REQUEST TO PLAN MEMORANDUM

DATE: August 24, 2020

TO: Chief Academic Officers, Montana University System

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

RE: September 2020 Request to Plan Proposals

The campuses of the Montana University System have proposed new academic programs or changes under the Request to Plan process authorized by the Montana Board of Regents. The 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 18th. Issues not resolved at that meeting should be submitted in writing to OCHE by noon on Friday, August 21st. If no concerns are received, OCHE will assume that the proposals have your approval.

Requests to Plan

Montana State University Bozeman:

- Request to plan an M.S. in Material Science
  Item #190-2001-R0920 | OCHE Analysis
- Request to plan an M.A. in Professional Studies
  Item #190-2002-R0920 | OCHE Analysis
- Request to plan an Astronomy and Astrophysics option within the Physics B.S.
  Item #190-2003-R0920 | OCHE Analysis

The University of Montana Missoula:

- Request to plan a PhD in Computer Science
  Item #190-1001-R0920 | OCHE Analysis
- Request to plan a C.A.S. and Certificate in Brewing Science
  Item #190-1002-R0920 | OCHE Analysis
- Request to plan an option in Human Physiology in the Integrative Physiology B.S.
  Item #190-1004-R0920 | OCHE Analysis
- Request to plan a PhD in Integrative Physiology and Rehabilitation Science
  Item #190-1005-R0920 | OCHE Analysis
- Request to plan the Montana Reparatory Theatre as a center
  Item #190-1006-R0920 | OCHE Analysis
- Request to plan the Skaggs Center for Telehealth and Precision Medicine
  Item #190-1007-R0920 | OCHE Analysis
  ****NOTE**** Due to the use of an honorific name, the Level II paperwork for this proposal will return for BOR review and approval at a future meeting. The materials submitted for BOR consideration at that time will include a summary of comment received from the public in accordance with BOR policy 1004.1 "Naming of Buildings"
- Request to plan a certificate in General Studies
  Item #190-1008-R0920 | OCHE Analysis

Montana Technological University:

- Request to plan an M.S. in Geological Engineering and adjust options within the M.S. in Geosciences
  Item #190-1501-R0920 | OCHE Analysis

Helena College University of Montana:

- Request to plan a C.A.S. and an A.S. in Fire & Emergency Services
  Item #190-1903-R0920 | OCHE Analysis

Montana University System

REQUEST TO PLAN FORM

ITEM 190-2001-R0920 **Meeting Date: September 2020**

Item Name

Program/Center/Institute Title: **Master's Degree in Materials Science** Planned 6-digit CIP code: **40.1001**

Campus, School/Department: **MSU-Bozeman, Graduate School** Expected Final Submission Date: 11/30/2020

Contact Name/Info: **Professor Rob Walker (rawalker@montana.edu)**

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

The proposed Master's program in Materials Science (Mat Sci) will provide students from a broad background of physical science and engineering disciplines with the opportunity to earn an Master's degree in Materials Science. The proposed program will complement the existing multi-campus Materials Science Ph.D. program. Students in the MS program will be required to take the full complement of 1st year Mat Sci courses being offered to Ph.D. students and then additional, elective courses in their second year to complete the remaining credit requirements. A list of those elective courses will be drawn from 400 and 500-level offerings in the College of Engineering and the College of Letters and Sciences. While students will be able to pursue a thesis-MS degree, we expect that most students will choose a course-work MS degree with a professional paper. The MS program will be directed/administered by the existing Mat Sci Ph.D. program leadership.

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

The proposed Master's program in Materials Science will serve three important purposes:

1. The MS program is an "accelerated" advanced degree program allowing students from a host of different disciplines who have earned a BS/BA/BE degree to complete an advanced degree in a minimum of 3 semesters (coursework MS). A thesis-based MS will require slightly longer.

2. The MS program will likely prove an effective recruiting tool for the Ph.D. program. In particular, current MSU undergraduates already interested in materials related science/engineering may wish to remain and earn an advanced degree. With this additional engagement, some of those students will find themselves drawn towards the research and discovery elements of the graduate experience and transition into the Ph.D. program. Anecdotally, many faculty in MSU's Mat Sci Ph.D. program have relayed these sentiments expressed by undergraduates whom they mentor.

3. For those students already enrolled in the Mat Sci Ph.D. program who choose not to continue their program of study but remain in good standing, the MS option would provide an exit ramp so that their work to date is recognized and rewarded. Currently, students who find themselves looking to leave the Ph.D. program must transfer to another department in order to earn a MS degree.

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3) Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.

Given that the Mat Sci MS program will coordinate closely with the existing Mat Sci Ph.D program and will not require new course offerings or research commitments, few new resources will be needed other than modest compensation for administrative staff who will ensure that MS Mat Sci students remain on track and continue to follow their program of study in a timely fashion.

4) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).

As mentioned above, MS students will be required to take the same complement of courses in the first year of the program as the Mat Sci PhD students in the first year. We will continue to utilize the expertise of faculty from different departments on MSU's and Montana Tech's campuses to teach the first year Mat Sci courses. (Note: these Mat Sci courses are available to *all* graduate students at MSU and MT-Tech regardless of major/graduate program.) These MTSI courses have witnessed increasing enrollment from graduate students in other degree programs. Student evaluations have noted that Mat Sci courses are rigorous and challenging but also useful and well-taught.

If the MS student elects to complete a thesis-based MS, research and scholarship activities can take place in any affiliated materials science laboratory on the Bozeman campus. Students will select a research advisor from the materials science affiliated faculty.

5) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

The Mat Sci MS program fits well with MSU's strategic plan "Choosing Promise." The Mat Sci MS program aims to expand high quality graduate education, especially to individuals who may not desire a PhD but do want an advanced degree. Offering a MS program in Mat Sci will broaden access to students from different backgrounds as well as those students drawn to interdisciplinary topics. The MS program will also add opportunities for students who desire further education and professional advancement without a long-term academic commitment.

Students in the program will sit for courses taught by faculty on our campus and from faculty at Montana Tech. The partnership between institutions will enable students to see firsthand, the diverse academic and research activities that impact our state and beyond and how the efforts from both institutions transform learning.

The MS option will provide students with a solid foundation in materials science and enable them to become highly skilled professionals in industry and academics. This MS program will be tailored to keep up with emerging workforce needs for trained scientists and engineers.

Montana University System

REQUEST TO PLAN FORM

Signature/Date		
Chief Academic Officer:	DocuSigned by: Robert Mokwa 212A28411AC04BD...	6/22/2020 | 4:40 PM MDT
Chief Research Officer*:		
Chief Executive Officer:	DocuSigned by: 7D6A4CE96C3F415...	6/22/2020 | 4:40 PM MDT
Flagship Provost:**	DocuSigned by: Robert Mokwa 212A28411AC04BD...	6/22/2020 | 4:40 PM MDT
Flagship President:**	DocuSigned by: 7D6A4CE96C3F415...	6/22/2020 | 4:40 PM MDT

*Center/Institute Proposal only
**Not applicable to the Community Colleges.

Montana University System
REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-2001-R0920

ITEM NAME: Master's Degree in Materials Science

OCHE ANALYSIS

Labor market outlook

Materials science and materials engineering as occupations are projected to have slower than average growth (0-3%) between 2018-2028 (O*NET).

	Material Scientist		Material Engineer	
	Montana	**Nation**	**Montana**	**Nation**
Current Employment	6	8100	51	27,700
Annual Openings	*	800	5	1,700
Median Wage	*	$96,810	$63,310	$93,360

SOURCE: O*NET & Montana Department of Labor and Industry. * indicates data not available.

Related programs / centers / institutes

Materials Science Ph.D. Program – co-administered by MSU and Montana Tech
M.S. in Material Science and Engineering, Montana Tech (launched 2019)

Budget Impact

X	**LOW** • **Only incidental costs**		**MEDIUM**		**HIGH** • **substantial commitment of resources relative to institutional budget**

CAO discussion and follow-up

Montana Tech supports this proposal.

ARSA/BOR comment and direction for Level II proposal

Montana University System

REQUEST TO PLAN FORM

ITEM 190-2002-R0920 **Meeting Date: September 2020**

Item Name

Program/Center/Institute Title: **MA in Professional Studies** Planned 6-digit CIP code: **30.0000**

Campus, School/Department: **Graduate School, Montana State University** Expected Final Submission Date: **Fall 2021**

Contact Name/Info: **Craig Ogilvie, craig.ogilvie@montana.edu**

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

In Masters of Arts in Professional Studies degrees, students can flexibly obtain the interdisciplinary knowledge needed to make progress on the grand challenges facing our state and communities. There would be three pathways into these programs;

1. A student can combine two to three strategic areas of study by completing existing graduate certificates and a professional paper that integrates the knowledge in the certificates, i.e. a stackable masters. The number of graduate credits will be at least 30cr, but each combination of graduate certificates will vary for each student. For example, a student interested in developing both management and data analysis skills may take two certificates; one in non-profit management and one in data science.

2. A student could propose a unique area of research that does not fit into a single disciplinary area. Students applying for this option would need to clearly describe and explain how the research requires an interdisciplinary approach to achieving the research and what expertise each discipline can offer when seeking a solution to the problem.

3. Students who have been working on the Individual Interdisciplinary PhD, but for a variety of reasons would like to step away from their doctoral work and complete a masters instead.

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

Working professionals in Montana are interested in developing their knowledge and skills by completing in-depth graduate courses and obtaining a credential that can lead to greater career opportunities and earnings. Graduate certificates occupy a unique position in that they are a viable first step for students given the smaller credit requirements of 12-15 credits, and they are often targeted to strategic, career-focused skills. Graduate certificates that stack to a Masters degree provide a means for students to start with a graduate certificate and then expand their educational progress towards a masters. The Masters degree conveys a higher level of achievement and is often required for advanced positions in Montana businesses and government agencies. Job projections in Montana http://lmi.mt.gov/Portals/193/Publications/LMI-

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Pubs/Labor%20Market%20Publications/Projections2018-28.pdf indicate that annually there will be almost 800 job openings in Montana requiring a masters degree, earning an estimated salary of nearly $70K. As of 5/21/2020 there are almost 400 positions in Montana posted on a major job board (www.indeed.com) that require a masters degree. Masters-level positions in the state are projected to increase by 2028 from 4.0 to 4.2% of the workforce.

3) Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.

None anticipated, since the program builds on existing graduate certificates at MSU as well as the infrastructure used to support the interdisciplinary PhD program. We note that this may help catalyze the creation of more graduate certificates.

4) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).

Both MSU and University of Montana have an interdisciplinary PhD program, University of Montana and Montana Tech have an interdisciplinary Masters (MA/MS), but there is no comparable stackable Masters degree in the MUS system. Both graduate schools at University of Montana and Montana Tech are interested in this option and will learn from our first experiences. Currently a student can apply credits obtained in a graduate certificate to a Masters degree in the same discipline. Going deep in one discipline may be advantageous for some students, and in those cases they would apply to existing disciplinary masters degrees. The stackable MA in Professional Studies in this proposal is different in that the areas of knowledge in each certificate can be very distinct.

5) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

MSU's Strategic plan GOAL 1.2 is: "Expand high-quality graduate education Montana State University will enroll and graduate more degree-seeking students at the graduate level and enhance the quality of graduate degree programs." Having a path to a stackable masters will increase the number of people in the state with a Masters credential. MSU can respond rapidly to the needs of the state by proposing new graduate certificates which can be utilized in this stackable masters. We expect that faculty, academic departments, and college will respond to this structure by proposing new graduate certificates to meet the needs of the people of Montana.

Signature/Date	
Chief Academic Officer: DocuSigned by: Robert Mokwa 212A28411AC04BD...	6/22/2020 | 1:19 PM MDT
Chief Research Officer*:	
Chief Executive Officer: DocuSigned by: 7D6A4CE96C3F415...	6/22/2020 | 1:19 PM MDT

Montana University System

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Flagship Provost:** DocuSigned by: Robert Mokwa 212A28411AC04BD...	6/22/2020 | 1:19 PM MDT
Flagship President:** DocuSigned by: 7D6A4CE96C3F415...	6/22/2020 | 1:19 PM MDT

*Center/Institute Proposal only
**Not applicable to the Community Colleges.

Montana University System
REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-2002-R0920

ITEM NAME: M.A. in Professional Studies

OCHE ANALYSIS	
Labor market outlook	Montana DLI projects that there will be 121 new jobs annually that require a Master's Degree (2018-2028) and 785 total openings annually (2018-2028) that require a Master's Degree. The projected average wage for these positions is $63,200. In comparison, the projected number of new jobs requiring a B.A. or B.S. for this same period is 845, with 8,237 total openings annually and an average wage of $63,394. The projected number of new jobs openings requiring a Ph.D. for this period is 138 annually, with 730 total openings annually and an average wage of $114,522.
Related programs / centers / institutes	M.A. and M.S. in Interdisciplinary Studies, University of Montana M.S. in Interdisciplinary Studies, Montana Tech Interdisciplinary Science Master's Degrees 2016-2018 UM-Missoula: 2018: 9; 2017: 6; 2016: 3 Montana Tech: 2018: 5; 2017: 3; 2016: 1
Budget Impact	**X** **LOW** • Only incidental costs ; **MEDIUM** ; **HIGH** • substantial commitment of resources relative to institutional budget
CAO discussion and follow-up	MSU, in their presentation, discussed how this master's program could develop into an opportunity for students to creatively stack graduate certificates towards a masters. OCHE recommended connection between MSU, UM and Tech, as each campus is engaged in related conversations around stackable graduate credentials and there is reasonable scope for collaboration.
ARSA/BOR comment and direction for Level II proposal	

Montana University System

REQUEST TO PLAN FORM

ITEM 190-2003-R0920 **Meeting Date: September 2020**

Item Name

Program/Center/Institute Title: **Physics BS - Astronomy and Astrophysics Option**

Planned 6-digit CIP code: **40.02**

Campus, School/Department: **MSU, Physics**

Expected Final Submission Date: **Nov 2020**

Contact Name/Info: **Wm. Randall Babbitt**

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

The Astronomy and Astrophysics Option would be one of the four options toward a BS in physics. The three other options are: Professional Option, Interdisciplinary Option, and Teaching Option.
The Astronomy and Astrophysics Option is intended primarily as preparation for graduate work in astrophysics or astronomy or for a career in astrophysics or astronomy or space science. The Astronomy and Astrophysics Option offers suggested paths for students who want to emphasize experimental studies or theoretical studies, while providing a sound background in both the experimental and theoretical fundamentals of physics, mathematics, astronomy, and astrophysics.

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

The interest of students nationally in pursuing graduate work or careers in astronomy and astrophysics is very strong. MSU has an internationally recognized strong research program in astronomy and astrophysics, which is currently led by five tenure track faculty members and several research faculty. Our strength in astronomy and astrophysicists has attracted a large number of graduate school applications (the stated interests of about 50% of applicants to MSU's physics PhD program are in the area of astronomy or astrophysics). The interest in astronomy is strong in undergraduates. Advisors claim that over a quarter of their advisees would take like to pursue the astronomy and astrophysicists option. The interest extends beyond our majors, to incoming freshman across the spectrum. In the past five years, 4783 students have taken ASTRO 110IN Introduction to Astronomy: Mysteries of the Sky (an average of 950 annually). Yet, we do not capitalize on this interest, by offering these students the option to pursue their interest with a dedicated program. We would use ASTR 110IN as a recruiting tool for the new option. We also are currently missing the opportunity to attract incoming freshman interested in astronomy and astrophysics to MSU physics, both in-state and out-of-state, as our current program is not listed as an astronomy program in college catalogs. Thus, this program fills the need of our current and prospective undergraduate students desire to get involved in frontier research in astronomy and astrophysics and go on to graduate work or careers in astronomy and astrophysics. The program also enhances the educational opportunities of students involved in MSU's Space Science Engineering Lab (SSEL).

In 2018, according to datausa.io, there were over 4300 people in the physics sciences workforce in Montana with average salaries over $62K (Workforce number for astronomy are lumped in with the physics sciences). Nationally

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over $1.1M are in the physics sciences workforce with a growth rate of 2.37% and average salaries of $109K. The number of degrees in astronomy and astrophysics awarded in 2015 grew by 15% (aip.org) and in 2017 grew by 20.3%. The average out of state tuition paid in this field is $49K.

According to **https://www.aip.org/statistics/reports/employment-and-careers-physics** , in 2017 and 2018 combined, 67% of students with bachelors degrees in physics went into the private sector. Of those who go into careers in engineering, more than 75% use their knowledge of physics and/or astronomy on a weekly basis, and about 70% use simulations or modeling on a weekly basis. Students in the astronomy option will get strong training in data analysis and some training in simulations, preparing them for careers in the growing tech industry of the Gallatin Valley.

3) Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.

The main resources that will be needed are for developing and teaching ASTR 475. Some time will be needed for the instructors of ASTR 372 and 373 to develop/adapt their courses.

The resources needed for ASTR 475 will be obtained by a combination of course lab fees, departmental support, and EPAF requests.

4) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).

The University of Montana has an astronomy concentration as part of their physics major, but not an astronomy or astrophysics option or major nor an astrophysics concentration. The proposed astronomy and astrophysics option has some overlap with the existing UM astronomy concentration, but the two programs have significant differences in course requirements. UM and MSU have different kinds of expertise in astronomy and astrophysics, and the proposed MSU astronomy option will take advantage of the expertise we have at MSU. We spoke to Andrew Ware, the department chair at UM physics/astronomy, about MSU's proposed option. He was supportive and we discussed possible areas of collaboration that could result from the MSU option and that would benefit the UM physics program. One possibility is for collaborative development of REU programs at MSU that UM students could attend. Another possibility is to do distance learning of some of the astronomy courses we will be teaching as part of the option, which could enhance the UM astronomy concentration. The implementation will depend on resources available for development of distance learning capability and proposing and winning a REU grant.

5) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

The proposed program will increase undergraduate research opportunities, better prepare our students for post-MSU graduate work or careers, and increase the research productivity of MSU. The program will increase enrollment in MUS by enticing the growing number of out-of-state students interested in astronomy and astrophysics.

The option will also increase our female population in physics at MSU, as national astro-programs typically have a higher ratio of women to men than do physics-only programs. According to Source: https://www.aip.org/statistics/reports/women-physics-and-astronomy-2019, in 2017, women earned 21% of physics bachelors' degrees and 20% of physics doctorates, whereas, in that same year, women earned 33% of astronomy bachelors' degrees and 40% of astronomy doctorates. Additionally, in the 2007–2016 Longitudinal Study of Astronomy Graduate Students, the study found no gender differences in salary for astronomy doctoral recipients as of 2015–16.

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Early and mid-career astronomy salaries (1-8 years after graduation) also had no significant difference between men and women. (Longitudinal study of Astronomy Graduate Students (2007-2016).

Montana University System

REQUEST TO PLAN FORM

Signature/Date	
Chief Academic Officer: DocuSigned by: Robert Mokwa 212A28411AC04BD...	7/8/2020 | 2:37 PM MDT
Chief Research Officer*:	
Chief Executive Officer: DocuSigned by: 7D6A4CE96C3F415...	7/8/2020 | 2:37 PM MDT
Flagship Provost:** DocuSigned by: Robert Mokwa 212A28411AC04BD...	7/8/2020 | 2:37 PM MDT
Flagship President:** DocuSigned by: 7D6A4CE96C3F415...	7/8/2020 | 2:37 PM MDT
*Center/Institute Proposal only **Not applicable to the Community Colleges.	

Montana University System

REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-2003-R0920

ITEM NAME: Physics B.S. – Astronomy and Astrophysics Option

OCHE ANALYSIS						
Labor market outlook	According to O*NET, there is a 4-6% projected growth for astronomers and 7-10% projected growth for physicists nationally between 2018-2028. Nationally, the median earnings of astronomers is $114,590.					
Related programs / centers / institutes	The University of Montana has an option in astronomy within their Physics B.S. program.					
Budget Impact		**LOW** • **Only incidental costs**	X	**MEDIUM**		**HIGH** • **substantial commitment of resources relative to institutional budget**
	Three courses (ASTR 372, 373, and 473) will be developed or adapted to support the new program.					
CAO discussion and follow-up	MSU's and UM's physics departments have had early conversations, including discussion of collaborative opportunities, such as a joint summer undergraduate research program,					
ARSA/BOR comment and direction for Level II proposal						

Montana University System
REQUEST TO PLAN FORM

ITEM XXX-XXX-XXXXX 190-1001-R0920 **Meeting Date** September 2020

Item Name Request for authorization to establish a Ph.D. in Computer Science

Program/Center/Institute Title: **Computer Science PhD** Planned 6-digit CIP code: **11.0701**

Campus, School/Department: **University of Montana, Missoula** Expected Final Submission Date: March 2021

Contact Name/Info: **Travis Wheeler, travis.wheeler@umontana.edu**

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

We will submit a proposal to create a Computer Science (CS) doctoral program.

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

The CS department is highly research active. One measure of that activity is the average research expenditure per faculty; UM CS ranks at least in the 80th percentile for public schools nationwide (https://bit.ly/2LmnmvV - Fig R2). We have a strong and growing graduate program, currently 35 students enrolled, with 26 students supported as Research Assistants by external research funds. Because the CS department currently offers only a Masters program, the large majority of these students are Masters students (six students advised by our faculty are enrolled in PhD programs outside of CS). This is an unsustainable situation, as it means that we are largely required to fill our grant-funded RA positions with students who enter the program with limited research experience or expectation, and who have relatively short time on campus. At present, there are three funded RA lines available, with no graduate students to fill them; pending the success of in-review grants, this number may grow. Creation of a PhD program will allow the CS department to improve recruitment of research-ready scholars, providing greater support for the research mission of the department and university.

