Program Change Request

New Program Proposal

Date Submitted: 11/18/20 11:21 am

Viewing: Environmental Remediation and Management

Last edit: 12/04/20 10:41 am
Changes proposed by: epboswell

Name of the school or college academic planner who you consulted with on this proposal.

Name
Karen Wasserman - ALS
Marty Gustafson - DCS

Proposal Abstract/Summary:

We propose a new master's degree level accelerated program "Master of Science in Environmental Remediation and Management" to be administratively housed in the Department of Soil Science in the College of Agricultural and Life Sciences. The program will provide advanced training in the technical aspects of the investigation, remediation, and monitoring of environmentally contaminated sites common to property transfers, site redevelopment, or site closures. The program will have international application and provide value-added coursework in technical communication (written and oral) and project management. Combined, these in-demand skills will prepare graduates for careers in US and international private consulting firms, industry, and federal, state, and municipal government agencies to meet the technical requirements of environmental compliance, and address community concerns, understand and facilitate funding opportunities for site cleanup and redevelopment, and manage field personnel and projects.

This is an accelerated, 30 credit, face-to-face, full-time program with three semesters (fall, spring, summer) of coursework and a planned launch of fall 2021. We expect an initial enrollment of 20 students with enrollment projected to grow to 50 students after four years.

Basic Information

Program State: Active
Type of Program: Degree/Major

Upload the Approved Notice of Intent and UW System Approval Memo.
Notice of Intent MS Env.pdf
Approval memo.pdf

Upload completed draft of the full Board of Regents Authorization Proposal for this program.
UW-Madison Environmental Remediation Mgmt MS - AUTHORIZATION 12 1 2020 Final.docx

Who is the Graduate or professional
The program will be governed by the home department/academic unit as specified. Will an additional coordinating or oversight committee be established for the program?
Yes

Describe procedures under which the coordinating/oversight committee will operate, including how the committee chair is appointed, to whom the chair reports, how pa provisions for transitions in the committee, and processes for interaction with the home department.
The program will benefit from multidisciplinary input and as such will have an advisory group that includes members from other CALS departments, the College of Letters and Science, and the College of Engineering. This group will advise the program on all matters but will have no executive role – the Department of Soil Science will be solely responsible for the program and will serve as the governance committee.

Is this in the Graduate School? Yes
Award: Master of Science
SIS Code:
SIS Description:
Transcript Title: Environmental Remediation and Management
Named Options:
Will this be offered as an additional major as well? No
Is this a non-admitting master’s degree? No

Roles by Responsibility: List one person for each role in the drop down list. Use the green + to create additional boxes.

<table>
<thead>
<tr>
<th>Role Type</th>
<th>Name (Last, First)</th>
<th>Email</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Director</td>
<td>Hartemink, Alfred</td>
<td><a href="mailto:hartemink@wisc.edu">hartemink@wisc.edu</a></td>
<td>608/26:</td>
</tr>
<tr>
<td>Primary Contact</td>
<td>Boswell, Edward</td>
<td><a href="mailto:epboswell@wisc.edu">epboswell@wisc.edu</a></td>
<td></td>
</tr>
<tr>
<td>Primary Dean’s Office Contact</td>
<td>Wassarman, Karen</td>
<td><a href="mailto:kmwassarman@wisc.edu">kmwassarman@wisc.edu</a></td>
<td>608/26:</td>
</tr>
<tr>
<td>Department Chair</td>
<td>Hartemink, Alfred</td>
<td><a href="mailto:hartemink@wisc.edu">hartemink@wisc.edu</a></td>
<td>608/26:</td>
</tr>
</tbody>
</table>

List the departments that have a vested interest in this proposal:

<table>
<thead>
<tr>
<th>Departments</th>
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</thead>
<tbody>
<tr>
<td>Biological Systems Engineering (BIO SYS EGR)</td>
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<tr>
<td>Civil and Environmental Engr (CIV EN EGR)</td>
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<tr>
<td>Inst for Environmental Studies (ENVIR ST)</td>
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<tr>
<td>Geoscience (GEOSCIENCE)</td>
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<tr>
<td>Life Sciences Communications (LIFE SC COM)</td>
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<tr>
<td>College of Engineering (ENGINEERG)</td>
</tr>
<tr>
<td>College of Letters &amp; Science (L&amp;S)</td>
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</tbody>
</table>

Are all program reviews in the home academic unit up to date? Yes
Are all assessment plans in the home academic unit up to date? Yes
Are all assessment reports in the home academic unit up to date? Yes
Mode of Delivery: Face-to-Face (majority face-to-face courses)
Will this program be part of a consortial or collaborative arrangement with another college or university? No
Will instruction take place at a location geographically separate from UW-Madison? No
Will this program have outside accreditation?  No
Will graduates of this program seek licensure or certification after graduation?  No
First term of student enrollment:  Fall 2021 (1222)
Year of three year check-in to GFEC (3 years after first student enrollment):  2025
Year of first program review (5 years after first student enrollment):  2027

If this proposal is approved, describe the implementation plan and timeline.
Immediately upon approval we will launch the marketing and recruiting campaign with
advisement from DCS. Recruiting will be supplemented with data from Salesforce, the campus
customer relationship management platform, and working with DCS on email messaging.
Because the first cohort target start date is Fall 2021, our recruiting efforts will begin within the
UW System, but focused efforts outside of the UW System will also occur. Application review
will occur simultaneously with the marketing and recruiting efforts and we anticipate enrolling
students beginning in June 2021. Summer 2021 will be spent enrolling students, assigning
personnel for student advising and coordination, and planning welcome and orientation
activities in preparation for a Fall 2021 start.
CALS Academic Affairs will convene an implementation meeting with campus units (budget
office, RO, graduate school, DCS, etc.) after approval to handle the fiscal and administrative set
up of the program.

