

## LEVEL II MEMORANDUM

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**DATE:** October 5, 2016

**TO:** Chief Academic Officers, Montana University System

**FROM:** John Cech, Deputy Commissioner for Academic and Student Affairs

**RE:** Level II Proposals

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The campuses of the Montana University System have proposed new academic programs or changes under the Level II approval process authorized by the Montana Board of Regents. The Level II proposals are being sent to you for your review and approval. If you have concerns about a particular proposal, you must share those concerns with your colleagues at that institution and try to come to some understanding prior to the Chief Academic Officer's conference call on November 1. If you cannot resolve your concerns, raise them at the Chief Academic Officer's conference call. Issues not resolved at that meeting should be submitted in writing to OCHE by noon on Friday, November 4. If no concerns are received, OCHE will assume that the proposals have your approval.

### **Level II Items**

#### **Flathead Valley Community College:**

- Request for authorization to establish an A.A.S. in Medical Laboratory Technology  
[Item 173-301-R1116](#) | [Academic Proposal Request Form](#) | [Curriculum Proposal Form](#) | [Intent to Plan](#)
- Request for authorization to establish an A.A.S. in Programming and Game Development  
[Item 173-302-R1116](#) | [Academic Proposal Request Form](#) | [Curriculum Proposal Form](#) | [Intent to Plan](#)

#### **Montana State University Bozeman:**

- Request for authorization to rename the Center for Wildlife Health and Disease Ecology  
[Item 173-2010-R1116](#) | [Academic Proposal Request Form](#) | [Research Center and Institute Proposal Form](#)
- Request for authorization to create the Pollinator Health Center  
[Item 173-2011-R1116](#) | [Academic Proposal Request Form](#) | [Research Center and Institute Proposal Form](#) | [Intent to Plan](#) |
- Request for authorization to create The Western Lands and Peoples Center (WLPC)  
[Item 173-2012-R1116](#) | [Academic Proposal Request Form](#) | [Research Center and Institute Proposal Form](#) | [Intent to Plan](#) |
- Request for authorization to establish a minor in Biomedical Engineering  
[Item 173-2013-R1116](#) | [Academic Proposal Request Form](#) | [Curriculum Proposal Form](#) | [Intent to Plan](#)

**November 17-18, 2016**

**ITEM 173-301-R1116**

**Request for authorization to establish an A.A.S. in Medical Laboratory Technology**

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**THAT**

Flathead Valley Community College requests authorization from the Montana Board of Regents to establish an associate of applied science degree in Medical Laboratory Technology.

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**EXPLANATION**

This two-year degree, created in partnership with local employers, will prepare students to sit for the certification exam administered by the American Society of Clinical Pathologists.

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**ATTACHMENTS**

Academic Proposal Request Form  
Curriculum Proposal Form  
Intent to Plan Form

**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

ITEM 173-301-R1116 Submission Month or Meeting: November 17-18, 2016

Institution: Flathead Valley Community College CIP Code: 51.1005

Program/Center/Institute Title: A.A.S. in Medical Laboratory Technology

Includes (please specify below): Online Offering \_\_\_\_\_ Options \_\_\_\_\_

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

     **A. Level I:**

**Campus Approvals**

- 1a. Placing a postsecondary educational program into moratorium** (Program Termination and Moratorium Form)
- 1b. Withdrawing a postsecondary educational program from moratorium**
- 2. Establishing, re-titling, terminating or revising a campus certificate of 29 credits or less**
- 3. Establishing a B.A.S./A.A./A.S. area of study**
- 4. Offering an existing postsecondary educational program via distance or online delivery**

**OCHE Approvals**

- 5. Re-titling an existing postsecondary educational program**
- 6. Terminating an existing postsecondary educational program** (Program Termination and Moratorium Form)
- 7. Consolidating existing postsecondary educational programs** (Curriculum Proposal Form)
- 8. Establishing a new minor where there is a major or an option in a major** (Curriculum Proposal Form)
- 9. Revising a postsecondary educational program** (Curriculum Proposal Form)
- 10. Establishing a temporary C.A.S. or A.A.S. degree program** *Approval limited to 2 years*

**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

   **X** **B. Level II:**

- X** **1. Establishing a new postsecondary educational program** (Curriculum Proposal and Completed Intent to Plan Form)
- 2. Exceeding the 120 credit maximum for baccalaureate degrees** *Exception to policy 301.11*
- 3. Forming, eliminating or consolidating an academic, administrative, or research unit** (Curriculum or Center/Institute Proposal and Completed Intent to Plan Form, except when eliminating or consolidating)
- 4. Re-titling an academic, administrative, or research unit**

**Specify Request:**

Flathead Valley Community College intends to establish an A.A.S. in Medical Laboratory Technology.

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

**1. Overview**

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

The A.A.S. program in Medical Laboratory Technology will prepare graduates for entry into technician-level positions in a clinical laboratory environment in hospitals, physician's offices, commercial laboratories, biotechnology, research laboratories, pharmaceutical companies, technical services and sales, or veterinary laboratories in the areas of hematology, blood bank, microbiology, and clinical chemistry. After completing all academic and clinical requirements of the program, students will be eligible to sit for the national certification exam and apply for state licensure.

**2. Institutional and System Fit**

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

During the first year of this program (the prerequisite phase), students will be enrolled in courses that are also taken by other pre-health professions students (i.e. biology, chemistry, and microbiology), and phlebotomy which is also taken by students in the medical assistant program. Other than that, there is no connection between the proposed program and existing programs.

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

No existing programs at the institution will be affected.

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

There are many health science programs at FVCC and they all involve direct patient care. Not all individuals interested in a medical related field want direct patient care. The emphasis in this program is to use laboratory skills in microbiology, immunology, blood and urinalysis, and clinical chemistry to better inform diagnosticians.

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

The first objective of the institutional goal "to increase student academic success" is to increase the percentage of students who obtain meaningful employment. At the current time, there is a huge demand for trained medical laboratory technologists, and graduates will easily enter the workforce at both small and large labs. Students will be placed in various facilities for their clinical experiences and this provides opportunities for both students and the clinics to determine whether or not the student is a good fit for that facility.

The second goal of the institution is to increase access to education. This program will provide opportunities for both non-traditional students as well as first generation students. This program will allow individuals who are already in the workforce as phlebotomists to increase their level of training and qualify for higher paying jobs. This program will also be a good fit for students who are very interested in working in health care but do not want the more traditional nursing, radiologic technology, surgical technology, paramedicine, routes.

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

**E. Describe the relationship between the proposed program and any similar programs within the Montana University System. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and if no efforts were made, explain why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement(s) as part of the documentation.**

This program will be the first AAS Medical Laboratory Technology degree in the state of Montana. What does exist within the state is a Bachelor's of Science degree in Medical Laboratory Science. This program is a consortium shared by the University of Montana, Montana State-Bozeman, and Montana State-Billings.

**3. Program Details**

**A. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog or other publications. NOTE: In the case of two-year degree programs and certificates of applied science, the curriculum should include enough detail to determine if the characteristics set out in Regents' Policy 301.12 have been met.**

(First Year)

Fall Semester

Required Prerequisite Courses

—	<u>Course</u>	<u>No.</u>	<u>Title</u>	<u>Credits</u>
	CHMY	121NL	Introduction to General Chem	4
	BIOB	160NL	Principles of Living Systems	4
	WRIT	101W	College Writing I	3
	COMX	115C	Intro to Interpersonal Communication	3
			Total Credits	15

Spring Semester

—	<u>Course</u>	<u>No.</u>	<u>Title</u>	<u>Credits</u>
	CHMY	123NL	Introduction to Organic Biochemistry	4
	M	115M	Probability and Linear Math	3
	Biom	250NL	Microbiology for Health Sciences	4
	AHMA	220	Phlebotomy	3
	*MLT	101	Introduction to MLT	2
			Total Credits	16

(Second Year)

Fall Semester

—	<u>Course</u>	<u>No.</u>	<u>Title</u>	<u>Credits</u>
	*MLT	201	Hematology	4
	*MLT	205	Urinalysis & Body Fluids	3
	*MLT	210	Immunology/Serology	3
	*MLT	215	Coagulation	2
	*MLT	220	Clinical I	3
			Total Credits	15

Spring Semester

—	<u>Course</u>	<u>No.</u>	<u>Title</u>	<u>Credits</u>
	*MLT	230	Immunohematology	5
	*MLT	235	Clinical Microbiology	5
	*MLT	221	Clinical II	5
			Total Credits	15

Summer Session

—	<u>Course</u>	<u>No.</u>	<u>Title</u>	<u>Credits</u>
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**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

*MLT	240	Clinical Chemistry	5
*MLT	223	Clinical III	4
		Total Credits	9

TOTAL PROGRAM CREDITS: 70

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

The plan implements the prerequisite Introduction to MLT course spring semester of 2017 along with a competitive application process for entry into the second year of the program. Students already having completed the first year of pre-requisite courses, including Introduction to MLT, during the 2016-2017 year would be eligible to apply spring 2017 for the second year of the program planned to begin in summer or fall of 2017. If a spring 2017 start for the Introduction to MLT is not possible, a backup plan is to run this first Introduction to MLT course summer of 2017 to accepted students only.

Due to the expense of equipment, space requirements, and limitations of space for clinical placement, it is anticipated that initially, no more than six students will be admitted to the second year of the program.

**4. Need**

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

Kalispell Regional Healthcare approached the college fall 2015 to request an AAS MLT degree. The hospitals and clinics in the FVCC service region are unable to attract enough BS-MLS graduates to fill their laboratory positions. Many states hire two year MLT graduates into technician jobs in the labs with BS-MLS graduates in supervisory roles, and this trend is on the rise. KRH is interested in filling their shortages by shifting to the MLT/MLS hiring scheme. Currently there are no MLT programs in Montana. Students at Miles Community College have an opportunity to complete a program through Bismarck State College in North Dakota.

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

The hospitals and clinics in the FVCC service region are unable to attract enough BS-MLS graduates to fill their laboratory positions. Many states hire two year MLT graduates into technician jobs in the labs with BS-MLS graduates in supervisory roles, and this trend is on the rise. KRH is interested in filling their shortages by shifting to the MLT/MLS hiring scheme. This program intends to train students to obtain gainful employment and fill an existing employer need.

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

According to the UD Department of Labor, Bureau of Labor Statistics, this field is expected to grow 16% from 2014-2024 nationally. For Montana from 2014-2017 an increase of 4.5 % or 20 jobs annually is predicted. From 2014-2024 an 18.5 % increase is predicted in Montana.

According to KRH, there is currently a shortage locally, and these shortages are predicted to increase with current plans to expand the laboratory. In addition to the local hospitals, shortages also exist in other laboratories and clinics in Flathead, Lincoln, and Lake Counties. Current employment data for Montana are shown below.

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

<b>Area: Montana</b>					
<b>Period: May 2015</b>					
Occupation (SOC code)	Employment(1)	Hourly mean wage	Annual mean wage(2)	Annual median wage(2)	Employment per 1,000 jobs
<b>Medical and Clinical Laboratory Technologists(292011)</b>	560	28.42	59120	59930	1.255
<b>Medical and Clinical Laboratory Technicians(292012)</b>	400	20.71	43080	39350	0.902
Footnotes:					
(1) Estimates for detailed occupations do not sum to the totals because the totals include occupations not					
(2) Annual wages have been calculated by multiplying the hourly mean wage by 2080 hours.					
SOC code: Standard Occupational Classification code -- see <a href="http://www.bls.gov/soc/home.htm">http://www.bls.gov/soc/home.htm</a>					
US Department of Labor Bureau of Labor Statistics					

PROGRAM	TITLE	HOURLY WAGES	JOB OPENINGS	PROJECTIONS
<b>CAREER COACH</b>	Medical and Clinical Laboratory Technician	\$11.20-29.82/hr. Median: \$21.50	50 employed in area 3 estimated job openings 15 approaching retirement age	Increase by 12% over next four years, 30% over age 55, may retire soon
<b>MCIS</b>	Medical Laboratory Technicians	MT: \$13.52-22.84 Median: \$16.47 US: \$14.84-23.30	MT: 510 US: 161.500	MT: 24.3% US: 29.7%
<b>O*NET</b>	Medical & Clinical Laboratory Technicians	MT: \$12.14-28.24 US: \$12.26-28.73	MT: 30 U.S. 6810	MT: +18% US: +6810
<b>EMSI</b>	See attached report			

**SOC CODE: 29-2012.00**

**Growth Factors:**

- The number of available diagnostic medical tests, treatments and procedures continue to grow
- Increased testing for genetic conditions
- More of the population has health care coverage
- Increase in aging population, especially in Flathead County

The major employers for medical laboratory technicians are hospitals, medical laboratories, and doctor's offices and clinics. Health care continues to be one of the top industries in Flathead Country with Kalispell Regional Healthcare being the largest employer in the valley with nearly 3000 employees. The hospital continues to expand services and facilities. For example, another expansion for a 190,000 pediatric center at the healthcare center was recently announced. According to the Flathead Beacon, (Tabish, 2016; ) "Since 2014, the hospital has added over 65 medical doctors, as well as nearly 20 allied staff, and now boasts over 2,530 full-time employees, according to hospital data. Healthcare employment in



**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

Flathead County has grown 47 percent in the last 10 years, according to state data. One in six workers in Flathead County are now employed in the health care and social services sector, making it the largest local employment sector. “

This program would complement existing health care programs offered through FVCC. Overall, given growth projections within this occupation and the local health care industry as a whole, expected retirements and relatively high wages, there does appear to be ample employment opportunities for program graduates.