We also highlight the value that a PhD program will provide during recruitment of faculty, in the event of future TT faculty searches. We've been lucky enough to attract a small number of high-quality applicants in recent searches, but a PhD program would increase the depth and diversity of our pool of strong applicants. In the three most-recent successful searches, nearly all applicants asked about the plans for creating a PhD program in the future. It is reasonable to expect that a large number of potential applicants simply removed UM from their target list based on lack of a PhD program. We specifically highlight the impact that we suspect this may have on our ability to recruit female applicants. Two recent searches each received only 1 female applicant, out of more than 50 total applicants. Females make up only ~20% of PhDs granted in CS departments nationwide, and are highly sought after by departments hoping to increase diversity. Anecdotally, we have heard from two strong female researchers that they would consider applying to UM CS, but only if it had a PhD program.

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3) Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.

Requested additional resources will be limited to:

- Creation of two additional PhD-level Teaching Assistant (TA) lines
- Modification of two current CS teaching assistant (TA) positions from Masters-level TA to PhD-level TA. The department currently hosts 5 Masters-level TA positions. This proposed change will result in cost increase, since PhD-level TA's are paid at a higher rate than Masters-level TAs.

4) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).

Montana State University has a PhD program in Computer Science. We are in regular contact with the Head of the MSU CS department (John Paxton); he has expressed strong support for the growth of UM CS and the creation of a UM CS PhD program. CS PhD training in Montana is not resource constrained, so there is no reason to be concerned about the existence of two such programs at the state's flagship schools. In fact, expansion of the UM research mission has motivated ongoing development of plans for an inter-department research symposium.

5) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

Research within the UM CS department is largely Data Science oriented, meaning that our interdisciplinary work aids the research enterprise across campus. Creation of an increasingly-robust graduate student research population will improve this campus-wide impact. We have accumulated nearly a dozen letters from colleagues across campus who advocate for creation of a CS PhD program (not included in this Intent to Plan).

President Bodnar has expressed a desire to see expansion of UM's focus on Computing and Data Science. Development of a CS PhD program will support this vision. The presence of such a program will attract businesses hoping to leverage our existing talent pool. And some of our own research programs will lead to locally-oriented spin-offs.

Signature/Date	, Interim Dean H&S
Chief Academic Officer:	
Chief Research Officer*:	
Chief Executive Officer:	
Flagship Provost:**	DocuSigned by: Jon Harbor 34E1E62599324B7...

Montana University System

REQUEST TO PLAN FORM

Flagship President:**	DocuSigned by: Seth Bodnar 9672218F28384DA...

*Center/Institute Proposal only
**Not applicable to the Community Colleges.

FOR OCHE USE	
Labor market outlook	
Related programs / centers / institutes	
CAO discussion and follow-up	
ARSA/BOR comment and direction for Level II proposal	

Montana University System

REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-1001-R0920

ITEM NAME Request for authorization to establish a Ph.D. in Computer Science

OCHE ANALYSIS

Labor market outlook

Computer scientists are in high demand both in Montana and nationally, with the occupation expected to grow 17% between now and 2028. Median earnings for computer scientists nationally are $122,840 (BLS). Nationally, 21% of job postings seeking computer scientists request a doctorate (Burning Glass Technologies).

Related programs / centers / institutes

Montana State University offers a PhD in Computer Science.

Montana Computer Science PhD Graduates 2016-2018			
	2018	**2017**	**2016**
Montana State University	**3**	**6**	**3**

Source: MUS Student Data Warehouse

Budget Impact

	LOW		MEDIUM		HIGH
	• **Only incidental costs**	**X**			• **substantial commitment of resources relative to institutional budget**

Requested additional resources will include:

- Creation of two-additional graduate TA lines
- Modification of two existing TA positions from the Masters-level to PhD-level
- Some amendments of faculty time allocation for PhD supervision

CAO discussion and follow-up

ARSA/BOR comment and direction for Level II proposal

Montana University System

REQUEST TO PLAN FORM

ITEM 190-1002-R0920 **September 2020**

Request for authorization to establish a C.A.S. in Brewing Science

Program/Center/Institute Title:	**Certificate of Applied Science in Brewing Science**	Planned 6-digit CIP code:	**26.1201**
Campus, School/Department:	**University of Montana-Missoula, College of Humanities and Sciences, Department of Chemistry and Biochemistry**	Expected Final Submission Date:	**March 2021**
Contact Name/Info:	**Christopher Palmer, Professor, Department of Chemistry and Biochemistry**		

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

The proposed program will allow students of chemistry, biochemistry, microbiology and related scientific fields to complete a certificate in brewing science through completion of appropriate prerequisites and a new 3-credit course in brewing science. This will be a partner program with a Certificate of Completion requiring fewer prerequisites and a non-credit Micro-Credential Program, which will both also require the course in brewing science (See Table below). Students in these programs may choose to complete optional internship credits with a local micro-brewery or distillery or in an on-campus laboratory that will provide analytical services to local and regional breweries and distilleries. This combination of programs will be attractive and accessible to a broad range of students at UM and Missoula College and will offer practical, enjoyable and employable skills and knowledge. The Certificate of Applied Science would complement and enhance existing chemistry and biology oriented B.S. programs.

Proposed Program	Prerequisites	New Required Courses	Audience
Certificate of Applied Science, Level II, 33 Cr.	30 Cr. General Chemistry, Analytical Chemistry, Microbiology, Biochemistry	**CHMY 314 Brewing Science, 3 Cr.**, late start	Natural Science Majors (e.g. Chemistry, Biology, Biochemistry, Microbiology)
Certificate of Completion, Level I, 17 Cr.	13 Cr. Chemistry, Biology	**CHMY 313 Intro to Brewing Science, 1 Cr.** traditional start & **CHMY 314 Brewing Science 3 Cr.**, late start	Other Majors (e.g. Wildlife Biology, Health)
Micro-Credential	Consent of Instructor	Non-credit course co-convened with CHMY 313 and CHMY 314	Community members, brewery employees

Montana University System
REQUEST TO PLAN FORM

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

Brewing, malting and distilling industries have a significant economic impact in Montana that continues to grow. In a 2016 report titled The Continuing Economic Impact of Craft Brewing in Montana, the Bureau of Business and Economic Research at UM concluded: "*The survey results from this study indicate continued growth in Montana's brewing sector. Beer production in 2015 was 15 percent above 2014 and 87 percent greater than in 2010, the first iteration of this study. Montana brewers continue to employ more people, increase payroll and make a greater number of purchases year over year. Furthermore, the share of expenditures to Montana businesses continues to increase, with a total of $19.8 million paid directly to Montana businesses. This study was the first to estimate agricultural purchases totaling $4.5 million in 2015, 36 percent of which were Montana agricultural producers."* It is clear anecdotally that this local industry continues to grow: In Missoula alone, at least two new microbreweries have opened since the 2016 study, with another three slated to open in 2020 or 2021. Meanwhile, malting operations in Great Falls (Malt Euro) and in Butte (Montana Craft Malt) provide a market for Montana agricultural producers and a source of local malt for the brewing industry. The proposed certificate and laboratory analysis programs will provide services to these burgeoning industries, allowing scientifically informed product development and quality control. Students who complete the certificate programs, especially those who take advantage of experiential learning opportunities, will help to meet a growing demand for qualified employees.

3) Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.

Professor Palmer will develop, introduce and teach a new course in Brewing Science required for the certificate and micro-credential programs. Professor Palmer will also advise and mentor students in the certificate program and will serve as the UM instructor of record for internship experiences that certificate earners may choose to complete. The Department will need to adjust Palmer's teaching assignments accordingly, and will need to hire an adjunct instructor to back fill for 4 credits of teaching per year. Current professional advisors will be informed of the new certificate and its requirements and can advise students accordingly.

Some additional instrumentation is needed to provide students with experience in a complete suite of analytical measurements for brewing concerns, as well as to provide analytical services for Montana breweries. The laboratory program will also need consumables and supplies to conduct the measurements.

To fund the program in the first three years, and to provide for purchase and maintenance of major instrumentation needs, program and Institutional leadership will seek external funding from local business organizations and leaders. Program leadership will apply for funding through UM's Student Instructional Equipment Fund (SIEF) and will seek surplus instrumentation from the Montana State Crime Laboratory. The laboratory will conduct analyses for local and regional businesses on a fee basis to pay for consumables and supplies.

The new Brewing Science course will include a laboratory experience component, and a Laboratory Course Fee of $50 per student (expected to generate up to $1200 per course offering) is proposed. Revenue generated with this fee will be used for consumables and supplies for the laboratory portion of the course. The laboratory will conduct analyses for local and regional businesses on a fee basis to provide additional funding for instrument maintenance and consumables and supplies.

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4) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).

Flathead Valley Community College, though the Brewing Academy of Montana, offers an A.A.S. degree in Brewing Science and Brewery Operations. The proposed certificate programs will provide students at UM with an opportunity to gain similar knowledge and experience as part of their regular B.S. degree program. The proposed certificate and micro-credential programs will also be attractive to local community members, and will provide convenient services to craft breweries in the Missoula and Bitterroot valleys.

The new brewing science course will include guest lectures by UM professors of microbiology and history, and the UM microbiology laboratory course will develop and implement a yeast-related laboratory exercise. Students in the brewing science course will partner with a local micro-brewery each year, or with the program at FVCC, to brew and market a batch of beer.

The certificate and micro-credential programs, and associated internship opportunities, will be accessible to students at Missoula College.

5) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

The proposed certificates in Brewing Science fit with UM's mission and Strategic Plan (Strategic Vision 1.1), especially with Strategic Opportunities 1 (Engage students where they are), 3 (Partner with place), 4 (Reinvent the heart of the curriculum) and 5 (Foster knowledge creation and innovation). The proposed certificates are student-first academic programs designed to provide practical skills and knowledge and to be accessible to students in a variety of educational pathways. The proposed certificate and micro-credential programs will be attractive to local community members, and will provide convenient services to craft breweries in the region. Through development of UM laboratory services and collaboration with local businesses, the certificates will offer and allow place-based experiential learning for students and faculty to engage and collaborate with burgeoning local brewing and distilling businesses in Montana. Student experiences and services provided by a UM-based brewing analysis laboratory will encourage innovation and product development by local brewers and distillers. The certificates will contribute to practical science-based education of students, allow students to experience science in practice, and produce graduates with skills employable in a growth sector of the local economy. The certificate programs will contribute directly to the UM Center of Excellence in Science and Technology, improving the visibility of UM's expertise in this realm, and may contribute indirectly to the UM Center of Excellence in Business and Entrepreneurship.

Montana University System

REQUEST TO PLAN FORM

Signature/Date
Chief Academic Officer:
Chief Research Officer*:
Chief Executive Officer:
Flagship Provost:** DocuSigned by: Reed Humphrey D3FE78AF0D42425...
Flagship President:** DocuSigned by: Seth Bodnar 9672218F28384DA...
*Center/Institute Proposal only **Not applicable to the Community Colleges.

