

MEMORANDUM

DATE: February 12, 2009

TO: Chief Academic Officers
Montana University System

FROM: Sylvia Moore
Deputy Commissioner of Academic & Student Affairs

RE: Level II Submission Items

The campuses of the Montana University System have proposed new academic programs or changes under the Level II approval process authorized by the Montana Board of Regents. The Level II proposals are being sent to you for your review and approval. If you have concerns about a particular proposal, you should share those concerns with your colleagues at that institution and try to come to some understanding. If you cannot resolve your concerns, you need to notify the Office of the Commissioner of Higher Education by March 4, 2009. That notification should be directed to Sarah Elkins, administrative assistant for Academic & Student Affairs. If Sarah does not hear from you, in writing, by March 4, OCHE will assume that the proposals have your approval.

The Level II proposals are as follows:

Miles Community College:

- Miles Community College asked for permission to establish an A.A.S. in Insurance
ITEM142-402-R0309 MCC AASI ITEM142-402-R0309_sm MCC AASI ITEM142-402-R0309_sm2 MCC AASI
- Miles Community College asked for permission to establish an A.A.S. in Biofuels Energy
ITEM142-403-R0309 MCC AAS BE ITEM142-403-R0309_sm MCC AAS BE ITEM142-403-R0309_sm2 MCC AAS BE

University of Montana-Missoula:

- The University of Montana-Missoula asked for permission to establish a Masters of Science program in Geography and to shift the current Masters of Arts in Cartography & GIS, and Community and Environmental Planning to the new M.S.
ITEM142-1009-R0309 UM MS GPHY ITEM142-1009-R0309_sm UM MS GPHY ITEM142-1009-R0309_sm2 UM MS GPHY

University of Montana-College of Technology

- The University of Montana-College of Technology requested approval to create a Certificate of Applied Science in Computer Aided Design
ITEM142-1008-R0309 UM COT CAS CAD ITEM142-1008-R0309_sm UM COT CAS CAD ITEM142-1008-R0309_sm2 UM COT CAS CAD

March 5 & 6, 2009

ITEM 142-402-R0309

Approval Of An Associate Of Applied Science Degree In Insurance

THAT:

The Board of Regents of Higher Education authorizes Miles Community College to offer a degree in Insurance beginning the fall of 2009.

EXPLANATION:

Miles Community College was approached by the Independent Insurance Agents of Montana to develop a curriculum in insurance that would prepare new talent for this field. The nationally recognized curriculum they were promoting was reviewed and an advisory committee consisting of professionals throughout the state and region was formed to recommend additional coursework in the field of study. The College is presenting this recommended scope and sequence along with letters of support that speak of a need that will be filled through this program.

ATTACHMENTS:

Linda Schmaing, Bob Biskupiak, John Menyhart, Robin Nelson and Laurance A. Hubbard.

MONTANA BOARD OF REGENTS
LEVEL II REQUEST FORM

Item No.:	142-402-R0309	Date of Meeting:	March 5-6, 2009
Institution:	Miles Community College		
Program Title:	A.A.S. in Insurance		

Level II proposals require approval by the Board of Regents.

Level II action requested (check all that apply): Level II proposals entail substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination of personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other campuses within the Montana University System and community colleges. Board policy 303.1 indicates the curricular proposals in this category:

- 1. Change names of degrees (e.g. from B.A. to B.F.A.)
- 2. Implement a new minor or certificate where there is no major or no option in a major;
- 3. Establish new degrees and add majors to existing degrees;
- 4. Expand/extend approved mission; and
- 5. Any other changes in governance and organization as described in Board of Regents' Policy 218, such as formation, elimination or consolidation of a college, division, school, department, institute, bureau, center, station, laboratory, or similar unit.

Specify Request:

Miles Community College seeks approval to offer an Associate of Applied Science in Insurance. This program will utilize nationally recognized curriculum in the insurance industry. Since there is no other degree program in the state that prepares students specifically for careers in insurance, it will be delivered online to reach constituents across the state of Montana. In addition to courses specific to insurance, students will also gain a basic business background to prepare them for all aspects of the field.

MONTANA BOARD OF REGENTS
NEW ACADEMIC PROGRAM PROPOSAL

ITEM 142-402-R0309

Institution: Miles Community College
Program Title: Associate of Applied Science in Insurance

OVERVIEW

Miles Community College seeks approval to offer an Associate of Applied Science in Insurance. This program will compliment the college's other offerings in the business field. Currently there is not a degree program in the state of Montana that prepares students for careers specifically in the insurance industry. This particular program will utilize the InVEST® curriculum endorsed by the Independent Insurance Agents and Brokers of America and national insurance companies such as Travelers, Hartford, Allstate, AIG and Safeco. The program will be delivered online to reach constituents across the state of Montana. Additions will be made to the InVEST program to ensure that students receive a valuable learning experience that includes discussions as well as projects that require students to visit insurance professionals in their area. In addition to the InVEST insurance curriculum, students will gather basic business skills that prepare them to manage a business and effectively communicate with people.

NEED

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

Miles Community College was approached by the President of the Independent Insurance Agents of Montana, John Menyhart, in the fall of 2007. For years, the state group had been discussing the lack of trained individuals in the field. They were asking colleges across the state if they would be interested in adding a program that would enhance the labor pool in their industry.

Independent Agents of Montana has 71 agency members with over 150 agency locations and over 1,000 employees. Other non-independent agencies such as Allstate, State Farm, Farmers Insurance, Farmers Union and Farm Bureau also employ a large number of insurance professionals in the state. The Montana State Fund/Workers compensation is the largest employer in the insurance industry in the state of Montana with 300 plus jobs. and approximately 25 – 30 openings per year according to Laurence Hubbard, President and CEO. According to a letter received from Mr. Hubbard during the development of this program, the Montana State Fund believes it is “imperative we find new ways to develop talent in our industry. We are very interested in supporting your curriculum through in-kind as well as direct financial commitment.”

The average age of insurance professional is 54 years old. According to the Insurity/Microsoft Millennials in Insurance Survey (2008), nearly 60 percent of employees in the industry are older

than age 45. The insurance industry has recognized the need to attract young people to the business and is approaching colleges to help with this task.

The Occupational Outlook Handbook 2008-09 Edition shows an increase in insurance related jobs of 13% through the next ten years. This statistic covers nearly every insurance job in the field from brokers to agents to claims adjusters or examiners and insurance financial managers. Larry Pastelle who heads the Risk Management program at Saint Johns University reported at the InVEST Conference last July that 23,000 new jobs were created in the insurance industry in 2008. He went on to say that 50% of the 2.3 million employees in the industry will retire in the next ten years and there are less than 40 full-time programs (university or two-year) to fill this need.

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

By creating an online distance program in this field, Miles Community College will have the ability to serve students throughout the state of Montana. In addition, after the two-year degree program is active, the College hopes to add classes that give professionals in the field their required continuing education units.

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

The demand for this program was provided by statistics given to MCC from the Independent Insurance Agents of Montana and members of the advisory board for this program which includes:

- Jim McCormick, Market Development Leader Montana State Fund -- Helena
- Tom Clarke, CPCU, Clarke Insurance Service – Miles City
- Jim Smith, CPCU, Trainer for Montana Insurance Education Foundation CIC & CISR classes -- Bozeman
- Tom Grau, CIC, CPCU, 2005-06 National President Independent Insurance Agents & Brokers Association – Great Falls
- Julie Bennett, CIC Office Manager First West Insurance (2007-2008 Vice President Independent Insurance Agents of Montana) – Bozeman
- Scott Tuxbury, President Big Sky Underwriters and the Montana Insurance Education Foundation – Missoula
- Curt McCamish, Insurance Store, Inc. – Broadus
- Carol Williams, CPCU, AIM, DAE, CPIW Director of Education & Development Payne Financial Group, Inc. – Spokane, WA
- K.C. Keith, AFIS, Vice President Stockman Insurance, Inc. – Miles City
- David Seitz, CIC, Vice President Seitz Insurance Agency – Sidney
- Sarah Trogden, Office Manager W.A. Mitchell Agency – Miles City
- John Menyhart, CIC, President (2007-2008) Independent Insurance Agents of Montana – Miles City

In discussions with these agencies, it was calculated that the yearly need for students from this program would be a minimum of 50 students per year. In a letter received from Laurence

Hubbard, President and CEO of the Montana State Fund/Workers compensation in April of 2008, that agency has approximately 25 – 30 openings per year alone. Mr. Hubbard went on to write that the Montana State Fund believes it is “imperative we find new ways to develop talent in our industry. We are very interested in supporting your curriculum through in-kind as well as direct financial commitment.”

Realistically, Miles Community College hopes to provide a pool of 30 candidates per year. It is obvious that the need exists, however, the College cannot guarantee the number of students who will be interested in completing this program. Many of the advisory group said that they would encourage their employees or potential employees to enroll in this online program.

INSTITUTIONAL and SYSTEM FIT

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

This program will fit nicely with other business programs offered at Miles Community College that include Small Business Management. Classes that will be offered in addition to the insurance curriculum already exist in other programs on the campus. The only suggested addition to any of the classes would be the discussion of Title 33 and Montana Insurance Code during the Business Law course.