**REFERENCES**

Tabish, D. (2016, June 2). News and Features. Retrieved from Flathead Beacon web site :  
<http://flatheadbeacon.com/2016/06/02/kalispell-regional-healthcare-expanding-pediatric-center/>

**5. Process Leading to Submission**

**A. Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.**

FVCC was approached by leadership from Kalispell Regional Health Care. They were made aware of a serious, immediate, and continuing need for individuals trained to do the lab work. Recruitment of graduates from the state’s MLS program has not been successful. Although an individual graduating from an MLT AAS program may need additional training in some areas (e.g. blood bank), there is a definite place for MLT-trained individuals in other areas of the lab. The first advisory committee meeting was held Tuesday August 9<sup>th</sup>, 2016, 10am. Adam Birks discussed KRMC’s request for this program. FVCC faculty provided a packet including a draft catalog page for the MLT program, course profiles, and example clinical skills checklists to each committee member. They then presented an overview of MLT programs, curriculum design for this program, staffing, facility, and equipment needs, and clinical rotations. A thorough discussion of implementation of such a program followed. In response to the members’ input, a few minor changes to the curriculum design were implemented.

**6. Resources**

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

In the early stages, the Program Director will likely prepare the supplies, instruments, chemicals, and biologicals for the laboratories and on-campus clinicals. Over time, it is likely this program will need laboratory technician support to prepare and order everything needed for the laboratory analyses. The hospital is aware and prepared to hire necessary personnel.

**B. Are other, additional resources required to ensure the success of the proposed program? If yes, please describe the need and indicate the plan for meeting this need.**

Each course in this program has a laboratory component. The equipment used is highly specialized and expensive. Some pieces of equipment (e.g. microscopes) already exist at the college and can be used.

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

Other pieces will need to be acquired. Of those, some are owned by the hospital and as older models, will be useable. Others might be able to be acquired as “loaners” and still other items will need to be purchased – hopefully with the help of the hospital.

**7. Assessment**

**A. How will the success of the program be measured?**

All new programs are reviewed after 2 years through a formal comprehensive program review. Considerations include: learning outcomes assessment, course scheduling and content, enrollment, needs, facilities, budget, and advisory committee feedback.

Montana University System  
INTENT TO PLAN FORM

Program/Center/Institute Title: Medical Lab Technician, AAS

Campus, School/Department: Flathead Valley Community College Expected Submission Date: January 2017

Contact Name/Info: Chris Clouse (406)756-4326 [cclouse@fvcc.edu](mailto:cclouse@fvcc.edu)

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

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

We plan to offer an Associates of Applied Science degree in Medical Laboratory Technology (MLT). This two year degree will prepare students to sit for the certification exam administered by the American Society of Clinical Pathologists (ASCP). We will seek accreditation through the National Accrediting Agency for Clinical Lab Sciences (NAACLS) with five years of inception.

This Associates degree will require at least 64 credits including 24 credits in medical lab science, chemistry and biology. The curriculum must include scientific content in clinical chemistry, hematology/hemostasis, immunology, immunohematology, transfusion medicine, microbiology, and laboratory operations. We will partner with local hospitals, clinics, and laboratories to develop agreements for clinical internships.

The program will be developed through the cooperative efforts of members of our health science, microbiology and chemistry departments. We are also partnering with Kalispell Regional Medical Center (KRMC) to develop curriculum, instruction and assessment plans.

We may also seek to align the program outcomes to allow students to transfer to MSU-Bozeman's Medical Laboratory Science Bachelor's degree program if possible. If this option is doable, we will offer an Associates of Science degree that included general education requirements necessary to transfer at the junior level. A program similar to this exists in North Dakota and we plan to consult with those schools to develop our program.

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

Flathead Valley Community College (FVCC) administration was contacted by KRMC administration in the fall of 2015 to see if we were interested in partnering with them to develop an MLT program. In the past, KRMC had preferred to hire bachelor prepared medical lab scientists (MLS). They were finding it increasingly difficult to recruit MLS's and decided that MLT's could, with proper oversight, help them meet their needs. KRMC supplies laboratory services to many other hospitals in Montana including those in Libby, Shelby and Cutbank to name a few. They felt that bringing MLT's into their labs and clinics would increase their flexibility to provide lab services to outlying hospitals.

As the population of the US ages, there will be increasing demand for laboratory services to support advanced medical care. The US Bureau of Labor and Statistics estimates that the demand for MLT's will increase by 16% over the next ten year, a rate they describe as "much faster than average". A November 2015 article by the American Association for Clinical Chemistry described the shortage of clinical laboratory professionals as "acute" due to the fact that the demand is increasing but the number of approved schools is actually decreasing.

Currently, there are no NAACLS accredited and approved MLT programs in Montana or Idaho; Oregon and Wyoming each have only one school. Most programs are found on the east coast where MLT's are more commonly used in

**Montana University System**  
INTENT TO PLAN FORM

laboratories. As the need for MLT's grows in the west, we felt that a Montana-based program would help meet an unmet need and would allow Montana students to stay in Montana to receive the training they need to become MLT's.

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


FVCC's mission statement reads *Flathead Valley Community College promotes excellence in lifelong learning, focusing on student success and community needs.* We have identified four core themes, one of which is workforce preparation. The proposed MLT program is a workforce preparation program that targets a known community need thus fulfilling our mission and addressing a core theme.

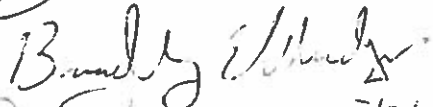
The college offers many other high quality health care programs (medical assisting, medical coding, paramedicine, pharmacy technology, physical therapist assistant, practical nursing, radiologic technology, registered nursing, and surgical technology). These programs are built on our excellent foundational courses in anatomy and physiology, chemistry, microbiology, and pathophysiology courses. The MLT program would complement our existing programs, rely on these same foundational courses and offer our students another high paying, in-demand career path.


**4) How does the proposed program/center/institute fit within the MUS system?**

As stated earlier, there is no existing MLT program in the state of Montana. We will be fulfilling an unmet need for the state's many hospitals and laboratories. We would like to work with the MLS program at MSU-Bozeman to create a program that could allow students to move into their four year degree program.

Signature/Date

College/School Dean:  5-25-16

Chief Academic Officer:  5/25/2016

Chief Executive Officer:  5/26/16

Flagship Provost\*: NA

Flagship President\*: NA

\*Not applicable to the Community Colleges.

Date of Final Review: July 19, 2016

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

**November 17-18, 2016**

**ITEM 173-302-R1116**

**Request for authorization to establish an A.A.S. in Programming and Game Development**

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**THAT**

Flathead Valley Community College requests authorization from the Montana Board of Regents to establish an associate of applied science degree in Programming and Game Development.

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**EXPLANATION**

This is an associate degree that will include areas of computer programming and game development. It provides students with a strong foundation in JAVA, with exposure to Windows programming and mobile application programming. Game Development includes game theory, game programming, and a course in virtual / augmented reality.

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**ATTACHMENTS**

Academic Proposal Request Form  
Curriculum Proposal Form  
Intent to Plan Form

**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

ITEM 173-302-R1116 Submission Month or Meeting: November 17-18, 2016

Institution: Flathead Valley Community College CIP Code: 36.0113

Program/Center/Institute Title: A.A.S. in Programming and Game Development

Includes (please specify below): Online Offering \_\_\_\_\_ Options \_\_\_\_\_

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

     **A. Level I:**

**Campus Approvals**

- 1a. Placing a postsecondary educational program into moratorium** (Program Termination and Moratorium Form)
- 1b. Withdrawing a postsecondary educational program from moratorium**
- 2. Establishing, re-titling, terminating or revising a campus certificate of 29 credits or less**
- 3. Establishing a B.A.S./A.A./A.S. area of study**
- 4. Offering an existing postsecondary educational program via distance or online delivery**

**OCHE Approvals**

- 5. Re-titling an existing postsecondary educational program**
- 6. Terminating an existing postsecondary educational program** (Program Termination and Moratorium Form)
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**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

X **B. Level II:**

- X 1. **Establishing a new postsecondary educational program** (Curriculum Proposal and Completed Intent to Plan Form)
- \_\_\_\_\_ 2. **Exceeding the 120 credit maximum for baccalaureate degrees** *Exception to policy 301.11*
- \_\_\_\_\_ 3. **Forming, eliminating or consolidating an academic, administrative, or research unit** (Curriculum or Center/Institute Proposal and Completed Intent to Plan Form, except when eliminating or consolidating)
- \_\_\_\_\_ 4. **Re-titling an academic, administrative, or research unit**

**Specify Request:**

Flathead Valley Community College intends to establish an A.A.S. in Programming and Game Development.

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

**1. Overview**

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

Flathead Valley Community College requests authorization from the Montana Board of Regents to establish an A.A.S. program in Programming and Game Development.

**2. Institutional and System Fit**

- A. What is the connection between the proposed program and existing programs at the institution?**

FVCC currently offers an AAS in Web Technology, AAS in Information Technology and the AS Computer Science Transfer. The AAS in Programming and Gaming complements the programs that serve the community and four-year-bound university students.

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

No.

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

The Web Technology Program addresses the needs of businesses for creating a web presence on the internet. Information technology addresses the infrastructure of technology for businesses. However, there is a void in the creation of software, applications and code maintenance of businesses. The same skills that are required to create a mobile application are the same skills needed for creating a mobile game. The same game creation skills are also the same for modeling real life scenarios. Businesses in the area have repeatedly asked if we have students with application programming skills and/or Windows programming skills. The students and parents are constantly asking if FVCC has any game development courses. This program provides a balanced approach to meeting the needs of both area businesses and student demands.

- D. How does the proposed program serve to advance the strategic goals of the institution?**

FVCC's mission statement is "Flathead Valley Community College promotes excellence in lifelong learning, focusing on student success and community needs." The proposed program aligns directly with the "Workforce Preparation" core theme objectives to offer workforce training aligned with community needs, and to provide students the skills necessary to be successful in their chosen occupations. Game programming has many concepts applicable to "traditional" application development. The mobile application and virtual/augmented reality components are also applicable to "traditional" business applications and are the future direction of computer applications. This program will provide a solution to the many students who wish to pursue a career in game development and software applications.

- E. Describe the relationship between the proposed program and any similar programs within the Montana University System. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and**



**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

**if no efforts were made, explain why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement(s) as part of the documentation.**

Three MUS colleges offer an AAS degree in programming: Helena College, City College, and Great Falls College. No two-year school within the MUS has a programming and gaming program, and no other community college in Montana is offering an emphasis in game development and programming. Therefore, this program would be fairly unique within the MUS system.

**3. Program Details**

**A. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog or other publications. NOTE: In the case of two-year degree programs and certificates of applied science, the curriculum should include enough detail to determine if the characteristics set out in Regents’ Policy 301.12 have been met.**

This program is designed to prepare students for entry into the field of software programming and game development. It provides students with a foundation in Java, windows programming, and mobile application programming. Game Development includes game theory, game programming, and a course in virtual / augmented reality. It should be noted that game platforms and technologies are often used in other non-gaming applications. Both the areas of programming and game development complement each other in terms of problem solving, programming, software analysis, software development, and practical applications. These skills are demanded by both students and the software development community and this program is designed to meet those demands.

Upon completion of this program, students will:

- *program Java SE applications*
- *program Windows applications*
- *program Android mobile applications*
- *have a foundation Game Design Theory*
- *program 2D and 3D games*

**Fall Semester**

<u>Course</u>	<u>No.</u>	<u>Title</u>	<u>Credits</u>
CSCI	111	Programming with Java I	4
MART	111	Interactive Web I	4
WRIT	101	College Writing	3
M	114	Extended Technical Math	3
<b>Total Credits</b>			<b>14</b>

**Spring Semester**

<u>Course</u>	<u>No.</u>	<u>Title</u>	<u>Credits</u>
CSCI	113	Programming with C++	4
PSXX	110	Applied Physics	4
CSCI	121	Programming with JAVA II	4
CSCI	122	Game Design Theory	3
CSCI	240	Databases and SQL	3
<b>Total Credits</b>			<b>17</b>

**Fall Semester\*\***

<u>Course</u>	<u>No.</u>	<u>Title</u>	<u>Credits</u>
		Elective	4
CSCI	208	Game Programming I	4
CSCI	238	Standards Based Mobile Applications	4

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

CSCI	206	.NET Applications	4
		<b>Total Credits</b>	<b>16</b>

**Spring Semester**

<u>Course</u>	<u>No.</u>	<u>Title</u>	<u>Credits</u>
CSCI	209	Game Programming II	4
CSCI	220	Virtual / Aug Reality	4
COMEX	115C	Interpersonal Communication	3
BGEN	204	Business Fundamentals	3
ITS	164	Networking Fundamentals	3
		<b>Total Credits</b>	<b>17</b>
		<b>Total Program Credits</b>	<b>64</b>

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

Upon approval, the program is to start fall of 2017. The program can accommodate the class cap of 20 students.

**4. Need**

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

According to the Occupation Overview EMSI Q1 Data Set May 2016, there will be a positive 37% job growth for the Flathead County, Lake County, Lincoln County and Sanders County. The median hourly earnings is expected to be 31.47 / hr. Also, students and parents are asking for classes in game design. Local employers are asking for students with Windows Programming and App development skills.

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

- Economic forecasters predict a 30 percent growth in software development jobs by 2026 in Northwest Montana.
- Roughly half of the jobs that pay \$57,000 or more per year are in occupations that commonly require applicants to have at least some computer coding knowledge or skill, according to a 2016 analysis of 26 million U.S. online job postings by market analytics firm Burning Glass and Oracle Academy. <https://heatst.com/biz/half-of-the-highest-paying-jobs-in-america-now-require-you-to-know-how-to-code/>
- Virtual Reality hardware sales are predicted to hit \$40 billion by 2020 as new software becomes available, according to playable media and games market research company SuperData. <http://www.wsj.com/articles/research-firm-lowers-projections-for-virtual-reality-sales-1460485946>

The student clientele is geared towards those students who have an interest in game development or those students wishing gain programming skills for creating applications and mobile apps. Students will have a foundation in JAVA, Windows Programming (C#) and Android App Development (The world’s most popular and installed operating system.)