Montana University System

REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-1002-R0920

ITEM NAME: C.A.S. and Certificate in Brewing Science

OCHE ANALYSIS	
Labor market outlook	Brewing science is not well tracked in occupational employment statistics and profiles. The most closely linked occupation (operators and tenders of vat-like equipment) has median wages of $40,190 in Montana (BLS). According to the Brewer's Association, a national craft brewing industry association, Montana craft breweries have grown in number from 33 in 2011 to 92 in 2019.
Related programs / centers / institutes	• Flathead Valley Community College offers an A.A.S. in Brewing Science and Brewery Operations. • MSU-Billings offers a 16-credit certificate in Craft Brewing and Fermentation through their extended campus.
Budget Impact	**LOW** • **Only incidental costs** | **X** | **MEDIUM** | **HIGH** • **substantial commitment of resources relative to institutional budget** Necessary resources will likely include: • Release time for a faculty member to develop a new course in Brewing Science • New instrumentation to support the lab portion of the program The University of Montana proposes to institute a $50 per student lab course fee to fund consumable lab materials.
CAO discussion and follow-up	• MSU-Billings program has lapsed. They expressed interest in sharing with UM regarding the structure of program and future options for collaboration. • Flathead Valley and UM program leads to connect prior to Level II submission. • UM should consider whether to place proposed courses at the upper division / lower division. If at the upper division, will these courses be accessible to students at Missoula College?
ARSA/BOR comment and direction for Level II proposal	

Montana University System

REQUEST TO PLAN FORM

ITEM 190-1004-R0920 **September 2020**

Request for authorization to establish an option in Human Physiology in the Integrative Physiology B.S.

Program/Center/Institute Title:	**Human Physiology option in the Integrative Physiology BS**	Planned 6-digit CIP code:	**26.0908**
Campus, School/Department:	**Integrative Physiology and Athletic Training**	Expected Final Submission Date:	**March 2021**
Contact Name/Info:	**John Quindry, Chair**		

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

A new option in Human Physiology in the Integrative Physiology BS would provide another route within the existing BS program for students seeking to pursue postbaccalaureate education in professional health science occupations. The new option provides students with a foundation in Human Physiology, Exercise Science, and Athletic Training in the tradition of Health and Human Performance (HHP). However, modifications to some of the core science requirements allow for a more streamlined degree for students who are interested in attending Physician Assistant (PA), Occupational Therapy (OT), or Nursing (RN) programs after they finish their bachelor's degree. Adjustments to the core science requirements align better with a number of professional health science schools. This will allow students to avoid extra, unnecessary classes while pursuing their bachelor's degree, ultimately decreasing the total number of credits needed for graduation.

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

The American Association of Colleges of Nursing states that there is a critical shortage for Registered Nurses (RN) in the United States. This shortage is attributed to the aging U.S. population and difficulties with increasing the capacity of training programs. If more students in Montana can earn a bachelor's degree that provides prerequisites for Accelerated BSN programs, this may help to ease the burden. Montana colleges with BSN programs are projected to meet the needs for our state; however this includes graduates from Montana State University's Accelerated BSN program, which requires applicants to hold a bachelor's degree. This novel degree, would increase the number of qualified students for BSN programs. This would allow for more graduates to enter the workforce more quickly, benefitting the student and the country.

A Montana Primary Care Workforce report states that the shortage of Physicians (MD and DO) in Montana will increase the need for RNs and PAs. These same trends are seen throughout the nation. According to Bureau of Labor statistics, there are a number of counties in Montana that do not have PAs currently employed. Many health care professionals and administrators view PAs as part of the solution to the nationwide shortage of MDs and DOs. A number of articles in the Journal of the American Academy of PAs point to the profession to help fulfill some of the duties performed by MDs and Dos.

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REQUEST TO PLAN FORM

Workforce data in the United States estimates that by 2030 all 50 states in the nation will have outpaced the need for OTs entering the workforce. Additionally, with the new Doctorate of Occupation Therapy (OTD) program at UM, there will be increased interest from students during their undergraduate careers. This option will allow students to study Human Physiology while preparing to meet the prerequisites needed to apply to the UM OTD program.

3) Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.

No new resources would be required to launch the new option.

4) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).

The University of Montana does not have a BSN degree, so many of our students seek acceptance into the other programs in our state. Articulation agreements and MOUs could be pursued with the existing BSN programs in Montana.

The new OTD program at UM could be another potential source for an articulation agreement. These opportunities could be explored as key hires are made within the OTD program.

Additionally, many of the students who initially begin their coursework at Missoula College and elect to move from an Applied Associates and into a bachelor's and possibly postbaccalaureate degree allow for a line of collaboration with the Health Science programs on this campus. HHP had existing MOUs with Missoula College, and this type of 2+2 agreement could be formed with our new School in the College of Health.

Students who are hoping to pursue acceptance into Master's PA programs are often required to have a number of clinical hours. This requirement could strengthen the affiliation with AHEC, and specifically the AHEC Scholars program at UM. If these hours were formalized, this could increase the number of students who were able to move through the AHEC Scholars program and create a pathway for completing the program requirements.

5) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

This proposal meets the University of Montana's Priority for Action 1 by creating a novel degree, based on student feedback, that streamlines the science core that students take to earn a degree in Integrative Physiology. By listening to our students, we came up with a plan to help the achieve their career and educational goals in a timely manner. By making slight adjustments in our core, required classes we can increase retention in our program, and focus on student success here at UM, and beyond while they are applying to postbaccalaureate programs in health science.

This proposal meets UM's Priority for Action 2 by being innovative in thinking about our standard curriculum. By making some adjustments in our required classes we can evolve our curriculum to be more dynamic to meet student and workforce needs. This new option (concentration) continues to allow Integrative Physiology and Athletic Training to collaborate with our partners in other science curriculum on our campus, while also adapting the curriculum to be innovative in our delivery.

Montana University System

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This proposed option (concentration) also allows IPAT to meet the Priority for Action 4 by Partnering with Place. There is an increasing demand from students who want to pursue postbaccalaureate degrees in Nursing and as Physician Assistants. This new option (concentration) allows our program to provide another avenue for students to meet these goals. Knowing the needs within the state of Montana, it also promotes students to seek opportunities for health-related experiences during their 4-year degrees. This strengthens partnerships with local area hospitals, health entities, AHEC, and local clinics. Missoula is rich with internship experiences for students in IPAT and this new option (concentration) would only enforce those collaborations with community partners.

Signature/Date
Chief Academic Officer:
Chief Research Officer*:
Chief Executive Officer:
Flagship Provost:** DocuSigned by: Reed Humphrey D3FE78AF0D42425...
Flagship President:** DocuSigned by: Seth Bodnar 9672218F28384DA...
*Center/Institute Proposal only **Not applicable to the Community Colleges.

Montana University System
REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-1004-R0920

ITEM NAME: Option in Human Physiology in the Integrative Physiology B.S.

OCHE ANALYSIS

Labor market outlook

This option is meant to provide a streamlined path through the University of Montana's existing program for students who aim to pursue further education as an RN (via an accelerated program), Physician's Assistant, or Occupational Therapist, rather than seeking immediate employment as an Exercise Physiologist / Athletic Training. These three occupations are projected to be among the fastest growing in Montana and nationally.

	Projected MT Growth '16 -'26	Median MT Wage
Physician's Assistant	+38% (50 annual openings)	$114,480
Occupational Therapist	+25% (30 annual openings)	$76,010
Registered Nurse	+19% (760 annual openings)	$73,300

Source: BLS

Related programs / centers / institutes

MSU-Bozeman offers a Health and Human Performance B.S. degree with options in Exercise Science and Kinesiology. Montana Tech offers a B.S. in Exercise and Health Science. UM-Western offers a B.S. in Kinesiology.

Budget Impact

X	**LOW** • **Only incidental costs**		**MEDIUM**		**HIGH** • **substantial commitment of resources relative to institutional budget**

CAO discussion and follow-up

ARSA/BOR comment and direction for Level II proposal

Montana University System

REQUEST TO PLAN FORM

ITEM 190-1005-R0920 **September 2020**

Request for authorization to establish a Ph.D. in Integrative Physiology and Rehabilitation Sciences

Program/Center/Institute Title:	**PhD in Integrative Physiology and Rehabilitation Sciences**	Planned 6-digit CIP code:	**26.0908**
Campus, School/Department:	**Integrative Physiology and Athletic Training**	Expected Final Submission Date:	**March 2021**
Contact Name/Info:	**John Quindry, Chair**		

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

We propose a new PhD in Integrative Physiology and Rehabilitation Sciences to be offered by the School of Integrative Physiology and Athletic Training (IPAT), housed within the College of Health. This proposed graduate degree is poised to have a significant impact as no other program like it exists in the state. Further, there is a high demand for PhD credentialed faculty at the state, reginal, and national levels within professional programs and clinical settings with a physiology-based training emphasis (e.g., AT, cardiac rehabilitation, PT, OT, etc). Within IPAT we currently do not offer a Ph.D. in our own program, and those who have historically wished to pursue doctoral level studies have been required to enroll in the Doctorate in Interdisciplinary Studies PhD program through the University of Montana. We currently have 3 doctoral students in our program and have accommodated several students in the past through the DIS program. Based on the continued growth in Integrative Physiology as a means to train future pre-professional students in rehabilitative degree options, it is a natural extension that successful IPAT-type programs also train many of the dual-credentialed faculty for these programs (e.g., PhD-PT, PhD-OT, etc). According to this rationale we will grow our graduate program by offering this doctorate to integrative physiologists, athletic trainers, physical therapists, occupational therapists, and speech language professionals that desire a terminal degree in order to conduct research and teach within their respective disciplines and clinical professions. The School of Integrative Physiology and Athletic Training would like to add the opportunity for students to obtain a Ph.D. in Integrative Physiology and Rehabilitative Sciences as related interests and career aspirations would thus be better served. This program also holds future potential as a dual degree option for professional students (AT/PT/OT) that are interested in a combined clinical-academic career option.

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

Current and ongoing student need: We currently have 3 students completing DIS programs of study tailored toward Integrative Physiology and Rehabilitation Sciences. Further, former students trained in IPAT, and current faculty in

the UM Physical Therapy program would have been better served by having a formalized program in Integrative Physiology and Rehabilitation Sciences.

Need within the MUS and Northwestern region: Pre-professional programs such as physical therapy, occupational therapy, etc. continue to grow in the US and other countries. For instance, the more recent Commission on Accreditation in Physical Therapy Education report indicates that since 2013 there has been a sustained linear increase in the number of DPT programs in the US. These programs, in addition to offering more total seats to students, are requiring additional faculty with a PhD credential. Given that most DPT students are trained in IPAT-type programs, it is a natural extension in logic that faculty in these professional programs will require a research-based terminal degree in programs such as Integrative Physiology and Rehabilitative Sciences. A similar logic holds for AT and OT programs.

3) Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.