Rationale and Justifications

Why is the program being proposed? What is its purpose?
In the US and internationally, thousands of abandoned commercial and industrial sites exist
that have unknown levels of soil and groundwater contamination presenting complex situations
for public and private interests. In addition to their potential for affecting community health,
these sites present significant barriers to the growth and revitalization of urban neighborhoods.
As outlined in the US Environmental Protection Agency roadmap, remediation and
redevelopment of these sites involves understanding state and federal regulations, conducting
site assessments and investigations, and, if required, selecting soil and groundwater
remediation or containment technologies to achieve case closure.
Many phases of environmental assessment, remediation, and redevelopment work are within
the purview of environmental scientists within consulting companies driven to efficiently meet
regulatory compliance for their clients prior to property transfer or redevelopment. This work
often requires a diverse skill set to meet not only the technical requirements of environmental
compliance but also to address community concerns, understand and facilitate funding
opportunities for site cleanup and redevelopment, and manage field personnel and projects. To
address these needs, the program will provide advanced training in the technical aspects of
environmental assessment and remediation, address the need for effective written and oral
communication, and provide personnel and project management training. The program will
provide in-depth physical science knowledge related to soil and groundwater and, through
coursework in project management, provide a foundation for rising to project management and
business development level positions within the field of environmental remediation.
Additionally, Occupational Safety and Health Administration (OSHA) Hazardous Waste
Operations and Emergency Response (HAZWOPER) 40-hour training, required for workers
involved in remediation work, will be provided as part of the program, streamlining the hiring
and training process for employers.

What is its relation to the institution's mission? (Consider the mission broadly as a major research university with missions in teaching, research, service, and the Wiscons mission of the sponsoring unit(s)?
The University of Wisconsin-Madison strategic plan includes building innovative professional
master’s-level degrees with an overall guiding principal to promote the application of teaching
to issues of importance for the state, the nation, and the world. Finding innovative solutions to
environmental contamination issues, from historic releases to emerging contaminants (e.g.,
PFAS), will continue to be of global importance well into the future. Additionally, the program
will scale the Wisconsin in experience by offering active learning opportunities and innovative
classroom environments in cooperation with local and regional industry professionals to
prepare students for successful careers.

The mission of the College of Agricultural and Life Science is to advance and share knowledge,
discover solutions and promote opportunities in food, agriculture, bioenergy, health and
environment, and human well being. A specific focus for healthy ecosystems is managing
landscapes to help provide clean water and air, mitigate climate change and promote
biodiversity while building communities and offering economic gain. This strategic priority
informs the Environmental Remediation and Management degree by helping communities
advance social and economic development while also being aware and knowledgeable of the
policy and environmental impacts of proposed solutions. The proposed program will support
the CALS mission by preparing environmental scientists to apply technical and collaborative
decision-making skills to promote healthy communities and sustainable economic
development.

Do current students need or want the program? Provide evidence.

According to the National Center for Education Statistics, there has been growing interest in
environmental technology/science Master’s degrees since 2012 as seen by increasing degree
conferrals. In keeping with this trend, UW-Madison’s Environmental Sciences BS degree
conferrals have doubled over the last 5 years to 63 conferrals in 2019-20 and we anticipate
recruiting from this major. Master’s level conferrals are also seeing growth. The Division of
Continuing Studies performed a competitive market analysis for other existing Master’s degree
programs based on degree name, degree conferred, curriculum, and model similarity. Although
over 93 institutions offer programs in environmental health and engineering-related fields,
market share is spread out and most institutions are located on the east and west coasts
indicating a lack of market saturation in the Midwest or leadership from an online institution.
Therefore, the proposed program will capitalize on the Midwest market and also stand alone in
offering field, project management, and communication experience through professionally-
driven case studies.

What is the market, workforce, and industry need for this program? Provide evidence.

There is strong national market demand for the environmental science skills proposed within
this program. The Division of Continuing Studies (DCS) performed an analysis using Burning
Glass Technologies real-time job market analytics software and found over 9,000 jobs that
require one or more of the environmental remediation-related skills and that are open to
applicants with a Master’s degree. These jobs are in a variety of occupations and industries and
most of those occupations are projected to grow between 2016 and 2026. In general, there are
a greater number of job postings within CA, TX, VA, NY, and NJ, than in the Midwest. Within
Wisconsin, Madison has an approximately four times higher demand than the national average,
while at the same time, there is a gap in graduate programs specializing in environmental
remediation in the Midwest, indicating that the Madison-Milwaukee area should be a strong
market for the degree.

How does the program represent emerging knowledge, or new directions in professions and disciplines?

NA - optional section where no market research exists.

In what ways will the program prepare students through diverse elements in the curriculum for an integrated and multicultural society (may include diversity issues in the
Diversity and Inclusion issues will be specifically addressed each semester in SOIL SCI 730
Colloquium: Environmental Remediation and Management (e.g., Strategies for Responding to
Hostile Climates Workshop by Erika Marin-Spiotta – Professor of Geography). SOIL SCI 430:
Environmental Soil Contamination presents a global and multicultural perspective on
environmental contamination issues through course content, case studies, and guest speakers
representing diverse countries and groups (e.g. South Africa, Italy, Kuwait, tribal nations,
women-owned business).

