DATE: July 25th, 2019

TO: Chief Academic Officers, Montana University System

FROM: Brock Tessman, Deputy Commissioner for Academic, Research, and Student Affairs

RE: September 2019 Level II Proposals

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, raise them at the Chief Academic Officer's conference call August 28th. Issues not resolved at that meeting should be submitted in writing to OCHE by noon on Friday, August 30th. If no concerns are received, OCHE will assume that the proposals have your approval.

Level II Items

Montana State University Bozeman:

- Request for authorization to establish a Master of Science in Bioengineering
  Item #184-2010-R0919 | Request Form | Curriculum Form | Fiscal Form | Intent to Plan

- Request for authorization to change the name of the Department of Agricultural Education to the Department of Agricultural and Technology Education
  Item #184-2011-R0919 | Request Form

September 11-12, 2019

ITEM 184-2010-R0919

Request authorization to establish a Master's of Science in Bioengineering

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THAT

Montana State University is proposing to offer a Master's of Science in Bioengineering

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EXPLANATION

The proposed MS in Bioengineering degree is intended to provide advanced training and practical skills to students seeking to apply engineering principles to biological or medical applications to solve a wide range of problems, including challenges in human health, energy, and the environment. The program is intended to be accessible to students with a diverse range of undergraduate degrees including the various engineering disciplines, biology, microbiology, biochemistry, and others.

ATTACHMENTS

Academic Proposal Request form
Curriculum Proposal form
Fiscal form
Intent to Plan

ITEM **184-2010-R0919** Submission Month or Meeting: **September 11-12, 2019**

Institution: **Montana State University** CIP Code: **14.0501**

Program/Center/Institute Title: **MS in Bioengineering**

Includes (please specify below): Online Offering _____ Options _____

Please mark the appropriate type of request and submit with an Item Template and any additional materials, including those listed in parentheses following the type of request. For more information pertaining to the types of requests listed below, how to complete an item request, or additional forms please visit http://mus.edu/che/arsa/academicproposals.asp.

A. Level I:

Campus Approvals

1a. Placing a postsecondary educational program into moratorium (Program Termination and Moratorium Form)

1b. Withdrawing a postsecondary educational program from moratorium

2. Establishing, re-titling, terminating or revising a campus certificate of 29 credits or less

3. Establishing a B.A.S./A.A./A.S. area of study

4. Offering an existing postsecondary educational program via distance or online delivery

OCHE Approvals

5. Re-titling an existing postsecondary educational program

6. Terminating an existing postsecondary educational program (Program Termination and Moratorium Form)

7. Consolidating existing postsecondary educational programs (Curriculum Proposal Form)

8. Establishing a new minor where there is a major or an option in a major (Curriculum Proposal Form)

9. Revising a postsecondary educational program (Curriculum Proposal Form)

10. Establishing a temporary C.A.S. or A.A.S. degree program *Approval limited to 2 years*

X **B. Level II:**

X **1. Establishing a new postsecondary educational program** (Curriculum Proposal and Completed Intent to Plan Form)

_____ **2. Permanent authorization for a temporary C.A.S. or A.A.S degree program** (Curriculum Proposal and Completed Intent to Plan Form)

_____ **3. Exceeding the 120 credit maximum for baccalaureate degrees** *Exception to policy 301.11*

_____ **4. Forming, eliminating or consolidating an academic, administrative, or research unit** (Curriculum or Center/Institute Proposal and Completed Intent to Plan Form, except when eliminating or consolidating)

_____ **5. Re-titling an academic, administrative, or research unit**

Proposal Summary [360 words maximum]

What

Establishment of a Master of Science degree program in Bioengineering

Why

MSU-Bozeman currently offers a BS in Biological Engineering and a Masters of Engineering (ME) in Bioengineering. The ME in Bioengineering is a course-work only degree**,** and students typically do not conduct independent research nor do they write a thesis. A number of students that have started the ME in Bioengineering have changed to the MS in Chemical Engineering so that they could **acquire the desired skills and experience associated with** conduct**ing independent research and writing a thesis. The MS** in Bioengineering will complement existing MS degrees in Chemical Engineering, Mechanical Engineering, Environmental Engineering and other MS degrees in biology and microbiology. The degree will provide a unique combination of engineering tools, biological principles, and an in-depth research experience culminating in a thesis.

