Curriculum Proposals Form)**
- 4. Departmental mergers and name changes**
- 5. Program revisions (Submit with completed Curriculum Proposals Form)**
- 6. Distance or online delivery of previously authorized degree or certificate programs**
- 7. Placement of program into moratorium (No Program Termination Checklist at this time – document steps taken to notify students, faculty, and other constituents and include this information on checklist at time of termination if not reinstated)**
- 8. Filing Notice of Intent to Terminate/Withdraw existing majors, minors, options, and certificates (No Program Termination Checklist at this time)**
- 9. Terminate/withdraw existing majors, minors, options, and certificates (Submit with completed Program Termination Checklist)**

 B. Level I with Level II documentation:

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

___ **1. Options within an existing major or degree** (Submit with completed Curriculum Proposals Form);

___ **2. Eliminating organizational units within larger institutions such as departments, divisions and colleges or schools with the exception of the Colleges of Technology where changes require Board action** (Submit with completed Curriculum Proposals Form)

___ **3. Consolidating existing programs and/or degrees** (Submit with completed Curriculum Proposals Form)

___ **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.

All other Level I 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.

X **D. Campus Certificates**

Although certificate programs of 29 credits or fewer may be implemented by the individual campuses without approval by the board of regents, those certificates do need to be reported to the office of the commissioner of higher education and listed on the Montana University System's official degree and program inventory. These Level I proposals will be listed as information items at the next regular meeting of the board.

Specify Request:

Highlands College of Montana Tech will implement a 19 credit Machining Technology Professional Certificate beginning Fall 2014. The Machining Technology Professional Certificate is a stackable credential leading either to placement in the work force or continuation to the Certificate of Applied Science (CAS) in Machining Technology. This professional certificate represents Tier 1 of the Machining Technology CAS approved in the March, 2014 BOR meeting as part of the Strengthening Workforce Alignment in Montana's Manufacturing and Energy Industries (SWAMMEI) initiative. Please see attachment with Machining Technology Professional Certificate identified.

MACHINING TECHNOLOGY
CERTIFICATE OF APPLIED SCIENCE DEGREE

Note: The highlighted section below outlines the Tier 1 Machining Technology Professional Certificate

OUTCOMES: GRADUATES ARE PREPARED TO:

- Meet safety requirements.
- Understand and utilize hand tools, precision measuring tools, taps & dies, layout. Beginning use of drilling machines, lathes, pedestal grinders, drill bit and lathe tool sharpening. Speeds and feed rates,
- Understand the use of measuring instruments and their purpose.
- Understand power sources and current types.
- Interpret machining blueprints and symbol interpretation.
- Read, interpret, and produce solutions to applications at the introductory technical mathematics level.

ESTIMATED RESIDENT PROGRAM COST*:

Tuition and Fees	\$	3226
Application Fee	\$	30
Program Fees	\$	450
Tools/clothing	\$	varies
Books/Supplies	\$	500
TOTAL	\$	4,206+

***Fall 2014, MUS Student Health Insurance Premium may be changing.**

Machining Technology Program Certificate of Applied Science Degree

Fall Entry Only

Course Number	Course Title	Credits	Semester Completed	Transfer or Waive	Grade
First Semester					
MCH 268	CNC I	3			
MCH 120	Blue print Reading & Interpretation for Machining	3			
MCH 160	Machine Shop I	3			
MCH 245	Shop Practices	2			
MCH 129	Machine Quality Control & Precision Measurement	3			
M 111 or M 90	Technical Math or Intro to Algebra	3 3			
MCH 230	Tooling & Fixtures Used in CNC	2			
	Credits (Fall)	19			
Second Semester					
MCH 260	Machine Shop II	3			
MCH 269	CNC II	3			
MCH 240	Metallurgy	2			
MCH 265	Advanced Machining & Manufacturing	4			
MCH 231	CNC Turning Operations Level 1	3			
MCH 291	Special Topic	1			
PSYX 100 or COMX 115	Introduction to Psychology or Interpersonal Communications	3 3			
WRIT 104 or WRIT 095	Workplace Communications or Developmental Writing	3 3			
	Credits (Spring)	22			
	Total Program Credits	41			

1. Overview

SWAMMEI is a \$25 million dollar grant project funded by the US Department of Labor that helps 13 Montana Colleges augment and enhance occupational training in 8 distinct occupational areas. The grant specifies that colleges will adopt “stacked credentials” to serve students in these specific occupational training programs. Stacked credential programs are comprised of industry-driven tiers of training (typically aligning with a semester’s worth of training). Each tier is designed to be commensurate with developing a complete set of skills, considered to add value to potential employees by employers. When possible, tiers have also been aligned with completion of industry-recognized credentials (e.g. NIMS Level I for machining). Students completing tiers can choose to enter the workforce upon completion of a tier or continue their education by continuing into additional training tiers/semesters. After completion of each tier/semester students will earn a professional certificate from participating colleges and will have had the opportunity to earn industry-recognized credentials as well. The overall intent is to enhance labor market payoffs for students by reducing the amount of time in training and increasing documentation of student’s competencies prior to completion of a two-year degree.