What gap in the program array is it intended to fill?

Several UW-Madison programs focus on environmental issues however, existing programs do
not offer the technical, communication, and management skills related to the field of
environmental remediation in the comprehensive manner of the proposed program.
Additionally, the program will be open to graduates from outside of engineering disciplines and
therefore serve a currently untapped market.

- MS in Environmental Conservation, Nelson Institute: This program offers two professional
master’s degree options, Environmental Observation and Informatics (EOI) and Environmental
Conservation. The conservation option focuses on conservation planning, land use policy and
professional skills, while the EOI option offers earth sensing technology, data analytics and

https://next-guide.wisc.edu/courseleaf/approve/?role=GRAD SCH Dept. Approver
modeling, and geospatial analysis. We have discussed the proposed program with the Nelson Institute and have confirmed that there is no overlap in the curriculum and that there are many opportunities for synergistic collaboration between students in both programs.

- MS in Environment and Resources, Nelson Institute: This program allows students to pursue a broad range of environmental studies incorporating physical or biological science research with social sciences and humanities. The program does not include specific depth areas, but allows flexibility for students to create a course plan suited to address environmental problems identified in their individual research. This is an interdisciplinary thesis-based research program and does not offer the technical, communication, and management skills in the proposed program.
- MS in Landscape Architecture, College of Letters and Science: This program offers a specialization in Restoration Ecology and Ecological Design, which focuses on natural landscaping and plant community restoration and not the identification, assessment, and remediation of environmental contamination.
- Master of Engineering in Civil and Environmental Engineering (online); Geotechnical Engineering; Geological Engineering; and MS in Civil and Environmental Engineering, named option “Environmental Science and Engineering” (on campus) from the College of Engineering. These programs offer coursework in the engineering design and analysis remediation and waste management technologies and require a B.S. in engineering from an ABET accredited program. Although there is some overlap in learning outcomes between these programs, the proposed program will not focus on engineering design and analysis skills. As such, the proposed program will be open to applicants with BS degrees outside of engineering and, therefore, will serve a currently untapped market. Through revenue sharing agreements, the proposed program will potentially incorporate two courses from these programs.

Diversity and Inclusion

Describe how the proposed program curriculum and learning outcomes will advance inclusive excellence. Discuss specific components and requirements within the curriculum and learning activities to engage in diversity with respect to perspectives, theories, practices, and populations different from themselves. If internships or clinical, practice-based placements be required, discuss how students will have access to diverse practice settings.

Diversity and inclusion issues will be embedded throughout classroom materials such as readings developed by diverse voices, presentations by industry leaders (e.g. Strategies for Responding to Hostile Climates Workshop by Erika Marin-Spiotta – Professor of Geography) and assignments that consider the impact of environmentally contaminated sites on disenfranchised populations (e.g. topics in environmental racism and environmental justice).

Science, Technology, Engineering and Mathematics (STEM) fields, have historically been and are currently lacking in representation of under-served populations. This includes both ethnic minorities and women. Increasing representation of women and minorities in the Environmental Remediation and Management program will be a priority. The program plans to partner with a number of existing programs on campus to help move this initiative forward.

Discuss how the proposed program will actively pursue an equity in student recruitment, access, retention, and degree completion. Describe specific strategies to identify for programs that do not have direct admissions. Include evidence-based and effective practices. Provide examples of academic and student support services that will be implemented at completion.

The program will be marketed at career fairs and conferences that draw together underrepresented student populations interested in STEM fields. Beyond advertising the program, the primary goal of attending these events is to create a contact list of interested candidates. Within one week after each event, prospective candidates will be contacted directly by either the program manager or the student services coordinator to begin building a personal connection with the program and with UW-Madison. During these initial conversations, the program representative will detail unique opportunities that are available for underrepresented candidates. These efforts will begin at the following three national conferences:

- SACNAS – Society for Advancement of Chicanos/Hispanics and Native Americans in Science - is an inclusive organization dedicated to fostering the success of Chicanos/Hispanics and Native Americans, from college students to professionals, in attaining advanced degrees, careers, and positions of leadership in STEM. The program will be represented at the SACNAS National Diversity in STEM Conference (Fall).
- AISES – American Indian Science and Engineering Society - with a membership of more than 4,600 individual members, AISES supports American Indian students in STEM disciplines. AISES
has awarded over $11 million in academic scholarships to American Indian STEM students. A program representative will attend the AISES National Conference.

- MANRRS – Minorities in Agriculture Natural Resources and Related Sciences. MANRRS is a national society that fosters and promotes the agricultural sciences and related fields in a positive manner among ethnic minorities and works to ensure that ethnic minorities will be involved in and associated with the agricultural sciences and related fields. MANRRS provides networks to support professional development of minorities. MANRRS also serves employers in the broader agricultural and natural resources sector. It provides them a platform to identify prospective well-qualified employees who are members of ethnic groups, which, when combined, are projected to be the new majority in the work force in the not too distant future. The program will be represented at the MANRRS National Conference.

    We recognize that program expenses may be a barrier to entry for prospective students and, therefore, application fee waivers ($75) will be offered to incentivize under-resourced students to apply. In addition, at least 5% of program net revenues will be used to support scholarships for under-resourced students. In the first year of the program, this amount ($33,000) equates to one full scholarship or two partial scholarships. As program enrollment grows, we expect to offer approximately three full scholarships ($99,000) or six partial scholarships each year.

