

M O N T A N A B O A R D O F R E G E N T S
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 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...



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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