No new resources would be required to launch the PhD offering in Integrative Physiology and Rehabilitation Sciences in the School of IPAT. For instance, we currently have 3 doctoral students in the Doctoral of Interdisciplinary Studies (DIS) working with faculty mentors in IPAT. Accordingly, the career emphasis of these current doctoral students is identical to the proposed PhD program in Integrative Physiology and Rehabilitative Sciences. These existing students are funded through foundation funds, partnerships with government entities, etc. While eventual growth of the proposed PhD program would benefit from internal investment, these funds are not prerequisite to formalize this degree program, as evidenced by our 3 current doctoral students and several students that have graduated using the DIS option.

4) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).

Novelty of the proposed program: Neither the University of Montana nor the MUS has a graduate program in Integrative Physiology and Rehabilitation Sciences. Moreover, we have worked closely with Montana State University to delineate that their proposed PhD in Exercise and Nutrition Sciences and this intent to plan proposal do not overlap. Both UM and MSU have drafted letters to formally indicate that our respective plans are not duplicative. These letters are available upon request.

Sharing of faculty resources: The PhD in Integrative Physiology and Rehabilitation Sciences will be primarily based out of IPAT, but will capitalize on resources within the College of Health, and other Colleges at the University of Montana. This resource sharing was recently optimized by the 2019 realignment of IPAT (then called Health and Human Performance) within the College of Health. Specifically, we have already arranged to formalize faculty from the Physical Therapy program and the planned Occupational Therapy to serve as affiliate faculty within IPAT. Similarly, reorganization of the Neural Injury Center (NIC) within McGill Hall (where IPAT is primarily housed) further facilitates faculty collaboration between IPAT-NIC-PT, and eventually OT. Additional faculty are likely to be affiliated with IPAT and the PhD in Integrative Physiology and Rehabilitation Sciences from the Public and Community Health Sciences, Speech Language and Hearing Sciences, the Family Medicine Residency program, the School of Pharmacy, Social Work, and the Division of Biological Sciences.

Sharing of curricular resources: The IPAT-based PhD in Integrative Physiology and Rehabilitation Sciences will include existing graduate course offerings from our School, but with our ongoing collaborations within the College of Health, we've also arranged to include course offerings from PT, the NIC (affiliate faculty to offer a new course), the Family Medicine Residency program, Public and Community Health Sciences, and presumably Occupational

Montana University System
REQUEST TO PLAN FORM

Therapy. Based on individual plans of study, course offerings will be provided through other College of Health and UM graduate programs as a means of providing content specific (e.g., specialized statistical approaches, biochemistry, or related applications of hard sciences, etc.).

Cultivation of research collaborations: Realignment of IPAT within the College of Health in 2019 optimized our ongoing research collaborations with Physical Therapy, The School of Public and Community Health Sciences, The School of Pharmacy, and the Neural Injury Center. Moreover, given the topical overlap, IPAT is certain to form research collaborations with the incoming Occupational Therapy program. These ongoing research collaborations include successful grant writing, orchestration of research studies (related to Integrative Physiology and Rehabilitation Sciences), the training of doctoral level graduate students, and publications in impactful refereed scientific journals. While these collaborative efforts advance College of Health academic careers in the areas of integrative physiology and rehabilitation sciences, the core product is graduate student trainees that are featured in the papers, presentations, and related research output. The final piece needed to solidify this ongoing research effort is a formalized doctoral degree program in Integrative Physiology and Rehabilitation Sciences to better serve the students.

5) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

This graduate program proposal meets the University of Montana's Priority for Action 1 by creating a novel terminal degree option for future professional program faculty, academic scientists, and highly qualified clinical professionals. Cultivation of this program plan is based on highly successful programs in the Northeastern US (e.g., Univ of Vermont), but is also in response to current and former doctoral students at UM that have had to use the DIS program to obtain a less tailored PhD directed toward integrative physiology and rehabilitation sciences.

This proposal meets UM's Priority for Action 2 by cultivating innovative higher education teacher-researchers that are needed to train the next generation of professional students. This approach capitalizes on the realignment of IPAT within the College of Health, an administrative move that has both cultivated new academic, professional, and research collaborations while also removing barriers to progress in terms of past struggle to share these finite resources across two Colleges. Given the flourishing collaborations between nationally and internationally recognized faculty from IPAT and PT, Public and Community Health Sciences, and anticipated collaborations with the onboarding OT program, this PhD program is poised to become a highly sought program for generations to come.

This proposed concentration also allows IPAT to meet the Priority for Action 4 by Partnering with Place. There is an increasing demand from students who want to acquire credential combinations such as PhD-AT, PhD-PT, PhD-OT, etc.. Moreover, with an ongoing wave of retirements from AT/PT/OT professional programs, there is a need for a new generation of academic scientists. Accordingly, the proposed program is likely to train students who have matriculated from the University of Montana (and other MUS programs), and that the PhD in Integrative Physiology and Rehabilitation Sciences will produce academic scientists that become faculty within professional programs at UM and within the greater Northwest US region.

Montana University System

REQUEST TO PLAN FORM

Signature/Date
Chief Academic Officer:
Chief Research Officer*:
Chief Executive Officer:
Flagship Provost:** DocuSigned by: Reed Humphrey D3FE78AF0D42425...
Flagship President:** DocuSigned by: Seth Bodnar 9672218F28384DA...
*Center/Institute Proposal only **Not applicable to the Community Colleges.

Montana University System

REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-1005-R0920

ITEM NAME: Ph.D. in Integrative Physiology and Rehabilitation Sciences

OCHE ANALYSIS						
Labor market outlook	While there is limited data on occupational demand for PhD trained individuals in the health specialties this program would serve (Occupational Therapy, Physical Therapy, Speech Pathology, etc.), there is substantial evidence of a coming shortage of qualified faculty broadly in health professions. Nationally, the number of postsecondary health specialties teachers (typically PhD trained) is anticipated to grow by 23% between 2018-2028, a much faster rate than occupations at large (BLS).					
Related programs / centers / institutes	No related doctoral program is offered in Montana.					
Budget Impact	X	**LOW** • **Only incidental costs**		**MEDIUM**		**HIGH** • **substantial commitment of resources relative to institutional budget**
CAO discussion and follow-up						
ARSA/BOR comment and direction for Level II proposal						

Montana University System

REQUEST TO PLAN FORM

ITEM 190-1006-R0920 **September 2020**

Request for authorization to establish the Montana Repertory Theatre as a center

Program/Center/Institute Title: **Montana Repertory Theatre** Planned 6-digit CIP code: **36.0117**

Campus, School/Department: **University of Montana** Expected Final Submission Date: **March 2021**

Contact Name/Info: **Michael Legg, Artistic Director – michael.legg@montanarep.com**

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

Mission Statement

Montana Repertory Theatre stands at the cross-section of educational and professional theatre, producing work that engages, challenges and celebrates Missoula and the state of Montana.

Background and History

Montana Repertory Theatre is the professional theatre-in-residence at the University of Montana. Established in 1967, The Rep has been a cornerstone of the arts in Montana for over half a century and is currently the only full-season Equity Theatre in the entire state. The Rep began its life as a regional touring operation, serving primarily the state of Montana. In the mid-90s, the touring operation underwent a vast expansion, making the annual spring production a national tour. As the market and logistics for theatrical touring evolve, Montana Rep is evolving as well. For most of its existence The Rep placed a focus on the "Great American Canon" with traditional offerings like Death of a Salesman, the Miracle Worker, and To Kill a Mockingbird. Under new leadership since summer 2018, The Rep is refocusing its efforts to benefit the state of Montana, and fast becoming a bastion in this part of the country for new works by a diverse community of artists. The Rep has not forsaken its commitment to great American works, but we have adopted a new mission to strengthen the relevance of our contribution through new works. In the year and a half since its leadership transition, Montana Rep has commissioned works from ten playwrights from all over the country and produced the world premiere of Go. Please. Go. by Emily Feldman. A central tenet of Montana Rep's new philosophy is diversity- in the playwrights we commission, the artists we hire, and the stories we tell. Montana Repertory Theatre is an invaluable institution in the arts landscape of Montana, and the company is newly dedicated to standing at the forefront of modern American Theatre.

2) Describe the need for the program/center/institute.

Montana Rep has offered professional theatre and theatre education to Montanans for over 50 years. The Rep's programming reaches at least 10,000 Montanans every year. The Rep has performed and/or taught in almost every county in the state, and most of the state's Indian Reservations. Particularly through our Educational Outreach program, which is free for Montana students and is offered at significant discounts for schools with financial hardship, Montana Rep brings the arts and arts education to the most sparsely populated and underserved areas of the state. The Rep is also

a prime recruiting tool for the University of Montana. The inclusion of a professional theatre company in residence creates a unique opportunity for students searching for a theatre training program. Whether in acting/directing, design or stage management, the potential for landing a professional gig with Montana Rep has drawn hundreds of students to UM's Theatre & Dance program. Each year, dozens of current UM students as well as recent UM graduates are hired for Rep projects. Additionally, our new works initiative has drawn an impressive list of nationally-renowned artists to Missoula to share their work. Most recently, we welcomed Martyna Majok, winner of the 2018 Pulitzer Prize for Drama, to UM for a week of workshops, panel and discussions, and a reading of her new play. The Rep is also in a position to forge unique partnerships with a variety of organizations around the country, including Native Voices at the Autry in Los Angeles and the New York City Children's Theater, and organizations closer to home like the Warren Miller Performing Arts Center in Big Sky and UM's Payne Family Native American Center. Under new leadership for two years, the Rep has been operating under a new commitment to diversity in programming and hiring practices, which is expanding our national profile and aligning the Rep with the important and exciting work being done by the most reputable companies operating in modern American theatre.

3) Describe any significant new resources needed to launch and sustain program/center/institute.

Montana Rep has been operational for over a half century. Although we are always evolving and striving for improvement, the Rep's operation is well-established and functional, and no significant additional resources will be needed to move forward.

4) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions.

Montana Rep is partnering with UM's Curry Health Center and UM's Social Work program on our upcoming production of "Zombie Thoughts" which explores the issue of severe anxiety in children. The Rep is also collaborating with UM's VETS (Veterans Education and Transition Services) organization on our upcoming production of "Reentry" which is a documentary play about American veterans returning from service in Afghanistan. The Rep is also being advised by the Payne Family Native American Center, which will act as a vital partner in the Rep's developing project to commission and produce an original theatrical work by an indigenous artist. The Rep has also worked closely with UM's Media Arts program on numerous occasions, including our next Educational Outreach production, for which Media Arts students have been contracted to develop video content. The Rep's most important and longstanding relationship is of course with the University of Montana's School of Theatre & Dance, in which the Rep is officially considered the theatre-in-residence. This mutually beneficial partnership has existed for as long as the company itself. Montana Rep intends to strengthen these existing relationships and looks forward to partnering with other UM and MUS organizations in the coming seasons.

5) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

The University of Montana boasts a rare opportunity to potential students through Montana Repertory Theatre. Most state universities do not have a professional theatre-in-residence, and the inclusion of such an entity has been the deciding factor for many who have chosen UM. Students and recent graduates who work with Montana Rep on Equity productions can earn points and achieve Equity (Actors and Stage Managers Labor Union) status by working and touring

Montana University System

REQUEST TO PLAN FORM

with Montana Rep. Touring with Montana Rep requires young artists to take on a variety of responsibilities, whether it's actors hanging lights or stage managers playing cameo roles onstage. Working with Montana Rep during their college experience ensures that UM students will have a more well-rounded, practical, and reality-based education, and also leads to professional connections that are essential to finding work beyond college.

Signature/Date
Chief Academic Officer:
Chief Research Officer*:
Chief Executive Officer:
Flagship Provost:** DocuSigned by: Reed Humphrey D3FE78AF0D42425...
Flagship President:** DocuSigned by: Seth Bodnar 9672218E28384DA...
*Center/Institute Proposal only **Not applicable to the Community Colleges.

Montana University System
REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-1006-R0920

ITEM NAME: Establish Montana Repertory Theatre as a Center

OCHE ANALYSIS						
Labor market outlook	**N/A**					
Related programs / centers / institutes						
Budget Impact	**X**	**LOW** • **Only incidental costs**		**MEDIUM**		**HIGH** • **substantial commitment of resources relative to institutional budget**
CAO discussion and follow-up	This proposal recognizes the Montana Repertory Theatre as an established unit of the University of Montana. Given its size and scope, such recognition for the Montana Repertory Theatre seems appropriate.					
ARSA/BOR comment and direction for Level II proposal						

Montana University System

REQUEST TO PLAN FORM

ITEM 190-1007-R0920 **September 2020**

Item Name

Program/Center/Institute Title:	Skaggs Center for Telehealth and Precision Medicine** **Note: name is tentative and contingent on approval by philanthropic donor, The ALSAM Foundation (a foundation of the Skaggs Family)	Planned 6-digit CIP code:	**51.2001**
Campus, School/Department:	University of Montana Skaggs School of Pharmacy	Expected Final Submission Date:	**November 2020**
Contact Name/Info:	Erica Woodahl, Ph.D.; Professor, Department of Biomedical and Pharmaceutical Sciences; Skaggs School of Pharmacy; erica.woodahl@umontana.edu; (406) 243-4129 Hayley Blackburn, PharmD; Assistant Professor, Department of Pharmacy Practice; Skaggs School of Pharmacy; hayley.blackburn@umontana.edu; (406) 243-6769 Marketa Marvanova, PharmD, PhD, BCGP, BCPP, FASCP; Dean, Skaggs School of Pharmacy; marketa.arvanova@umontana.edu; (406) 243-5112		

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

The Skaggs Center for Telehealth and Precision Medicine in the Skaggs School of Pharmacy (SSOP) will consist of three primary components, each providing the potential for integration of direct clinical services for patients, support for healthcare professionals and healthcare institutions across Montana, experiential learning opportunities for trainees (students and fellows), and innovative opportunities for collaborative research:

1. **An interprofessional telehealth effort** will provide telehealth services across the state, while simultaneously providing hands-on training opportunities for Doctor of Pharmacy (PharmD) students and the opportunity to partner with other health professions (e.g. physical therapy, family medical residents) within the College of Health (CoH) as the Center grows. The Center will provide opportunities for interprofessional team-based care that would otherwise be inaccessible for many Montanans.

2. **Precision medicine innovations**—such as pharmacogenetics—will be integrated into clinical services in the Center and consultations will be offered statewide to healthcare professionals via telehealth and virtual access. The University of Montana (UM) is a leader in pharmacogenetics with rural and tribal populations. The Center will also provide new research opportunities to both graduate and health professions students in the areas of precision medicine, pharmacogenomics, and implementation science.

3. **Expansion of rural health outreach programs** will build upon our successful SSOP ImProving Health Among Rural Montanans (IPHARM) program, helping identify patients with poor access to healthcare services and connecting them to care. Mobile units will provide capacity to travel to rural communities for face-to-face care services by interprofessional teams of students and faculty. Patients identified through rural outreach and mobile services will be linked into local services and referred for follow-up care.

Montana University System
REQUEST TO PLAN FORM

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

The SSOP will launch the Skaggs Center for Telehealth and Precision Medicine as an innovative statewide hub for education, research, and telehealth and precision medicine services true to CoH and SSOP missions. The SSOP has been working toward this vision for several years and the challenges presented by the COVID-19 pandemic have demonstrated the urgent need for more equitable access to telehealth and precision medicine technologies, combined with leadership, innovation, and quality training opportunities in these areas.

With over 53% of Montanans living in rural areas and a population density of 6.9 people/mile^2, rurality poses unique challenges in providing healthcare throughout our state. Currently, 54 of 56 counties in Montana are designated as health professional shortage areas (HPSAs) (Designated HPSA Statistics, June 2020, HRSA; https://data.hrsa.gov/tools/shortage-area/hpsa-find), leaving many Montanans without access to basic health services. In a largely rural state with a chronic shortage of healthcare professionals, many Montanans struggle to obtain the healthcare services they need. Despite having a higher burden of chronic, many rural Montanans do not have a primary care provider, and many have to drive significant distances to access clinical care. Access to specialty clinical services and the latest medical innovations remain further out of reach. Advances in precision medicine—utilizing a patient's genetics, lifestyle, and environment to guide care—promise to transform healthcare. The most readily adoptable tool of precision medicine—pharmacogenetics—uses a patient's genetic profile to select the safest and most effective medication(s). With >99% of patients carrying information in their genes that can be used to tailor medications, pharmacogenetic testing holds benefits for both healthcare systems and patients (https://www.biorxiv.org/content/10.1101/2020.05.30.125583v2). Yet implementation of pharmacogenetics in clinical practice has been troublingly uneven, with rural and tribal communities being left almost entirely behind. Disparities may continue to worsen under current models of care, but pharmacists can help address shortfalls in primary care services, manage population health initiatives, and serve as essential experts in precision medicine and pharmacogenetics for rural and tribal Montanans.

The Center will provide training opportunities for PharmD students in telehealth and precision medicine, as well as developing future training programs for practicing professionals, and will expand to provide opportunities for training in interprofessional team-based care for CoH health professions students. Interprofessional experiences are requirements for PharmD program accreditation and for other health professions programs, and this Center creates a training and experiential opportunities for our students that are not always readily available.

3) Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.

A recent philanthropic commitment of $8M has been made for the construction of a new addition to the Skaggs building on the UM campus, which will house the Skaggs Center for Telehealth and Precision Medicine, with another $2M that will be secured through additional philanthropic and grant support. Establishing the Center will require hiring full- and part-time staff (e.g. program manager, IT personal, and bioinformaticist) and additional strategic faculty, staff, and fellow positions will be added based upon future growth of the Center.

This Center will not result in significant curricular changes, but will expand and enhance current experiential learning and training opportunities and available clinical rotations within our existing PharmD curriculum.

4) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).

Within the SSOP, this Center will build on collaborations between the Department of Biomedical and Pharmaceutical Sciences and the Department of Pharmacy Practice and will provide opportunities for students in

the PharmD program and the Pharmaceutical Sciences and Drug Design graduate program. CoH programs prepare students, residents, and fellows to serve in the health professions and train graduate students in cutting-edge biomedical research. The CoH mission is to promote UM as a leader in the training of an interprofessional healthcare and research workforce that can address health disparities in rural and underserved communities in Montana, culturally proficient education, and community interactions and engagements. The establishment of this Center provides future opportunities for collaborations between these programs.

The SSOP is a leading partner in the campus-wide UM Health & Medicine (UMHM) initiative that serves to bridge health-related studies and develop external partnerships to help identify state workforce, technology, and innovation needs. UMHM is heavily focused on interprofessional education, and this Center will provide students with vital tools to work collaboratively within a rapidly changing healthcare landscape. The growing prevalence of telehealth and tele-education will allow for even more cross-unit and cross-campus collaboration for students and faculty, as they will be able to work with partners who are leveraging similar technology and engaging in other efforts to address rural health disparities. We envision the potential for future collaborations and partnerships with other units on campus, other health professions programs within MUS, state agencies, and health systems to promote workforce development and engage in innovative programs and research.

5) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

Student Success: The SSOP prepares graduates (PharmD, MS, PhD) for rapidly changing fields of pharmacy and pharmaceutical sciences, and trains students to be highly skilled researchers, educators, and patient-centered healthcare providers. The CoH has a longstanding commitment to recruiting and training American Indian students, and developing research programs to address health disparities in American Indian communities.

Excellence and Innovation: The Center will expand access to telehealth and precision medicine across the state and train students in these rapidly developing areas. Exciting opportunities include teaching and learning using simulation, tele-education, and new experiential learning opportunities. The Center is poised to be the first in the US to implement pharmacogenetic testing for rural and tribal populations, a program that will yield an enormous database for a myriad of future research projects.

"Mission First, People Always": the SSOP a long history of partnering with Montana's rural and tribal communities, preparing trainees to provide high-level care and access to cutting-edge research, and remains committed to addressing health disparities and inequities. This new Center will increase our capacity and outreach in these important areas.

Partner with Place: Building and maintaining strong partnerships with communities, healthcare systems, and state agencies is a cornerstone of our Center. The SSOP has existing collaborations with several statewide clinical and pharmacy initiatives, utilizes healthcare systems as training sites for students, and has extensive ties with health systems serving high proportions of rural and underserved populations, including American Indian, pediatric, and geriatric patients across the state of Montana.

Proudly tell the UM story: The novel training opportunities of this Center will be an excellent recruitment tool for professional and graduate students into our programs. As the first to launch precision medicine implementation in rural and tribal settings, UM will be a model for the country. The COVID-19 pandemic has highlighted the need for transitioning to telehealth to provide clinical services, and the UM will deliver innovative interprofessional experiential training to prepare health professions students for expanded scopes of work.

Montana University System

REQUEST TO PLAN FORM

Signature/Date
Chief Academic Officer:
Chief Research Officer*:  **7/23/2020**
Chief Executive Officer:
Flagship Provost:** DocuSigned by: Reed Humphrey D3FE78AF0D42425...
Flagship President:** DocuSigned by: Seth Bodnar 9672218F28384DA...
*Center/Institute Proposal only **Not applicable to the Community Colleges.