Will approval of the proposed program require changes to any existing programs at the institution?

This program will add insurance classes and utilize other existing courses currently offered in other business programs. It will not require a change to any existing programs at the institution.

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

The differentiation from other programs is the eight classes that will be added that specifically cover insurance topics.

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

Miles Community College strategic initiatives include:

- Initiative 1: Foster quality leadership
- Initiative 2: Provide a quality student experience
- Initiative 3: Provide quality academics
- Initiative 4: Cultivate quality community relationships
- Initiative 5: Recruit and retain students
- Initiative 6: Nurture a healthy College environment
- Initiative 7: Actively seek sustainable funding

By adding an AAS in Insurance, Miles Community College will meet the first five initiatives of the institution. This program will foster quality leadership in the field of insurance where none currently exists in the state of Montana. The College will provide a quality student experience and quality academics by adopting a nationally recognized curriculum in the industry and providing opportunities for students to interact with professionals in the field during their classes. This will in turn cultivate quality community relationships by providing students with access to professionals in the field and to give the community the opportunity to meet and groom potential employees. This additional program will also recruit students to the college that may have not sought an education here otherwise. These include non-traditional aged students who may be place bound, but want to improve their quality of life through an education that is offered online.

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.

There are no current programs in the Montana University System that focus on insurance. A track can be established for an AS with an emphasis in business which would utilize the insurance credits as electives. Then students could transfer and finish a degree in business at a four-year institution in-state, or transfer out-of-state where there are bachelor programs in risk management. The advisory committee encouraged the College to make such a track available, so that those students who wanted to become underwriters or risk managers could continue on for their four-year degree with little duplication of course work.

PROGRAM DETAILS

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.

INSURANCE AAS DEGREE Total credits 62

Freshman Fall Semester			Freshman Spring Semester		
INS 101	Introduction to Insurance	1	INS 122	Personal Insurance	3
INS 121	Property and Liability Insurance Principles	3	INS 123	Commercial Insurance	3
ACTG 201	Financial Accounting	4	ACTG 202	Managerial Accounting	4
CA 102	Human Relations	2	WRIT 122	Introduction to Business Writing	3
IT 120	Introduction to Computers	3	BU110	Business Mathematics	3
			STAT 216	OR Intro to Statistics	(4)
WRIT 121	Introduction to Technical Writing	3			
	Total Credits	16		Total Credits	16(17)

Sophomore Fall Semester			Sophomore Spring Semester		
INS 281	Principles of Insurance Production	3	INS 282	Principles of Multiple-lines Insurance	3
BU 213	Marketing	3	INS 283	Insurance Sales Management	3
BU 207	Business Law (including Title 33 and MT Insurance Code)	3	BU 214	Management	3
ECNS 201	Principles of Microeconomics	3	BU 216	Customer Service	3
BU 215	Human Resource Management	3	INS 241	Insurance Industry Internship	3
	Total Credits	15		Total Credits	15

The required general education credits for this program include:

Communications Technical Writing (3 credits)
 Mathematics: Business Math or Introduction to Statistics (3 or 4 credits)
 Human Relations: Human Relations (2 credits)

INSURANCE COURSE DESCRIPTIONS

INS 101 Introduction to Insurance

Students will identify and describe the basic principles of insurance as well as how insurance jobs relate to one another. Students will understand how property and liability insurance works.

INS 121 Property and Liability Insurance Principles

Students become familiar with the principles that underlie property and liability insurance. Students are introduced to insurance contracts, insurance marketing, underwriting, claims adjustment, risk management and general policy provisions. Co-requisite: INS 101 Introduction to Insurance.

INS 122 Personal Insurance

Students analyze commercial loss exposure and personal insurance coverage including homeowners and other dwelling coverage, personal liability, inland marine, auto, life, health and government programs. Pre-requisite: INS 121 Property and Liability Insurance Principles.

INS123 Commercial Insurance

Students analyze commercial loss exposures and coverage including property, business income, inland and ocean marine, crime, boiler and machinery, general liability, business auto, workers compensation, farm and business owners, as well as miscellaneous liability coverage, surety, and excess and surplus lines. Co-requisite: INS 122 Personal Insurance.

INS281 Principles of Insurance Production

Students will be introduced to an overview of the principles of insurance production and the principles of agency and sales management. Special emphasis will be placed on the insurance product and insurance markets in the context of personal lines coverage as well as limited commercial lines coverage. Pre-requisite: INS 123 Commercial Insurance.

INS 282 Principles of Multi-lines Insurance

Students learn the principles of multiple-lines insurance production. Special emphasis will be placed on the insurance product and insurance markets in the context of commercial lines coverage. Pre-requisite: INS 281 Principles of Insurance Production.

INS 283 Insurance Sales Management

Students focus on the producer's office environment and the ability to use sales management techniques as a means to identify and sell to selected markets. Students learn to apply management principles to the business of running an agency. Special emphasis is placed on how management concepts can be applied to the producers' sales efforts.

INS 241 Insurance Industry Internship

This course is a planned and supervised work-learning experience in an agency or company that is related to the Insurance industry.

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

If approved, this program will be offered the fall of 2009. It will be available entirely online, which will open up the opportunity for students throughout the state to access the program, while working or living in their respective community. The expectation is that this program will appeal to the non-traditional aged students who is place bound. Utilizing estimates from other new programming started at Miles Community College the enrollment pattern should follow as thus:

- FY10 5 students in the program
- FY11 15 freshmen plus 5 sophomores = 20 total students
- FY12 20 freshmen plus 15 sophomores = 35 total students
- FY13 30 freshmen plus 20 sophomores = 50 total students
- FY14 30 freshmen plus 30 sophomores = 60 total students

To ensure students have a valuable education, the program director will also be encouraged to provide coursework that will prepare the students for recognized certifications in the industry such as CIC, Certified Insurance Counselor. Adding these components will make the program more widely recognized and esteemed throughout the industry.

RESOURCES

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

There will be the requirement of one additional faculty person to take on the responsibilities of teaching the insurance courses in this field. This person will have to have a minimum of five years of experience in the insurance field. They will start as an adjunct faculty, with the opportunity to teach other business courses in the program should their degree be in that area.

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.

There are no additional costs to the institution for the addition of this program above and beyond the hiring of the faculty member.

ASSESSMENT

How will the success of the program be measured?

Success of this program will be assessed through the number of graduates placed in the insurance industry or transferred into an insurance program at a four-year institution. The goal is to fill the vacant job pool in the state by providing a total of 70 graduates in the program over the next five years.

The other goal will be to have 100% of our graduates earn at least one nationally recognized certification at the conclusion of the program.

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.

John Menyhart, President of the Independent Insurance Agents of Montana met with the MCC Dean of Academic Affairs, Shelly Weight, in September of 2007 presenting a need in the state and region for trained personnel in the insurance field. John presented the College with numerous articles pointing out the need in the industry.

Shelly investigated the InVEST curriculum that John was promoting. She found it to have many admirable components and liked the fact that it was nationally recognized. She then contacted John to help her put together an advisory committee for this venture.

In January of 2008, all potential committee members were contacted and agreed to serve. Delegates to the committee were chosen from around the state of Montana and one member from the state of Washington, as they were the closest state with a University program in Risk Management.

The committee met in February and March of 2008 to formulate a suggested curriculum that would meet the needs of the most agencies and insurance companies in the state. Plus, the committee was adamant that they also wanted a transfer AS degree with an emphasis in insurance that would coordinate with this AAS curriculum.

The suggested curriculum was taken to the business and information technology faculty in April of 2008. The faculty made additional suggestions and approved of the program.

During the months of March through July 2008, Shelly conducted local and national research to identify the needs in this field. She visited the state meeting of the Independent Insurance Agents in the spring to review the suggested curriculum and delivery method to gauge interest. She received letters of support and encouragement for the development of the curriculum and began receiving calls and e-mails from students who had "heard" there may be a program in insurance in the near future at MCC. She also attended the national InVEST conference in July to further gather national trends identifying need and to better comprehend the required curriculum. Utilizing this information, the suggested curriculum was taken through the Academic Standards committee at the College and approved.

Letters of support are provided with this document as hard copy attachments and include:

1. Linda Schmaing, President Independent Insurance Agents of Montana (electronic)
2. Bob Biskupiak CPCU, CIC, CEO/Executive Director of Independent Insurance Agents of Montana (electronic and hard copy)
3. John S. Menyhart, CIC, IIAM InVEST Chair, Past president – IIAM Independent Insurance Agents of America (hard copy)
4. Robin M. Nelson, Bishop Insurance Service (hard copy)
5. Laurance A. Hubbard, President/CEO Montana State Fund (hard copy)

1/29/2009

Montana Board of Regents
Office of Commissioner of Higher Education
Montana University System
2500 Broadway Street
PO Box 203201
Helena, MT 59620-3201

RE: INVEST (Insurance Program) through Miles City Community College

Dear board members,

It is with great enthusiasm for our insurance industry that I compose this letter thanking you for considering this new program as part of Montana's higher education system.

With this program M.C.C. benefits from an existing insurance curriculum rather than having to invest resources to build such a curriculum. We believe the market shows a definite need for this skill set in Montana and the surrounding states. It provides our industry an approach to the "millennium" generation for a successful career opportunity for which you can acquire accredited training. Insurance agencies of all sizes believe this to be a valuable asset for job applicants.