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

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

<u>Career Coach</u>		<b>Hourly Wages</b>	<b>Outlook</b>	
	<b>Video Game Designer (Computer Operations, all other - SOC 15-1199)</b>	16.59-38.49 Median: 24.60	45 Employed in area 1 opening 10 approaching retirement	Increase by 2.2% over next four years
	<b>Software Developer (Systems)</b>	21.93-67.06 36.22 Median	61 employed in area 4 annual openings 9 approaching retirement	Increase by 16.4% over next four years
	<b>Computer Programmer</b>	18.06-49.32 31.41 Median	72 employed in area 4 annual openings	Increase by 11.1% over next four years
	<b>Computer Systems Analyst (SOC 15-1121)</b>	18.09-43.03 31.08 Median	113 employed in area 8 estimated job openings 24 approaching retirement	Increase by 18.6% over next four years
<u>MCIS</u>		<b>Wages</b>	<b>Outlook (Annual Openings) 2014-2024</b>	<b>Avg. Educational Attainment</b>
	<b>Software Developers, Applications (15-1132)</b>	MT: 27.98-46.07 Median 37.63 US: 35.45-58.15 Median: 45.92	<b>MT: 61 (+24.4%)</b>  <b>US: 37,730 (+20.8%)</b>	Usually at least a bachelors, sometimes a masters.
	<b>Computer Programmer (SOC 15.1131)</b>	MT: 21.28-36.50  US: 28.46-48.28	MT: 59 (+14.2%) US: 11810 (+8.3%)	Most have at least a bachelor's degree, generally in Computer Science

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

	<b>Computer Systems Analyst</b>	MT: 15.99-38.38 Median: 30.79 US: 31.02-50.46 Median: 39.76	MT: 28 (+27.8%) US: 20,960 (+24.5%)	Typically need bachelor's degree in computer area
	<b>Video Game Designers</b>	MT: 20.56-36.50 US: 30.59-51.11	MT: 10 (+9.6%) US: 4020 (+3.8%)	Most have bachelor's degree in computer graphics or related field
<b>Economic Modeling Systems Inc.</b>				

**5. Process Leading to Submission**

**A. Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.**

The decision to pursue this program was in responds to student, parent and local business demand. This was then followed up by an EMSI Occupation Overview needs assessment.

From the FVCC March 2013 Survey it was noted:

- “• Computer and Information Sciences Computer and information sciences enjoyed broad support from employers, who ranked it third in terms of their individual needs and second in terms of the county’s overall needs.
- This area also was projected to have the third highest job growth, with 35 new jobs projected over the next five years. “

**6. Resources**

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

Yes. Total credit hours for courses by semester with the addition of the new AAS program are as follows assuming a starting quarter of fall 2017:

Fall 2017	18
Spring 2018	31
Fall 2018	34
Spring 2019	41

The data shows that starting in spring of 2018 there will be a total of 31 CSCI credit hours will be taught with the additional classes of the AAS program. This will require more than one fulltime faculty. The recommended action would be to contract for a one year temporary position with the option that the person can go towards full time pending success of the program.

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

**B. Are other, additional resources required to ensure the success of the proposed program? If yes, please describe the need and indicate the plan for meeting this need.**

No.

**7. Assessment**

**A. How will the success of the program be measured?**

The program will go through a formal review after two years by the Program Review Committee as mandated by FVCC policy. Results of the findings will determine, success; suggestions of improvement and further monitoring; or shuttering of the program.

**Montana University System**  
*INTENT TO PLAN FORM*

Program/Center/Institute Title: **Programming and Game Development AAS**

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Campus, School/Department: **Flathead Valley Community College / Computer Science** Expected Submission Date: **9/28/16**

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Contact Name/Info: **James Goudy / [jgoudy@fvcc.edu](mailto:jgoudy@fvcc.edu) – Cell: 406.465.3008**

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

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

**Programming and Game Development:** This is an associate degree that will require at least 64 credits in the areas of computer programming and game development. It provides students with a strong foundation in JAVA, with exposure to Windows programming and mobile application programming. Game Development includes game theory, game programming, and a course in virtual / augmented reality. It should be noted that game platforms are also used in real life areas other than gaming. For example, NASA trains their space station astronauts using the Unreal gaming engine. Both areas of programming and game development complement each other in terms of problem solving, programming, software analysis, software development, and practical applications. These skills are demanded by both students and the software development community.

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

As the program director for the Computer Science Transfer curriculum at FVCC, I am constantly being asked by students and parents if FVCC has any courses or programs related to game development. I am also asked by area employers for students that know Windows programming or can do mobile application development. I often remind students that the skills used in developing gaming are also applicable to real life applications as well. Gaming engines are also used in the programming of virtual and augmented reality applications. The Unreal gaming engine is used for enterprise applications. Listed below are several examples.

- Rotor design studio brings Toyota Showroom 360 To Life With Unreal Engine<sup>1</sup>
- NASA Trains Astronauts With Unreal Engine<sup>2</sup>
- Simulation Increases Empathy For People Living With Dementia<sup>3</sup>

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<sup>1</sup> "Rotor Brings Toyota Showroom 360 to Life with Unreal Engine." 2016. 6 May. 2016  
<<https://www.unrealengine.com/showcase/rotor-brings-toyota-showroom-360-to-life-with-unreal-engine>>

<sup>2</sup> "How NASA Trains Astronauts with Unreal Engine." 2016. 6 May. 2016  
<<https://www.unrealengine.com/showcase/how-nasa-trains-astronauts-with-unreal-engine>>

<sup>3</sup> "Simulation Increases Empathy for People Living with Dementia." 2014. 6 May. 2016  
<<https://www.unrealengine.com/showcase/virtual-dementia-experience>>

## Montana University System

The following charts show that there will be an approximate 30% growth in software development jobs over the next 10 years within FVCC's service area. The proposed Programming and Game Development AAS program is designed to meet this demand by providing students a strong foundation in game development and application programming.

### Software Development Job Growth for the Flathead Region

#### Regional Trends



Region	2014 Jobs	2024 Jobs	Change	% Change
Region	3,779	4,774	995	26.3%
Lake County, MT	64	96	32	50.0%
Lincoln County, MT	23	30	7	30.4%
Sanders County, MT	14	19	5	35.7%
Flathead County, MT	255	350	95	37.3%

EMSI Q1 2016 Data Set | [www.economicmodeling.com](http://www.economicmodeling.com)

#### Area Job Growth by Occupation for the Flathead Region

Occupation	2014 Jobs	2024 Jobs	Change	% Change
Computer Systems Analysts (15-1121)	779	1,093	314	10%
Computer Programmers (15-1131)	889	998	109	12%
Software Developers Applications (15-1132)	791	1,113	322	41%
Software Developers Systems Software (15-1133)	612	843	231	33%

EMSI Q1 2016 Data Set | [www.economicmodeling.com](http://www.economicmodeling.com)

## Montana University System

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

FVCC's mission statement is "Flathead Valley Community College promotes excellence in lifelong learning, focusing on student success and community needs." The proposed program aligns directly with the "Workforce Preparation" core theme objectives to offer workforce training aligned with community needs, and to provide students the skills necessary to be successful in their chosen occupations. Game programming has many concepts applicable to "traditional" application development. The mobile application and virtual/augmented reality components are also applicable to "traditional" business applications and are the future direction of computer applications. This program will provide a solution to the many students who wish to pursue a career in game development and software applications.

- 4) How does the proposed program/center/institute fit within the MUS system?

Three MUS colleges offer an AAS degree in programming: Helena College, City College, and Great Falls College. No two year school within the MUS has a programming and gaming program, and no other community college in Montana is offering an emphasis in game development and programming. Therefore, this program would be fairly unique within the MUS system.

### Signature/Date

College/School Dean: 

Chief Academic Officer: 

Chief Executive Officer: 

Flagship Provost\*: NA

Flagship President\*: NA

\*Not applicable to the Community Colleges.

Date of Final Review: July 19, 2016

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



November 17-18, 2016

ITEM 173-2010-R1116

**Request for authorization to rename the Center for Wildlife Health and Disease Ecology**

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**THAT**

Montana State University requests authorization from the Montana Board of Regents to rename the Center for Bison and Wildlife Health to the Center for Wildlife Health and Disease Ecology

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**EXPLANATION**

With this name change, we propose to repackage, reinvigorate and modernize the existing “Center for Bison and Wildlife Health” within the Department of Microbiology and Immunology (MBI) at MSU. We propose to rename the center to “Center for Wildlife Health and Disease Ecology” to broaden the focus of the center and catalyze interest in the growing field of disease ecology. The original center was initiated by faculty who worked only on bison, and hence their focus was on bison health. Our focus is broader because of the broader faculty interests, covering wildlife diseases at local, national and international scales. Even on the local scale, we aim to work on a variety of species, including bighorn sheep, wolves, elk, moose, bats, and prairie dogs. Although we hope to include research on bison health within the center, singling out a specific species may give the incorrect impression that our focus is too narrow.

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**ATTACHMENTS**

Academic Proposal Form  
Research Center Proposal Form

**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

ITEM 173-2010-R1116 Submission Month or Meeting: November 17-18, 2016

Institution: Montana State University CIP Code: \_\_\_\_\_

Program/Center/Institute Title: Center for Wildlife Health and Disease Ecology

Includes (please specify below): Online Offering \_\_\_\_\_ Options \_\_\_\_\_

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

     **A. Level I:**

**Campus Approvals**

- 1a. Placing a postsecondary educational program into moratorium** (Program Termination and Moratorium Form)
- 1b. Withdrawing a postsecondary educational program from moratorium**
- 2. Establishing, re-titling, terminating or revising a campus certificate of 29 credits or less**
- 3. Establishing a B.A.S./A.A./A.S. area of study**
- 4. Offering an existing postsecondary educational program via distance or online delivery**

**OCHE Approvals**

- 5. Re-titling an existing postsecondary educational program**
- 6. Terminating an existing postsecondary educational program** (Program Termination and Moratorium Form)
- 7. Consolidating existing postsecondary educational programs** (Curriculum Proposal Form)
- 8. Establishing a new minor where there is a major or an option in a major** (Curriculum Proposal Form)
- 9. Revising a postsecondary educational program** (Curriculum Proposal Form)
- 10. Establishing a temporary C.A.S. or A.A.S. degree program** *Approval limited to 2 years*

**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

X **B. Level II:**

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

\_\_\_\_\_ **2. Exceeding the 120 credit maximum for baccalaureate degrees** *Exception to policy 301.11*

\_\_\_\_\_ **3. Forming, eliminating or consolidating an academic, administrative, or research unit** (Curriculum or Center/Institute Proposal and Completed Intent to Plan Form, except when eliminating or consolidating)

X **4. Re-titling an academic, administrative, or research unit**

**Specify Request:**

Request authorization from the Montana Board of Regents for Montana State University to rename the Center for Bison and Wildlife Health to the Center for Wildlife Health and Disease Ecology

**Montana Board of Regents**  
**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

**1. State the proposed Institute/Center's name and purpose.**

This is a request to change the name of a Regent's-approved Center from the current name of "Center for Bison and Wildlife Health" to "Center for Wildlife Health and Disease Ecology."

**2. A comprehensive statement of the Institute/Center's mission and its relationship to the University mission.**

**A. State the Institute/Center's mission.**

The mission of the Center is to serve as an internationally recognized center of excellence for interdisciplinary research on wildlife health and disease.

**B. Identify the Institute/Center's goals and objectives.**

With this name change, we propose to repackage, reinvigorate and modernize the existing "Center for Bison and Wildlife Health" within the Department of Microbiology and Immunology (MBI) at MSU. We propose to rename the center to "Center for Wildlife Health and Disease Ecology" to broaden the focus of the center and catalyze interest in the growing field of disease ecology. The original center was initiated by faculty who worked only on bison, and hence their focus was on bison health. Our focus is broader because of the broader faculty interests, covering wildlife diseases at local, national and international scales. Even on the local scale, we aim to work on a variety of species, including bighorn sheep, wolves, elk, moose, bats, and prairie dogs. Although we hope to include research on bison health within the center, singling out a specific species may give the incorrect impression that our focus too narrow.

The center, which will have an expanded focus on wildlife health and infectious disease ecology, will have the following updated goals and objectives:

1. Become an internationally recognized center of excellence for interdisciplinary research on wildlife health and disease.
2. Procure research funding for wildlife health research initiatives.
3. Become a think-tank and innovation center for wildlife disease research.
4. Prototype and refine interdisciplinary approaches to research.
5. Attract international science leaders to Montana to think about wildlife disease issues.
6. Serve as a hub for researchers interested in wildlife health locally, nationally and internationally.
7. Create a regional community for scientists with similar interests (e.g. MSU, NIH Rocky Mountain Labs, wildlife agencies, wildlife NGOs).
8. Convene workshops, speaker series and training courses.

**Montana Board of Regents**  
**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

**C. What specific need is being responded to in developing the proposed Institute/Center?**

This center already exists. We are only requesting a name change. We propose to repackage, reinvigorate and modernize the existing "Center for Bison and Wildlife Health" within the Department of Microbiology and Immunology (MBI) at MSU. Given MSU's history, unique geography and interdisciplinary expertise, we have an opportunity to update the existing center and take it to a new institutional trajectory that promotes leadership in science, education and practice.

**D. Describe how the Institute/Center benefits the department, college, or institution.**

This center will continue to bring recognition to MSU as an internationally recognized center of excellence for interdisciplinary research on wildlife health and disease. The center will also help procure research funding for wildlife health research initiatives. Changing the name to become more relevant to current issues in the field will help to accomplish these goals.