Once students are admitted, the program will continue to strengthen personal connections and will offer to cover travel expenses for a campus visit. During the initial recruitment phase, the visiting student will be paired with a graduate student(s) from the Department of Soil Science. Additionally, visiting students will meet with representatives from the Graduate School Office of Diversity, Inclusion, and Funding. The program will require and fund staff professional development specific to DEI. For example, program staff may earn a Diversity and Inclusion Certificate composed of four online courses. This training will equip program staff with skills necessary to recruit, support, and retain students from underserved communities.

As the program grows, enrolled students from underrepresented populations will have the opportunity to serve as program ambassadors and the program has set aside funds for them to represent the program at conferences and assist with establishing relationships with potential candidates. We hope that this ambassador program will begin to create a pipeline of prospective students from underserved populations and, in turn, create a stronger student community within the program and campus.

Environmental justice is a vital component of the challenges that this program will equip students to tackle. We view this as a valuable program component for at least two reasons. First, EJ issues disproportionately affect underserved communities, solving these issues may be a driving force behind student’s enrollment in the program i.e., they want to solve these problems. Secondly, professionals that focus on issues of EJ may be excellent mentors for underrepresented students. The program will actively seek to make connection between students and mentors of similar backgrounds or cultures.

Consider how the proposed program will ensure equity in recruiting and hiring of faculty, instructional staff, and staff who will oversee the program curriculum, professor research/scholarship where relevant.

Future program hires will rely on faculty diversity and inclusion training and hiring efforts, as well as campus-wide Faculty Diversity Initiatives offered by the Office of the Provost that assist departments to recruit and retain a demographically representative faculty. Our future career services support staff, and any additional hiring for the program, will be done through the lens of diversity and inclusion, beginning with advertising the opening widely where it would garner interest from a diverse applicant pool.

Future staffing decisions will take advantage of the Target of Opportunity (TOP) hiring program, as well as other opportunities to cultivate and nurture potential talent for recruitment of diverse faculty and staff. Additionally, we will provide pathways to “Grow Your Own,” by mentoring program participants who might be potential faculty/staff.

Note any plans or strategic initiatives at the university that are closely linked with the development of the proposed program. Note how efforts will align with the appropriate strategic initiatives at the university that address diversity where relevant. To the extent that the response to questions related to diversity, equity, and inclusion are connected to plans at the department, specific connections explicit where relevant.

The goals of this program align with the UW-Madison Institutional Statement on Diversity:

“Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experiences, values, abilities, and beliefs enrich the university community. We support education and research that promotes understanding, respect for diversity, and social justice to advance individual and collective achievement.”
experience, status, ages, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. “We seek to activate this mission by cultivating a group of students who will become productive upon graduation to implement what they learn into careers and community engagement that provide service based on their knowledge or expertise, or providing pathways for continued engagement as faculty and staff in the program. 
https://facstaffprovost.wisc.edu/faculty-diversity-initiative/

Faculty and Staff Resources

List the core program faculty and staff with title and departmental affiliation(s) who are primarily involved and will participate in the delivery and oversight.

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<thead>
<tr>
<th>Name (Last, First)</th>
<th>Department</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hartemink, Alfred</td>
<td>Soil Science (SOIL SCI)</td>
<td>Professor and Chair</td>
</tr>
<tr>
<td>Boswell, Edward</td>
<td>Soil Science (SOIL SCI)</td>
<td>Faculty Associate/Program</td>
</tr>
<tr>
<td>Pedersen, Joel</td>
<td>Soil Science (SOIL SCI)</td>
<td>Professor</td>
</tr>
<tr>
<td>Runge, Troy</td>
<td>Biological Systems Engineering (BIO SYS EGR)</td>
<td>Professor and Chair</td>
</tr>
<tr>
<td>Brossard, Dominique</td>
<td>Life Sciences Communications (LIFE SC COM)</td>
<td>Professor and Chair</td>
</tr>
<tr>
<td>Cardiff, Michael</td>
<td>Geoscience (GEOSCIENCE)</td>
<td>Associate Professor</td>
</tr>
</tbody>
</table>

What resources are available to support faculty, staff, labs, equipment, etc.? The Department of Soil Science has the staff, laboratories, and equipment for sampling and analysis sufficient to support faculty.

Program advisor(s) with title and departmental affiliation(s).

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<thead>
<tr>
<th>Name (Last, First)</th>
<th>Department</th>
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</thead>
<tbody>
<tr>
<td>Boswell, Edward</td>
<td>Soil Science (SOIL SCI)</td>
<td>Program manager</td>
</tr>
<tr>
<td>Garvin, Julie</td>
<td>Soil Science (SOIL SCI)</td>
<td>Graduate Student Coordinator</td>
</tr>
</tbody>
</table>

Describe how student services and advising will be supported. The program manager and Julie Garvin (Soil Science Graduate Student Coordinator) will be responsible for student advising. As program enrollment grows, program revenues will be used to support additional student services and advising efforts.

Confirm that the program advisor(s) or coordinator(s) have been consulted and reviewed this proposal.