Colleges engaged in SWAMMEI have agreed to identify common learning outcomes that students will gain in order to complete each tier. Upon completion of articulation agreements, students will gain an opportunity to seamlessly transfer between consortium member colleges into subsequent training tiers.

In some cases, adoption of the stacked credential model is possible with small tweaks to existing CAS and AAS curricula – in essence, providing more off-ramps and on-ramps into these programs.

The SWAMMEI Tier I Machining Technology program serves as entry-level training for students pursuing an occupation as machine operators/machinists

2. Provide a one paragraph description of the proposed program. Be specific about what degree, major, minor or option is sought.

Colleges participating in SWAMMEI Tier I machining have agreed to teach to a common set of learning outcomes. These learning outcomes are well aligned with entry-level aspects of the NIMS industry-recognized-credentials, providing students an opportunity to earn credentials as part of their course of study. Students will complete a SWAMMEI Tier I Machining Technology Professional Certificate.

3. Need

A. To what specific need is the institution responding in developing the proposed program?

The SWAMMEI grant is aimed at enhancing labor market payoffs for students by reducing the amount of time they spend in training in order to become qualified for jobs in industry. The college is responding by creating additional off-ramps and on-ramps into existing machining programs by adopting a stacked credential model. The stacked credential model provides students a certificate/professional certificate upon successful completion of each Tier of training which prepares them for entry-level work that requires some post-secondary training.

B. How will students and any other affected constituencies be served by the proposed program?

All SWAMMEI partners have worked closely (and will continue to work closely) with business partners to ensure that training programs align with workforce demands. Students gain from efficient programs that employers have participated in creating and condoning. Students also gain the benefit of additional options for continuing their education.

C. What is the anticipated demand for the program? How was this determined?

Overall, it is anticipated that 226 students are likely to be engaged in Tier I training prior to fall semester of 2016 (116 at MUS college campuses). These numbers were derived during development of the SWAMMEI project with each colleges providing best-guess estimates based upon historical enrollment data. Highlands College anticipates serving 10 students per year, this is the maximum based on capacity of classrooms.

4. Institutional and System Fit

A. What is the connection between the proposed program and existing programs at the institution?

Highlands College has already gotten approval from the BOR for a CAS in Machine Technology. This professional certificate breaks that CAS into two professional certificates that can be stacked into one CAS. By completing multiple tiers a student will be completing very similar curricular work and expectations as in existing programs.

B. Will approval of the proposed program require changes to any existing programs at the institution? If so, please describe.

No. It provides students additional opportunities but does not change or limit existing opportunities.

C. Describe what differentiates this program from other, closely related programs at the institution (if appropriate).

This program creates a shorter term training program. Existing programs train students for higher paying wages in that same industry but with no current off ramp prior to completion of the degree program.

D. How does the proposed program serve to advance the strategic goals of the institution?

This program is well aligned with the workforce demand of local employers. This alignment should help increase completion and placement rates of program completers.

E. Describe the relationship between the proposed program and any similar programs within the Montana University System. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and if no efforts were made, explain why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement(s) as part of the documentation.

The SWAMMEI program intentionally creates parallel programs at participating institutions, based around a set of commonly-agreed-upon learning outcomes for each tier. This will allow seamless student transfer between colleges in this tiered system. Articulation agreements are still being developed within the grant’s short implementation timeline, but there is a common understanding among consortium members about the benefit for students of articulation between tiers.

5. Program Details

- A. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog or other publications. NOTE: In the case of two-year degree programs and certificates of applied science, the curriculum should include enough detail to determine if the characteristics set out in Regents’ Policy 301.12 have been met.**

Course Number	Course Title	Credits
First Semester		
MCH 268	CNC I	3
MCH 120	Blue print Reading & Interpretation for Machining	3
MCH 160	Machine Shop I	3
MCH 245	Shop Practices	2
MCH 129	Machine Quality Control & Precision Measurement	3
MCH 230	Tooling & Fixtures Used in CNC	2
M 111	Technical Math	3
	Credits (Fall)	19

MCH 268 CNC Machining I

3 credits (Hrs: 3 Lec.) This course is designed to expose the students to the basics of Computer Numerically Controlled (CNC) programming. Programming will begin at entry level using G-Codes and M-Codes. MDI (Manual Data Input) will be used to generate programs. Fixtures, jigs, and proper tool selection will be covered. Programs will be written and used on a Haas Mini Mill.