Currently 60% of the insurance industry's employees are older than the age 45. Thus as they continue to reach retirement age we face the war of attracting new talent to this viable and growing industry. Surveys also show that 55% of the "millennium" generation would consider working in our industry or already are at some level.

Thank you for your time and consideration.

Linda Schmaing
IIAM President
(Independent Insurance Agents of MT)

Linda Schmaing

ISU Insurance Services
Streeter Brothers
406-252-0551 ext. 3018
800-676-5898



Independent Insurance Agents of Montana, Inc.

Montana Insurance Education Foundation, Inc.
Public Risk Insurance Management, Inc.



January 29, 2009

Montana Board of Regents
PO Box 203201
Helena, MT 59620-3201

Re: InVest Program through Miles Community College

Ladies and Gentlemen:

I serve as the Executive Director of the Independent Insurance Agent's Association of Montana. Our association is comprised of over 150 independent insurance agency offices and employees over 1,000 people in Montana. The InVEST program was developed by our national association and is being rolled out across the country. The mission the InVEST program is to promote insurance education to attract individuals to pursue employment in the insurance industry. More specifically, InVest develops a diverse pool of insurance professionals and informed consumers by educating high school and community college students about careers in insurance, financial services and risk management.

There are several critical challenges facing the insurance industry in Montana, as well as nationwide. We are all aware of the "graying of America" issue and this will hit the insurance industry hard. Industry surveys indicate that the average age of an insurance professional is 54 years old. Over 60% of industry employees are over the age of 45. The insurance industry has recognized the need to attract young people to the business. The InVest program is focused on making people aware of all the many opportunities in the profession. Unfortunately many people believe a career in insurance is just about sales, but the fact is that there are many diverse career opportunities. These opportunities exist right here in Montana. Young people just out of high school are searching for the right career path and unfortunately many have to leave the state to find good jobs. The program with Miles Community College will benefit students, the insurance profession and the State of Montana overall.

Personally, I have been fortunate to spend my entire 28 year career in Montana. I worked for several insurance companies before becoming an independent insurance agent. When I started my career in 1981 there were many insurance companies located in Montana. That has

ITEM 142-403-R0309

Approval Of An Associate Of Applied Science Degree In Biofuels Energy

THAT:

The Board of Regents of Higher Education authorizes Miles Community College to offer a degree in Biofuels Energy beginning fall semester 2009.

EXPLANATION:

The "green collar" job sector is experiencing rapid growth throughout the United States. Of the 2.3 million people already employed in the green energy sector, over one million of them work with biofuels.

As part of the American Recovery and Reinvestment Act of 2009 presented to Congress, President Obama has included \$58 billion to be devoted to energy investment. His administration wants to change our dependence on foreign oil. Their goal is to double alternative energy production in three years. They have also set a goal that 25 percent of our energy will come from renewable sources by 2025.

Governor Schweitzer also promotes the growth of energy production in Montana and sees education as the key. Based on the initiatives of our government leaders, Miles Community College is proposing a degree program in Biofuels Energy that will serve as a catalyst for economic growth in our state. Through this program, the College will train the workforce of our future.

ATTACHMENTS:

MONTANA BOARD OF REGENTS

LEVEL II REQUEST FORM

Item No.:	142-403-R0309	Date of Meeting:	March 5-6, 2009
Institution:	Miles Community College		
Program Title:	A.A.S. in Biofuels Energy		

Level II proposals require approval by the Board of Regents.

Level II action requested (check all that apply): Level II proposals entail substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination of personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other campuses within the Montana University System and community colleges. Board policy 303.1 indicates the curricular proposals in this category:

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- 2. Implement a new minor or certificate where there is no major or no option in a major;
- 3. Establish new degrees and add majors to existing degrees;
- 4. Expand/extend approved mission; and
- 5. Any other changes in governance and organization as described in Board of Regents' Policy 218, such as formation, elimination or consolidation of a college, division, school, department, institute, bureau, center, station, laboratory, or similar unit.

Specify Request:

Miles Community College seeks approval to offer an AAS in Biofuels Energy. This program will provide students with hands-on learning experiences in the operation of seed presses and reactors needed to produce biofuels. In addition, the students will study science courses to better understand the chemical composition of the fuel and the required standards of production. Biological and plant science classes will also be taken to learn about the growth cycle and composition of the seed stock required to make biofuel. Finally, a feeds and feeding course concludes the program where students learn of the nutritional value of the residue left from biofuels production and its quality in the feeding of livestock. Components of business courses have also been included in the program of study to prepare students who may want to be managers or entrepreneurs in the green energy industry.

MONTANA BOARD OF REGENTS

NEW ACADEMIC PROGRAM PROPOSAL

ITEM 142-403-R0309

Institution: Miles Community College

Program Title: Associate of Applied Science in Biofuels Energy

OVERVIEW

Miles Community College was awarded a WIRED grant through the Office of the Commissioner of Higher Education in 2007. Through this project, one goal was to develop a curriculum in biofuels that could be used by the burgeoning businesses in this industry to train their employee base. The project director was hired in February of 2007 and has been researching this field, demonstrating findings from this research to the public and developing curriculum. A few classes have been offered on a trial basis to gauge the value and interest of this program. The College now believes they have the equipment, staff and student interest in place to offer a degree in this growing field.

NEED

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

The “green collar” job sector is experiencing rapid growth throughout the United States. Currently in Montana, there are ten biofuels plants at different stages of development. Some are still researching the feasibility of the plant, while others are operational. One of the restricting forces to this growth is lack of a trained labor force.

In a United Nations report released September 24, 2008, it was stated that development of alternative energy should create more than 20 million jobs around the world in coming decades as governments adopt policies to reduce green house gas emissions. The “Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World,” report identified 2.3 million people already working in green energy jobs with half of them in biofuels. It went on to predict that 12 million new jobs could be created by 2030 in biofuels-related agriculture and industry.

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

The College’s advisory committee partners such as Sustainable Systems and Earl Fisher Biofuels are encouraging the development of this program to give them a pool of qualified employees. Currently, on-the-job training is performed, but management from both companies agrees that a student with a basic understanding of biofuels would help to advance their mission much more quickly and effectively. In almost every state in the nation entry-level positions in biofuels require at least a certificate of applied science.

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

Existing biodiesel and oilseed processing plants in Montana employ approximately 40 people. If all of the proposed new biodiesel plants come to fruition, this number will expand to 100. Therefore, an additional 60 employees will be required within the next five years. This data was gathered from personal contact with existing companies in the state as well as those who are in the development phase. The current “green energy” community in Montana is quite small, and through the College’s involvement in the WIRED grant, relationships have been built with most of the players in the industry.

The expected need for “green collar” workers is proportionate to the growth of this industry and the policies put in place at the state and federal level. Currently, as part of the American Recovery and Reinvestment Act of 2009 presented to Congress, President Obama has included \$58 billion to be devoted to energy investment in the coming years.

INSTITUTIONAL and SYSTEM FIT

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

This program is most closely tied to our Agriculture program at the College. Coursework in feeds and feeding, with discussion of co-products from biofuels production has been introduced into the curriculum. In addition, the two programs are jointly applying for a greenhouse in which they can work with the various seed crops available to produce biofuels. The agriculture program will also use the greenhouse for experiments in plant sciences and natural conservation courses that have an emphasis in rangeland.

The crux of the biofuels program at Miles Community College is to add value to the prevalent agriculture industry in eastern Montana. Therefore, both agriculture and the biofuels program will work very closely together.

Will approval of the proposed program require changes to any existing programs at the institution?

The approval of this program will not require changes to any existing programs.

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

This program will be entirely different from any other offered on campus. Even though it will work closely with our agriculture program, there is only one required course that is the duplicated. However, each program will encourage and list directed electives from the other program.

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

Miles Community College strategic initiatives include:

- Initiative 1: Foster quality leadership
- Initiative 2: Provide a quality student experience
- Initiative 3: Provide quality academics
- Initiative 4: Cultivate quality community relationships
- Initiative 5: Recruit and retain students
- Initiative 6: Nurture a healthy College environment
- Initiative 7: Actively seek sustainable funding

By adding an AAS in Biofuels Energy, Miles Community College will meet the first five initiatives of the institution. This program will foster quality leadership in biofuels and prepare students for careers in this field. A quality student experience and quality academics will also be provided through a curriculum endorsed by the advisory committee which is made up of leaders in the green energy industry in Montana. This committee has insisted that the program provide hands-on experience in the operation of the oilseed press and refining equipment. These same advisory board members have agreed to provide internships for our students, which cultivates quality community relationships. It gives industry leaders an opportunity to meet and groom potential employees. This additional program will also recruit students to the college that may have not sought an education here otherwise.

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.

While there are wind energy programs in the state, there are no programs that specifically address biofuels and give hands-on training in the operation of the equipment that produces the fuel. The College also has equipment for the preliminary testing of fuel for quality control purposes.

The most closely related program in the state is the AAS in Energy Technology offered by the University of Montana-COT. This program is more general and lacks the depth in biofuels provided by the MCC curriculum. Miles Community College has been a partner with the UM-COT as they have worked together to develop and implement curriculum. In fact, the MCC WIRED staff traveled to Missoula with the biofuels process demonstration equipment to present to their Energy Technology students..