Select the Graduate Research Scholars Community for this program.
Science and Medicine Graduate Research Scholars Program

Resources, Budget, and Finance

Is this a revenue program? Yes

Upload the 131 spreadsheet. MS Env Rem Budget 2021.xlsx

What is the tuition structure for this program? Market-based tuition - separate proposal to be submitted

Select a tuition increment: $1,100/credit

What is the rationale for selecting this tuition increment? The Division of Continuing Studies performed a competitive pricing study comparing tuition for similar degree programs across peer institutions. Of ten comparable peer programs, the total tuition cost ($1,100/credit plus segregated fees) are lower than the six face-to-face and one of the online programs in the analysis. This places the program at a competitive price point among similar peer programs. This tuition increment is projected to support program expenses and provide a margin for investment in department salaries, staff professional development, and additional department and program scholarships for
Wisconsin residents.


Provide a summary business plan.

Immediately upon academic planning approval we will launch the marketing and recruiting campaign with advisement from DCS. Recruiting will be supplemented by Salesforce and working with DCS on email messaging. Because the first cohort target start date is Fall 2021, our recruiting efforts will begin within the UW System, but focused efforts outside of the UW System will also occur. Application review will occur simultaneously with the marketing and recruiting efforts and we hope to be enrolling students beginning in June 2021. Summer 2021 will be spent enrolling students, assigning personnel for student advising and coordination, and planning welcome and orientation activities in preparation for a Fall 2021 start. The program has letters of support from relevant departments/colleges that are prepared to support faculty buy-out and teaching in participating departments.

We anticipate funding from the Division of Continuing Studies to build out marketing strategy and recruitment plans for Fall 2022. The DCS Recruitment Team will assist in creating and implementing program-specific recruiting plans and support development of websites and other communication materials. Market-based tuition will be set at $1,100/credit. Enrollment will begin with 20 students (department investment margin $60,800) and increase with additional cohorts of students until a goal of 50 students is reached in Year 5 (department investment margin $472,029). These revenues will be used to create new faculty lines, support student services, support professional development of program staff, and maintain an internal scholarship fund.

Provide an overview of plans for funding the program including but not limited to program administration, instructional/curricular delivery, technology needs and program.

The program is expected to be self-funded through tuition revenue within 3 years of implementation.

Funding for program development is supported by the Division of Continuing Studies and CALS.

Tuition revenue will be gathered centrally at CALS/Soil Science dept and will support relevant staff including the program manager, student services coordinator, a future program coordinator, and administrative support.

Program partners are compensated by the program through a Memorandum of Agreement to support instruction at $600/credit hour per student. The terms of these memoranda will be re-assessed every 1-3 years. Program revenues will fund new faculty salaries, TAs for department and program participants, and an internal scholarship fund.

What is the marketing plan?

For the first year, the program will lead the marketing and recruiting campaign with advisement from DCS. Recruiting will be supplemented by Salesforce and working with DCS on email messaging. Because the first cohort target start date is Fall 2021, our recruiting efforts will begin within the UW System, and focused efforts outside of the UW System will also occur. For the fall 2022 cohort, marketing efforts will be led by the Division of Continuing Studies Integrated Marketing & Communications (IMC) team. IMC will develop a learner-centric marketing strategy to build awareness of the program and generate a diverse cross-section of leads. Specific digital marketing efforts employed are likely to include paid and unpaid tactics, like search, social media, and email. Assets will be developed using lead conversion best practices. In the marketing planning phase the IMC marketing team will develop and implement a marketing plan, identify targeted and diverse audiences and key messages, develop content, and build a marketing campaign with supporting creative materials. The IMC marketing team will continue to monitor performance and optimize the campaign for improved results.

Describe resource and fiscal considerations - A. Provide an overview of plans for funding the program including program administration, instructional/curricular delivery, technology needs, marketing (if relevant), financial aid and scholarships (if relevant), capacity for student learning outcomes assessment and program review.

Program revenue will cover all program costs including administration, teaching academic staff, new faculty lines, student services and an internal scholarship fund. The Department of Soil Science has capacity to fund the additional outcomes assessment and program review with current resources. The Department of Soil Science has submitted a budget request to the Division of Continuing Studies requesting funding for program development and marketing and recruiting until the point when program revenues will cover all new personnel and marketing costs.

Describe resource and fiscal considerations - B. Are the faculty, instructional staff and key personnel existing or new faculty and staff? If they already serve existing programs, if new faculty and staff will be added, how will they be funded?

Existing faculty and staff can meet the teaching, administrative, and advising needs through the first three years. The program manager will take on much of the program development, new course development, and
initial course delivery, with assistance from all program faculty. Because early enrollment is anticipated to be low, adding students to existing courses will not cause capacity issues. As enrollment numbers grow, instructional compensation ($600/credit) will assist with creating any new sections or hiring teaching assistants that may be required for courses outside of the department.

Long-term program operation (5+ years) with projected enrollments of 50 + students/year will require hiring additional dedicated instructional staff and a program coordinator. Exact needs will be determined based on student demand for academic topics or program services. Program tuition revenue will be used to fund these positions.

Describe resource and fiscal considerations - C. What impacts will the program have on staffing needs beyond the immediate program? How are those needs being met?

The program is designed to have very little impact on staffing needs outside of program activities. Program partners across campus providing instructional support will be compensated through an MOU to support instruction on a cost per credit basis.

Describe resource and fiscal considerations - D. For graduate programs, describe plans for funding students including but not limited to funding sources and how funding is provided.

The students are primarily self-funded, but budget projections include waivers and scholarships (at 3% and 5% of tuition revenue, respectively) resulting in approx. 4 full, or multiple partial scholarships per year by year 5. Additional scholarships for WI residents are included as program costs.