MCH 120 Blueprint Reading and Interpretation for Machining

3 credits (Hrs: 3 Lec.) Blueprint reading covers orthographic projection, line identification, auxiliary and sectional views, dimensioning of drawings, common abbreviations, tolerance, and sketching techniques.

MCH 160 Machine Shop I

3 credits (Hrs: 1 Lec., 4 Lab) Introduction to machine shop practices. Course covers hand tools, precision measuring tools, taps & dies, layout. Beginning use of drilling machines, lathes, pedestal grinders, drill bit and lathe tool sharpening. Speeds and feed rates. Shop safety and PPE

MCH 245 Shop Practices

2 credits (Hrs: ongoing) This is an ongoing semester course during normally scheduled shop hours. It is intended to match students with live, practical shop experiences involving subject matter previously covered in other courses. Emphasis will be on safety and productivity.

MCH 129 Machine Quality Control and Precision Measurements

3 credits (Hrs: 1Lec., 2Lab) Students will develop the knowledge and skills to prepare them to analyze and evaluate the processes and methodology required in an industrial production environment to determine if quality control standards are being met.

Topics include: use of non-precision measuring tools, use of precision measuring tools, use of comparison gauges, and analysis of measurements

MCH 230 Tooling and Fixtures Used in CNC

2 credits (Hrs: 2Lec) Tooling and fixtures used in CNC are discussed in a classroom environment. These topics, for both mill and lathe, will be discussed in order to facilitate the students' ability to select proper work holding devices and cutting tools for various types of machining operations that may be performed. Cutting tool information is one of the most multifaceted areas of study for developing machinists and programmers. Both must be able to discern proper set-ups based on part and tool geometry while providing proper speed and feed data. The use of formulas and reference materials will be studied as a necessary facet of the manufacturing process.

M 111 Technical Mathematics

3 credits (Hrs: 3 Lec.)

This course presents basic mathematical topics as they are applied in a technical program. Topics covered include percent, ratio proportion, formula evaluation, basic algebra and geometry concepts, trigonometry and measurement are developed and integrated in a technical.

6. Resources

A. Will additional faculty resources be required to implement this program? If yes, please describe the need and indicate the plan for meeting this need.

In this case, SWAMMEI Tiers create an additional training option for students within our current program, and therefore additional faculty resources are not required.

B. Are other, additional resources required to ensure the success of the proposed program? If yes, please describe the need and indicate the plan for meeting this need.

Integration of industry recognized credentials into programs typically requires an institution and/or faculty to become accredited by the national association governing the credentials, in this case NIMS credentials. It will cost approximately \$3,000 to certify all interested faculty from SWAMMEI participating colleges. In addition, there are costs associated with students becoming registered and credentialed with NIMS. These costs may be covered either by integrating fees into programs fees, upon BoR approval to do so, or will accrue to the student independent of course fees.

7. Assessment

How will the success of the program be measured?

As part of the SWAMMMEI project, grant staff will track the following outcome measures for each program:

Annual graduation rate for all students by program; employment rate of program completers by program; employment retention rate of completers, one year following program completion, by program; average earnings of completers, one to three years following program completion, by program; transfer rate for program that have facilitating transfers as a substantial part of their mission; total number of participants employed at enrollment who receive a wage increase post-enrollment; total number of participants retained in employment after grant-funded program of study completion; total number of participants employed after grant-funded program of study completion; total number of participants enrolled in further education after grant-funded program of study completion; total number of participants earning credential; total number of participants completing credit hours; total number of participants still retained in their program of study or another TAACCCT-funded program; total number of participants who have completed a TAACCCT funded program, and; total unique participants served

Success for grant purposes will be based upon the number of students enrolling in, completing, obtaining employment and retained in employment as per the outcome estimates included in our approved grant application.

For purposes of long-term success, the newer certificate program data will be compared to previous CAS/AAS completion-rate, placement-rate, wage-rate, employment-retention to assess if the new mechanism is leading to improved labor market outcomes for students.

8. Process Leading to Submission

Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.

During development of the SWAMMEI grant, significant work was done to engage local businesses across the state in conversations about their workforce needs and specific training that would help meet those workforce needs. Their input helped the state-wide SWAMMEI partners identify target occupations and training programs to include in the project. During development of the project, in the time available, the project's steering committee engaged faculty and administrators to identify college

needs in order to deliver targeted training programs. College CEOs/Deans/Presidents were frequently involved in the project's direction.

After the grant's award as announced by USDOL, faculty at participating colleges from around the state met to discuss common learning outcomes. Outreach to business partners and other related businesses has continued with an intention to increase that engagement radically in the coming months through grant-funded workforce navigators that will conduct more specific outreach.

These navigators also work very intimately with Montana Department of Labor One-Stop Centers in their local community. The navigators help identify and recruit individuals that would be well-served by grant-funded programs.