**E. Describe the Institute/Center's relationship to the University mission.**

The state mission of Montana State University is to educate students, create knowledge and art, and serve communities by integrating learning, discovery and engagement. This mission of this existing Center is to serve as a resource for interdisciplinary research and education on wildlife health and disease. The Center will also help procure research funding for wildlife health research initiatives. These are all consistent with the University mission.

**3. Briefly describe the Institute/Center's anticipated activities.**

**A. Identify faculty expertise available for participation in the Institute/Center's activities.**

MBI has established a "Research and Instructional Core" and a group of faculty studying zoonotic diseases (animal and human health) and supported by competitive research funding that probably well exceeds \$100 million dollars over >20 years. This funding has led to research expertise and facility upgrades that are the building blocks of this expanded initiative. Moreover, MBI hosts the WIMU regional program in Veterinary Medicine, and has links to the Washington State University Paul G. Allen School for Global Animal Health, which complements the proposed direction for our Center.

**B. Which departments on campus will be involved and how will the Institute/Center contribute to the academic programs of the institution?**

This center already exists in the Department of Microbiology and Immunology. Activities of the Center will contribute to new courses being planned in the field of Disease Ecology. Disease Ecology is highly interdisciplinary and merges concepts from microbiology, immunology, evolution, mathematics, epidemiology, medicine, veterinary medicine, ecology, and geography. Thus the discipline of Disease Ecology is positioned to address major global health issues such as how climate change affects pathogen transmission dynamics, or why pathogens spread in some communities but not in others. The goals of this Disease Ecology course differ from other disciplines such as epidemiology (aims to identify risk factors for disease), or parasitology (focuses on parasite taxonomy and life cycles), microbiology (focuses on studying microscopic organisms).

**Montana Board of Regents**  
**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

**4. Identify the organizational structure of the Institute/Center within the institution.**

**A. Identify all agencies, organizations and/or institutions that will be involved.**

This is an existing Center in the Department of Microbiology and Immunology at Montana State University. This is only a request for a name change. In the future, we hope to engage scientists with similar interests from a variety of agencies/organizations/institutions (e.g., MSU, UM, NIH Rocky Mountain Labs, Wildlife Agencies, Wildlife NGOs).

**B. Identify advisory council information.**

The advisory council will include highly connected leaders in the field of Disease Dynamics, Disease Ecology, or Wildlife Health; faculty from MSU; potential patrons; people with experience starting and growing organizations; experts in interdisciplinary approaches to science; and people who are willing to work to grow the center. For example, potential board members include:

Internal:

- Mark Jutila (Head of Department MBI)
- Mark Young (Associate Vice President for Research)
- Raina Plowright (Assistant Professor and expert in this area)

External (possible members):

- Peter Hudson (Fellow of the Royal Society and Director of Huck Institute for Life Sciences at Pennsylvania State University, world leader in field of Disease Ecology)
- Gary Tabor (Executive Director Center for Large Landscape Conservation, decades of experience establishing and growing organizations)
- Michael Gorman (Professor at University of Virginia – expert in interdisciplinary approaches to science)
- Pamela Thye (New York donor with experience on board of large wildlife NGOs & access to donors for funding)
- Chris or Rebekah Bunting (business leaders and philanthropists)
- Brad Vale (former senior vice president Johnson and Johnson, DVM PhD)
- Mary Pearl (Dean of Macauley College, CUNY, former president of Wildlife Trust)
- Jonathan Patz (Director Global Health Initiative University Wisconsin, shared Nobel Laureate)
- Megan Parker (Executive Director Working Dogs for Conservation)

**5. Identify first year and continuing finances necessary to support the Center/Institute, including the sources of funding.**

This is an existing Center.

**A. Will additional faculty and other resources be required to implement this Center/Institute? If yes, please describe the need and indicate the plan for meeting this need.**

No.

**Montana Board of Regents**  
**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

**B. Are other, additional resources required to ensure the success of the proposed Center/Institute? If yes, please describe the need and indicate the plan for meeting this need.**

No.

**6. Describe other similar Centers/Institutes or research capacities in the state and surrounding region.**

**A. Describe the relationship between the proposed Center/Institute and any similar Centers/Institutes, programs, or research capacities within the Montana University System.**

This is an existing Center. There are no similar Centers within the Montana University System. However, there are faculty interested in Disease Ecology and wildlife health scattered across institutions including at MSU, University of Montana (one faculty member), MT Fish Wildlife and Parks (at least three employees), Wildlife Conservation Society (one employee), USGS (at least three employees), NIH Rocky Mountain Labs (at least two employees) and other institutions. One of the longer term goals of our Center is to facilitate interaction of these individuals.

**B. In cases of substantial duplication, explain the differences between these and the need for the proposed Center/Institute at an additional institution. Describe any efforts that were made to collaborate with these Centers/Institutes, programs or research capacities. If no efforts were made explain why.**

N/A

**7. Assessment: How will the success of the program be measured?**

We will assess growth of the Center and acquisition of new extramural funding.

**8. State the internal campus review and approval process which has occurred prior to submission to the Commissioner's Office. Indicate, where appropriate, involvement by faculty, students, community members, professional constituencies, etc.**

The Department Head and interested faculty met and considered new names for the Center. We then discussed the change with VP and Dean Charles Boyer, who approved of this name change. We also solicited input of interested parties and arrived at the new name.

**November 17-18, 2016**

**ITEM 173-2011-R1116**

**Request for authorization to create the Pollinator Health Center**

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**THAT**

Montana State University requests authorization from the Montana Board of Regents to establish the Pollinator Health Center

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**EXPLANATION**

The Pollinator Health Center at Montana State University aims to improve pollinator health and mitigate pollinator losses through research, education, and outreach endeavors.

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**ATTACHMENTS**

Academic Proposal Form  
Research Center Proposal Form  
Intent to Plan



**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

ITEM 173-2011-R1116 Submission Month or Meeting: November 17-18, 2016

Institution: Montana State University CIP Code: \_\_\_\_\_

Program/Center/Institute Title: Pollinator Health Center

Includes (please specify below): Online Offering  Options \_\_\_\_\_

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

     **A. Level I:**

**Campus Approvals**

- 1a. Placing a postsecondary educational program into moratorium (Program Termination and Moratorium Form)**
- 1b. Withdrawing a postsecondary educational program from moratorium**
- 2. Establishing, re-titling, terminating or revising a campus certificate of 29 credits or less**
- 3. Establishing a B.A.S./A.A./A.S. area of study**
- 4. Offering an existing postsecondary educational program via distance or online delivery**

**OCHE Approvals**

- 5. Re-titling an existing postsecondary educational program**
- 6. Terminating an existing postsecondary educational program (Program Termination and Moratorium Form)**
- 7. Consolidating existing postsecondary educational programs (Curriculum Proposal Form)**
- 8. Establishing a new minor where there is a major or an option in a major (Curriculum Proposal Form)**
- 9. Revising a postsecondary educational program (Curriculum Proposal Form)**
- 10. Establishing a temporary C.A.S. or A.A.S. degree program *Approval limited to 2 years***

**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

X **B. Level II:**

- 1. **Establishing a new postsecondary educational program** (Curriculum Proposal and Completed Intent to Plan Form)
- 2. **Exceeding the 120 credit maximum for baccalaureate degrees** *Exception to policy 301.11*
- X 3. **Forming, eliminating or consolidating an academic, administrative, or research unit** (Curriculum or Center/Institute Proposal and Completed Intent to Plan Form, except when eliminating or consolidating)
- 4. **Re-titling an academic, administrative, or research unit**

**Specify Request:**

Request authorization from the Montana Board of Regents for Montana State University to establish the Pollinator Health Center

**Montana Board of Regents**  
**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

**1. State the proposed Institute/Center's name and purpose.**

**Pollinator Health Center**

**2. A comprehensive statement of the Institute/Center's mission and its relationship to the University mission.**

**A. State the Institute/Center's mission.**

The Pollinator Health Center at Montana State University aims to improve pollinator health and mitigate pollinator losses through research, education, and outreach endeavors.

**B. Identify the Institute/Center's goals and objectives.**

Establishing a Center at MSU would serve the following objectives: (1) showcase our current research efforts, (2) identify collaborative areas of research, (3) compete for a wider array of funding sources, (4) provide a forum for pollinator health scientists and our students to interact, (5) host seminar speakers and visiting scientists, and (6) host future pollinator health conference(s).

**C. What specific need is being responded to in developing the proposed Institute/Center?**

Global, National, and State Level Need: Pollinators, including bees, are essential for plant reproduction in agricultural, non-agricultural, and natural landscapes. Recent losses of managed and wild bee species have negative impacts on crop production and ecosystem diversity. Honey beekeeping is an important part of Montana agriculture; MT ranked 2nd in honey production in 2013 (~15 million pounds, \$31,088,000 value) and provided over 150,000 colonies for national pollination services (almond pollination rental fee ~\$150 per colony). Since 2006, the average annual loss of honey bee colonies in the U.S. has averaged 33%; these levels of losses are unsustainable. Additionally, wild pollinators have been shown to equal or exceed honey bees in their value to crop pollination and agricultural yield. While other U.S. states and European nations have allocated resources necessary to document lists of wild pollinator species and monitor their status, Montana currently does not; we do not have a state list of pollinator species. Clearly, there is a critical need to enhance research efforts aimed at mitigating pollinator losses and optimizing pollinator health.

**D. Describe how the Institute/Center benefits the department, college, or institution.**

Montana State University Need: Numerous MSU faculty members and affiliates (see list below) are working independently or in small-group collaborations on important topics in pollinator health. Establishing a Center at MSU would help us (1) showcase our current research efforts, (2) identify collaborative areas of research, (3) compete for a wider array of funding sources, (4) provide a forum for us and our students to interact, (5) host seminar speakers and visiting scientists, and (6) host regional and international pollinator health conferences in the future (i.e., regional 2017-2018, international 2020). MSU's current areas of expertise include (1) Molecular Mechanisms of Honey Bee Host – Pathogen Interactions (Flenniken), (2) Plant-Pollinator Biodiversity and Ecosystem Function (Burkle), (3) Wild Pollinator Identification in the Rocky Mountain West (Burkle, Delphia, O'Neill, Reese, Ivie), (4) Pollination Services (Burkle and Delphia), (5) Agricultural Pollination

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(Flenniken, Ivie, Burkle, O'Neill, Delphia), (6) Pollinator Production and Conservation (Flenniken, O'Neill, Burkle), (7) the Impacts of Chemicals on Bee Health and Longevity (Peterson, O'Neill, Flenniken), among others.

**MSU Faculty, Scientists, and Affiliates Involved in Pollinator Research and Associated Projects**

Michelle Flenniken, Assistant Professor, Plant Sciences and Plant Pathology  
Laura Burkle, Assistant Professor, Ecology  
Mike Ivie, Associate Professor, Plant Sciences and Plant Pathology  
Bob Peterson, Professor, Land Resources and Environmental Sciences  
Kevin O'Neill, Professor, Land Resources and Environmental Sciences  
Kevin Wanner, Associate, Plant Sciences and Plant Pathology  
Justin Runyon, PhD, Research Entomologist, Rocky Mountain Research Station, USDA, Forest Service  
Casey Delphia, Research Associate- Land Resources and Environmental Sciences and Ecology  
David Baumbauer, Plant Growth Center and Horticulture Farm Manager, Plant Sciences and Plant Pathology  
Ruth O'Neill, Research Associate, Plant Sciences and Plant Pathology  
Katie Daughenbaugh, PhD, Research Associate, Plant Sciences and Plant Pathology  
David Weaver, Professor, Land Resources and Environmental Sciences  
Gadi Reddy, Superintendent & Associate Professor, Western Triangle Ag Research Center

**E. Describe the Institute/Center's relationship to the University mission.**

As the state's land-grant university, Montana State University has an important role in performing cutting edge research, teaching students, and engaging the community in outreach events that highlight relevant and timely research programs.

There is a great deal of national and international attention focused on improving pollinator health, including President Obama's Memorandum/Initiative to Promote the Health of Honey Bees and Other Pollinators, the Government Accountability Offices March 2016 Report, and the Development of Pollinator Research Action Plan published in May 2015 by the Pollinator Health Action Task Force. We are currently developing a website on which we can highlight our research efforts, publications, and outreach endeavors. The website will serve to centralize information regarding our research efforts aimed at improving pollinator health, define the strengths of our programs in the context of other national and international programs, and enhance the recognition of this research at multiple levels (i.e., university, local, state, national, and international levels).

In summary, The Pollinator Health Center will integrate MSU faculty members investigating many aspects of pollinator health. The Pollinator Health Center, coupled with MSU's Honey Bee Research Site and Pollinator Garden (a 0.5 acre sited at MSU's Horticulture farm that features pollinator-

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friendly forage and honey bee colonies), will encompass multiple Strategic Planning Goals including Learning, Community Integration, and Discovery.

**3. Briefly describe the Institute/Center's anticipated activities.**

Activities associated with the Pollinator Health Center at MSU include (1) showcasing our current research efforts, (2) identifying collaborative areas of research, (3) submitting grants to a wider array of funding sources, (4) provide a forum for us and our students to interact, (5) host seminar speakers and visiting scientists, and (6) potentially host a regional pollinator health conference in 2018 and an international pollinator health conference in the future (i.e., 2020). Affiliates of the Pollinator Health Center will hold meetings to prioritize and synergize our efforts. Initially, these meetings will be led by Dr. Michelle Flenniken and Dr. Laura Burkle (Co-Directors of the Pollinator Health Center).