Resources

There would be no direct cost attributable to this change. There would be no changes in reporting lines, program mission, faculty assignments, or duplication of administrative activities.

Relationship to similar MUS programs

There would be no duplication of existing programs in the MUS. There are no other programs in Bioengineering at any level (BS, MS, or PhD) within the Montana University System. The closest program in the MUS system outside of MSU-Bozeman is probably the MS in Environmental Engineering at Montana Tech, but the proposed program would be much less focused on environmental challenges and be more heavily focused on combining biological and medical tools with engineering principles to solve challenges related to human health and energy.

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CURRICULUM PROPOSAL FORM

1. **Overview of the request and resulting changes.** Provide a one-paragraph description of the proposed program. Will this program be related or tied to other programs on campus? Describe any changes to existing program(s) that this program will replace or modify. *[100 words]*

   The proposed MS in Bioengineering degree is intended to provide advanced training and practical skills to students seeking to apply engineering principles to biological or medical applications to solve a wide range of problems, including challenges in human health, energy, and the environment. The program is accessible to students with a diverse range of undergraduate degrees including the various engineering disciplines, biology, microbiology, biochemistry, and others. No existing programs will be immediately replaced or modified as a result of the proposed program.

2. **Relation to institutional strategic goals.** Describe the nature and purpose of the new program in the context of the institution's mission and core themes. *[200 words]*

   MSU-Bozeman currently offers a BS in Biological Engineering and a Masters of Engineering (ME) in Bioengineering. The ME in Bioengineering is a course-work only degree, and students typically do not conduct independent research nor do they write a thesis. A number of students that have started the ME in Bioengineering have changed to the MS in Chemical Engineering so that they could conduct research and write a thesis. The MS in Bioengineering will complement existing MS degrees in Chemical Engineering, Mechanical Engineering, Environmental Engineering and other MS degrees in biology and microbiology. The degree will provide a unique combination of engineering tools, biological principles, and an in-depth research experience culminating in a thesis.

   Montana State University is a research university, and increasing the rate of Masters graduates is a key part of MSU's Strategic Plan (e.g., see "GOAL 1.2: Expand high-quality graduate education", especially Metric 3). Establishing a MS program in Bioengineering will allow recruitment of a broader range of MS students that may have previously pursued a MS in Bioengineering from another institution outside of Montana.

3. **Process leading to submission.** Briefly detail the planning, development, and approval process of the program at the institution. *[100 words]*

   A committee including members from three different engineering departments was formed in the summer of 2018. Committee members included Dr. Robin Gerlach, Dr. Connie Chang, and Dr. Stephanie McCalla from Chemical and Biological Engineering; Dr. Ron June from Mechanical and Industrial Engineering; and Dr. Anna Kuntz from Electrical and Computer Engineering. This committee focused on questions including focus areas for the potential MS in Bioengineering program as well as the potential for existing courses to cover most or all of the focus areas. The committee strongly supported the development of an 'Intent to Plan' to the BOR and the development of this new program proposal.

4. **Program description.** Please include a complete listing of the proposed new curriculum in Appendix A of this document.

   a. List the program requirements using the following table.

	Credits
Credits in required courses offered by the department offering the program	8-10
Credits in required courses offered by other departments	15-17

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CURRICULUM PROPOSAL FORM

Credits in institutional general education curriculum	0
Credits of free electives	5-7
Total credits required to complete the program	30

b. List the program learning outcomes for the proposed program. Use learner-centered statements that indicate what students will know, be able to do, and/or value or appreciate as a result of completing the program.

The MS in Bioengineering degree is intended to provide advanced training and practical skills to students seeking to apply engineering principles to biological or medical applications to solve a wide range of problems, including challenges in human health, energy, and the environment. Students successfully completing the MS in Bioengineering will have achieved the following outcomes:

- graduates will have an integrated knowledge of biological science and engineering fundamentals.
- graduates will be proficient in the use of modern techniques, tools, procedures, and information sources that are useful in the solution of problems in bioengineering.
- graduates will have the ability to apply their scientific knowledge and engineering tools and techniques to design solutions that address problems relevant to human health, energy, environment, or other emerging areas.
- graduates will have the breadth and depth of knowledge, and a commitment to continued learning, necessary to understand the economic, social, and ethical aspects of their work, and to effectively, communicate the results of their work to a diverse audience.