Montana University System

REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-1007-R0920

ITEM NAME: Skaggs Center for Telehealth and Precision Medicine

OCHE ANALYSIS	
Labor market outlook	**N/A**
Related programs / centers / institutes	While there are other MUS centers which also work on issues of rural health, telemedicine, precision medicine, and interprofessional education, the proposed centers activities, in OCHE's judgment, compliment rather than detract from these other efforts. ***MUS*** • Institute for Interprofessional Education and Collaborative Practice in Health and Medicine ***MSU-Bozeman*** • Montana Area Health Education Center • Montana Office of Rural Health • Center for American Indian and Rural Health Equity ***UM-Missoula*** • Center for Population Health Research • Neural Injury Center • National Native Children's Trauma Center • Rural Institute: A Center for Excellence in Developmental Disabilities
Budget Impact	**LOW** • **Only incidental costs** | **MEDIUM** | **X** | **HIGH** • **substantial commitment of resources relative to institutional budget** A recent philanthropic commitment of $8M has been made for the construction of a new addition to the Skaggs building on the UM campus, which will house the Skaggs Center for Telehealth and Precision Medicine, with another $2M that will be secured through additional philanthropic and grant support. Establishing the Center will require hiring full- and part-time staff (e.g. program manager, IT personal, and bioinformaticist) and additional strategic faculty, staff, and fellow positions will be added based upon future growth of the Center.
CAO discussion and follow-up	OCHE noted that there could be good opportunities for research collaboration between the proposed Center, Montana's active INBRE program, and Montana AHEC.
ARSA/BOR comment and direction for Level II proposal	

****NOTE**** Due to the use of an honorific name, the Level II paperwork for this proposal will return for BOR review at a future meeting. The materials submitted for BOR review will include a summary of comment received from the public in accordance with BOR policy 1004.1 "Naming of Buildings"

Montana University System

REQUEST TO PLAN FORM

ITEM 190-1008-R0920 **September 2020**

Request for authorization to establish a certificate in General Studies

Program/Center/Institute Title: **Certificate of General Studies** Planned 6-digit CIP code: **24.0199**

Campus, School/Department: **Missoula College, UM/Applied Arts and Sciences** Expected Final Submission Date: **March 2021**

Contact Name/Info: **Kim Reiser, Department Chair Applied Arts and Sciences**

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

We are submitting this request to plan for a Certificate of General Studies. The Certificate of General Studies recognizes completion of UM general education requirements that also fulfill the 30 required credits of the MUS Core to allow a student to transfer general education credits to any MUS academic unit.

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

The purpose of the Certificate of General Studies, which will also fulfill the requirements for the MUS Core, is to recognize students whose primary goal is to complete their "generals" at Missoula College. Many of these students move on without completing the 30 required credits of the MUS core needed for smooth transition to another Montana academic unit (BOR 301.10). In addition, as we do not currently have a credential for general education, we are unable to track successful completion for these students. This stackable credential would no doubt increase retention for this population at the college.

In essence, students could use this certificate as a milestone toward receiving their Associate of Arts or Associate of Science degree at Missoula College. Alternatively, they could use the certificate to demonstrate completion of core general education courses to facilitate transfer within the Montana University System or accelerate their work in a baccalaureate program on the UM Mountain Campus. This credential can be completed in a single academic year.

3) **Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.**

As the curriculum for completing general education coursework already exists at Missoula College, there would be no new resources required to launch this certificate.

Montana University System

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4) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).

The Certificate of General Studies is offered at Great Falls College, Gallatin College, and Miles City Community College. The certificate is collaborative in nature in that it fulfills the requirements of the MUS core that were intended to create smooth transitions to any area of study within the MUS system. These efforts represent the comprehensive two-year goals outlined for two-year colleges within the MUS system.

5) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

According to BOR Policy 301.10, "The Montana university system (MUS) is committed to facilitating the ease of undergraduate student transfer to its campuses, particularly in the area of general education." The Certificate of General Studies works toward that goal with a credential that can be counted as a success both on a personal level and an institutional level.

In addition, UM's first Priority for Action is to "place student success at the center of all we do." Included in this is a call to "renew our intense focus on student retention, persistence, and success through graduation and beyond." This credential would no doubt increased persistence and retention for our students simply desiring to complete their general education credentials as part of their educational journey.

Signature/Date	
Chief Academic Officer:	**July 23, 2020**
Chief Research Officer*:	
Chief Executive Officer:	
Flagship Provost:**	DocuSigned by: Reed Humphrey D3FE78AF0D42425...

Montana University System

REQUEST TO PLAN FORM

Flagship President:** DocuSigned by: Seth Bodnar 9672218F28384DA...
*Center/Institute Proposal only **Not applicable to the Community Colleges.

Montana University System

REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-1008-R0920

ITEM NAME: Certificate in General Studies

OCHE ANALYSIS						
Labor market outlook	**N/A** A Certificate in General Studies can help students signal to their transfer institution that they have completed a rigorous general education curriculum and, thus, ensure they do not need to take duplicative general education coursework after transfer. MUS policy requires institutions to accept other campus's general education curricula as meeting lower division general education requirements. However, it can be difficult for transfer institutions to discern whether a student has completed Gen Ed. This certificate serves as to both recognize students for completing their general education and to provide a clear signal to the transfer institution.					
Related programs / centers / institutes	Currently Great Falls College and Miles Community College offer similar certificates recognizing completion of a full general education curriculum. Other MUS campuses are exploring whether to add such a certificate.					
Budget Impact	**X**	**LOW** • **Only incidental costs**		**MEDIUM**		**HIGH** • **substantial commitment of resources relative to institutional budget**
CAO discussion and follow-up	Helena College lauded the proposal and indicated they plan to submit a request for a similar program in the coming year.					
ARSA/BOR comment and direction for Level II proposal						

Montana University System
REQUEST TO PLAN FORM

ITEM 190-1501-R0920 **Meeting Date**

Item Name

Program/Center/Institute Title: **M.S. Geological Engineering** Planned 6-digit CIP code: **14.39.01**

Campus, School/Department: **Montana Technological University** Expected Final Submission Date: **March 2021**

Contact Name/Info: **Mary MacLaughlin mmaclaughlin@mtech.edu, 406-496-4655**

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

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

The M.S. degree in Geoscience has seven options: four in geoscience (engineering geology, geochemistry, geology, and hydrogeology) and three in engineering (geological engineering, geophysical engineering, and hydrogeological engineering). This request consists of separating the seven options into two M.S. degrees, changing the name of one option, and adding an additional option. The four geoscience options would remain in the Geoscience M.S. and would be joined by an option in geophysics (renamed from geophysical engineering). The geological engineering option would be elevated to the proposed new M.S. in Geological Engineering, which would include options in hydrogeological engineering (existing) and geotechnical engineering (new).

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

Master's-level expertise in geological engineering, geotechnical engineering, and hydrogeological engineering are in high demand in the private and government sectors. Students and employers are interested in having the word engineering in the degree title on the transcript and diploma for the students who complete an engineering option. Yet no geological engineering master's degree programs are currently available in Montana. Montana Tech's existing degree structure, in which the engineering options are housed within an umbrella M.S. Geoscience degree, creates confusion regarding the engineering content of the programs, and the degree name is a barrier to professional registration for graduates. Moreover, prospective students seeking an M.S. program in geological, geotechnical, or hydrogeological engineering are unlikely to consider Montana Tech's Geoscience M.S. because of the degree name, unless they obtained their bachelor's degrees at Montana Tech and know the strengths of the curriculum. Adding a specific geotechnical option within the MS in Geological Engineering will help prospective students find this area of emphasis. This addition also creates parallelism between the proposed MS in Geological Engineering and three options within Montana Tech's coursework-only Master of Engineering degree (geological engineering, geotechnical engineering, and hydrogeological engineering).

3) **Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.**

None. The curricula, courses, library, faculty, and research infrastructure are in place. The proposal is to separate the engineering options in the Geoscience M.S. and offer them under the degree named M.S. in Geological

Montana University System
REQUEST TO PLAN FORM

Engineering. In addition, a geotechnical track within the geological engineering option would be elevated to a degree option. The geophysical engineering option would be renamed as geophysics and kept in the Geoscience M.S.

4) **Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).**

Collaborations in geoscience and engineering research are numerous between and among Montana Tech departments, the University of Montana-Missoula, Montana State University-Bozeman, and the Montana Bureau of Mines and Geology, and these collaborations will continue. Including the word "engineering" in the degree title for the engineering options is likely to enhance collaboration opportunities with engineering departments at MSU-Bozeman and beyond. There are no other geological engineering master's degree programs in Montana or specific options in geotechnical engineering, geophysics, or hydrogeological engineering. No new courses are required, and existing course sharing and research collaborations are expected to continue.

5) **Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.**

The proposed M.S. in Geological Engineering directly fits Montana Tech's mission by providing exemplary graduate-level engineering education that blends theory with practice to prepare graduates equipped to meet the changing needs of society and especially to contribute to the responsible development and use of natural resources. The curriculum exists and is successful. The engineering options typically enroll and graduate about one third of the students in the Geoscience M.S. This proposal also would improve alignment between the degree curriculum with the degree name for students in the engineering options of the geoscience program, and it would facilitate professional registration for geological engineering graduates.

Signature/Date	
Chief Academic Officer:	8/4/2020
Chief Research Officer*:	
Chief Executive Officer:	8/4/2020
Flagship Provost:**	
Flagship President:**	

*Center/Institute Proposal only
**Not applicable to the Community Colleges.

Montana University System
REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-1501-R0920

ITEM NAME: M.S. Geological Engineering & amend M.S. Geosciences option titles

OCHE ANALYSIS

Labor market outlook

This proposal does not anticipate developing a wholly new degree program. Rather, it separates existing options in the existing M.S. in Geosciences into separate degrees (M.S. in Geosciences, with options in engineering geology, geochemistry, geology, hydrogeology, and geophysics; M.S. in Geological Engineering with options in hydrogeological engineering and geotechnical engineering). These changes are meant to ensure students degree names correctly reflect their training and expertise.

Occupational demand in Montana, all levels of education			
	Annual Openings	Growth 2018-28	Median Wage
Mining and Geological Engineers	10	-3%	$92,250
Geoscientists	30	+16%	$85,780

Source: O*NET

Related programs / centers / institutes

No other campus in the Montana University System offers a specific graduate degree options in geological engineering, geophysics, or geotechnical engineering. Montana State University offers an M.S. in Earth Sciences with concentrations in Geology and Geography. MSU's M.S. in Civil Engineering could also allow students to accumulate some similar coursework, though in a less focused manner. The University of Montana offers an M.S. in Geosciences.

MUS Geosciences / Earth Science M.S. graduates 2017-2019			
	2019	**2018**	**2017**
Montana Technological University	11	12	15
Montana State University	6	9	13
The University of Montana	7	8	4
TOTAL	24	29	32

Source: MUS Student Data Warehouse

Budget Impact

X	**LOW** • **Only incidental costs**		**MEDIUM**	**HIGH** • **substantial commitment of resources relative to institutional budget**

CAO discussion and follow-up

OCHE requested that Tech, in their final proposal, describe the curriculum of each reconfigured option. Given the number of options across these two degrees, it is important the proposed curriculum provides a distinct enough experience to merit the different option names.

ARSA/BOR comment and direction for Level II proposal

Montana University System

REQUEST TO PLAN FORM

ITEM 190-1903-R-0920_RTP **Meeting Date: 09/2020**

Item Name: Request for authorization to plan a Certificate of Applied Science in Fire & Emergency Services and an Associate of Science (A.S.) in Emergency Services

Program/Center/Institute Title:	**Helena College University of Montana**	Planned 6-digit CIP code: 43.0203
Campus, School/Department:	**Trades**	Expected Final Submission Date:
Contact Name/Info:	**Sandra Bauman, Dean CEO/Tammy Burke, Executive Director of Career and Technical Education**	

This form is meant to increase communication, collaboration, and problem-solving opportunities throughout the MUS in the program/center/institute development process. The completed form should not be more than 2-3 pages. For more information regarding the program/center/institute approval process, please visit http://mus.edu/che/arsa/academicproposals.asp.