**A. Identify faculty expertise available for participation in the Institute/Center's activities.**

Michelle Flenniken is an expert in honey bee host pathogen interactions. Flenniken is an Assistant Professor in the Department of Plant Sciences and Plant Pathology at Montana State University. Research in the Flenniken Lab is aimed at elucidating the molecular mechanisms underlying host-pathogen interactions in agriculturally important systems; including honey bees (*Apis mellifera*). Projects in the lab focus on honey bee antiviral defense, pathogens associated with colony losses (including CCD), immune response and outcome of infections, and sublethal effects of agrochemicals on honey bee health.

Laura Burkle is an expert in native bee ecology and pollination in managed and wild systems. Burkle is an Assistant Professor of Ecology at Montana State University. Research in the Burkle lab aims to understand the environmental drivers of variation in plant and pollinator biodiversity and pollination services across heterogeneous landscapes. Projects in the lab include the effects of climate change, wildfire, and land use on plant-pollinator interactions. In agricultural systems, we are studying the efficacy of techniques, such as perennial flower strips, to improve pollinator forage and health.

Flenniken and Burkle have published numerous articles and given professional and public talks on this research. Additionally, the results of their research have been highlighted in many popular media outlets.

For details on other MSU Faculty, Scientists, and Affiliates Involved Pollinator Research, see our website, which will be available in July 2016 ([montana.edu/pollinators](http://montana.edu/pollinators)).

**B. Which departments on campus will be involved and how will the Institute/Center contribute to the academic programs of the institution?**

The Center would include members from several departments (i.e., Plant Sciences and Plant Pathology, Ecology, and Land Resources and Environmental Sciences), both the College of Agriculture and the College of Letters and Sciences at Montana State University. All affiliated faculty

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members would continue to perform the duties associated with their current positions (i.e., research, teaching, outreach, and service).

The Pollinator Health Center will enhance academic programs at MSU by providing a forum for multidisciplinary researchers and their graduate student to share ideas (e.g., meetings, presentations, and collaborations). This level of interaction will benefit teaching, since many members will incorporate aspects of their research into their academic teaching assignments, and thus exposing MSU students to cutting edge science aimed at addressing real-world challenges.

**4. Identify the organizational structure of the Institute/Center within the institution.**

Michelle Flenniken, PSPP, Co-Director, would be advised by Dr. John Sherwood (Dept. Head) and the Dean and VPR of the College of Agriculture.

Laura Burkle, Ecology, Co-Director would be advised by Dr. Dave Roberts (Dept. Head) and the Dean of the College of Letters and Sciences.

Affiliated faculty members would continue to perform all of their duties, and submit grants to OSP via their normal channels.

**A. Identify all agencies, organizations and/or institutions that will be involved.**

Montana State University, Western Triangle Ag Research Center, USDA Forest Service—Rocky Mountain Research Station

**B. Identify advisory council information.**

Initially, the Pollinator Health Center will be informally advised by Montana State University members (e.g., Department Heads, including Dr. John Sherwood, Deans (primarily Dr. Charles Boyer, CoA Dean and VP), Dr. Renee Reijo Pera (Vice President for Research and Economic Development), Dr. Mark Young (Assistant VPR and founder of the Thermal Biology Institute), stakeholders including the Montana State Beekeeper Association and the Montana Department of Agriculture, and non-profit organizations, including the Xerces Society (which is involved with pollinator conservation) and Project Apis m. (which supports honey bee research and pollinator forage enhancement in agricultural landscapes).

If needed, an advisory council will be established in the future.

**5. Identify first year and continuing finances necessary to support the Center/Institute, including the sources of funding.**

No funds are required to initiate the establishment of the Pollinator Health Center. Funds are requested to host at least two nationally recognized scientists in Pollinator Health, who will give talks as part of the launch of the Center during the 2016-2017 academic year (\$4,000).

The development of a website will be supported by the VPR's Office and produced with assistance from Tracy Ellig, Executive Director University Communications, and his team.

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Several Pollinator Health Center Affiliates (e.g., Flenniken, Burkle, Peterson, O'Neill, Ivie, and others) received "Research Enhancement Grants" through the VPR's Office.

**A. Will additional faculty and other resources be required to implement this Center/Institute? If yes, please describe the need and indicate the plan for meeting this need.**

No.

**B. Are other, additional resources required to ensure the success of the proposed Center/Institute? If yes, please describe the need and indicate the plan for meeting this need.**

No, though hosting prominent pollinator health scientists would help publicize and promote our new Center.

**6. Describe other similar Centers/Institutes or research capacities in the state and surrounding region.**

There are no similar Centers in the state or surrounding region.

The most relevant centers are the Pollinator Research Center at Penn State (<http://ento.psu.edu/pollinators>) directed by Dr. Christina Grozinger and the UC Davis Honey and Pollination Center (<http://honey.ucdavis.edu/>) directed by Dr. Elina Lastro Nino.

**A. Describe the relationship between the proposed Center/Institute and any similar Centers/Institutes, programs, or research capacities within the Montana University System.**

NA

**B. In cases of substantial duplication, explain the differences between these and the need for the proposed Center/Institute at an additional institution. Describe any efforts that were made to collaborate with these Centers/Institutes, programs or research capacities. If no efforts were made explain why.**

We have received input from the Directors of these existing centers in Pennsylvania and California, and we anticipate collaborating with them on certain activities, such as hosting the International Pollinator Health Conference in the future.

There will be some similarities between MSU's Pollinator Health Center and existing Centers at Penn State and UC-Davis, such as an overall mission to improve pollinator health. MSU's Center for Pollinator Health, however, will have unique research foci, such as investigation of honey bee host-pathogen interactions from the colony to molecular level, examining the pollination efficiency of multiple bee species and forbs, and determining how disturbances in the Intermountain West (like wildfire) affect pollinator communities.

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**7. Assessment: How will the success of the program be measured?**

- 1) Development of a website that showcases our current research efforts and monitoring the number of website views.
- 2) Increased collaboration and interaction among scientists and students who perform pollinator-related research
- 3) Increased funding of pollinator-related research projects on campus
- 4) Increased seminar speakers and visiting scientists focused on pollinator research
- 5) Hosting a regional, national, and international pollinator health conferences in the future
- 6) Faculty members will continue to publish research and review articles, we will examine the groups publication record (i.e., the number and quality of publication) before and after the establishment of this center.

**8. State the internal campus review and approval process which has occurred prior to submission to the Commissioner's Office. Indicate, where appropriate, involvement by faculty, students, community members, professional constituencies, etc.**

Flenniken was encouraged to submit this request by VPR Reijo Pera. We spoke with appropriate faculty and members of the local scientific community to inform them of the opportunity and gauge interest.



# Montana University System

## NOTICE OF INTENT TO PLAN

Program/Institute Title: Pollinator Health Center  
Campus, School/Department: MSU-Bz, Plant Sciences and Plant Pathology  
Contact Name/Info: Michelle Flenniken, michelle.flenniken@montana.edu  
Expected Submission Date: NOV 2016  
Mode of Delivery: Blended

To increase communication, collaboration, and problem solving opportunities throughout the MUS in the program/center/institute development process, please complete this form not more than 18 months in advance of the anticipated date of submission of the proposed program/center/institute to the Board of Regents for approval.

For more information regarding the Intent to Plan process, please visit the Academic and Student Affairs Handbook.

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

The Pollinator Health Center at Montana State University aims to improve pollinator health and mitigate pollinator losses through research, education, and outreach endeavors. Establishing a Center at MSU would serve the following objectives: (1) showcase our current research efforts, (2) identify collaborative areas of research, (3) compete for a wider array of funding sources, (4) provide a forum for pollinator health scientists and our students to interact, (5) host seminar speakers and visiting scientists, and (6) host future pollinator health conference(s).

Pollinators, including bees, are essential for plant reproduction in agricultural, non-agricultural, and natural landscapes. Recent losses of managed and wild bee species have negative impacts on crop production and ecosystem diversity. Honey beekeeping is an important part of Montana agriculture; MT ranked 2nd in honey production in 2013 (~15 million pounds, \$31,088,000 value) and provided over 150,000 colonies for national pollination services. Since 2006, the average annual loss of honey bee colonies in the U.S. has averaged 33%; these levels of losses are unsustainable. Additionally, wild pollinators have been shown to equal or exceed honey bees in their value to crop pollination and agricultural yield. While other U.S. states and European nations have allocated resources necessary to document lists of wild pollinator species and monitor their status, Montana currently does not have a state list of pollinator species. Clearly, there is a critical need to enhance research efforts aimed at

mitigating pollinator losses and optimizing pollinator health, the Pollinator Health Center at MSU will achieve this goal.

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

Montana State University Need: Numerous MSU faculty members and affiliates (see list below) are working independently or in small-group collaborations on important topics in pollinator health.

Establishing a Center at MSU would help us:

- (1) showcase our current research efforts,
- (2) identify collaborative areas of research,
- (3) compete for a wider array of funding sources,
- (4) provide a forum for us and our students to interact,
- (5) host seminar speakers and visiting scientists, and
- (6) host regional and international pollinator health conferences in the future (i.e., regional 2017-2018, international 2020).

MSU's current areas of expertise include:

- (1) Molecular Mechanisms of Honey Bee Host – Pathogen Interactions (Flenniken),
- (2) Plant-Pollinator Biodiversity and Ecosystem Function (Burkle),
- (3) Wild Pollinator Identification in the Rocky Mountain West (Burkle, Delphia, O'Neill, Reese, Ivie),
- (4) Pollination Services (Burkle and Delphia),
- (5) Agricultural Pollination (Flenniken, Ivie, Burkle, O'Neill, Delphia),
- (6) Pollinator Production and Conservation (Flenniken, O'Neill, Burkle),
- (7) the Impacts of Chemicals on Bee Health and Longevity (Peterson, O'Neill, Flenniken), among others.

MSU Faculty, Scientists, and Affiliates Involved in Pollinator Research and Associated Projects

Michelle Flenniken, Assistant Professor, Plant Sciences and Plant Pathology

Laura Burkle, Assistant Professor, Ecology

Mike Ivie, Associate Professor, Plant Sciences and Plant Pathology

Bob Peterson, Professor, Land Resources and Environmental Sciences

Kevin O'Neill, Professor, Land Resources and Environmental Sciences

Kevin Wanner, Associate, Plant Sciences and Plant Pathology

Justin Runyon, PhD, Research Entomologist, Rocky Mountain Research Station, USDA, Forest Service

Casey Delphia, Research Associate- Land Resources and Environmental Sciences and Ecology

David Baumbauer, Plant Growth Center and Horticulture Farm Manager, Plant Sciences and Plant Pathology

Ruth O'Neill, Research Associate, Plant Sciences and Plant Pathology

Katie Daughenbaugh, PhD, Research Associate, Plant Sciences and Plant Pathology

David Weaver, Associate Professor, Land Resources and Environmental Sciences

Gadi Reddy, Superintendent & Associate Professor, Western Triangle Ag Research Center

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

As the state's land-grant university, Montana State University has an important role in performing cutting edge research, teaching students, and engaging the community in outreach events that highlight relevant and timely research programs. There is a great deal of national and international attention focused on improving pollinator health, including President Obama's Memorandum / Initiative to Promote the Health of Honey Bees and Other Pollinators, the Government Accountability Offices March 2016 Report, and the Development of Pollinator Research Action Plan published in May 2015 by the Pollinator Health Action Task Force. We are currently developing a website on which we can highlight our research efforts, publications, and outreach endeavors. The website will serve to centralize information regarding our research efforts aimed at improving pollinator health, define the strengths of our programs in the context of other national and international programs, and enhance the recognition of this research at multiple levels (i.e., university, local, state, national, and international levels).

In summary, The Pollinator Health Center will integrate MSU faculty members investigating many aspects of pollinator health. The Pollinator Health Center, coupled with MSU's Honey Bee Research Site and Pollinator Garden (a 0.5 acre sited at MSU's Horticulture farm that features pollinator-friendly forage and honey bee colonies), will encompass multiple Strategic Planning Goals including Learning, Community Integration, and Discovery.

**4) How does the proposed program/center/institute fit within the MUS system?**


The Center would include members from several departments (i.e., Plant Sciences and Plant Pathology, Ecology, and Land Resources and Environmental Sciences), both the College of Agriculture and the College of Letters and Sciences at Montana State University. All affiliated faculty members would continue to perform the duties associated with their current positions (i.e., research, teaching, outreach, and service). The Pollinator Health Center will enhance academic programs at MSU by providing a forum for multidisciplinary researchers and their graduate student to share ideas (e.g., meetings, presentations, and collaborations). This level of interaction will benefit teaching, since many members will incorporate aspects of their research into their academic teaching assignments, and thus exposing MSU students to cutting edge science aimed at addressing real-world challenges.

## Signatures

### Intent to Plan

Program/Institute/Center Title: NOV 2016  
Campus: Pollinator Health Center  
Expected Submission Date: MSU-BZ

#### Signature/Date

Associate Provost: (procedural, not approval)	DocuSigned by: <i>Ron Larsen</i> E9B7047DE1CA414...	5/27/2016	
College/School Dean:	DocuSigned by: <i>Charles Boyer</i> F0955DA5F88442B...	5/31/2016	
Chief Academic Officer:	DocuSigned by: <i>Martha Potvin</i> 43A1A78D200F474...	6/3/2016	
Chief Executive Officer:	DocuSigned by: <i>[Signature]</i> 7D6A4CE96C3F415...	6/6/2016	
Flagship Provost:	DocuSigned by: <i>Martha Potvin</i> 43A1A78D200F474...	6/3/2016	
Flagship President:	DocuSigned by: <i>[Signature]</i> 7D6A4CE96C3F415...	6/6/2016	
Date of Final Review:	<u>September 15, 2016</u>		

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

**November 17-18, 2016**

**ITEM 173-2012-R1116**

**Request for authorization to create The Western Lands and Peoples Center (WLPC)**

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**THAT**

Montana State University requests authorization from the Montana Board of Regents to establish the Western Lands and Peoples Center (WLPC)

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**EXPLANATION**

The core mission of the proposed center is to foster the integrated study of the North American West with a focus on human/environmental interactions, or the “lands and peoples,” of the region. Situated within a public, land-grant institution whose charter is to serve and educate all citizens in the state of Montana, the proposed WLPC will be part of an established academic network that conveys research and learning to every county in the state. With its emphasis on developing connections throughout the sciences, social sciences, humanities, and the arts, the proposed center will position MSU as an important site for creative scholarship across interdisciplinary fields that are dedicated to advancing knowledge about the land and people of the North American West.