5. **Need for the program.** To what specific student, regional, and statewide needs is the institution responding to with the proposed program? How will the proposed program meet those needs? Consider workforce, student, economic, societal, and transfer needs in your response as appropriate. *[250 words]*

MSU-Bozeman currently offers a BS in Biological Engineering and a ME in Bioengineering. These popular programs are not meeting current needs because a research-based, advanced degree in these areas is not available. Further, established faculty in the NACOE have significant research funding available to support research projects in the Bioengineering research area.

The degree would be supported by faculty and researchers in all departments in the NACOE and the Center for Biofilm Engineering. Each semester, a number of students graduating with a BS in Biological Engineering express an interest in pursuing a MS in Bioengineering but are unable to pursue the MS in Montana. The US Bureau of Labor statistics projects that employment of biomedical engineers is growing 7% from 2016 to 2026.

The program is not expected to require the development of new courses or additional faculty. Due to the broad nature of Bioengineering research, a few existing courses will provide the foundational coursework for the degree, and additional courses will be selected by the student's committee to complement the student's research plan. The proposed planning committee for the MS in Bioengineering program included faculty from multiple engineering disciplines.

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6. **Similar programs.** Use the table below to identify and describe the relationship between any similar programs within the Montana University System.

Institution Name	Degree	Program Title

a. If the proposed program substantially duplicates another program offered in the Montana University System, provide a rationale as to why any resulting duplication is a net benefit to the state and its citizens. *[200 words]*

The program will not overlap with any other programs in the Montana University System. The closest program in the MUS system outside of MSU-Bozeman is probably the MS in Environmental Engineering at Montana Tech, but the proposed program would be much less focused on environmental challenges and more heavily focused on combining biological and medical tools with engineering principles to solve challenges related to human health and energy.

b. Describe any efforts that were made to collaborate with similar programs at other institutions. If no efforts were made, please explain why. *[200 words]*

Due to the absence of similar programs in the MUS system, no formal collaborations were established in the creation of this program. We do anticipate that some students successfully completing Bachelor's degrees at other MUS institutions will choose to pursue the proposed MS degree in Bioengineering.

7. **Implementation of the program.** When will the program be first offered? If implementation will occur in phases, please describe the phased implementation plans. *[100 words]*

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CURRICULUM PROPOSAL FORM

a. Complete the following table indicating the projected enrollments in and graduates from the proposed program.

Fall Headcount Enrollment					Graduates				
AY 2021	AY 2022	AY 2023	AY 2024	AY 2025	AY 2021	AY 2022	AY 2023	AY 2024	AY 2025
2	4	6	8	8	0	2	3	4	4

b. Describe the methodology and sources for determining the enrollment and graduation projections above. *[200 words]*

The NACOE awarded almost 70 Masters degrees in 2018, including 6 MS degrees from the Chemical Engineering department, 22 MS degrees from the MIE department, and 7 from the Electrical and Computer Engineering department. Since these department provide the greatest overlap with the proposed MS degree in Bioengineering and because research-based MS degrees typically require 2 years for completion, we estimate the program demand at 4-8 new students per year once the program is well established, 4-8 MS degrees per year, and 8-12 students in the program at any given time once the program is well established by 2023.

c. What is the initial capacity for the program?

Due to existing faculty with research in the area of Bioengineering and existing courses that will support students pursuing the MS in Bioengineering degree, we anticipate the program operating with an initial capacity that is close to the full program capacity. Hence 4-8 new students could join the first year even though we expect initial demand to be somewhat less due to the program being new and unknown.

8. **Program assessment.** How will success of the program be determined? What action would result if this definition of success is not met? *[150 words]*

The program will be assessed in three areas: student recruitment, student progress towards the MS degree, and graduation rate. Student recruiting refers to our ability to attract and admit high-quality applicants. Successful student progress towards the degree refers to the enrolled students passing courses on schedule, preparing a high-quality dissertation, and defending the dissertation within 2-2.5 years of starting the program. Finally, we consider 2-4 students graduating per year a sustainable rate, given the size of our faculty and the other MS programs within the college.