PROGRAM DETAILS

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.

Associate of Applied Science Degree (A.A.S.) *Biofuels*

This two-year program is designed to allow students to attain employment upon graduation in the alternative energy field or related endeavors. This is designed to be a terminal degree to provide students the skills necessary for entry level employment or enhancement of current employment.

Upon graduation of this program, graduates will be able to:

- Demonstrate an understanding of systems perspectives in the industry;
- Apply basic scientific processes in bioenergy production;
- Perform and describe basic mechanical functions pertaining to biofuels production.
- List bioenergy feedstocks and co-products and describe their benefits and uses;
- Explain the similarities and differences of wind, solar, biomass, geothermal, and biofuels technologies;
- Demonstrate verbal and written communication organization and leadership styles;

First Year – Fall Semester		Cr. Hrs.	First Year – Spring Semester		Cr. Hrs.
EG 100	Intro to Biofuels	1	EG 101	Renewable Energy	3
CA 112	Public Speaking	3	AG 105	Plant Science	3
	or		WRIT 121	Intro to Technical Writing	3
CA 111	Interpersonal Communications	(3)	ACTG101	Accounting Procedures	3
IT 120	Intro to Computers	3	SC 107	General Chemistry	4
M 100	Intro to Technical Mathematics	3			
SC 110	Hazardous Materials	2			
	Directed Elective	3			
Total Credits Fall Semester		15	Total Credits Spring Semester		16
Second Year – Fall Semester		Cr. Hrs.	Second Year – Spring Semester		Cr. Hrs.
EG 201	Energy Mechanics	3	EG 220	Energy Leadership	2
ECNS 201	Principles of Microeconomics	3	EG 202	Biofuel Production	3
SC 101	Principles of Biology	4	EG 241	Internship	3
	Directed Elective	3	AG 202	Feeds and Feeding	3
	Directed Elective	2		Directed Elective	3
Total Credits Fall Semester		15	Total Credits Spring Semester		14

Directed Elective Choices

Agricultural Classes:

AG 101 Animal Science
AG 102 Natural Resources
AG 201 Soil Resources

Other Electives:

AM 210 Oxy-Acetylene Welding
AM 220 Arc Welding
EO 121 CDL Operations
ET 101 Electricity
ET 102 Series and Parallel Circuits
ET 103 Circuit use
ET 104 Conductors and Batteries

Business/IT Classes:

IT 140 Business Software
IT 150 Operating Systems
BU 207 Business Law I
BU 213 Marketing
IT 225 Intro to Programming
BU 214 Management

The general education requirements satisfied through this program include:

Human Relations:	Public Speaking or Interpersonal Communications (3 credits)
Communication:	Introduction to Technical Writing (3 credits)
Mathematics:	Intro to Technical Mathematics (2 credits)

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

Currently, the College is offering a Renewable Energy course on an elective basis. This semester there are four students enrolled. Three of these students want to complete the Biofuels Energy program if it is approved. In addition, the WIRED project staff have been demonstrating the biofuels process and collecting “interest” cards from high school and non-traditional students who are interested in this field of study. To date the College has five students in the recruiting database listing their interest in starting the biofuels program in the fall of 2009. Two other students are entered into the database with an expected start date of 2010. Utilizing this information, MCC is making the following program projections:

FY10	5 students
FY11	10 freshmen + 5 sophomores = 15 students
FY12	10 freshmen + 10 sophomores = 20 students

At this time, with the jobs available in the state of Montana, twenty students is most likely the maximum we could expect for enrollment. If there is a growth in the industry, then our numbers would grow exponentially. It is somewhat of the chicken and egg quandary. It is difficult for the industry to grow without a qualified workforce, yet many people do not want to train in a field that “may” explode in a few years. There are ample opportunities available for jobs outside of the state, but most of the students at MCC want to stay in Montana.

The College is backing this program based on the fact that the Obama administration wants to change the way we use energy and our dependence on foreign oil. Their goal is to double alternative energy production in three years with the goal that 25 percent of our energy in 2025 is to come from renewable sources.

Governor Schweitzer also promotes investment in the brainpower and the infrastructure of Montana to facilitate the growth of energy production. In a 2007 article of Montana Business and Technology (spring/summer issue), the governor stated, “What do these investments look like? Education. It starts with education.” In this article he also went on to support a production of a billion barrels of biofuel. As promoted in our program, the Governor advocates agriculturists utilizing camelina, canola and safflower as the seed of choice for our biofuels production.

Based on the goals of our leadership, Miles Community College is taking a stand in offering a new program and curriculum that will serve as a catalyst for economic growth. There are no guarantees of success, but the stars are in alignment more than ever before to see a green energy economy developed in the state.

RESOURCES

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 faculty member for this program could be funded through WIRED funds until December 2009. In 2010, the cost of the faculty member would no longer be grant funded and would be provided through general education funds.

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.

Most of the equipment for this program has been purchased through the WIRED grant. The College is applying for other grant funding and appropriations to expand the program further. Therefore, there is no expectation that the general fund of Miles Community College will have to absorb the cost of equipment for the program. The College will have to replenish supplies, but much of these expenditures can be recovered in student course or program fees.

ASSESSMENT

How will the success of the program be measured?

The success of this program will be measured through the number of graduates placed in the biofuels or energy related field upon graduation. The goal is that 100% of the graduates will find employment as “green collar” workers.

In addition to placement, the College also looks at the viability of cost-effectiveness of a program. Therefore, there must be a sufficient number of students enrolled in the program to offset the costs of the instructor and the equipment and supplies. A cost-analysis of every program on campus is conducted for cost effectiveness.

Continued review and assessment of the curriculum will also take place through the Internship program. During this program, employers are to rate the preparedness of the student for the job in which they were placed. The employers are also asked to discuss additional knowledge they would have expected the student to possess. Through this process of contact with industry leaders, Miles Community College will continually assess the validity of the program in providing the workers needed for the biofuels industry in Montana.

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.

The WIRED grant was written in 2006 with the goal of developing a curriculum in biofuels. The grant was awarded January of 2007 and the project director was hired in February 2007. As part of the grant, the director has researched the industry completely and attended state and national meetings that deal with the new biofuels industry. She has worked closely with research institutions such as Montana State University who continue to work with seed stock for this process, gelling properties, and the feasibility of production agriculture raising their own fuel.

Equipment has been ordered each year of the project to provide demonstrations and promote the industry. Through this grant, the College has amassed demonstration size equipment as well as larger production equipment to be utilized in the program. They have given an average of 32 demonstrations per year.

The advisory board for curriculum development and other aspects of the program was created in the spring of 2007. Through their efforts, the curriculum was approved and sent forth to the Academic Standards committee on campus for approval in the spring of 2008. Advisory board members who approved this curriculum include:

Bret Earl, Earl Fisher Biofuels
Logan Fisher, Earl Fisher Biofuels
Paul Miller, Sustainable Systems
Dave Litzen, KL Processing
Gary Iverson, Great Northern Growers
Jack Larson, Retired Agriculture Instructor

Final equipment purchases will be completed in the spring of 2009 through the grant funding, which allows for an official start date of the program as fall of 2009 based upon approval by the Board of Regents. Appropriation requests have also been submitted that will expand the program further, should approval be granted. Please view the two letters of support for our current program proposal as well as continued expansion of our efforts.

EASTERN MONTANA BIOMASS TASK FORCE

242 E. Front Street

Forsyth, MT 59327

406-346-4270

March 3, 2008

The Honorable Dennis Rehberg
United States House of Representatives
516 Cannon House Office Building
Washington D.C. 20515

Dear Congressman Rehberg:

The Eastern Montana Biomass Task Force would like to take this opportunity to express our support for the bio-fuels program at Miles Community College (MCC) in Miles City Montana.

The Eastern Montana Biomass Task Force is a local group of private landowners, federal, state and local government officials and members of local economic development organizations interested in the utilization of local woody biomass resources, the development of small business opportunities to accomplish that utilization, and creating an awareness of the availability of the forest resources in southeastern Montana.

The proposal by MCC to expand their current bio-fuels training program to include equipment used for training in the ethanol production process that could potentially use woody biomass as a feedstock would be beneficial to the local community as well as the efforts of the Task Force. Implementation of this proposal would greatly raise awareness as to the opportunities that exist in the use of a locally available and renewable resource in the production of ethanol. There also exists a tremendous educational opportunity, not only for those attending MCC, but for local high schools, FFA chapters and other local groups and organizations where this technology can be shared and demonstrated.

I would like to thank you for the opportunity to comment on this proposal and would like to again express our support for the Bio-Fuels program at MCC and their proposed expansion of that program to include training equipment for the ethanol production process.

Sincerely



Doug Martens
Eastern Montana Biomass Task Force

MONTOLA – A Division of...



P.O. Box 478, Hwy 2 E., Culbertson, Montana 59218 www.sustainable-systems-llc.com; www.montola.com
Ph: 1.406.532.3268 Fax: 1.406.543.2304 info@sustainable-systems-llc.com

February 27, 2008

The Honorable Dennis Rehberg
United States House of Representatives
516 Cannon House Office Building
Washington D.C. 20515

Dear Congressman Rehberg:

Sustainable Systems, LLC supports Miles Community College's application for federal appropriations for expanding their biofuels program. Quality curriculum development is essential for workforce training and development in the emerging biofuels fields. Sustainable Systems has been an active supporter of Miles Community College WIRED program and plans to continue this relationship through their program growth.

