

**DEPARTMENT OF LAND RESOURCES AND  
ENVIRONMENTAL SCIENCES**

*Montana State University*



**GRADUATE STUDENT  
HANDBOOK**

**Information for graduate students enrolled in the  
ONLINE M.S. in Land Resources and Environmental Sciences  
at Montana State University**

**<http://eu.montana.edu/online/degrees/lres/>**

Revised: Spring 2018

**NOTE: THE MSU BULLETIN, GRADUATE CATALOG, AND THE GRADUATE SCHOOL HAVE  
PRECEDENCE OVER THIS PUBLICATION RELATIVE TO OFFICIAL PROCEDURES AND DEADLINES.**

The Graduate School website may be found at **<http://www.montana.edu/wwwdg/>**

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### **Introduction:**

The Department of Land Resources and Environmental Sciences (LRES) at Montana State University offers an online graduate program leading to an M.S. degree in Land Resources and Environmental Sciences. This program is designed to provide outstanding graduate training opportunities across a substantial breadth of disciplinary interests. Programs are specifically adapted to each graduate student and often address processes at multiple scales through well-integrated, multi-disciplinary efforts. Student professional papers are directed toward improving understanding of principles and processes important to land resources and environmental sciences, with opportunities for direct ties to management.

Understanding is developed through targeted advanced coursework tailored to the student. Professional papers may involve, but are not limited to, topics such as watershed hydrology, integrated management of invasive plant species, soil nutrient management, land reclamation, restoration ecology, fluvial systems ecology and restoration, riparian ecology, microbial ecology of natural systems, chemical fate and transport, water quality, crop diversification, precision agriculture, environmental risk assessment, remote sensing and GIS applications, and climate variability.

The information contained in this booklet has been assembled for the convenience of graduate students and advisors in LRES. This booklet should be used in concert with the MSU Bulletin and information on The Graduate School website. **Graduate students are expected to become thoroughly familiar with the regulations of this booklet and those of The Graduate School.** Failure to follow these regulations and observe the degree requirements could result in complications and often delays progress in completing the chosen degree.

**It is the student's responsibility to meet all deadlines regarding her/his graduate program.** Deadlines may change from time to time. Check with The Graduate School and the LRES Program Manager, Lisa Brown, for updated information.

All policies listed in the MSU Bulletin, Graduate Catalog, and in this booklet apply to all graduate candidates in the online M.S. degree program in the Department of Land Resources and Environmental Sciences.

### **Program Requirements:**

A minimum of 30 credits is required for graduation:

- 27 credits of course work from 400/500 level courses:
- 3 credits of professional paper requirement

### **Prerequisites:**

- Bachelor's degree in a related field or evidence of strong science background
- Undergraduate GPA of 3.0 or better
- GRE combined score greater than 300
- Show significant promise for success in a graduate program
- TOEFL (Test of English as a Foreign Language) score of 550 (paper-based test), 231 (computer-based test), and 80 (internet-based test) – required only for international students whose native language is not English.

Meeting the minimum department standards does not ensure admission to the program. The minimum GPA, GRE, and TOEFL scores are not absolute thresholds. Admission to Montana State University programs is based on a number of factors, including prior academic and professional experience and the personal statement. As per The Graduate School, students may be admitted into full or provisional status.

Under provisional admission status, a student must receive a “B” or better in the initial 9 credits in Graduate School course work. Failure to meet the provisions specified above will result in probation or possible suspension from academic programs at Montana State University. For more information, please refer to The Graduate School’s policies regarding admission status ([http://www.montana.edu/gradschool/cat\\_admin\\_pol.html](http://www.montana.edu/gradschool/cat_admin_pol.html)).

**Admissions:**

To apply:

1. Contact Lisa Brown, the LRES program manager, at 406-994-3062 or [lisa.brown@montana.edu](mailto:lisa.brown@montana.edu), well in advance of the deadlines below, to make sure that you understand all requirements.
2. Send:
  - a. Official transcripts from all post-secondary institutions
  - b. A one-page narrative outlining your goals and interests in obtaining a graduate degree in Land Resources and Environmental Sciences
  - c. Official GRE scores
  - d. Curriculum vita
  - e. Three letters of recommendation in sealed and signed envelopes (or contact Lisa Brown for alternative submission formats)
  - f. TOEFL scores (required only for international students whose native language is not English)

By:

U.S. and Canadian citizens

- June 15 for fall
- November 1 for spring
- March 1 for summer

Non-U.S. or Canadian citizens

- May 15 for fall
- October 1 for spring
- February 1 for summer

To:

Lisa Brown  
LRES Program Manager Extended University  
Montana State University  
EPS 128  
P.O. Box 173860  
Bozeman, MT 69717-3860

3. Fill out an MSU graduate school application (\$60)  
(If you choose to fill out the paper application, send it to Lisa Brown at Extended University.)