UW System Administration and the Board of Regents require submission of budget information in a specific format. These forms will be completed in collaboration with APIR after school/college approval and before submission to UWSA for Board consideration. These forms are uploaded here by APIR.

Does the program or change require substantial new resources other than those just described? Describe the needs. Confirm that the dean is committed to providing the needed resources.

No substantial new resources will be required. The Dean is committed to supporting successful CALS programs.

Are new Library resources needed to support this program?

No

Describe plans for funding students including but not limited to funding sources and how funding decisions are made.

Students will be self-funded and are not allowed teaching or research assistantships. However, budget projections include tuition waivers (3%) and scholarships at 5% of tuition revenue resulting in full scholarships or multiple partial scholarships. The program committee will determine scholarship qualifications and conduct selection of awards. Additionally, we plan to provide additional scholarships for WI residents from underrepresented student populations as part of program costs.

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Curriculum and Requirements

Guide Admissions/How to Get In tab

Approved Shared Content from /shared/graduate-school-admissions/

Last Approved: May 14, 2020 3:38pm

Please consult the table below for key information about this degree program’s admissions requirements. The program may have more detailed admissions requirements, the program’s website.

Graduate admissions is a two-step process between academic programs and the Graduate School. Applicants must meet the minimum requirements of the Graduate School. Have researched the graduate program(s) you are interested in, apply online.

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
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<tbody>
<tr>
<td>Fall Deadline</td>
<td>May 30</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>This program does not admit in the spring.</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>This program does not admit in the summer.</td>
</tr>
<tr>
<td>GRE ( Graduate Record Examinations)</td>
<td>GRE is not needed for students with a 3.00 or higher GPA; applicants with a GPA below 3.00 may be consic also submit Graduate Record Examination (GRE) scores.</td>
</tr>
<tr>
<td>English Proficiency Test</td>
<td>Every applicant whose native language is not English or whose undergraduate instruction was not in English score and meet the Graduate School minimum requirements (<a href="https://grad.wisc.edu/apply/requirements/">https://grad.wisc.edu/apply/requirements/</a>).</td>
</tr>
<tr>
<td>Other Test(s) (e.g., GMAT, MCAT)</td>
<td>n/a</td>
</tr>
<tr>
<td>Letters of Recommendation Required</td>
<td>2</td>
</tr>
</tbody>
</table>

Although applications for the MS in Environmental Remediation and Management will be accepted on a rolling basis, applications received by the Fall deadline each year will be reviewed for admission purposes and tuition assistance. Applications are submitted online through the UW-Madison Graduate School. Applicants will need to create a username and password to...
former UW students, this will be a new account that does not use your NetID. When applying for our MS program select the fall term for the calendar year you are applying. Remediation and Management in the drop-down tab. Prospective students who apply by the Fall deadline will be informed of their admissions status by late June. A foundation in the basic sciences is necessary and the program requires all students to have successfully completed the pre-requisite or equivalent coursework listed below but is likely to delay completion of graduate studies.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 221</td>
<td>Calculus and Analytic Geometry I</td>
</tr>
<tr>
<td>CHEM 103</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CHEM 104</td>
<td>General Chemistry II</td>
</tr>
</tbody>
</table>

Applicants must have received a bachelor’s degree from an accredited four-year institution with an undergraduate GPA of 3.0 or higher. Applicants with GPAs below 3.0 may circumstances, and they must provide GRE scores. For those who have GPAs at 3.0 or above, GRE scores are not required for admission to the MS in Environmental Remediation. Candidates with diverse professional and academic backgrounds are encouraged to apply. Admissions decisions will be based on the entirety of each applicant’s credentials below.

Reasons for graduate study/statement of interest in this program or field

Two letters of professional recommendation; one letter from a faculty member and one letter from a university advisor from the undergraduate institution are preferred. If a letter from current or former employer is recommended. Although the online UW-Madison application gives you the option of adding three references, only two references are allowed.

One copy of undergraduate transcripts submitted electronically in the application

Professional credentials/resume

Supplemental application (found in UW-Madison online application)

GRE scores (dependent on undergraduate GPA)

For foreign students, TOEFL or IELTS scores are also needed. The minimum TOEFL score required is 92 for the internet-based test (IBT) and 580 for the paper-based test (PBT). Applicants with language scores below these requirements may be considered for program admission under special circumstances. The UW-Madison Graduate School also takes into consideration non-traditional applicants accepted into the program.

Describe plans for recruiting students to this program.

Working in concert with the Division of Continuing Studies where appropriate, we plan to:
- Travel to college and career fairs across the United States (in this case, the host institution invites many colleges to participate in the event and host informational booths)
- Create pop-up events and lunch and learns at targeted universities and businesses (in this case, UW-Madison is the only visiting institution, so this would be a more intimate event with a presentation)
- Host a series of events on UW-Madison campus targeting UW-Madison students in relevant areas of study (examples might include: tips for your application, meeting faculty and having a chance to see career outlook)
- Host booths at targeted conferences and career fairs to reach working professionals
- Call all leads within 24 hours of RFI (request for information) form submission including video conferencing as requested to answer questions.
- One to one email and texting with prospective students to answer questions and connect to program staff as appropriate
- Develop automated campaigns to move prospective students from 1) being interested and wanting to learn more to 2) starting the application to 3) finally completing the application
- Develop automated yield campaigns and strategies to get accepted students to enroll
- Coordinate many of the above recruitment activities in conjunction with partner departments (e.g., partners take program brochures to conferences they attend)

What is the recruiting and admissions strategy for underrepresented students?