Sustainable Systems, LLC currently employs 23 full time individuals at our Montola oil seed processing operation in Culbertson and with in the next 5 years we see employment being near 50 full time employees. Our payroll and benefits total approximately \$100,000 per month in a town with a population of 700 people. We look forward to increasing this however we need the employees to make our growth happen. To that end, we have encouraged and supported curriculum development in the biofuels and biobased product industry in Montana and believe this type of program at MCC will allow us to access a trained and knowledgeable workforce so that we may be competitive in the global agricultural processing industry.

Sincerely,

Paul T. Miller, Ph.D.

President

ITEM 142-1009-R0309

Approval to establish a Masters of Science in Geography

THAT:

In accordance with Montana University System Policy, the Board of Regents of Higher Education authorizes The University of Montana—Missoula to establish a Masters of Science in Geography.

EXPLANATION:

Geography is a discipline at the interface of social science, physical/natural sciences, and information science that trains students to work in a variety of fields and settings. As such, it is not uncommon for geography departments to offer both M.S. and M.A. degree programs to differentiate between the physical and human areas of study, and academic and professional orientations.

The M.S., and its options, will allow students to be better prepared for work in professional areas that require emphasis in science and technology. Students desiring to study physical geography (i.e., biogeography climatology, geomorphology, and meteorology) will be better served by a M.S. degree, because of its very nature, than the current M.A. degree. It is often the case that state and federal agency job classifications often explicitly require a M.S. degree of applicants. Additionally, practitioners in the planning and GIS fields have expressed a need for more trained professionals in these areas. The M.S. degree program with restructured options will help to fill this need. The M.A. program will continue for those students with stronger interest in cultural/human issues and careers in teaching and research.

ATTACHMENTS:

MONTANA BOARD OF REGENTS

LEVEL II REQUEST FORM

Item No.:	142-1009-R0309	Date of Meeting:	March 5-6, 2009
Institution:	The University of Montana—Missoula		
Program Title:	Establish M.S. in Geography		

Level II proposals require approval by the Board of Regents.

Level II action requested (check all that apply): Level II proposals entail substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination of personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other campuses within the Montana University System and community colleges. Board policy 303.1 indicates the curricular proposals in this category:

- 1. Change names of degrees (e.g. from B.A. to B.F.A.)
- 2. Implement a new minor or certificate where there is no major or no option in a major;
- 3. Establish new degrees and add majors to existing degrees;
- 4. Expand/extend approved mission; and
- 5. Any other changes in governance and organization as described in Board of Regents' Policy 218, such as formation, elimination or consolidation of a college, division, school, department, institute, bureau, center, station, laboratory, or similar unit.

Specify Request:

The University of Montana – Missoula requests permission to establish a Masters of Science program in Geography, and to shift two existing options (Cartography & GIS and Community & Environmental Planning) from the existing M.A. to the new M.S.

IV. Proposal

1. Overview

This proposal is to create a Master of Science (M.S.) Degree in Geography. This M.S. degree would complement and further articulate the existing M.A. degree with the Major in Geography (General Geography). Furthermore, this proposal will move two existing options in Cartography and GIS (Cart/GIS) and in Community and Environmental Planning (CEP) from the M.A. to the proposed M.S. The structures, course and research requirements corresponding to these two options are being modified to provide for both academic and professional orientations. It is envisioned that the new degree and modified options will produce a stronger set of programs that will better serve students.

2. Need

a. Specific Needs.

The Department of Geography and the President's Office at The University of Montana have both had repeated requests from practitioners in the planning and Cart/GIS fields (in both the public and private sectors) for curricula in Cart/GIS and in CEP that are more professionally oriented and sensitive to the Cart/GIS and planning needs of local governments and industry in Montana.

Another need stems from the fact that the discipline of geography is unique when compared with other established academic disciplines in that it overlaps the social and physical sciences, and informational technologies (e.g., cartography, GIS, and remote sensing). As such, it is not uncommon for geography departments to offer both M.S. and M.A. degree programs to differentiate between the physical and human areas of study, and academic and professional orientations.

Geography's external departmental review completed in January 2007 evoked the strong recommendation of the administration that Geography restructure its graduate programs to create a M.S. degree with options in Cart/GIS and CEP. The purpose behind this recommendation was to bring Geography's curriculum into alignment with other geography departments in the United States that have established similar degrees to better serve majors in physical geography, cartography and GIS, and planning.

Establishing an M.S. would allow students more interested in the physical area of study with a more professional orientation to obtain the credentials necessary for those positions, while students pursuing an M.A. would concentrate on more on cultural human issues and possible careers in teaching and research.

b. How will students and other constituencies be served?

The M.S., and its options, will allow students to be better prepared for work in professional areas that require emphasis in science and technology.

Students desiring to study physical geography (i.e., biogeography climatology, geomorphology, and meteorology) will be better served by a M.S. degree, because of its very nature, than the current M.A. degree. Some students hoping to work in federal agencies following the completion of the existing M.A. program find that agency job classifications explicitly require a M.S. degree of applicants.

As noted in above, practitioners in the planning and GIS fields have expressed a need for more trained professionals in these areas. The M.S. degree program with restructured options will help to fill this particular need, while preserving the M.A. degree for those students with different interests.

c. Anticipated demand.

Many of our current students have expressed the perspective that changes in our degree programs such as proposed here would better fit their academic and professional goals. Alumni working in the GIS and planning professions have also noted that such changes would have benefited them with respect to their levels of training and ability to complete degree requirements in a timely fashion. Discussions with prospective graduate students have revealed that the proposed changes would increase the attractiveness of our degree programs as compared with others elsewhere in the region and in the nation.

3. Institutional and System Fit

a. Connection between existing and proposed programs.

As noted above, this proposal will create a M.S. degree that will complement an existing M.A. It will also shift the two options from the M.A. to the M.S., as appropriate. The proposal will thus actually serve to better articulate the academic and professional fields falling under the scope of the discipline. Geography faculty members will work with prospective students to determine the best course of study, depending on the students' career plans and specific interests.

b. Will approval of the proposed program require changes to any existing programs at the institution?

No changes to any existing programs at The University of Montana, other than slight changes to course and thesis requirements corresponding to the two options, will be required.

c. Describe what differentiates this program from other, closely related programs at the institution.

Graduate studies in cartography/GIS and planning at The University of Montana are only offered by The Department of Geography. Though graduate study in geomorphology can be pursued in the Department of Geosciences, the orientation of such work differs from that which is frequently undertaken in geography. Furthermore, the M.S. will permit students to focus their studies and research in the areas of biogeography, climatology, and meteorology in addition to geomorphology.

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

The University of Montana has maintained a graduate program in planning for approximately thirty years, and it has a goal to see this program improved such that it better serves the needs of students, practitioners, and Montana communities that are faced with challenges relating to changing demographics and economies. This planning program, which is not duplicated elsewhere in the Montana University System, will also be better suited for accreditation as a result of the proposed changes.

The university also has the goal of promoting the development of programs and research related to mountain studies, and the M.S. will better allow this goal to be realized.

e. Describe the relationship between the proposed program and any similar programs within the Montana University System.

The Department of Earth Sciences at Montana State University offers a M.S. degree. Geology and Geography are concentrations offered within that degree. Close examination of the course offerings in the Geography concentration show few overlaps with courses offered by the Department of Geography at the University of Montana.

In the area of General Geography, one course taught in the Earth Sciences Department is similar to one taught in the Department of Geography at UM. This course is GEOG 405, Geographic Thought taught at MSU, which compares with GEOG 520, Seminar in Geographical Thought is taught at the University of Montana. This particular course is featured in virtually every master's level program in geography departments throughout the United States. Otherwise there is virtually no duplication of courses offered by the Department of Earth Sciences at MSU and the Department of Geography at The University of Montana.

No new courses will be added to the Department of Geography's curriculum as a result of the creation of a Master of Science degree. Consequently, there will be virtually no impact on similar programs offered at Montana State University. None of the other units of the Montana University Systems have similar programs that might be affected.

The Department of Earth Sciences at MSU offers two graduate-level courses that concern planning, one that focuses on Land Use Planning and the other that concerns

Tourism Planning. A specific concentrated program of study in planning is not provided through the Geography concentration there, nor through the MSU School of Architecture's Master in Architecture degree program.

Similarly, the Department of Earth Sciences offers two graduate level courses concerning GIS. One of these courses is concerned with GIS Research Fundamentals and the other with Advanced GIS Analysis. A specific concentrated program of study in cartography and GIS is not provided through the Geography concentration there. Both of the courses at MSU are taught by adjunct faculty.

4. Program details

a. Detailed description of the proposed curriculum.