If we find that we are not achieving these outcomes, the faculty will develop and implement a plan for improving performance in any area(s) that are found to be lagging, as these outcomes are largely under faculty control.

a. Describe the assessment process that will be used to evaluate how well students are achieving the intended learning outcomes of the program. When will assessment activities occur and at what frequency? *[150 words]*

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The program learning outcomes will be assessed biannually using the following measures:

- Knowledge of biological sciences and engineering fundamentals will be assessed using the GPA of graduates.
- Proficiency in the use of modern techniques, tools, procedures, and information sources will be assessed using the pass rate of the thesis defense and through a biannual review of theses by the program oversight committee.
- Ability to design solutions that address relevant problems will be assess through a biannual review of theses by the program oversight committee.
- Ability to effectively communicate the work to a diverse audience will be assess based on the number of student presentations and publications.

b. What direct and indirect measures will be used to assess student learning? *[100 words]*

The student must pass the mandatory thesis defense, meet the minimum course credits and grade requirements of the graduate school (direct measures), and must also meet the research quality expectations and recommendations of the Advisor and the Graduate Committee (indirect measures). For example, MS students in the program are generally expected to prepare and present a research conference paper and/or prepare a peer-reviewed manuscript for journal publication while enrolled in the MS program.

c. How will you ensure that the assessment findings will be used to ensure the quality of the program? *[100 words]*

The Chemical and Biological Engineering department has a graduate program coordinator that works with the department head to monitor recruiting of graduate students, assistantship recommendations, and many other duties associated with the PhD program. Ultimately, the Department Head is responsible for monitoring the state of the MS program.

d. Where appropriate, describe applicable specialized accreditation and explain why you do or do not plan to seek accreditation. *[100 words]*

MS programs in engineering do not receive a specialized accreditation. MSU's undergraduate chemical engineering and biological engineering programs are accredited by ABET

9. Physical resources.

a. Describe the existing facilities, equipment, space, laboratory instruments, computer(s), or other physical equipment available to support the successful implementation of the program. What will be the impact on existing programs of increased use of physical resources by the proposed program? How will the increased use be accommodated? *[200 words]*

The Norm Asbjornson College of Engineering has the existing research and teaching space, equipment, and facilities to deliver the MS in Bioengineering program to the small number of students in the program. The college currently enrolls about 4000 undergraduate students and over 100 graduate

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CURRICULUM PROPOSAL FORM

students, so the impact of an additional 10 Bioengineering MS students can be absorbed using existing equipment and facilities.

b. List needed facilities, equipment, space, laboratory instruments, etc., that must be obtained to support the proposed program. (Enter the costs of those physical resources into the budget sheet.) How will the need for these additional resources be met? *[150 words]*

No new facilities or equipment is needed. This is due, in part, to the fact that Bioengineering research is already being conducted at MSU in the NACOE, but the students conducting the research are limited to non-Bioengineering MS degrees.

10. Personnel resources.

a. Describe the existing instructional, support, and administrative resources available to support the successful implementation of the program. What will be the impact on existing programs of increased use of existing personnel resources by the proposed program? How will quality and productivity of existing programs be maintained? *[200 words]*

The MSU Chemical and Biological Engineering department has 16 tenure-track faculty, 3 instructional faculty, and 3 support staff (administrative assistant, accounting support, and student success coordinator). The department currently provides the following degree programs:

- Chemical Engineering (approximately 450 students)
- Biological Engineering (approximately 150 students)
- MS-Chemical Engineering (approximately 20 students)
- MS-Environmental Engineering (approximately 10 students)
- Masters of Engineering in Chemical Engineering and Bioengineering (approx. 3 students)
- PhD in Engineering (chemical engineering): 16

b. Identify new personnel that must be hired to support the proposed program. (Enter the costs of those personnel resources into the budget sheet.) What are the anticipated sources or plans to secure the needed qualified faculty and staff? *[150 words]*
No additional personnel are needed to support the proposed MS in Bioengineering.

11. Other resources.

a. Are the available library and information resources adequate for the proposed program? If not, how will adequate resources be obtained? *[100 words]*

Existing information resources are adequate.