The USDOL grant mandates that grant-funded programs begin by fall of 2014. This timeline dictates a very aggressive approval process that frankly falls out of sync with MUS typical approval processes. In order to meet the \$25 million USDOL grant timeline colleges will submit their Level I approval with Level II documentation requests to Board of Regents by April 18th to allow Regents to consider the requests during their May meeting. Colleges have run programs through a fast-track approval process on their own campuses to accommodate USDOL's timeline. Subsequent to Board of Regents approval, approval requests will be forwarded to Northwest Commission on Colleges and Universities (NWCCU). NWCCU has been apprised of the grant, the potential influx of program approval requests and has expressed that they are prepared to assess these requests quickly with an expectation to response by late July or August 2014. New certificate programs will then be forwarded to US Department of Education to consider each program's eligibility for financial aid status. It is expected that USDOE will have responded by mid-fall.

ITEM 164-1902+C0714

Request for authorization of Helena College-UM to revise two existing and add four new Accounting and Business Technology Certificates

THAT

The Board of Regents of Higher Education authorizes the Helena College University of Montana Accounting and Business Technology program to revise two existing campus certificates and add four.

EXPLANATION

The campus certificates supplement a contemporary learning focus in which students tailor their education toward their interest and work force needs.

- Bookkeeping Specialist (revised) is comprised of 21 credits: ACTG101 Accounting Procedures I, ACTG 102 Accounting Procedures II, ACTG 180 Payroll Accounting, ACTG125 QuickBooks or ACTG205 Computerized Accounting, ACTG211 Income Tax Fundamentals, CAPP156 MS Excel or CSCI172 Intro to Computer Modeling and CAPP266 Advanced MS Excel.
 - Finance Specialist (new) is comprised of 21 credits: ACTG101 Accounting Procedures I, ACTG102 Accounting Procedures II, ACTG211 Income Tax Fundamentals, BGEN105 Intro to Business, BGEN210 Foundations of Business Ethics, BFIN205 Personal Finance, and BFIN265 Intro to Business Finance.
 - Accounting Information Specialist (new) is comprised of 21 credits: ACTG101 Accounting Procedures I, ACTG125 QuickBooks or ACTG205 Computerized Accounting, ACTG211 Income Tax Fundamentals, ACTG230 SABHRS or ACTG180 Payroll Accounting, BMIS270 MIS Foundations for Business, CAPP156 MS Excel or SCCI 172 Intro to Computer Modeling, and CAPP 266 MS Advanced Excel.
 - Human Resource Specialist (revised) is comprised of 21 credits: ACTG101 Accounting Procedures I, ACTG180 Payroll Accounting or ACTG205 Computerized Accounting, BGEN105 Intro to Business, BGEN201 Foundations of Business Ethics or BMGT236 Business Law II, BGMT215 Human Resources Management, BMGT263 Legal Issues in Human Resources, and BMGT235 Business Law.
 - Small Business Specialist (new) is comprised of 21 credits: ACTG101 Accounting Procedures I, ACTG180 Payroll Accounting or ACTG205 Computerized Accounting, BGEN105 Intro to Business, BGEN201 Foundations of Business Ethics or BGEN235 Business Law, BMGT210 Small Business Management or PSCI240 Intro to Public Administration, BMKT225 Marketing or BVMKT225 Advertising or MART145 Web Design, and TASK150 Customer Services Strategies.
 - Management Information Systems (new) is comprised of 21 credits: ACTG101 Accounting Procedures I, ACTG180 Payroll Accounting or ACTG205 Computerized Accounting, BGEN201 Foundations of Business Ethics, BMGT235 Management, BMIS270 MIS Foundations for Business, CAPP156 MS Excel or CSCI172 Intro to Computer Modeling, CAPP266 MS Advanced Excel or STAT216 Intro to Statistics.
-

ATTACHMENTS

Level I Request Form

Item Number: 164-1902+C0714

Meeting Date: July 10, 2014

Institution: Helena College

CIP Code: _____

Program Title: New / revised Accounting and Business Technology Certificates

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 for Academic and Student Affairs, by no later than five weeks prior to the final posting date for the next scheduled meeting of the Board. The Deputy Commissioner will review the proposal and respond to the proposing campus with any questions or concerns within one week, allowing the proposing campus one week to respond before the Item is posted for the BOR scheduled meeting.

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Specify Request:

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Management Information Systems (new) is comprised of 21 credits: ACTG101 Accounting Procedures I, ACTG180 Payroll Accounting or ACTG205 Computerized Accounting, BGEN201 Foundations of Business Ethics, BMGT235 Management, BMIS270 MIS Foundations for Business, CAPP156 MS Excel or CSCI172 Intro to Computer Modeling, CAPP266 MS Advanced Excel or STAT216 Intro to Statistics.