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**ATTACHMENTS**

Academic Proposal Form  
Research Center Proposal Form  
Intent to Plan

**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

ITEM 173-2012-R1116 Submission Month or Meeting: November 17-18, 2016

Institution: Montana State University CIP Code: \_\_\_\_\_

Program/Center/Institute Title: The Western Lands and Peoples Center (WLPC)

Includes (please specify below): Online Offering  Options \_\_\_\_\_

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

     **A. Level I:**

**Campus Approvals**

- 1a. Placing a postsecondary educational program into moratorium** (Program Termination and Moratorium Form)
- 1b. Withdrawing a postsecondary educational program from moratorium**
- 2. Establishing, re-titling, terminating or revising a campus certificate of 29 credits or less**
- 3. Establishing a B.A.S./A.A./A.S. area of study**
- 4. Offering an existing postsecondary educational program via distance or online delivery**

**OCHE Approvals**

- 5. Re-titling an existing postsecondary educational program**
- 6. Terminating an existing postsecondary educational program** (Program Termination and Moratorium Form)
- 7. Consolidating existing postsecondary educational programs** (Curriculum Proposal Form)
- 8. Establishing a new minor where there is a major or an option in a major** (Curriculum Proposal Form)
- 9. Revising a postsecondary educational program** (Curriculum Proposal Form)
- 10. Establishing a temporary C.A.S. or A.A.S. degree program** *Approval limited to 2 years*

**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

X **B. Level II:**

- 1. **Establishing a new postsecondary educational program** (Curriculum Proposal and Completed Intent to Plan Form)
- 2. **Exceeding the 120 credit maximum for baccalaureate degrees** *Exception to policy 301.11*
- X 3. **Forming, eliminating or consolidating an academic, administrative, or research unit** (Curriculum or Center/Institute Proposal and Completed Intent to Plan Form, except when eliminating or consolidating)
- 4. **Re-titling an academic, administrative, or research unit**

**Specify Request:**

Request for authorization from the Montana Board of Regents for Montana State University to establish the Western Lands and Peoples Center (WLPC)

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**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

**1. State the proposed institute/center's name and purpose.**

The Western Lands and Peoples Center (WLPC)

The proposed WLPC builds on a strong base of scholarship on the North American West in the College of Letters and Science and Montana State University, more generally. Through the proposed Center, MSU will become an international hub for the study of critical issues involving the western US and Canada. MSU is the ideal home for such a center due to our already-existing expertise, our community networks, our geographic location at the meeting place between the Great Plains and the Mountain West, as well as our proximity to Yellowstone National Park. By supporting and advancing interdisciplinary research, publication, graduate and undergraduate scholarship, as well as engagement with the Digital Humanities—the interface between the new information sciences and traditional humanistic inquiry—we seek to establish a research-based resource for the regional, national, and global community.

**2. A comprehensive statement of the Institute/center's mission and its relationship to the University mission.**

**A. State the institute/center's mission.**

The core mission of the proposed center is to foster the integrated study of the North American West with a focus on human/environmental interactions, or the “lands and peoples,” of the region. Situated within a public, land-grant institution whose charter is to serve and educate all citizens in the state of Montana, the proposed WLPC will be part of an established academic network that conveys research and learning to every county in the state. With its emphasis on developing connections throughout the sciences, social sciences, humanities, and the arts, the proposed center will position MSU as an important site for creative scholarship across interdisciplinary fields that are dedicated to advancing knowledge about the land and people of the North American West.

**B. Identify the institute/center's goals and objectives.**

1]. The proposed center seeks to bring the various nodes of excellence in research, teaching, and scholarship on the North American West at MSU into interaction with each other and make the University a major hub for the development of cutting-edge research and digital projects on the region. This work will be made available to the public through scholarly presentations at local, regional, national, and international conferences; online publications; and peer-reviewed journals.

2]. The proposed center's initiatives and publications will be interdisciplinary in scope as will any undergraduate and graduate student activities and initiatives introduced by the proposed WLPC. Interdisciplinary is often difficult to implement due to the dominance of disciplinary silos in academic structures and their budgets. This proposed center will enable faculty and students to better coordinate and publicize the many scholarly projects that are ongoing at MSU. Creating a center with an independent budget focused on regional studies and a mission that broadly encompasses the humanities, the social sciences, and the environmental sciences from the outset



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**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

will thus offer a major advance in promoting interdisciplinary research, outreach, and teaching endeavors at MSU.

3]. MSU faculty and graduate students will become more competitive in garnering external research funds for their ongoing scholarly projects by having their work associated with the resources and support of the proposed center.

**C. What specific need is being responded to in developing the proposed Institute/center?**

Demographic studies indicate that the population of the United States is becoming increasingly concentrated in the West, a trend that is likely to continue over the next decades. Establishing a Western Lands and Peoples Center at MSU will help the academic and larger community gain a deeper understanding of the many social, political, and economic changes driven by this region. It will provide a forum for discussion between the university and public over issues facing the state and region, and heighten the importance of imagining the North American West from a variety of viewpoints.

**D. Describe how the institute/center benefits the department, college, or institution.**

The proposed center draws on the cross-disciplinary expertise that already exists in various academic units at MSU. These include Agriculture, American Studies, Architecture, Art, Earth Sciences, Ecology, English, Film and Photography, History and Philosophy, Native American Studies, Political Science, and Sociology and Anthropology. Faculty and students in various departments often work without knowledge of complementary research taking place in other sections of the university. The proposed center will bring together scholars from different disciplines in order to enrich their research and productivity. Collaboration will enable them to be more competitive in applying for local, national, and international grants, which will enhance their research initiatives. Such opportunities are likely to also favorably impact students' future job opportunities and academic plans.

**E. Describe the institute/center's relationship to the University mission.**

As part of a land-grant institution, the scholarly community at MSU has a special responsibility to foster understanding of the local spaces and larger region in which we live, work, and study. As such, a proposed Western Lands and Peoples Center will help integrate learning, discovery, and engagement by bringing together students, faculty, and community members who share an interest in the interdisciplinary study and ongoing centrality of the North American West across national and international contexts.

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**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

**3. Briefly describe the institute/center's anticipated activities.**

The activities scheduled in the upcoming months at MSU include

1]. Hosting a week-long public program of lectures and hands-on workshops called "Building Community through Historic Preservation" in Bozeman in September 2016, which will be co-sponsored with the Extreme History Project and funded in part by the National Humanities Alliance. Participants include members of the university faculty, staff from the State Historic Preservation Office, and staff from the city of Bozeman.

2]. A "Perspectives on the American West" speaker series will take place at the MSU Museum of the Rockies in fall 2016, funded through the MSU College of Letters and Science and featuring MSU History Professor and Wallace Stegner Chair of Western American Studies Mark Fiege, University of Colorado Distinguished Professor and Moses Lasky Professor of Law Charles Wilkinson, Montana native and award-winning author Maile Meloy, and Conservation Scientist David Theobald from Colorado State University in Fort Collins.

3]. Beginning in fall 2016, the proposed center will establish a research cluster that will pull together faculty and graduate students who are conducting research on the region. The group will determine a broad theme to explore through shared readings that connect to the mission of the proposed Center. Faculty and graduate students from different disciplines will meet frequently throughout the year to discuss the readings related to the topic.

4]. MSU faculty are organizing a symposium on Ivan Doig scheduled for fall 2017 which will highlight the recently acquired Ivan Doig Papers in MSU's Special Collections and will result in a set of scholarly publications.

5]. The proposed center is also organizing a series of interdisciplinary scholarly presentations on "Digital Cultures and the American West" in spring 2017.

6]. Starting in spring 2016 and with the help of a Phase II HASS Award from MSU, faculty began offering research support for graduate students in the form of travel grants and writing awards.

**A. Identify faculty expertise available for participation in the institute/center's activities.**

MSU's existing faculty expertise on the North American West draws from the Department of Earth Sciences, including Institute on Ecosystems Director Professor Cathy Whitlock, who is nationally and internationally recognized in the field of past climatic and environmental change with particular reference to the American West. The Department also has a strong group of geographers whose research focuses on the human and physical geography of the American West, including Professor William Wyckoff and Assistant Professors Jordy Hendrikx, Julia Haggerty, and Jamie McEvoy.

The proposed center draws on faculty in the Department of Ecology, particularly Professors Andy Hansen, Scott Creel, Andrea Litt, and Wyatt Cross, many of whom are also involved in the Institute on Ecosystems.

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The Department of English includes noted scholars of western US and environmental literature such as Professors Robert Bennett, Linda Karell, and Susan Kollin. In addition, Rick Bass, the current Western Writer-in-Residence, was appointed in August 2015 and will serve in the position through the 2017-18 academic year.

The School of Film and Photography houses an MFA program in Science and Natural History Filmmaking; Professor Andrew Parker Nelson in particular has expertise in the history and criticism of the cinematic Western; Professor Alexis Pike's photography and Professor Cindy Stillwell's films have also investigated and represented the region in many award-winning works.

The Department of History and Philosophy is the current home of the Wallace Stegner Chair in Western American Studies, which is presently held by western environmental historian Dr. Mark Fiege. The Department also features distinguished historians of western American and Canadian history such as Professors Mary Murphy and Robert Rydell along with emerging scholars such as Professor Amanda Hendrix-Komoto. The Department likewise has distinguished environmental historians, including Dr. Brett Walker and Dr. Timothy LeCain, as well as Dr. Susan Cohen who has expertise in museum-based exhibitions. Philosophy professors in the Department include Dr. Sara Waller who studies animal intelligence and is hosting a conference on "Wild Animals in the Wild West" in fall 2016 as well as Dr. Kristin Intemann who works on environmental ethics and feminist philosophy of science.

The Department of Native American Studies has a strong group of scholars whose research focuses on Native American culture and issues facing American Indians today, including Professor Walter Fleming, Associate Professors Kristen Ruppel and Matthew Herman, as well as Assistant Professors Gail Small and Gina Richard. The Sheldon and Audrey Katz Chair is an endowed Chair for Visiting Scholars and public figures in the field of Native American Studies. Recent holders of the Chair have included major figures such as Bill Yellowtail, Dr. Henrietta Mann, and Dr. Joseph Gone.

The Department of Political Science includes faculty member Dr. David Parker, who is widely recognized as a major authority on Montana Politics and the politics of the West more generally.

The Department of Sociology & Anthropology includes Professor Kaylin Greene who works on health and family issues as well as Professor Colter Ellis who researches rural sociology.

Also, in the College of Agriculture, Dr. Cathy Zabinski from the Department of Land Resources and Environmental Sciences is an expert in plant and soil ecology as well as restoration ecology and sustainable agriculture.

**B. Which departments on campus will be involved and how will the institute/center contribute to the academic programs of the institution?**

The departments at MSU that would be involved in the proposed center include American Studies, Architecture, Art, Earth Sciences, Ecology, English, Film and Photography, History and Philosophy, Land Resources and Environmental Sciences, Native American Studies, Political Science, and Sociology and Anthropology. The proposed center offers support to academic programs in the form of graduate student mentoring and funding, which includes research grants and dissertation

**Montana Board of Regents**  
**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

completion awards. Through the establishment of a research cluster, the proposed center will enable faculty and graduate students to gain deeper interdisciplinary knowledge of the North American West, which will enhance their research initiatives and teaching activities.

**4. Identify the organizational structure of the institute/center within the institution.**

The proposed center is organized by a Director (Prof. Susan Kollin/English) and two Co-Directors (Prof. Mary Murphy/History and Prof. Robert Rydell/History) who will be responsible for writing reports, fundraising, event organizing, and publicity. In addition, a Faculty Advisory Board comprised of nearly a dozen MSU professors from eight departments or academic units will help establish, determine, and organize the proposed center's various initiatives and activities.

**A. Identify all agencies, organizations and/or institutions that will be involved.**

The proposed Western Lands and Peoples Center will be housed at MSU. The proposed center builds on established relationships with the Montana Historical Society; the Western Heritage Center in Billings; the Butte Silver Bow Archives; the Buffalo Bill Center of the West in Cody, Wyoming; and Yellowstone National Park. The proposed center also anticipates establishing additional initiatives and partnerships with the Institute on Ecosystems housed at both MSU-Bozeman and UM-Missoula as well as MSU's Burton K. Wheeler Center for Public Policy.

**B. Identify advisory council information.**

The members of the Faculty Advisory Council for the proposed WLPC include Rick Bass (Western Writer-in-Residence/English), Mark Fiege (Wallace Stegner Chair in Western American Studies/History and Philosophy); Walter Fleming (Native American Studies); Julia Haggerty (Earth Sciences); Andrew Hansen (Ecology); Amanda-Hendrix-Komoto (History and Philosophy); Susan Kollin (English); Mary Murphy (History and Philosophy); Andrew Patrick Nelson (Film and Photography); Gina Richard (Native American Studies); Robert Rydell (History and Philosophy); William Wyckoff (Earth Sciences); Cathy Zabinski (College of Agriculture/Land Resources and Environmental Science); Jan Zauha (MSU Libraries).