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CURRICULUM PROPOSAL FORM

b. Do existing student services have the capacity to accommodate the proposed program? What are the implications of the new program on services for the rest of the student body? *[150 words]*

The change in student headcount will be small. We do not anticipate any capacity issues with student services.

12. Revenues and expenditures. Describe the implications of the new program on the financial situation of the institution. *[100 words]*

The students in the Bioengineering MS program pay graduate tuition, which generally comes from their appointment as graduate research assistants funded by external grants and contracts.

a. Please complete the following table of budget projections using the corresponding information from the fiscal analysis form for the first three years of operation of the new program.

		Year 2	Year 3
Revenues	$5,933	$11,886	$17, 798
Expenses	0	0	0
Net Income/Deficit (revenues-expenses)	$5,933	$11, 886	$17,798

b. Describe any expenses anticipated with the implementation of the new program. How will these expenses be met? *[200 words]*

There are no incremental costs or needs anticipated with the proposed MS in Bioengineering program.

i. If funding is to come from the reallocation of existing state appropriated funds, please indicate the sources of the reallocation. What impact will the reallocation of funds in support of the program have on other programs? *[150 words]*

The state appropriated funds that currently support research and graduate teaching in the NACOE and departments therein will be continued and the proposed program's needs will be met using the current support.

ii. If an increase in base funding is required to fund the program, indicate the amount of additional base funding and the fiscal year when the institution plans to include the base funding in the department's budget.

N/A

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iii. If the funding is to come from one-time sources such as a donation, indicate the sources of other funding. What are the institution's plans for sustaining the program when that funding ends? *[150 words]*
N/A

iv. Describe the federal grant, other grant(s), special fee arrangements, or contract(s) that will be valid to fund the program. What does the institution propose to do with the program upon termination of those funds? *[150 words]*
N/A

13. Student fees. If the proposed program intends to impose new course, class, lab, or program fees, please list the type and amount of the fee.

We plan no new fees. Engineering students are currently subject to the Engineering Program Fee, and this will still be true with the proposed Bioengineering MS program.

14. Complete the fiscal analysis form.

Signature/Date

College or School Dean: 5/13/19

Chief Academic Officer: 6-4-19

Chief Executive Officer: June 4, 2019

Flagship Provost*: 6-4-19

Flagship President*: June 4, 2019

*Not applicable to the Community Colleges.

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CURRICULUM PROPOSAL FORM

Appendix A – Proposed New CurriculumA Bioengineering MS program of study should include the following:

Course	Name	Credits
EGEN 506	Numerical Sol to Engr Problems	3
EBIO 590	Master's Thesis	8-10
Engineering Courses		**6**
EBIO 461	Principles of Biomedical Engineering	3
EELE 509	The Art of Biochips – Solving Healthcare Problems with BioMEMS	3
EENV 561	Environ Eng Reactor Theory	2
EENV 562	Water Treatment Process/Design	3
EENV 563	Wastewater Treat Proc/Design	3
EM 525	Continuum Mechanics	3
EMEC 524	Cellular Mechanotransduction	3
Biology or Biomedical Courses		**6**
BCH 544	Molecular Biology	3
BIOH 528	Molecular Basis of Neurological Diseases	3
BIOH 542	Survey of Current Cell Signaling	3
BIOH 565	Gene Expression Lab: From Genes to Proteins to Cells	3
MB 520	Microbial Physiology	3
MB 540	Environmental Microbiology	3
Other Graded Courses		**5-7**

Curriculum requirements for the M. S. degree in Bioengineering are highly individualized and established in consultation with and approved by the student's graduate committee. The courses listed are often considered when establishing the program of study for a particular student. Exceptions from the Engineering course requirements (6 credits) and Biological or Biomedical course requirements (6 credits) will be considered by the Bioengineering MS oversight committee.
Total number of credits must be 30 credits or greater.