Provide a description of the program/center/institute.

Helena College currently offers an Associated of Applied Science Degree in Fire and Rescue. Due to advisory board/industry feedback, and program review/assessment from AY 18-19 revealing a trend in decreasing enrollment and high cost per completion, this program was placed on hold to determine the future direction of the program. Focused meetings with the local and regional fire service, review of department of labor statistics and market research, and student feedback from recent graduates working in the field; the following determinations were made 1) the program currently is not requiring students have work-based learning while in the program 2) students are not consistently earning industry recognized credentials needed for employment 3) students are not earning any transfer credits for advanced degrees 4) the Fire and Emergency Services Industry has evolved into a more professional and selective organization requiring job applicants to have not only the required certifications and skills, but also the emotional intelligence and critical thinking skills necessary to succeed in this very public facing career. This industry also values higher level credentials (bachelor's and master's degrees) for promotion within the industry.

In response to the above findings and employment data indicating the continued demand for skilled workers in this industry, it was determined that the best course of action to successfully move the program forward would be to change the degree from an Associate of Applied Science in Fire and Rescue to an Associate of Science Degree in Fire and Emergency Services. Academic requirements necessary for the core, and the academic courses and hands-on requirements needed to meet industry standards will be combined in this curriculum. Work-based learning will also be a required component (6 credits over three semesters) of this degree. As a result of this curriculum revision, students will not only obtain the preferred national certifications and have necessary training for employment; but will also be more prepared for the workforce and future educational opportunities. The addition of the work-based learning credits does increase the total number of credits to higher than usual for a typical Associate of Science Degree; however, we feel this is a critical component to student success and employer satisfaction upon hiring.

In order to accommodate the needs of a diverse population of students, and for those not interested in the Associate of Science Degree, Helena College will offer alternative pathways in the way of varying credentials including a Certificate of Technical

Montana University System

REQUEST TO PLAN FORM

Studies in Emergency Medical Services (all courses would be transferable to paramedic/paramedicine), and a Certificate of Applied Science in Fire and Emergency Services (this is a stackable credential with the AS degree). Each alternative pathway will result in at least one industry recognized credential necessary for employment in that field.

Below is the proposed curriculum outline identifying courses included in the CTS, CAS, and AS Degrees

Program AS Fire and Emergency Services	**Name of Course**	**Credits**
First Semester		
Fire 101	Intro to Fire Service	4
Fire 102	Intro to Fire Service II	4
M121	College Algebra - online	3
BIOH 104 or BIOH 201	Intro to Human Biology or A&P 1	4
FIRE 298	Fire Service Internship **(required)**	2
Total Credits		17
Second Semester		
FIRE 110	Hazardous Materials (industry credential)	2
FIRE 106	Wildland Fire Fighting	3
FIRE 131	Fire Apparatus and Hydraulics (industry credential)	4
COMX 115	Introduction to Interpersonal Communication	3
WRIT 101	College Writing	3
FIRE 298	Fire Service Internship **(required)**	2
Total Credits		17
CAS Fire and Emergency Serv./Total Credits	Certification for FF1 (industry credential)	34
Third Semester		
FIRE XXX	**New Course Intro To Fire Bureau	4
BIOM 250 or BIOH 211	Microbiology for Health Sciences or A&P II	4
PSYX 100	Intro to Psychology	3
NASX 105	Native American Studies (D)	3
FIRE 298	Fire Service Internship **(optional)**	2
SPNS 101 or Humanities Electiv	Elementary Spanish I (recommended)	4
Total Credits		16/18
Fourth Semester		
Fire 242	Rescue	6
Fire 261	Building Construction for the Fire Service	2
PSYX 240	Abnormal Psychology	3
SPNS 102 or Humanities elective	Elementary Spanish II (recommended)	4
FIRE 288	Capstone **(required)**	2
Total Credits		17
Total Credits AS	Certification for FF2 (industry credential)	67/69

CTS- Emergency Medical Services		Credits
ECP 131	EMT with clinical	7
AHMS 144	Medical Terminology - Online	3
ECP 206 or ECP 200	EMS Case Studies- Online	4
ECP 200	Transition to Paramedic Care-Online	3
Total Credits CTS		17

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

The Fire and Rescue program has been a long-standing program at Helena College. There are currently only two colleges in Montana, Helena College and City College, that provide fire service training and a high demand for this occupation. The Fire and Rescue Advisory Board for Helena College has expressed concern regarding the amount of fire and rescue personnel that are retiring and the lack of replacement staff. They have also expressed that the fire and rescue workers are becoming more and more needed as all-hazard emergency responders; not just responding to fire emergencies but all emergencies. According to the Department of Labor Statistics there are currently 840 jobs for firefighters and 210 jobs for first line supervisors of firefighting in Montana. The average wage for a career firefighter in Montana is $51,880 and for a supervisor it is $67,740. Nationally there are over 300,000 job openings in this occupation. (see data tables provided below (https://www.bls.gov/oes/current/oes_mt.htm#31-0000)

Occupation code	Occupation title (click on the occupation title to view its profile)	Level	Employment	Employment RSE	Employment per 1,000 jobs	Location quotient	Median hourly wage	Mean hourly wage	Annual mean wage	Mean wage RSE
33-2011	Firefighters	detail	840	12.6%	1.799	0.81	$25.27	$24.94	$51,880	4.4%
33-1021	First-Line Supervisors of Firefighting and Prevention Workers	detail	210	16.1%	0.456	0.96	$33.96	$32.57	$67,740	2.0%

National estimates for this occupation: Top

Employment estimate and mean wage estimates for this occupation:

Employment (1)	Employment RSE (3)	Mean hourly wage	Mean annual wage (2)	Wage RSE (3)
324,620	0.9 %	$26.27	$54,650	1.0 %

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Percentile wage estimates for this occupation:

Percentile	10%	25%	50% (Median)	75%	90%
Hourly Wage	$12.29	$16.57	$24.45	$33.19	$44.24
Annual Wage (2)	$25,550	$34,470	$50,850	$69,040	$92,020

2) Describe any significant new resources (financial, staff, facility, new curricula) needed to launch and sustain the program/center/institute.

Fire and Rescue has been an existing program at Helena College. Previously, this program employed a Director and a large number of adjuncts. The Director responsibilities are now being handled by the Executive Director of Career and Technical Education, and a full-time faculty position has been hired. This results in a great deal of savings in regard to cost per student for this program. Helena College also has most of the necessary equipment which is very costly; therefore, there will be minimal new resources required. Our goal is to relocate this program from the Donaldson Campus to the Airport Campus to maximize utilization of unused space at the Airport Campus and free up area at the Donaldson Campus for potential expansion of student activities on that campus. This will also require minimal remodeling costs to make the existing Airport Campus space usable for the fire program.

3) Describe any efforts or opportunities you have identified for collaboration either within the institution or between MUS institutions (i.e. articulation, course-sharing, research collaboration).

We have currently explored multiple potential transfer opportunities with other institutions as follows: 1) Helena College is currently exploring a potential 2 +2 or 2 +3 articulation with University of Montana to the Bachelor of Science in Public and Community Health 2) City College who also currently has an Associate of Science in Fire Science offering is excited to partner with Helena College to align both of these programs as well as to support development of articulations. MSUB offers an online BAS option with differing concentration areas including Health Administration and Business. Although this is normally articulated to an AAS Degree, in conversation it was suggested that this could be an additional option for these students 3) MSU Billings also offers as online BSLS degree which would also be an excellent alternative for these students and this articulation has also been discussed. If the intent to plan is approved, we will move forward with designing articulation agreements in these areas as we feel this would provide excellent transfer options for students who attain their Associate of Science in Fire and Emergency Services.

4) Describe how the program/center/institute fits with the institutional mission, strategic plan, existing institutional program array, and academic priorities as described in the most recent Academic Priorities and Planning Statement.

The mission of Helena College is to provide access to and support of high-quality lifelong education for our diverse community. This program has the potential to be offered statewide in even rural areas. We are currently offering this

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program in Helena, Missoula, and Livingston. With industry support and updated technology, we feel that we can continue to make this program accessible to students in even the most rural areas. By changing this program to an Associate of Science Degree with a potential online articulation for a Bachelor's degree, we are serving our community and the statewide fire service by providing them a skilled and highly educated workforce. The rigor of this program will continue to be of the highest standard to ensure student success in obtaining industry recognized credentials and employment.

In alignment with the strategic plan of Helena College this degree meets all of the strategic goals of the college in that it promotes student success and achievement by leading directly to immediate employment but also provides additional educational options that can be achieved while the student is employed. In working with the fire service across the state of Montana we will build relationships and community to connect our students to future employment and strengthen Montana's workforce. Lastly, Helena College will always strive to ensure equity and inclusion for all programs and all students. In an industry like Fire Service that has struggled with a lack of diversity, Helena College has and will continue to promote and support all students that desire a career in the fire service.

Signature/Date
Chief Academic Officer:
Chief Research Officer*:
Chief Executive Officer:
Flagship Provost:**
Flagship President:**
*Center/Institute Proposal only **Not applicable to the Community Colleges.

Montana University System
REQUEST TO PLAN – OCHE ANALYSIS

ITEM 190-1903-R0920

ITEM NAME: Certificate of Applied Science in Fire & Emergency Services an A.S. in Fire & Emergency Services

OCHE ANALYSIS

Labor market outlook

There is a high projected demand for professionals in fire and rescue jobs at both the national and state levels. Of the top 20 professions in this area on O*NET, more than half are listed in their highest job growth category. According to Montana DLI, for all jobs in this area, there is projected job growth between 2020-2028.

	Firefighter		Paramedic	
	Montana	**Nation**	**Montana**	**Nation**
Current Employment	743	332,400	756	262,100
Annual Openings	57	25,000	57	19,900
Median Wage	$52,550	$50,850	$29,340	$35,400

SOURCE: O*NET & Montana Department of Labor and Industry

Related programs / centers / institutes

Fire Science A.S. at City College MSU Billings
Paramedic A.A.S. at City College MSU Billings
Paramedic A.A.S. at Flathead Valley Community College
Paramedic A.A.S. at Great Falls College - MSU

Fire Science / Protection Associate Degrees 2016-2018

	2018	**2017**	**2016**
Helena College	8	12	6
City College	4	7	5

Budget Impact

X	**LOW** • **Only incidental costs**		**MEDIUM**		**HIGH** • **substantial commitment of resources relative to institutional budget**

CAO discussion and follow-up

CAOs and OCHE lauded Helena College for their process in revising this credential. The stackable career pathway they propose should help students to leverage these credits and credentials towards a bachelors degree, which is more and more the preferred credential in this field.

ARSA/BOR comment and direction for Level II proposal