**5. Identify first year and continuing finances necessary to support the center/institute, including the sources of funding.**

In spring 2016, Professors Susan Kollin, Mary Murphy, and Robert Rydell received a competitive, 3-year Humanities and Social Science Phase II grant for \$350,000 from the Office of the Vice President of Research and Economic Development and the Office of the President at MSU. A faculty member associated with the proposed center also received a grant from the National Humanities Alliance to fund a series of week-long public history events scheduled for fall 2016. Additional funding for the proposed center has been included in the ongoing MSU capital campaign. We also plan to apply for additional sources of funding from appropriate regional and national foundations as well as federal agencies.

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**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

**A. Will additional faculty and other resources be required to implement this center/institute? If yes, please describe the need and indicate the plan for meeting this need.**

No

**B. Are other, additional resources required to ensure the success of the proposed center/institute? If yes, please describe the need and indicate the plan for meeting this need.**

The proposed WLPC will need to locate office space on campus to house an administrative assistant and the Director as well as the center's various activities.

**6. Describe other similar centers/institutes or research capacities in the state and surrounding region.**

The University of Montana at Missoula is home to the O'Connor Center for the Rocky Mountain West, which has developed a focus that does not overly compete or intersect with the activities that MSU is pursuing. In July 2016, two MSU faculty members, Profs. Susan Kollin and Mary Murphy, met with Dr. Larry Swanson, the Director of the CRMW, to discuss plans to develop a Western Lands and Peoples Center in Bozeman. The focus of the CRMW in Missoula is on regional growth and development (economics, geography, demography, and regional sciences), regional journalism (online and radio), and regional history. The proposed WLPC at MSU seeks to build on our already-existing research expertise in the study of the North American West's geography and geology; ecological studies of wildlife, fisheries, and resources in the West; studies of Indigenous societies and issues facing Native American peoples across the region; human/environmental interactions; the Digital Humanities; museum studies; and the culture, film, literature, and history of the region.

The University of Colorado-Boulder is home to the Center of the American West, which maintains a focus on public policy and debate, and thus also does not overlap with or duplicate the primary activities of the proposed Western Lands and Peoples Center at MSU.

**A. Describe the relationship between the proposed center/institute and any similar centers/institutes, programs, or research capacities within the Montana University System.**

During our July 2016 visit in Missoula with the Director of the CMRW, MSU faculty came to a deeper understanding of the ongoing need for developing future collaborations across the state to address the many social, environmental, and economic issues facing our local communities, Montana, and the region as a whole.

**Montana Board of Regents**  
**RESEARCH CENTER AND INSTITUTE PROPOSAL FORM**

**B. In cases of substantial duplication, explain the differences between these and the need for the proposed center/institute at an additional institution. Describe any efforts that were made to collaborate with these centers/institutes, programs or research capacities. If no efforts were made explain why.**

As noted above, we do not foresee substantial duplication with the CRMW in Missoula, but hope to develop collaborative activities and programming of relevance to the future initiatives of both campuses.

**7. Assessment: How will the success of the program be measured?**

The success of the proposed center's program will be measured through evaluations solicited from audience members and participants at relevant activities. Likewise, our success will be measured by the grants and funds we are able to raise, as well as the publications, workshops, and conferences we are able to develop during the proposed center's first few years. We will also complete a report at the end of the academic year that outlines our activities and successes during that period.

**8. State the internal campus review and approval process which has occurred prior to submission to the Commissioner's Office. Indicate, where appropriate, involvement by faculty, students, community members, professional constituencies, etc.**

The proposed center received an initial review and approval in spring 2016 by garnering a Phase II Humanities and Social Science Grant from the MSU Office of the VPRED and MSU Office of the President, which provides funding for its first 3 years. The Dean of the MSU College of Letters and Science supports the proposed center and has provided funds for various initiatives related to the proposed Center. Two MSU faculty visited the Director of the O'Conner Center for the Rocky Mountain West in summer 2016 to discuss plans to develop a Western Lands and Peoples Center at MSU. In addition, MSU faculty have met with the Director of the Montana Historical Society; the Curator of History at the Museum of the Rockies in Bozeman; and the Curator of the Buffalo Bill Museum and Western American History at the Center for the American West in Cody, Wyoming.

## Montana University System

### NOTICE OF INTENT TO PLAN

Program/Institute Title: Western Lands and Peoples Center  
Campus, School/Department: MSU-Bz, Department of English/College of Letters and Science  
Contact Name/Info: Susan Kollin, susan.kollin@msu.montana.edu  
Expected Submission Date: NOV 2016  
Mode of Delivery: N/A

To increase communication, collaboration, and problem solving opportunities throughout the MUS in the program/center/institute development process, please complete this form not more than 18 months in advance of the anticipated date of submission of the proposed program/center/institute to the Board of Regents for approval.

For more information regarding the Intent to Plan process, please visit the Academic and Student Affairs Handbook.

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

The Western Lands & Peoples Center (WLPC) will build on a broad base of scholarship on the North American West in the College of Letters and Science and Montana State University more generally. Through the WLPC, MSU will become an international hub for the study of critical issues involving the western US and Canada. MSU is the ideal home for such a Center due to our already-existing expertise, our community networks, our geographic location at the meeting place between the Great Plains and the Mountain West, and our proximity to the border between the US and Canada. By supporting and advancing interdisciplinary research, publication, graduate and undergraduate scholarship, as well as engagement with the Digital Humanities—the interface between the new information sciences and traditional humanistic inquiry—we seek to establish a research-based resource for the regional, national, and global community. The activities scheduled in the upcoming months at MSU include a series of talks in fall 2016 on historic preservation which will be co-sponsored with the Extreme History Project and funded in part by the National Humanities Alliance; a “Perspectives on the American West” speaker series at the Museum of the Rockies in fall 2016 funded through the MSU College of Letters and Science; a symposium on Ivan Doig scheduled for fall 2017 that will highlight the recently acquired Ivan Doig Papers in MSU’s Special Collections; a series of interdisciplinary presentations on “Digital Cultures and the American West” in 2017; and research support for graduate and undergraduate students in the form of grants and writing workshops.

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

According to the Center for Public Education, the population of the United States is becoming increasingly concentrated in the West, which grew by 14.3% between 2000 and 2010. This trend will continue, as the region's population is projected to continue growing by 45.8% from 2000 to 2030. (See "The United States of Education: The Changing Demographics of the United States and Their Schools" at [www.centerforpubliceducation.org](http://www.centerforpubliceducation.org)). Establishing a Western Lands and Peoples Center at Montana State University will help the academic and larger community gain a deeper understanding of the many changes and vital importance of a region whose presence and population have been greatly increasing over the years. Not only will the establishment of a WLPC enable students and faculty to obtain a stronger interdisciplinary perspective on the local spaces in which they live and work, but it will also enable them to be more competitive in applying for local, national, and international grants to enhance their research initiatives. Such opportunities are likely to have a favorable impact on students' future job opportunities and their academic plans.

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

As members of a land-grant institution, the scholarly community at MSU has a special responsibility to foster understanding of the local spaces and larger region in which we live, work, and study. As such, the Western Lands and Peoples Center integrates learning, discovery, and engagement by bringing together students, faculty, and community members who share an interest in the interdisciplinary study and ongoing centrality of the North American West in a national and international context. The MSU departments that currently have a base of faculty expertise in the American West include Ecology, English, Film and Photography, Geography, Health and Human Development, History and Philosophy, Modern Languages, Native American Studies, Political Science, and Sociology and Anthropology.

**4) How does the proposed program/center/institute fit within the MUS system?**

The Western Lands and Peoples Center draws on the cross-disciplinary expertise that already exists in various academic departments at MSU-Bozeman. These research areas include the history, literature, and culture of the North American West; the study of Indigenous societies and the issues facing Native American peoples across the region and the US; ecological studies of wildlife, fisheries, and resources in the West; research on region-specific issues pertaining to rural health, health disparities, and mental health; and the study of the North American West's geography and geology.



## Signatures

### Intent to Plan

Program/Institute/Center Title: Western Lands and Peoples Center  
Campus: MSU-Bz, Department of English/College of Letters and Science  
Expected Submission Date: NOV 2016

#### Signature/Date

College/School Dean:	<p>DocuSigned by: <i>Medi Rae</i> B2A500E9B3D647A...</p>	7/19/2016
Graduate Dean: (Graduate academic programs only)	_____	_____
Vice President Research: (Research centers/institutes only)	<p>DocuSigned by: <i>Renee Reijo Pera</i> C253991F11494BD...</p>	7/19/2016
Chief Academic Officer:	<p>DocuSigned by: <i>Robert L. Mokwa</i> 9EDD74A82C3A419...</p>	7/21/2016
Chief Executive Officer:	<p>DocuSigned by: <i>[Signature]</i> 7D6A4CE96C3F415...</p>	7/25/2016
Flagship Provost:	<p>DocuSigned by: <i>Robert L. Mokwa</i> 9EDD74A82C3A419...</p>	7/21/2016
Flagship President:	<p>DocuSigned by: <i>[Signature]</i> 7D6A4CE96C3F415...</p>	7/25/2016
Date of Final Review:	September 15, 2016	

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

November 17-18, 2016

ITEM 173-2013-R1116

**Request for authorization to establish a minor in Biomedical Engineering**

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**THAT**

Montana State University requests authorization from the Montana Board of Regents to create a minor in Biomedical Engineering.

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**EXPLANATION**

This minor in Biomedical Engineering is intended primarily for undergraduate students throughout the MSU College of Engineering who have an interest in biomedical applications of engineering. The minor curriculum will give students the interdisciplinary expertise required to thrive in biomedical industry, professional programs, and graduate programs.

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**ATTACHMENTS**

Academic Proposal Form  
Curriculum Proposal Form  
Intent to Plan

**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

ITEM 173-2013-R1116 Submission Month or Meeting: November 17-18, 2016

Institution: Montana State University CIP Code: 14.0501

Program/Center/Institute Title: Minor in Biomedical Engineering

Includes (please specify below): Online Offering  Options

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

     **A. Level I:**

**Campus Approvals**

- 1a. Placing a postsecondary educational program into moratorium (Program Termination and Moratorium Form)**
- 1b. Withdrawing a postsecondary educational program from moratorium**
- 2. Establishing, re-titling, terminating or revising a campus certificate of 29 credits or less**
- 3. Establishing a B.A.S./A.A./A.S. area of study**
- 4. Offering an existing postsecondary educational program via distance or online delivery**

**OCHE Approvals**

- 5. Re-titling an existing postsecondary educational program**
- 6. Terminating an existing postsecondary educational program (Program Termination and Moratorium Form)**
- 7. Consolidating existing postsecondary educational programs (Curriculum Proposal Form)**
- 8. Establishing a new minor where there is a major or an option in a major (Curriculum Proposal Form)**
- 9. Revising a postsecondary educational program (Curriculum Proposal Form)**
- 10. Establishing a temporary C.A.S. or A.A.S. degree program *Approval limited to 2 years***

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**ACADEMIC PROPOSAL REQUEST FORM**

X **B. Level II:**

- X **1. Establishing a new postsecondary educational program** (Curriculum Proposal and Completed Intent to Plan Form)
- 2. Exceeding the 120 credit maximum for baccalaureate degrees** *Exception to policy 301.11*
- 3. Forming, eliminating or consolidating an academic, administrative, or research unit** (Curriculum or Center/Institute Proposal and Completed Intent to Plan Form, except when eliminating or consolidating)
- 4. Re-titling an academic, administrative, or research unit**

**Specify Request:**

Request for authorization from the Montana Board of Regents for Montana State University to create a minor in Biomedical Engineering.

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

**1. Overview**

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

This **minor in Biomedical Engineering** is intended primarily for undergraduate students throughout the MSU College of Engineering who have an interest in biomedical applications of engineering. The minor curriculum will give students the interdisciplinary expertise required to thrive in biomedical industry, professional programs, and graduate programs.

**2. Institutional and System Fit**

- A. What is the connection between the proposed program and existing programs at the institution?**

The proposed minor in Biomedical Engineering program will be drawn from courses with a medical and/or medically relevant engineering emphasis already offered through Chemical and Biological Engineering, Mechanical Engineering, Electrical Engineering, and Biology Departments throughout campus. Additional engineering coursework that provide important tools for biomedical engineers are also included.

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

No.

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

The Biological Engineering program focuses on the application of engineering to biological systems and the use of biological systems in solving scientific and engineering challenges, whereas the Biomedical Engineering minor will focus on engineering applications to medical challenges and human health. There is currently no minor available in Biological or Biomedical Engineering at MSU.

- D. How does the proposed program serve to advance the strategic goals of the institution?**

The Biomedical Engineering minor will help to attract some of the best undergraduate students to Montana State University. A significant number of outstanding, prospective students express an interest in Biomedical Engineering. Faculty research continues to grow in the Biomedical Engineering area, and, as described previously, there is a documented need for more graduates with training in Biomedical Engineering in the state of Montana.

- E. Describe the relationship between the proposed program and any similar programs within the Montana University System. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and if no efforts were made, explain why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement(s) as part of the documentation.**

A Biomedical Engineering major does not exist in the Montana University Systems and there are no highly similar programs in the Montana University System. The closest program is probably the Biomedical Sciences Option in Cell Biology and Neurosciences. The option is designed for students that wish to conduct research

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

or teaching in cell biology, molecular biology, developmental biology, or neuroscience. This is very different from the proposed Biomedical Engineering minor, which is designed for students that wish to learn how to apply advanced math, physics, and engineering principles to biomedical systems. The Biomedical Engineering minor requires, for example, that students already have 4 semesters of calculus and 2 semesters of physics so the foundation of the minor bridges math, physics, biology, chemistry, and engineering.