Academic Degree Program Proposal - Fiscal Analysis Form

CAMPUS:	Bozeman
AWARD LEVEL:	Grad
PROGRAM NAME:	MS in Bioengineering
PROGRAM CODE:	

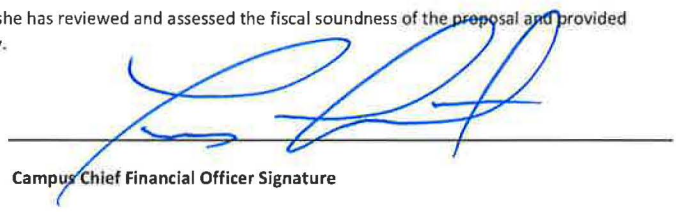
ENROLLMENT PROJECTIONS	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Headcount					
annual unduplicated headcount of students with declared major or minor within the program	2	4	6	8	8
Credit Hours					
annual avg. credits hours earned per student in program related curriculum	12	12	12	12	12
Student FTE					
Undergrad: (Headcount x CH)/30 Graduate: (Headcount x CH)/24	1	2	3	4	4
Completions					
Annual number of program completers	0	2	3	4	4

REVENUE					
Tuition Revenue (net of waivers)	$5,933	$11,866	$17,798	$23,731	$23,731
Institutional Support					
Other Outside Funds (grants, gifts, etc.)					
Program Tuition/Fees					
Total Revenue	**$5,933**	**$11,866**	**$17,798**	**$23,731**	**$23,731**
Total Revenue per Student FTE	**$5,933**	**$5,933**	**$5,933**	**$5,933**	**$5,933**

EXPENDITURES						
Tenure Track Faculty	FTE					
	Salary + Benefits					
Non-tenure Track Faculty *Includes Adjunct Instructors	FTE					
	Salary + Benefits					
Graduate Teaching Assistants	FTE					
	Salary + Benefits					
Staff	FTE					
	Salary + Benefits					
Total Faculty & Staff	FTE					
	Salary + Benefits	**$0**	**$0**	**$0**	**$0**	**$0**
Operations (supplies, travel, rent, etc)						
Start-up Expenses (OTO)						
Total Expenses		**$0**	**$0**	**$0**	**$0**	**$0**

Student FTE to Faculty (TT + NTT) Ratio	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Net Income/Deficit (Revenue - Expenses)	$5,933	$11,866	$17,798	$23,731	$23,731

The signature of the campus Chief Financial Officer signifies that he/she has reviewed and assessed the fiscal soundness of the proposal and provided his/her recommendations to the Chief Academic Officer as necessary.



Campus Chief Financial Officer Signature

Chief Financial Officer Comments

Montana University System

INTENT TO PLAN FORM

Program/Center/Institute Title: **MS in Bioengineering**

Campus, School/Department: **MSU-Bozeman/NACOE/Chem & Bio Engineering** Expected Submission Date: **Fall 2019**

Contact Name/Info: **Jeffrey Heys**

To increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process, please complete this form not more than 18 months in advance of the anticipated date of submission of the proposed program/center/institute to the Board of Regents for approval. The completed form should not be more than 2-3 pages. For more information regarding the Intent to Plan process, please visit http://mus.edu/che/arsa/academicproposals.asp.

1) **Provide a description of the program/center/institute.**

The **MS in Bioengineering** degree is intended to provide advanced training and practical skills to students seeking to apply engineering principles to biological or medical applications to solve a wide range of problems, including challenges in human health, energy, and the environment. The program should be accessible to students with a diverse range of undergraduate degrees including the various engineering disciplines, biology, microbiology, biochemistry, and others.

2) **Describe the need for the program/center/institute. Specifically, how the program/center/institute meets current student and workforce demands. (Please cite sources).**

MSU-Bozeman currently offers a BS in Biological Engineering and a ME in Bioengineering. These popular programs are not meeting current needs because a research-based, advanced degree in this area is not available. Further, established faculty in the NACOE have significant research funding available to support research projects in the Bioengineering area.

Each semester, a number of students graduating with a BS in Biological Engineering express an interest in pursuing a MS in Bioengineering but are unable to pursue the MS in Montana. The US Bureau of Labor statistics projects that employment of biomedical engineers is growing 7% from 2016 to 2026.

The program is not expected to require the development of new courses or additional faculty. Due to the broad nature of Bioengineering research, a few existing courses will provide the foundational coursework for the degree, and additional courses will be selected by the student's committee to complement the student's research plan. The degree would be supported by faculty and researchers in all departments in the NACOE and the Center for Biofilm Engineering. The proposed planning committee for the MS in Bioengineering program includes faculty from multiple engineering disciplines.