GRADUATE DEGREES IN GEOGRAPHY

M.A. or M.S. in GEOGRAPHY without option (General Geography)

M.S. in GEOGRAPHY with option in CARTOGRAPHY AND GIS

**M.S. in GEOGRAPHY with option in COMMUNITY AND ENVIRONMENTAL
PLANNING**

9/9/08

The Department of Geography offers graduate study leading to the M.A. and M.S. degrees. Students in General Geography may elect to pursue either degree. Students in either the Cartography & GIS Option or the Community or the Environmental Planning Option must complete the requirements of those options under the M.S. degree.

In addition to course requirements, students pursuing the M.A. or M.S. without option (General Geography) are required to successfully defend a thesis or one or more papers of publishable quality before an examining committee. The paper or papers of publishable quality must be intended for publication in a peer-reviewed journal.

Students pursuing the M.S. in Geography with option in Cartography & GIS or with option in Community and Environmental Planning may choose either a thesis track, a professional paper track, or a non-thesis track. Requirements for the thesis track are the same as those for General Geography. The professional paper track requires the successful completion of a professional paper. The difference between a thesis and a professional paper is that while the thesis is directed toward advances in the discipline, the professional paper may be directed toward advances in the profession. Both the thesis and professional paper must be successfully defended before an examining committee. The non-thesis track requires additional course work, the successful completion of a comprehensive written examination, and the successful defense of a

significant professional work (report, portfolio, etc.) before an examining committee.

A minimum of 30 credits plus a thesis (typically 3-6 cr.) is required for the M.A. or M.S. degree in General Geography. A minimum of 30 credit hours is required for either the Cartography & GIS Option or the Community and Environmental Planning Option when choosing a thesis or professional paper track. A minimum of 40 hours is required for the non-thesis track. See specific requirements for the *options* for additional information on the thesis, professional paper, and professional degree tracks.

Graduate School Requirements: Of the minimum number of credits required, 20 must be in the major. Of course credits (exclude thesis), 50% but no more than 18 credits must be 500-level courses. Students register for thesis and other credits commensurate with the use of facilities, involvement of faculty, and demonstrated progress in the degree program. Students must be continuously registered including the final term during which they complete all degree requirements. Please see Graduate School Policy on *Continuous Registration*.

**M.A. or M.S in GEOGRAPHY without option (General Geography)
9/18/07**

Symbolic Systems Requirements for M.A. or M.S. in General Geography (3-6 credits; does not count toward the 30 credit minimum).

M.A. students in General Geography must satisfy a symbolic system requirement through a language or quantitative methods course (see a. or b. below), depending on area of specialization. M.S. students in General Geography must satisfy a symbolic system requirement through a quantitative methods course (see b. below). Symbolic systems courses must be taken for a letter grade. Upon approval of the advisor, previous course work may meet the symbolic systems requirement.

- a. Language course: at least one semester of the second year of a foreign language (200- level or higher; intensive language programs, such as summer institutes, are highly recommended)
- b. Quantitative methods course: at least one 400- or 500-level quantitative methods course (Math 444, Math 445, Geog 484, Math 541, Math 543, Math 547, Psych 520, Psych 521, Psych 522, Soc 562 or 563, a course in spatial statistics, etc.)

Additional courses for students who do not possess an undergraduate degree in geography or closely allied field (3-9 credits; does not count toward 30 credit minimum).

In consultation with the advisor, students are strongly encouraged to take upper-division or graduate courses in systematic geography (Geography and Society, Physical Geography, Human-Environment Interaction)

If not previously taken (4 credits; does not count toward 30 credit minimum)

Geog 387-3 Principles of Digital Cartography
Geog 389-1 Laboratory

Required Courses (11 credits)

Geog 500-R2	Geography Graduate Colloquium
Geog 504-1	Introduction to Geographical Research
Geog 505-2	Research Design
Geog 520-3	Seminar in Geographical Thought

Methods-3 A techniques course based on the student's research interests, such as field methods (i.e. Geog 385), quantitative methods (i.e. Math 444 or 445, Geog 484, Soc 562 or 563, etc.), qualitative methods (i.e. Soc 561, EVSt 555, etc.), historical methods, survey methods (i.e. Econ 486), advanced computer methods, etc.

The intent of the methods requirement is provide students with a solid background in methodologies used for thesis research.

Methods courses in geography that are related to a student's thesis research can fulfill the methods requirement, but not methods courses that are degree requirements, including requirements of an option. (Elective methods courses, however, can be used to meet the methods requirement.)

Seminar (minimum 3 credits)

One Seminar in Geography (in addition to Geog 520)

Electives (minimum 16 credits)

In consultation with the advisor, students in Geography without option elect upper-division or graduate-level courses from the following

Regional Geography Courses

Geographic Methods Courses

Systematic Geography Courses from the fields of
Geography and Society
Physical Geography
Human-Environment Interaction

Other Courses from Allied Disciplines

M.S. in GEOGRAPHY with option in CARTOGRAPHY & GIS
9/18/07

Tracks: Those choosing to pursue the option in Cartography & GIS may choose a thesis, professional paper, or non-thesis degree track.

Thesis track: A minimum of 30 credits plus a thesis (typically 3-6 credits) are required. The thesis must be successfully defended before an examining committee. Geog 504 and 505 are required as part of the thesis and will not count toward the 30 credit minimum.

Professional paper track: A minimum of 30 credits plus a professional paper (typically 3-6 credits) are required. The professional paper must be successfully defended before an examining committee. Geog 504 and 505 are required as part of the professional paper and will not count toward the 30 credit minimum. The difference between a thesis and a professional paper is that while the thesis is directed toward advances in the discipline, the professional paper may be directed toward advances in the profession.

Non-thesis track: A minimum of 40 credits are required plus the successful completion of a comprehensive written examination, and the successful defense of a significant professional work (paper, report, portfolio, etc.) before an examining committee.

Those students selecting the thesis and professional paper tracks are required to complete a methods requirement:

Methods-3 A methods course based on the student's research and/or professional interests, such as field methods (i.e., Geog 385), quantitative methods (i.e., Math 444 or 445, Geog 484, Soc 562, etc.), qualitative methods (i.e., Soc 561, EVST 555, etc.), historical methods, or survey methods (i.e., Econ 486), advanced computer methods, etc.

The intent of the methods requirement is to provide students with a solid background in methodologies used for research and professional practice.

All students in the Cartography & GIS Option must complete a symbolic systems requirement with MATH 444 and/or MATH 445. In consultation with the advisor, students also must meet a methods requirement with an advanced computer methods course, e.g. CS 207, 365, or 435. If not taken previously, students are required to take Geog 387-3 cr. and Geog 389-1 cr. (credits do not count toward degree).

Students who have not previously completed coursework in the area of Geographical Thought will be required to take Geog 520 (Seminar in Geographical Thought).

Graduate School Requirements: Of the minimum number of credits required, 20 must be in the major. Of course credits (excluding thesis), 50% but no more than 18 credits must be 500-level courses. Students register for thesis and other credits commensurate with the use of facilities, involvement of faculty, and demonstrated progress in the degree program. Students must be continuously registered including the final term during which they complete all degree requirements. Please see Graduate School Policy on *Continuous Registration*.

Students electing the Cartography and GIS option must complete the following:

Required Courses (25 credits)

Geog 483-3	Transport, Planning, and GIS
Geog 489-1	Laboratory (with Geog 483)
Geog 487-3	Remote Sensing and Raster GIS
Geog 489-1	Laboratory (with 487)
Geog 488-3	Thematic Cartography and GIS
Geog 489-1	Laboratory (with 488)
Geog 500-R2	Geography Graduate Colloquium
Geog 580-3	Seminar in GIS and Cartography
Geog 587-3	Digital Image Analysis and Modeling
Geog 589-1	Laboratory (with 587)
Geog 588-3	Vector GIS
Geog 589-1	Laboratory (with 588)

Electives (5-15 credits)

Geog 467-3	Planning Decision Support Systems
Geog 468-3	Community and Regional Analysis
Geog 469-1	Laboratory (with Geog 468)
Geog 484-3	Spatial Analysis and GIS
Geog 485-3	Internet GIS
Geog 489-1	Laboratory (with 485)
Geog 495-3	Digital Mapping & Design
Geog 589-3	Internship
For 551-4	Digital Image Processing

Other electives may be chosen in consultation with the advisor.

Courses taken previously: The same courses taken previously or similar courses taken elsewhere will be evaluated by the advisor in order to determine whether or not they satisfy any of the requirements. Criteria for such evaluations include the course content, the date that the course was taken, and the grade received. In general, professional training courses such as those offered by software companies may not be used to substitute for course requirements. Since GIS is so dependent on advances in technology, courses taken over three

years previously cannot be used to substitute for requirements. Geog 387/89, Principles of Digital Cartography, is primarily concerned with the discipline of cartography and the manner in which it can be used to improve maps made with a GIS. Previous GIS training will not be considered a substitution for this course.

M.S. in GEOGRAPHY with option in COMMUNITY AND ENVIRONMENTAL PLANNING**9/18/07**

Tracks: Those choosing to pursue the option in Community and Environmental Planning may choose a thesis, professional paper, or non-thesis degree track.

Thesis track: A minimum of 30 credits plus a thesis (typically 3-6 credits) are required. The thesis must be successfully defended before an examining committee. Geog 504 and 505 are required as part of the thesis and will not count toward the 30 credit minimum.