Science, Technology, Engineering and Mathematics (STEM) fields, have historically been and are currently lacking in representation of under-served populations. This includes both ethnic minorities and women. Increasing representation of women and minorities in the Environmental Remediation and Management program will be a priority and we plan to partner with the CALS Equity and Diversity Committee to identify opportunities for recruitment and retention of underrepresented student populations. Additionally, we will work in concert with DCS to market the degree via career fairs and conferences broadly, but also focus on events that draw together underrepresented student populations, such as:

- SACNAS - Society for Advancement of Chicanos/Hispanics and Native Americans in Science- is an inclusive organization dedicated to fostering the success of Chicanos/Hispanics and Native Americans, from college students to professionals, in attaining advanced degrees, careers, and positions of leadership in STEM. Program will be represented at the SACNAS National Diversity in STEM Conference (Fall).
- AISES – American Indian Science and Engineering Society - with a membership of more than 4,600 individual members, AISES supports American Indian students in STEM disciplines. AISES has awarded over $11 million in academic scholarships to American Indian STEM students. Through scholarships and internships, workforce development and career resources, national and regional conferences, science fairs, leadership development and other STEM focused programming. Program representative will attend annual conference. The program will be represented at the AISES National Conference.
MANRRS -- Minorities in Agriculture Natural Resources and Related Sciences. MANRRS is a national society that fosters and promotes the agricultural sciences and related fields in a positive manner among ethnic minorities and works to ensure that ethnic minorities will be involved in and associated with the agricultural sciences and related fields. MANRRS provides networks to support professional development of minorities. MANRRS also serves employers in the broader agricultural and natural resources sector. It provides them a platform to identify prospective well-qualified employees who are members of ethnic groups, which, when combined, are projected to be the new majority in the workforce in the not too distant future. The program will be represented at the MANRRS National Conference.

The planning committee recognizes that program expense may be a barrier to entry. Therefore, by the third year of the program at least 5% of program net revenues will be used to support scholarships for students from under-resourced populations to support our recruiting goals around diversity. This amount equates to roughly four full scholarships or many more partial scholarships, to recruit and retain high quality candidates from all backgrounds.

Projected Annual Enrollment:

<table>
<thead>
<tr>
<th>Year</th>
<th>Projected Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>20</td>
</tr>
<tr>
<td>Year 2</td>
<td>30</td>
</tr>
<tr>
<td>Year 3</td>
<td>40</td>
</tr>
<tr>
<td>Year 4</td>
<td>50</td>
</tr>
<tr>
<td>Year 5</td>
<td>50</td>
</tr>
</tbody>
</table>

Describe plans for supporting enrollments that are much higher or much lower than the anticipated enrollment.

In the event of low enrollment, efforts to expand administrative resources will be curtailed and instructional expenses will decrease, as they are linked to student enrollment through the $/credit instructional compensation. Marketing, recruitment and enrollment data will be evaluated to assess shortcomings and identify overlooked opportunities. Marketing and recruiting techniques will be re-evaluated and re-engaged in the marketplace to increase enrollment in the next cycle.

If higher-than-expected enrollment were to occur, expanding instructional resources will be a first priority. New course sections will be created for required courses and any high-demand elective courses. High enrollment will produce high tuition revenue, and this would be applied to increasing existing instructor appointments, and/or hiring additional teaching assistants, and/or tapping private sector instructional expertise, and/or one-time faculty overload requests. Staff capacity can be rapidly increased through use of student hourly workers, overload requests and overtime depending on employee labor classification. If the high enrollment levels continue, additional instructional and administrative staff will need to be hired.

Those who are not familiar with using the html editor fields may upload a document with information about the curriculum for use by those who will format and edit the content that will appear in the Guide.

Guide Requirements tab

Approved Shared Content from /shared/graduate-minimum-degree-requirements-and-satisfactory-progress/
Last Approved: May 14, 2020 3:39pm

Minimum Graduate School Requirements

Review the Graduate School minimum academic progress and degree requirements, in addition to the program requirements listed below.

Major requirements

Mode of instruction

<table>
<thead>
<tr>
<th>Mode of Instruction</th>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Approved Shared Content from /shared/graduate-school-mode-instruction-definitions/

Last Approved: Oct 15, 2020 8:18am

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students are able to complete a program with minimal disruptions to their life commitments.

Evening/Weekend: Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the flexibility to work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online environment.

Curricular Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit Requirement</td>
<td>30 credits</td>
</tr>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>16 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework Requirement</td>
<td>Half of degree coursework (15 credits out of 30 total credits) must be completed graduate-level coursework; courses with the G</td>
</tr>
<tr>
<td>Overall Graduate GPA Requirement</td>
<td>3.00 GPA required.</td>
</tr>
<tr>
<td>Other Grade Requirements</td>
<td>The Graduate School requires that students maintain a graduate grade-point average (GPA) of 3.00 (on a 4.00 scale) for all grading. Incomplete course grades are considered to be unsatisfactory if they are not removed during the next enrolled semester.</td>
</tr>
<tr>
<td>Assessments and Examinations</td>
<td>No formal examination is required.</td>
</tr>
<tr>
<td>Language Requirements</td>
<td>No language requirements.</td>
</tr>
</tbody>
</table>