By:

- July 15 for fall
- December 1 for spring
- April 1 for summer

**Curriculum:**

The flexible and interdisciplinary nature of this program allows you to select courses to fit your professional goals and interests. Most of the courses are offered online, but there are also 3 hybrid field-online courses.

Rubric	No.	Course	Semester	Credits	Location
<b>Required Course (3 credits required)</b>					
LRES	575	Professional Paper	Fall, Spring, Summer	3	Online
<b>Elective Courses (27 credits required)</b>					
LRES	507	Environmental Risk Assessment	Fall (alt yrs odd)	3	Online
LRES	510	Biodiversity Survey and Modeling Methods	Summer/Fall	3	Online & Campus
LRES	515	Microbial Ecology	Spring	3	Online
LRES	521	Holistic Thought and Management	Spring	3	Online
LRES	531	Applied Watershed Hydrology	Fall	3	Online
LRES	532	Soil Ecosystems and Processes	Fall	3	Online
LRES	533	Wetland Ecology and Management	Spring	3	Online
LRES	534	Environmental Data Analysis	Fall/Spring	3	Online
LRES	540	The Ecology of Plants and Plant Communities	Fall	3	Online
LRES	544	Water Quality	Spring	3	Online
LRES	565	Environmental Biophysics	Fall	3	Online
LRES	566	Chemical Ecology	Spring	3	Online
LRES	569	Ecology of Invasive Plants in the Greater Yellowstone Ecosystem	Summer	3	Online & Campus
LRES	571	Landscape and Ecosystem Ecology	Spring	3	Online
LRES	573	Remote Sensing Applications in Environmental Science	Fall	3	Online
LRES	591	Restoration Ecology and Application	Summer	3	Online & Campus
LRES	592	Independent Study/Internship	Fall, Spring, Summer	3	Online
MB	527	Toxicology: The basic science of poisons	Spring	3	Online
AGSC	401	Integrated Pest Management	Fall (alt yrs odd)	3	Online
ENTO	510	Insect Ecology	Spring (alt yrs odd)	3	Online
PSPP	546	Herbicide Physiology	Fall (alt yrs even)	3	Online

**Advisors and Graduate Committee:**

Upon entering the program, each student will be automatically assigned a three-person graduate committee. The first advisor is the academic advisor who will be assigned to each student at the beginning of the program to aid students in course selection and development of a program of study. The academic advisor will be the primary contact for each graduate student and assist the student in all matters related to graduate study. The academic advisor must be a tenure track or tenured professor from LRES.

**Duties of the academic advisor:**

- Help determine the student's program of study (required courses) in consultation with the student.
- Monitor student progress.
- Review program change requests.
- Ensure program rigor.
- Evaluate the written and oral professional paper.
- Monitor student progress toward degree completion and adherence to the time schedule for meeting Department and The Graduate School requirements.

The second and third advisors are professional paper readers. The role of these advisors is, at a minimum, to serve as readers and arbiters on the professional paper.

Duties of the professional paper readers:

- Provide reviews of professional paper drafts.
- Evaluate the oral professional paper.

All three committee members must sign off on the program of study for the student to successfully complete the program. The academic advisor and other committee members have the responsibility to be familiar with and to uphold LRES and MSU standards for the M.S. degree, and to provide excellent mentorship to LRES graduate students under their supervision, consistent with departmental goals and expectations.

The Program of Study, including the composition of the graduate committee, may be altered as needed, subject to department and The Graduate School approval. Any changes may be requested before or during the term affected. Final changes must be made at least one month before the end of the term in which degree requirements will be completed. The second and third advisors may be changed according to the needs and interests of the student. For instance, a student might want to have his or her professional paper instructor serve on the graduate committee, or a student might want an external committee selection (e.g. a professional mentor or collaborator - contingent upon LRES approval).

**Graduate Program of Study Form:**

The course program is planned by students in close collaboration with the academic advisor, and is submitted to the Department Head, followed by the Graduate School, by the end of the third semester. The academic advisor must initial the original copy of the program form before it is submitted to the Department Head. The program may later be altered as needed, subject to department and The Graduate School approval. Any changes may be requested before or during the term affected. Final changes must be made at least one month before the end of the term in which degree requirements will be completed. Students are allowed to transfer into the program up to 9 credits from prior graduate-level courses, assuming the credits were not previously used to obtain an academic degree.