**3. Program Details**

- A. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog or other publications. NOTE: In the case of two-year degree programs and certificates of applied science, the curriculum should include enough detail to determine if the characteristics set out in Regents’ Policy 301.12 have been met.**

This minor is intended primarily for undergraduate students throughout the MSU College of Engineering who have an interest in biomedical applications of engineering. The minor curriculum will give students the interdisciplinary expertise required to thrive in biomedical industry, professional programs, and graduate programs.

Minor requirements: A minimum 27 credits total is required for the minor. The minor consists of 6 credits of two required courses (ECHM 461 – 3 cr and EMAT 464 – 3 cr), 6 credits of Biology electives, 6 credits of Engineering/Math electives and 9 credits of General electives which, depending on a student’s particular interest and background may fall into one of the following focus areas: Computational Modeling, Instrumentation, Biomechanics/Biomaterials, Tissue Engineering, or Biotechnology. It is not required that students follow any of the suggested focus areas, rather focus areas are provided to only to illustrate ways in which students can prepare themselves for some of the many diverse aspects of biomedical engineering. Note that some of the Biology electives and Engineering/Math electives are duplicated under one or more of the focus areas. Courses taken to satisfy the Biology or Engineering/Math elective credits may not also be used to satisfy the general electives in the focus areas (i.e. no double counting).

**Required Courses**

<b>Course</b>	<b>Title</b>	<b>Cr.</b>
EBIO 461	Principles of Biomedical Engineering	3
EMAT 464	Biomedical Materials Engineering	3
<b>Biology Electives (6 credits)</b>		<b>6</b>
BCH 380	Biochemistry (5 cr)	
BIOB 260	Cellular and Molecular Biology (4 cr)	
BIOB 410	Immunology (3 cr)	
BIOB 425	Adv Cell & Molecular Biology (3 cr)	
BIOH 201	Hum Anatomy & Physiology I (5cr)	
BIOH 211	Hum Anatomy & Physiology II (4cr)	
BIOH 320	Biomedical Genetics (3 cr)	
BIOH 395	Human Pathophysiology (3 cr)	
BIOM 360	General Microbiology (5 cr)	
BIOM 400	Medical Microbiology (3 cr)	
<b>Engineering and Math Electives (6 credits)</b>		<b>6</b>
EBIO 216	Elem Princ of Bioengineering (3 cr)	
EBIO 324	Bioengineering Transport (3 cr)	

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**CURRICULUM PROPOSAL FORM**

EMEC 424	Cellular Mechanotransduction (3 cr)
EMEC 465	Bio-inspired Engineering (3 cr)
M 430	Mathematical Biology (3 cr)

**Focus Area Electives (9 credits)**

9

**Computational Modeling Focus Area**

M 221	Introduction to Linear Algebra (3 cr)
M 441	Numerical Linear Algebra & Optimization (3 cr)
M 442	Numerical Solution of Differential Equations (3 cr)
EMEC 103	CAE I-Engineering Graphics Communications (2 cr)
EMEC 203	CAE II-Mechanical Engineering Computations (2 cr)
EMEC 303	CAE III-- Systems Analysis (3 cr)

**Instrumentation Focus Area**

EELE 201	Circuits I for Engineering (4 cr)
EELE 203	Circuits II for Engineering (4 cr)
EELE 261	Intro To Logic Circuits (4 cr)
EELE 308	Signals and Systems Analysis (3 cr)
EELE 334	Electromagnetic Theory I (3 cr)
EELE 407	Intro To Microfabrication (3 cr)
EMEC 360	Measurement & Instrumentation (3 cr)

**Biomechanics/Biomaterials Focus Area**

EGEN 201	Engineering Mechanics--Statics (3 cr)
EGEN 202	Engineering Mech--Dynamics (3 cr)
EGEN 205	Mechanics of Mtls (equiv 305) (3 cr)
BIOB 410	Immunology (3 cr)
EMEC 424	Cellular Mechanotransduction (3 cr)
EMEC 465	Bio-inspired Engineering (3 cr)

**Tissue Engineering Focus Area**

EMEC 424	Cellular Mechanotransduction (3 cr)
EMEC 465	Bio-inspired Engineering (3 cr)
BIOB 260	Cellular and Molecular Biology (4 cr)
BIOB 425	Adv Cell & Molecular Biology (3 cr)
BIOH 313	Neurophysiology (3 cr)
BIOH 455	Molecular Medicine (3 cr)

**Biotechnology Focus Area**

BCH 380	Biochemistry (5 cr)
BCH 441	Biochemistry of Macromolecules (3 cr)
BCH 444R	Biochemistry & Molecular Biology Methods (3 cr)
BIOB 205	Methods in Biotechnology (4 cr)
BIOB 476R	Gene Construction (4 cr)
BIOH 320	Biomedical Genetics (3 cr)
BIOH 422	Genes and Cancer (3 cr)
BIOH 465R	Gene Expression Lab: From Genes to Proteins to Cells (3 cr)

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

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

All required and elective courses are already being offered at Montana State University. It is expected that 10 to 20 students will pursue the minor within the first year of its introduction, and it is expected that roughly 20 to 40 students total will be in the program after 4 years.

**4. Need**

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

In 2011, the Bureau of Labor and Statistics listed biomedical engineering as the fastest growing occupation in the United States. A variety of factors have contributed to this demand for biomedical engineers in the workforce, such as: an aging population, growing health concerns, a demand for more sophisticated medical equipment, and a concern for cost effectiveness in medicine. This trend is particularly noticeable in the state of Montana, where the employment growth rate in the biosciences was four times greater than the national average from 2001-2011. Bozeman has the highest concentration (33%) of these companies. Economic development analysis has found that these companies, which are largely based in biomedical sciences, contribute significantly to the growth of Montana's economy.

Many prospective and current MSU students have recognized this rapid expansion of the biomedical engineering workforce. The department chair of Chemical and Biological Engineering has cited that 30-50 prospective students per year state that they are unlikely to attend MSU unless we have a Biomedical Engineering major or minor. These are often students with very strong academic records, who we are actively recruiting into MSU. It is important to note that this number is likely a small sample of the total students wishing to pursue biomedical engineering, as it only accounts for students who spoke directly with the department chair. These interests are echoed by current MSU students. During the recent Departmental Advisory Review in the Chemical and Biological Engineering department, current MSU students expressed a desire to see more biomedical applications in their curriculum. To meet the both the demand in the workforce and the educational interests of MSU students, we propose a Biomedical Engineering minor in the Chemical and Biological Engineering Department. This minor will serve two important purposes: it will be a recruiting tool for prospective students considering MSU, and it will make graduates of MSU more competitive either in the workforce or in graduate and professional program admissions. Students with a background in biomedical engineering can be placed in a variety of areas; biomedical engineers are employed in universities, hospitals, research facilities, academia, industry, and government agencies.

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

The impact of this program will be threefold.

1. There will be a more qualified employee pool for biomedical industry in Montana, which is a stated need for local industry.
2. Montana State University will recruit students from outside Montana as well as retain excellent students within Montana who have an interest in biomedical engineering.
3. Students will be better prepared for medical school, graduate school, and biomedical industry jobs both within and outside of Montana.



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**CURRICULUM PROPOSAL FORM**

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

Based on student interest, both prospective and current students surveyed, we estimate approximately 20-40 students per year graduating with a Biomedical Engineering minor. Currently, over 400 students per year graduate with a degree in Biological, Chemical, Mechanical, or Electrical Engineering – the 4 most likely majors for students also pursuing a minor in the proposed Biomedical Engineering minor. Thus, we are assuming that, on average, 5-10% of students in those majors will also seek the Biomedical Engineering minor.

**5. Process Leading to Submission**

**A. Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.**

The Biomedical Engineering minor was designed by a faculty committee in the department of Chemical and Biological Engineering with experience in biology, biomedical engineering, and curriculum design. Additionally, the curriculum was reviewed by the faculty in the Chemical and Biological Engineering department.

**6. Resources**

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

No.

**B. Are other, additional resources required to ensure the success of the proposed program? If yes, please describe the need and indicate the plan for meeting this need.**

No.

**7. Assessment**

**A. How will the success of the program be measured?**

Learning Objectives. The learning objectives are based upon current ABET Engineering Accreditation requirements because many courses in the minor are already assessed using these learning outcomes.

Upon completion of this minor, students will:

1. be able to apply knowledge of mathematics, physics, biology, and biochemistry to solve biomedical engineering problems,
2. be able to perform a basic design of a system, component, or process to meet desired needs within realistic constraints,
3. have a knowledge of contemporary issues in biomedical engineering,
4. have an ability to use the modern engineering tools to solve biomedical problems, and

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

5. have an ability to communicate effectively, including communication with individuals from related disciplines.

Assessment of Learning Outcomes:

The two required courses will be assessed once every 3 years by the faculty in Chemical and Biological Engineering. This assessment will include an examination of course materials and a direct assessment of samples of student work to determine if learning objectives are being achieved. The faculty assessment will be supported by a secondary assessment by the Department Advisory Committee for ChBE.

For courses outside of Chemical and Biological Engineering, the course content will be assessed once every three years by examining each course syllabus and assessing whether or not the course content and course learning objectives are still appropriate for the minor and contribute towards achieving the learning objectives.

Additional assessment data on the full program, beyond the individual courses, will include:

1. Number of students that pursue a minor in Biomedical Engineering (goal is at least 10 and hopefully 20 per year)
2. Number of students that complete a minor in Biomedical Engineering (goal is an average of 10 per year by the 4th year of the minor's existence).
3. Retention of students within the minor (goal is 75% retention of students that start pursuing the minor)
4. Student employment after graduation, include average salary, in an area related to Biomedical Engineering
5. National awards given to students pursuing the minor

## Montana University System

### NOTICE OF INTENT TO PLAN

Program/Institute Title: Minor in Biomedical Engineering  
Campus, School/Department: MSU-Bz, Chemical and Biological Engineering  
Contact Name/Info: Jeff Heys, jeffrey.veys@montana.edu  
Expected Submission Date: SEP 2016  
Mode of Delivery: Face-to-Face

To increase communication, collaboration, and problem solving opportunities throughout the MUS in the program/center/institute development process, please complete this form not more than 18 months in advance of the anticipated date of submission of the proposed program/center/institute to the Board of Regents for approval.

For more information regarding the Intent to Plan process, please visit the Academic and Student Affairs Handbook.

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

We propose a new minor in Biomedical Engineering at Montana State University - Bozeman. This Minor is intended for undergraduate students throughout the MSU College of Engineering who have an interest in biomedical applications of engineering. The minor curriculum will give students the interdisciplinary expertise required to thrive in biomedical industry, professional programs, and graduate programs. The focus of this program is to identify and apply basic tools used in current biomedical engineering industry, research, and development.

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

In 2011, the Bureau of Labor and Statistics listed biomedical engineering as the fastest growing occupation in the United States. A variety of factors have contributed to this demand for biomedical engineers in the workforce, such as: an aging population, growing health concerns, a demand for more sophisticated medical equipment, and a concern for cost effectiveness in medicine. This trend is particularly noticeable in the state of Montana, where the employment growth rate in the biosciences was four times greater than the national average from 2001-2011. Bozeman has the highest concentration (33%) of these companies. Economic development analysis has found that these

companies, which are largely based in biomedical sciences, contribute significantly to the growth of Montana's economy. Many prospective and current MSU students have recognized this rapid expansion of the biomedical engineering workforce.

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

This minor will serve two important purposes: it will be a recruiting tool for prospective students considering MSU-Bozeman, and it will make graduates of MSU-Bozeman more competitive either in the workforce or in graduate and professional program admissions. Both of these purposes align with the MSU-Bozeman institutional mission and the strategic plan. MSU-Bozeman is the ideal campus for this program because the proposed Biomedical Engineering Minor curriculum will be drawn from courses with a medical and/or medically relevant engineering emphasis already offered through Chemical and Biological Engineering, Mechanical Engineering, Electrical Engineering, and Biology Departments throughout campus.

**4) How does the proposed program/center/institute fit within the MUS system?**


The Biomedical Engineering workforce demand is increasing in the State of Montana. However, a Biomedical Engineering major does not exist in the Montana University Systems and there are no highly similar programs in the Montana University System. The closest program is probably the Biomedical Sciences Option in Cell Biology and Neurosciences on the MSU-Bozeman campus. The option is designed for students that wish to conduct research or teaching in cell biology, molecular biology, developmental biology, or neuroscience. This is very different from the proposed Biomedical Engineering minor, which is designed for students that wish to learn how to apply advanced math, physics, and engineering principles to biomedical systems. The Biomedical Engineering minor requires, for example, that students already have 4 semesters of calculus and 2 semesters of physics so the foundation of the minor bridges, math, physics, biology, chemistry, and engineering.

## Signatures

### Intent to Plan

Program/Institute/Center Title: Minor in Biomedical Engineering  
Campus: MSU-BZ  
Expected Submission Date: SEP 2016

Signature/Date

Associate Provost: <small>(procedural, not approval)</small>	DocuSigned by: <i>Ron Larsen</i> E9B7047DE1CA414...	5/3/2016	
College/School Dean:	DocuSigned by: <i>Butt Gunn</i> 3E122B977D064AC...	5/4/2016	
Chief Academic Officer:	DocuSigned by: <i>Martha Potvin</i> 43A1A78D200F474...	5/9/2016	
Chief Executive Officer:	DocuSigned by: <i>[Signature]</i> 7D6A4CE96C3F415...	5/24/2016	
Flagship Provost:	DocuSigned by: <i>Martha Potvin</i> 43A1A78D200F474...	5/9/2016	
Flagship President:	DocuSigned by: <i>[Signature]</i> 7D6A4CE96C3F415...	5/24/2016	
Date of Final Review:	July 19, 2016		

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