Professional paper track: A minimum of 30 credits plus a professional paper (typically 3-6 credits) are required. The professional paper must be successfully defended before an examining committee. Geog 504 and 505 are required as part of the professional paper and will not count toward the 30 credit minimum. The difference between a thesis and a professional paper is that while the thesis is directed toward advances in the discipline, the professional paper may be directed toward advances in the profession.

Non-thesis track: A minimum of 40 credits are required plus the successful completion of a comprehensive written examination, and the successful defense of a significant professional work (report, portfolio, etc.) before an examining committee.

All students in the Community and Environmental Planning Option must complete a symbolic systems requirement with MATH 444 and/or MATH 445.

Students who have not previously completed coursework in the area of Geographical Thought will be required to take Geog 520 (Seminar in Geographical Thought).

Those students selecting the thesis and professional paper tracks are required to complete a methods requirement:

Methods-3 A methods course based on the student's research and/or professional interests, such as field methods (i.e., Geog 385), quantitative methods (i.e., Math 444 or 445, Geog 484, Soc 562, etc.), qualitative methods (i.e., Soc 561, EVST 555, etc.), historical methods, or survey methods (i.e., Econ 486), advanced computer methods, etc.

The intent of the methods requirement is to provide students with a solid background in methodologies used for research and professional practice.

Graduate School Requirements: Of the minimum number of credits required, 20 must be in the major. Of course credits (excluding thesis), 50% but no more

than 18 credits must be 500-level courses. Students register for thesis and other credits commensurate with the use of facilities, involvement of faculty, and demonstrated progress in the degree program. Students must be continuously registered including the final term during which they complete all degree requirements. Please see Graduate School Policy on *Continuous Registration*.

Prior coursework completed by CEP graduate students will be reviewed for proficiency in the areas of urban and rural studies, and for physical geography. Students showing deficiencies in any of these areas will be required to complete requisite coursework in addition to the graduate degree requirements.

Required Courses (in addition to other option requirements discussed above – minimum of 25 credits)

Geog 435-3	Environmental Hazards and Planning
Geog 465-3	Planning Principles and Processes
Geog 466-3	Environmental Planning
Geog 468-3	Community and Regional Analysis
Geog 469-1	Laboratory with Geog 468
Geog 500-R2	Geography Graduate Colloquium
Geog 560-3	Seminar in Planning
Geog 561-3	Land Use Law

Select at least one of the following courses (3-4 credits):

Geog 412-3	Towns and Rural Settlement
Geog 467-3	Planning Decision Support Systems
Geog 483-3	Transport, Planning & GIS
Geog 489-1	Laboratory with Geog 483
Geog 564-3	Planning Design

Highly recommended for either degree:

Geog 598-R3	Internship (maximum 6 cr.)
Geog 562-2	Land Use Clinic

Electives (7-17 credits)

Community Planning Group

Geog 401-3	Regionalism and the Rocky Mountain West
Geog 415-3	Migration and Population Change
Geog 417-3	Cultural and Global Competence
Anth 451-3	Cultural Resource Management
Anth 587-3	Seminar in Cultural Resource Management
Comm 512-3	Seminar in Dispute Resolution
EVST 450-3	Food, Agriculture, and the Environment
EVST 477-3	Environmental Justice Issues and Solutions
For/ EVST 473-3	Collaboration in Natural Resources Decisions
For 475-3	Sociology of Environment and Development

For 478-3	Montana Community Analysis
Soc 340-3	The Community
Soc 342-3	Urban/Metropolitan Sociology
Soc 346-3	Rural Sociology
Soc 571-3	Seminar in Rural and Environmental Change
PSc 501-3	Public Administration
PSc 364-3	State and Local Government

Environmental Planning Group

Geog 322-3	Meteorology
Geog 365-3	Geomorphology
Geog 426-3	Biogeography
Geog 432-3	Human Role in Environmental Change
Geog 525-3	Global Change
EVST 465-3	Restoration Ecology
EVST 540-3	Watershed Conservation Ecology
For 424-3	Community Forestry and Conservation
For 455-3	Riparian Ecology and Management
For 481-3	Forest Planning
For 485-3	Watershed Management
NAS 330E-3	Ecological Perspectives in Native American Traditions

GIScience Group

Geog 487-3	Remote Sensing and Raster GIS
Geog 489-1	Laboratory (with 487)
Geog 488-3	Thematic Cartography and GIS
Geog 489-1	Laboratory (with 488)
Geog 580-3	Seminar in GIS and Cartography
Geog 587-3	Digital Image Analysis and Modeling
Geog 589-1	Laboratory (with 587)
Geog 588-3	Vector GIS
Geog 589-1	Laboratory (with 588)
CRT 182-T-2	Computer Aided Design (COT Course)

Policy Group

EVST 502-3	Environmental Law for Non Lawyers
EVST 560-3	Environmental Impact Analysis
For 422-3	Natural Resources Policy and Administration
LAW 663/EVST 567-2	Water Law

Native American Communities

NAS 324H-3	Indians of Montana Since the Reservation Era
NAS 341S-3	Contemporary Issues of American Indians
NAS 400-3	Tribal Sovereignty

Others

Geog 596-R3	Independent Study (maximum 3 cr.)
Other electives in consultation with advisor	

b. Planned implementation.

Because the proposed changes to our degree programs represent a restructuring, a phased implementation will not be required. In the immediate-term, we expect that current levels of enrollment in the M.A. General degree will be split with the M.S. General (approximately 5-6 students per year in each). This should grow as the changes become publicized through the UM Graduate Catalog, our own departmental media (website, newsletter), and national geography program guides. We also expect that current levels of enrollment in the two options (approximately 3-4 students per year in each) will continue in the immediate-term, and even grow as a result of publicity.

5. Resources**a. Faculty resources.**

Our current faculty resources are completely adequate to accommodate and implement this proposal. There will be no additional faculty or staff requirements.

b. Other resources.

There will be no additional space or curriculum needs in order to implement this proposal.

6. Assessment

The success of the proposed changes to our graduate degree programs will be measured through the tracking of statistics concerning changes in enrollments and matriculation for each degree and option. Furthermore, the Department of Geography's current assessment plan, revised and approved in fall 2007, will be modified to address the proposed degree and modified options in order to measure learning outcomes associated with each.

7. Process leading to submission

This proposal originated in the Department of Geography following the aforementioned department review, meetings with professional practitioners, and discussions with current and prospective students and alumni. The faculty created a subcommittee to articulate and develop the proposal, which was presented to the faculty for review and revision. The proposal was then approved by consensus. The Chair of Geography and the Dean of the College of Arts and Sciences then signed the documents necessary to submit the proposal to the Provost's Office and the Faculty Senate.

This proposal was reviewed and approved by the affected departments as follows:

Department Name: Geography

Date: 9/18/08

In addition the deans of the following Schools/Colleges reviewed and approved the proposal:

Dean of: The College of Arts and Sciences Date: 9/23/08

The proposal was reviewed and approved by the Faculty Senate at the University of Montana Date: January 2009

[No outside consultants were employed for the development of this proposal.]

March 5-6, 2009

ITEM -142-1008-R0309

**Approval To Establish The Computer Aided Design (CAD),
Certificate Of Applied Science Program In The Department Of
Applied Computing And Electronics At The University Of
Montana, College Of Technology**

THAT:

In accordance with Montana University System Policy, the Board of Regents of Higher Education authorizes The University of Montana, College of Technology to create a Computer Aided Design (CAD) Certificate of Applied Science program in the Department of Applied Computing and Electronics.

EXPLANATION:

The proposed program introduces students to graphic communications; computer-aided design and modeling systems; geographic information systems; surveying; written communication; and business practices. Graduates from the proposed program prepare for entry-level, professional careers involving technical support for civil engineering firms, surveyors, and land-use planners, and will be in demand by employers in the local economy. Our advisory committee of potential employers has assisted in crafting the learner outcomes and curriculum of this proposal. These employers report demand in their industry for graduates with the educational outcomes acquired from the Computer Aided Design program. Furthermore, research from the U.S. Department of Labor reports that several careers involving computer-aided design are expected to grow at a rate as fast as or faster than average for all occupations.

ATTACHMENTS:

MONTANA BOARD OF REGENTS

LEVEL II REQUEST FORM

Item No.:	142-1008-R0309	Date of Meeting:	March 5-6, 2009
Institution:	The University of Montana - Missoula COT		
Program Title:	Certificate of Applied Science in Computer Aided Design		

Level II proposals require approval by the Board of Regents.

Level II action requested (check all that apply): Level II proposals entail substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination of personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other campuses within the Montana University System and community colleges. Board policy 303.1 indicates the curricular proposals in this category:

- 1. Change names of degrees (e.g. from B.A. to B.F.A.)
- 2. Implement a new minor or certificate where there is no major or no option in a major;
- 3. Establish new degrees and add majors to existing degrees;
- 4. Expand/extend approved mission; and
- 5. Any other changes in governance and organization as described in Board of Regents' Policy 218, such as formation, elimination or consolidation of a college, division, school, department, institute, bureau, center, station, laboratory, or similar unit.

Specify Request:

The University of Montana – College of Technology Department of Applied Computing and Electronics requests permission to initiate a Certificate of Applied Science in Computer Aided Design.