**Application for Advanced Degree:**

An Application for Advanced Degree must be submitted the semester of graduation to the LRES Program Manager in time to allow completion and auditing, and then it is forwarded to The Graduate School on or before the specified deadline. If a student does not complete the requirements during the term specified, the previous application must be withdrawn and a new application form must be submitted to the LRES Program Manager to forward to The Graduate School by the applicable deadline. Thus, the

student and academic advisor should carefully plan the timing of program completion and filing the application for advanced degree. If the professional paper is submitted *after* the published deadline and the student is currently registered for three credits, the student may choose to make all corrections/changes **before the first day of the following academic term** and be eligible for a one-credit registration the following term (instead of the mandatory three credit registration the term of graduation). Students who choose and are eligible for this option will be *certified to graduate the following term*. **If more time is needed beyond the first day of the following term, the student will be required to register for at least three credits to be eligible for graduation that term.**

### **Professional Paper:**

The professional paper requirement is intended to give students an in-depth experience in the design, implementation, and completion of a rigorous project. Like a thesis, the outcome of a professional paper is expected to be at least one manuscript of publishable quality in a peer-reviewed journal. As such, approximate guidelines for the length of the paper are between 25-45 double spaced pages. The professional paper requirement is designed to be flexible to the particular needs of each student and tailored to his/her topic of study and/or research. Professional papers may involve, but are not limited to, topics such as hydrology, watershed analysis, integrated management of invasive plant species, soil nutrient management, bioremediation, land reclamation, restoration ecology, fluvial systems ecology and restoration, riparian ecology, microbial ecology of natural systems, chemical fate and transport, water quality, crop diversification, precision agriculture, environmental risk assessment, remote sensing and GIS applications, and climate variability.

The professional paper documents a rigorous, original project conducted by the student. It is a scholarly formulation, assessment, and analysis of a problem. It is not a term paper from a course. The professional paper must be an original analysis in which the student addresses a clearly formulated problem. The topic of the professional paper should be well aligned with the background or experience of the professional paper instructor to ensure quality mentoring. Although the professional paper is expected to be a rigorous analytical exercise, it is not a thesis, and therefore primary data collection is not strictly required. Professional papers can be based on either primary or secondary data analyses. Although not preferred, and with instructor approval, it can be based on a novel, synthetic analysis of existing literature provided the student conducts a clearly unique academic study. For all papers, the abstract must clearly indicate the student's contribution and report results from the analysis.

Students are expected to identify a professional paper instructor before enrolling in the professional paper course. Once a suitable professional paper instructor is identified, the student is expected to complete a professional paper proposal form by the middle of the semester **before** enrolling in the course. The proposal must be approved by the professional paper instructor. The student will work closely with his/her professional paper instructor to develop a professional paper during the time he/she is registered for the 3 credits. The student is encouraged to draw upon ongoing work-place relationships, collaborations, and research interests in designing and implementing his/her professional paper.

The student is required to orally present the final professional paper to his/her committee in person, via webinar, teleconference, or other appropriate technology. The committee must approve the professional paper for completion of the degree.

The format for the written professional paper will follow closely the thesis preparation

guidelines established by The Graduate School. Make certain that all names and titles in the acknowledgments and on the signature page are accurate and spelled correctly.

The student is required to offer co-authorship to his/her professional paper instructor (and other advisors if appropriate) if the professional paper leads to a publication.

**Duties of the professional paper instructor:**

- Approve the professional paper proposal the semester before the student enrolls in the professional paper course.
- Monitor student progress during the professional paper course.
- Provide mentoring to the student on the professional paper project if applicable.
- Provide reviews of professional paper drafts.
- Provide reviews of professional paper oral presentation.
- Grade the final professional paper (letter grade), including oral presentation, based on input from graduate committee.

**Grievances:**

If such cases arise, these are referred to the major advisor, the LRES Graduate Affairs committee, and/or the Department Head, respectively.

**Graduate Program Overview Committees:**

Many aspects of the LRES Graduate Program fall under the authority of the LRES Graduate Curriculum Committee. An LRES Graduate Affairs Committee may also be appointed by the Department Head to develop or evaluate the policies and procedures concerning graduate study and to coordinate these with the departmental faculty.

**Department Head:**

The Department Head serves multiple functions relative to graduate students and programs. Among these are oversight and approval of proposed graduate programs and associated forms, and ensuring that the quality and standards of the departmental M.S. and Ph.D. programs are upheld and maintained.

The Department Head also serves as an advocate for LRES graduate students, and as a mediator of any disputes or difficulties encountered by graduate students that cannot be satisfactorily resolved by the student's major advisor. Students are encouraged to contact the Department Head before any such difficulties become exacerbated and/or prolonged.