ITEM: 138-1504-R0308

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

LEVEL II REQUEST FORM

Item No.:	**138-1504-R0308**	**Date of Meeting:**	**March 6-7, 2008**
Institution:	**Montana Tech of The University of Montana**		
Program Title:	**Montana Math and Science Academy**		

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:

Approval is requested to establish the Montana Math and Science Academy. This is a residential program that permits high school juniors to initiate work in a rigorous curriculum that permits them to complete the last two years of high school simultaneously with the first two years of college. After completing this curriculum, graduates will have satisfied their high school curriculum and should be able to complete a bachelor's degree in math, science or engineering in two or at most three years.

Overview

The Montana Math and Science Academy is proposed as a residential dual-credit program for high school juniors who have outstanding academic performance and high standardized test scores. The curriculum of the academy is designed to permit these students to complete 60 credit hours of college work that also satisfies the requirements for high school graduation. A college degree will not be awarded therefore the Academy will not require new courses or new degrees at Montana Tech. Academy students will take courses currently offered and honors courses with our degree-seeking students in subject areas where they are offered. Graduates of the Academy will be eligible to continue and complete a BS degree at Montana Tech or they could transfer to other institutions across the state and country.

1. Need

a. Maintaining and enhancing the economic competitiveness our Nation has enjoyed since World War II requires that we educate more scientists and engineers who are highly innovative. While some have argued that we are educating enough scientists and engineers, nobody argues that we are educating enough highly innovative scientists and engineers. The specific need to which Montana Tech is responding is the well-documented need for the United States to remain competitive through research in science and engineering.
b. Graduates of the Montana Math and Science Academy will have a two-year head start towards completing advanced degrees.
c. We anticipate that 20 students a year can benefit from this program. This means that the Academy will have 40 students enrolled per year when fully operational.

2. Institutional and System Fit

a. Montana Tech of The University of Montana has both a current mission and a deep history in Science, Technology, Engineering and Mathematics (STEM) programs. The fact that this curriculum can be implemented without introducing new courses is testimony to the excellent fit at Montana Tech for the Academy.
b. Approval and implementation of the Montana Math and Science Academy will not require changes to any current programs.
c. This program is different from all other programs at Montana Tech only in that it is specifically designed to serve high-achieving high school juniors and seniors. All other programs on the Tech campus are designed to serve high school graduates.
d. There are no programs in Montana or the Pacific Northwest that provide the opportunity afforded by the Montana Math and Science Academy. Several MUS Institutions have dual-credit courses available to high school students. While these programs permit high school students to gain college credit for a relatively small number of courses, they do not generally give students the opportunity to complete two full years of college credit that is transferable to other universities.

3. Program Details

a. The two years of academic work will consist of not less than 60 credit hours as outlined below:

- Mathematics: Up to 12 credit hours including Math 1530 (Calculus II)
- Science: 29 credit hours including biology, chemistry, engineering, geology, and physics with labs.
- English and Communication: 11 credit hours
- Humanities and Social Science: 6 credit hours
- Electives: Within the Humanities, Social Science, and English courses there are 12 elective credits.

While the curricula will vary slightly from student to student depending on their experiences and needs, a typical 60 credit junior / senior curriculum is presented below:

Fall Semester Junior Year					**Spring Semester Junior Year**			
MATH	1216	Pre-Calculus	4		MATH	1520	Calculus I	3
CHEM	1056	Gen Chem I	3		CHEM	1066	Gen Chem. II	3
CHEM	1136	Chem Lab I	1		CHEM	1166	Chem Lab. II	1
BIOL	1086	Intro to Ecol	2		BIOL	1116	Cell Biology	4
BIOL	1096	Intro to Biodiv	2		COMM	2016	Pres Tech Info	2
COMM	1046	Eng Comp	3		HNR	1966	Honors Seminar	1
			15					**14**
Fall Semester Senior Year					**Spring Semester Senior Year**			
MATH	1530	Calculus II	3		MATH	xxxx	Math elective	3
PHYS	1046	Physics I	3		PHYS	2076	Physics II	3
GEOL	1010	Phys Geology	3		PHYS	2096	Physics Lab I	1
	xxxx	Hum / Soc Sci elec	3		ENGR	1010	Intro to Engr Calc	3
ENGL	xxxx	English elective	3			xxxx	Hum/Soc Sci elec	3
					ENGL	xxxx	English elective	3
			15					**16**

Because BIOL 1086, BIOL 1096, BIOL 1116, ENGR 1010, and GEOL 1010 have laboratory experiences embedded within them, the example curriculum given above has 8 total credits of laboratory.

b. If appropriate funding is available, the first class of 20 students will be admitted to the Academy in the fall of 2010. Thereafter 20 additional students will be admitted to the junior class each fall.

4. Resources

a. Although the students in this program will be taught in regular sections or honors sections of Montana Tech courses, some additional faculty positions will be necessary. It is estimated that as a minimum 2 new FTE faculty positions will be required. In some cases part-time faculty can be used to teach sections that will release other faculty to teach sections that involve these students. We anticipate we will have competition among faculty to teach these very bright students. The resources for these positions will come from the FTE appropriation and tuition for the 40 FTE students.

b. The total budget for the Montana Math and Science Academy is $750,000 annually. A base budget increase of $250,000 per year will be sought through the budget initiative process. Tuition for 40 students will generate about $250,000. This will create an operating budget of $500,000. Room and Board will cost another $250,000. It is our intention that the income stream from room and board will support the bond payments to construct a new residence hall for these students. The request for bonding to construct a residence hall for the Academy will be processed through channels at an appropriate time. We have assurance of support for tuition scholarships for 40 students for four years. We are also searching for additional private funding to cover room and board. Thus, in direct state appropriation, we are requesting $250,000 which is approximately equivalent to the FTE student appropriation received by Montana Tech for current students.

5. Assessment

Assessment of the Academy will be based on:

- qualifications of the applicants and enrolled students as measured by SAT scores, ACT scores, number of national merit semifinalists, etc.;
- the academic success of the students in the academy as measured by GPA, credits passed, etc.
- student performance on discipline and course specific national exams, such as the American Chemical Society National General Chemistry Exam;
- the semester to semester and junior to senior retention rates;
- student satisfaction as measured by the Noel Levitz Student Satisfaction Survey;
- an independent measure of academic performance and proficiency using the ETS MAPP exam;
- the number of students pursuing four year degrees, particularly in STEM disciplines, and the length of time required for these students to complete these degrees;
- the number of students ultimately continuing on to graduate school or pursing professional careers, again particularly in STEM related disciplines.

6. Processes Leading to Submission

This proposal has been approved by the Curriculum Committee and the Faculty of Montana Tech. The concept of the Academy was presented to the Montana Board of Education on January 10, 2008 and was discussed by the Board of Regents of Higher Education on January 11, 2008. The issues of teacher certification and dual credit have been discussed with MEA/MFT on January 22, 2008 and these same issues have been addressed with the Office of Public Instruction on January 23, 2008.

After approval of this proposal by the Board of Regents of Higher Education, we will work through the Office of Public Instruction to seek approval of school districts across Montana to permit graduates of the Academy to receive a high school diploma, for the school district to receive the financial support for the student and for the school district to receive credit for test scores and scholarship recognition that would have accrued had the student remained in the school district.