Computer Aided Design - Certificate of Applied Science
Department of Applied Computing and Electronics, The University of Montana
New Program Proposal - September, 2008

1. Overview

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

The Department of Applied Computing and Electronics at The University of Montana, College of Technology requests permission to initiate the Computer Aided Design (CAD), Certificate of Applied Science program. The proposed program introduces students to graphic communications; computer-aided design and modeling systems; geographic information systems; surveying; written communication; and business practices. Graduates prepare for entry-level, professional careers involving technical support for civil engineering firms, surveyors, and land-use planners.

2. Need

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

The *American Council of Engineering Companies of Montana (ACEC)* reports that its members suffer from a workforce shortage in trained, competent CAD technicians. The shortage is not unique to the state of Montana, rather a trend of national concern. Firms in other parts of the country are responding by importing foreign workers or outsourcing operational elements. The problem is amplified by the workforce exodus of the baby-boomer generation and student enrollment declines in full 4-6 year engineering degree programs.

The 2008-2009 edition of the U.S. Department of Labor Occupational Outlook Handbook predicts employment for Urban and Regional Planners to grow by 15%; Civil Engineering Technicians by 10%; Surveyors, Cartographers, and Mapping Technicians by 21%; and Civil Drafters by 6%. Professionals in all of these fields will rely on a support staff of technicians with skills involving computer-aided design.

Regions throughout the Western United States continue to wrestle with issues involving new development, subdivisions, revitalization projects, appropriate land-use, transportation systems and infrastructure. Individuals involved with planning and design process will rely on accurate data collection, computer generated design models, geographical information systems, and appropriate interpretation processes. Our program proposes to educate individuals with the technical expertise to support these systems.

The need for this program has been brought to the attention of our academic unit by local industry. Civil engineering firms in our region have requested a collegiate program to educate individuals for professional careers supporting engineering-related fields. Our program is responsive to these local workforce demands.

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

Our program will benefit students by providing access to well-paying jobs. Our advisory committee expects wages for graduates to start at \$15-\$16 per hour. The Bureau of Labor Statistics for the state of Montana reports average salaries for Surveying and Mapping Technicians at \$15.65/hour; Civil Engineering Technicians at \$18.90/hour; and Architectural and Civil Drafters at \$18.11/hour.

Other constituencies served by the proposed program include students from the Pre-Engineering Program offered through the Department of Physics at The College of Arts and Sciences and students from The School of Education. Currently, there are limited introductory course offerings in the areas of computer-aided design (CAD) and geographical information systems (GIS) offered through the University of Montana - Missoula campus. Courses in CAD will benefit students pursuing engineering degrees. A strong interest in GIS for students pursuing careers as secondary teachers has been reported by the School of Education. Additionally, demand for professional development in GIS for teachers has been noted in the K12 community. Our proposed program seeks to align with the College of Arts and Sciences and the School of Education to enhance opportunities for students by providing course offerings involving CAD and GIS technologies.

The Welding and Carpentry programs offered through the Department of Industrial Technology currently require students to complete one course in CAD for graduation. Our department currently offers this course as a service to these programs. The benefit of additional CAD training for students involved in Industrial Technology programs has been discussed with faculty in these other related programs.

Students pursuing the Information Systems option of the Computer Technology program do not have the opportunity to study spatial data sets. An introductory course in GIS will enhance the breadth of education for Computer Technology students.

Overall, the courses offered through the Computer Aided Design program have broad-based interest and benefit to all students by boosting educational opportunities in numerous academic disciplines.

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

Student interest in the proposed program is expected to be strong. Currently, Sentinel High School has an enrollment of between 100-140 students involved in computer design and drafting courses each semester. Similar interest exists at other area high schools. The majority of these students do not go on to pursue careers in the areas of engineering or architecture. Programs available in computer-aided design are limited. Our investigation for this proposal includes a visit to an area high school and discussions with high school teachers and career counselors.

It is anticipated that graduates from the proposed program will be in demand by employers in the local economy. Our advisory committee of potential employers has assisted in crafting the learner outcomes and curriculum of this proposal. These employers report demand in their industry for graduates with the educational outcomes acquired from the Computer Aided Design program. Letters of support from potential employers are included in the proposal. Furthermore, research from the U.S. Department of Labor reports that several careers involving computer-aided design are expected to grow at a rate “faster than average” while others at a rate “as fast as the average” for all occupations.

3. Institutional and System Fit

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

Coursework involving computer-aided design currently exists through the Computer Technology Program of the Department of Applied Computing and Electronics. The proposed Computer Aided Design Certificate of Applied Science program will build upon the course offerings found in the Computer Technology A.A.S. degree program. Additionally, the program will partner with surveying coursework offered through the Department of Industrial Technology, business coursework offered through the Department of Business Technology, and the general education offerings of the Department of Applied Arts and Sciences.

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

No

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

No other programs of a similar nature exist at The University of Montana.

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

As the two-year college at The University of Montana, the College of Technology has been charged with establishing and maintaining programs for workforce development. The proposed program attempts to establish new opportunities to enhance the economy of Montana through workforce development.

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.

Programs involving computer aided design exist at the College of Technology at Montana Tech and the College of Technology at MSU Billings. The geographic distance involved in the Billings program does not make it a viable candidate for duplication. Our advisory committee reports current capacity from other programs is insufficient to meet all demands in our state.

The College of Technology at Montana Tech houses a Civil Engineering Technology program. Our advisory committee has recommended the pursuit of a two-year engineering technology degree. As we grow our Computer Aided Design, Certificate of Applied Science program, we plan to actively pursue opportunities for collaboration with Montana Tech.

4. 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.

Program Description:

The Computer Aided Design program introduces students to graphic communications; computer-aided design and modeling systems; geographic information systems; surveying; written communication; and business practices. Graduates are prepared to pursue entry-level, professional careers as technicians supporting civil engineering firms, surveyors, and land-use planners.

Student Outcomes:

Upon completion of the program, students will be able to:

- Utilize graphic technologies to produce engineering documents.
- Employ productivity software to solve technical problems.
- Model field data collected from surveying using geographical information systems.
- Demonstrate clarity, style, force of ideas, and structure in writing.
- Solve technical problems involving mathematics at the level of college algebra
- Describe business organization, management, economics, financing, labor, and management strategies.

Program Requirements and Sequencing:

Courses	Autumn	Spring
CRT 111 Fluency in I.T.	3	
CRT 182T Computer Aided Design I	2	
CRT 195 Special Topics: Computer Aided Design II	3	
CRT 195 Special Topics: Graphics Communication	2	
HEO 140T Basic Surveying	2	
MAT 118 College Algebra	3	
Total	15	
BUS 103S Principles of Business		3
CRT 172 Introduction to Computer Modeling		3
CRT 175 Geospatial Technologies		4
CRT 184 Civil Design Technologies		3
WTS 101 English Composition		3
Total		16

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

Upon approval, we plan to implement the program Autumn Term 2009. We anticipate capacity to support 20 new students. We expect to graduate 50% of the cohort by the end of our first year. Graduation rates at two year institutions range from 25%-40% nationally. Our program seeks to perform at a higher than average rate as a result of the many retention efforts taking place at the College of Technology.

5. 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.

A Perkins workforce development grant has been used to fund tenure-track faculty and faculty affiliates for the development and a first-time "run" of new course offerings. The program will seek to fill limited number of empty seats in current course offerings. Additional sections of existing and new courses will be staffed using the adjunct faculty model. The Perkins workforce grant will be used to continue the funding of additional course development and assist in staffing additional sections of courses for the first year of the program.

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.

Computer-aided design software is a required element for this program. The program will ally with existing campus site licensing agreement to provide access to the ESRI and AutoDesk software products needed for the program.

6. Assessment.

How will the success of the program be measured?

Multiple indicators will be used to measure the success of the program. General interest will be measured by the number of incoming students entering the program. Curriculum programming and delivery success will be measured through student matriculation and graduation. Overall program effectiveness will be assessed through graduate employment and employer satisfaction. Graduate surveys and employer surveys will be used to measure effectiveness.

7. 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.

Work on the program was initiated through informal discussions with individuals from the local engineering community and a request from a Regent through a communication from the President's office. Faculty affiliates from private CAD training organizations, adjunct faculty, and tenure track faculty were all enlisted as content developers, program developers, and program curriculum advisors. Faculty members from the pre-engineering program and School of Education were enlisted in an advisory capacity and as course developers. Teachers from Sentinel High School were consulted. Standards from the Accrediting Body for Engineering Technology were consulted in curriculum development. Community members consisting of engineers and potential employers from local engineering firms were pulled together in an advisory function. Grant funding was obtained to continue development and implementation efforts. Campus I.T. directors provided direction and best practices for obtaining necessary software.

This proposal was reviewed and approved by the affected departments as follows:

Department Name: Industrial Technology Date: 24 Sept. 2008

Department Name: Applied Arts and Sciences Date: 24 Sept. 2008

Department Name: Business Technology Date: 24 Sept. 2008

In addition the deans of the following Schools/Colleges reviewed and approved the proposal:

Dean of: College of Technology Date: _____

The proposal was reviewed and approved by the Faculty Senate at the University of Montana Date: Nov. 2008

[No outside consultants were employed for the development of this proposal.]

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