3) **Describe how the program/center/institute fits with the institutional mission, strategic plan, and existing institutional program array.**

Montana State University is a research university, and increasing the rate of Masters graduates is a key part of MSU's draft Strategic Plan (e.g., see "GOAL 1.2: Expand high-quality graduate education", especially Metric 3). Establishing a MS program in Bioengineering will allow recruitment of a broader range of MS students that may have previously pursued a MS in Bioengineering from another institution outside of Montana.

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INTENT TO PLAN FORM

4) Describe how the program/center/institute overlaps, complements, or duplicates existing efforts in the MUS. Describe efforts that will be made to collaborate with similar programs at other institutions. If no efforts will be made, please explain why.

MSU-Bozeman currently offers a BS in Biological Engineering and an ME in Bioengineering. The ME in Bioengineering is a course-work only degree and students typically do not conduct independent research nor do they write a thesis. A number of students that have started the ME in Bioengineering have changed to the MS in Chemical Engineering so that they could conduct research and write a thesis. The proposed MS in Bioengineering will complement existing MS degrees in Chemical Engineering, Mechanical Engineering, Environmental Engineering and other MS degrees in biology and microbiology. The degree will provide a unique combination of engineering tools, biological principles, and an in-depth research experience culminating in a thesis. The program will not overlap with any other programs in the MUS.

Signature/Date

College/School Dean:

Chief Academic Officer:

Chief Executive Officer:

Flagship Provost*:

Flagship President*:

*Not applicable to the Community Colleges.

Date of Final Review:

When submitting the proposal to the BOR, include this signed form with the Level II request.

ITEM 184-2011-R0919

Request authorization to change the name of the Department of Agricultural Education to Department of Agricultural and Technology Education

THAT

Montana State Univiertsy is requesting authorization to change the name from Department of Agricultural Education (AGED) to Department of Agricultural and Technology Education (ATE)**.**

EXPLANATION

The name change better reflects the nature of the programs now administered by this department through the College of Agriculture (BS in Technology Education Broadfield Teaching, BS in Technology Education – Industrial Technology, BS in Agricultural Education Broadfield Teaching, and BS in Agricultural Education – Communications, Leadership, and Extension)

ATTACHMENTS

Academic request form

ITEM **184-2011-R0919** Submission Month or Meeting: **September 11-12, 2019**

Institution: **Montana State University** CIP Code: _____

Program/Center/Institute Title: **College of Agriculture; Department of Agricultural Education**

Includes (please specify below): Online Offering _____ Options _____

Please mark the appropriate type of request and submit with an Item Template and any additional materials, including those listed in parentheses following the type of request. For more information pertaining to the types of requests listed below, how to complete an item request, or additional forms please visit http://mus.edu/che/arsa/academicproposals.asp.

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_____ **1. Establishing a new postsecondary educational program** (Curriculum Proposal and Completed Intent to Plan Form)

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_____ **3. Exceeding the 120 credit maximum for baccalaureate degrees** *Exception to policy 301.11*

_____ **4. Forming, eliminating or consolidating an academic, administrative, or research unit** (Curriculum or Center/Institute Proposal and Completed Intent to Plan Form, except when eliminating or consolidating)

X **5. Re-titling an academic, administrative, or research unit**

Proposal Summary [360 words maximum]

What The proposed name change to Department of Agricultural and Technology Education (ATE), from Department of Agricultural Education (AGED) better reflects the fact that this is a merged department, which included the Department of Agricultural Education in the College of Agriculture (COA) and the Technology Education program in the Department of Education in the College of Education, Health, and Human Development (EHHD).

Why Retitling the program from the Department of Agricultural Education to the Department of Agricultural and Technology Education will better describe the programs being offered by the merged department.

Resources No additional resources are requested

Relationship to similar MUS programs Similarity with the merged programs and other MUS programs has existed for years. A bachelor's degree program (Agricultural Operations Technology) exists at MSU-Northern with some similarity to each of the Ag Education and Technology Education programs. The merged department (ATE) is open to collaborating with the Dean of the College of Technical Sciences at MSU-Northern.