Course List

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL</td>
<td>Environmental Soil Contamination</td>
</tr>
<tr>
<td>SOIL SCI 430</td>
<td>Colloquium: Environmental Remediation and Management</td>
</tr>
<tr>
<td>SOIL SCI 730</td>
<td>Hydrogeology</td>
</tr>
<tr>
<td>GEOSCI/G L E 627</td>
<td>Professional Presentations</td>
</tr>
<tr>
<td>F P D 702</td>
<td>Scientific Writing</td>
</tr>
<tr>
<td>LSC 560</td>
<td>Hazardous Waste Operations and Emergency Response (HAZWOPER) and Field Safety Training</td>
</tr>
<tr>
<td>SPRING</td>
<td>Assessment of Environmental Impact</td>
</tr>
<tr>
<td>SOIL SCI 330</td>
<td>Toxins in the Environment: Sources, Distribution, Fate, &amp; Effects</td>
</tr>
<tr>
<td>SOIL SCI/ENVIR ST 575</td>
<td>Colloquium: Environmental Remediation and Management</td>
</tr>
<tr>
<td>SOIL SCI/CV ENGR/M&amp;ENV TOX 631</td>
<td>Remediation Geotechnics</td>
</tr>
<tr>
<td>SOIL SCI 730</td>
<td>Risk Communication</td>
</tr>
<tr>
<td>CV ENGR/G L E 635</td>
<td>Field Methods for Environmental Characterization, Analysis, and Monitoring</td>
</tr>
<tr>
<td>LSC 625</td>
<td>Financial and Business Acumen</td>
</tr>
<tr>
<td>SUMMER</td>
<td>Project Management Essentials</td>
</tr>
<tr>
<td>SOIL SCI 630</td>
<td>Colloquium: Environmental Remediation and Management</td>
</tr>
<tr>
<td>SOIL SCI 730</td>
<td>Financial and Business Acumen</td>
</tr>
<tr>
<td>F P D/ACCT BS/GEN BUS 781</td>
<td>Colloquium: Environmental Remediation and Management</td>
</tr>
<tr>
<td>F P D/GEN BUS/OTM 784</td>
<td>Project Management Essentials</td>
</tr>
</tbody>
</table>

M.S. in Environmental Remediation and Management

Approved Shared Content from /shared/graduate-school-policies/

Last Approved: May 18, 2020 11:25am

Graduate School Policies

The Graduate School’s Academic Policies and Procedures provide essential information regarding general university policies. Program authority to set degree policies by school lies with the degree program faculty. Policies set by the academic degree program can be found below.
Specific Policies

PRIOR COURSEWORK

Graduate Work from Other Institutions
Students will not be permitted to use credits from previously earned graduate coursework.

UW-Madison Undergraduates
With program approval, up to 6 credits of coursework listed in the required courses grid may be counted toward the course requirements. No credits may be counted toward the course requirements. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

UW-Madison University Special
With program approval, and payment of the difference in tuition, students are allowed to count up to 15 credits of coursework numbered 300 or above taken at the minimum graduate residence credit requirement and the minimum graduate degree credit requirement. These credits may be counted toward the minimum if they are in courses numbered 700 or above. Coursework earned five or more years prior to admission is not allowed to satisfy requirements.

PROBATION

The Graduate School regularly reviews the record of any student who earned grades of B, C, D, F, or Incomplete in a graduate course (300 or above). This review considers future enrollment or in being suspended from the Graduate School.

Good standing (progressing according to standards; any funding guarantee remains in place).
Probation (not progressing according to standards but permitted to enroll; loss of funding guarantee; specific plan with dates and deadlines in place in regard to Unsatisfactory progress (not progressing according to standards; not permitted to enroll, dismissal, leave of absence or change of advisor or program).

A semester GPA below 3.0 will result in the student being placed on academic probation. If a semester GPA of 3.0 is not attained during the subsequent semester of enrollment if enrolled part-time), this will be deemed unsatisfactory progress and the student may be dismissed from the program or allowed to continue for one ad

The Graduate School.

ADVISOR

Every student in the program will be required to have an advisor. Program staff will work with the student to identify an advisor during the fall semester. Once an advisor is named, the student is expected to maintain communication with their advisor to ensure they are making satisfactory progress toward their degree.

CREDITS PER TERM ALLOWED

Students will follow the prescribed course sequence.

TIME CONSTRAINTS

Master's degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

Grievances and appeals

Approved Shared Content from /shared/graduate-school-grievance-policy/

Last Approved: May 14, 2020 3:39pm

These resources may be helpful in addressing your concerns:
Bias or Hate Reporting
Graduate Assistantship Policies and Procedures
Hostile and Intimidating Behavior Policies and Procedures
Office of the Provost for Faculty and Staff Affairs
Dean of Students Office (for all students to seek grievance assistance and support)
Employee Assistance (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-docs, and graduate students)
Employee Disability Resource Office (for qualified employees or applicants with disabilities to have equal employment opportunities)
Graduate School (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
Office of Compliance (for class harassment and discrimination, including sexual harassment and sexual violence)
Office of Student Conduct and Community Standards (for conflicts involving students)
Ombuds Office for Faculty and Staff (for employed graduate students and post-docs, as well as faculty and staff)
Title IX (for concerns about discrimination)

Approved Shared Content from /shared/college-agricultural-life-sciences-grievance-policy/

Last Approved: May 14, 2020 2:20pm

College of Agricultural and Life Sciences: Grievance Policy

in the College of Agricultural and Life Sciences (CALS), any student who feels unfairly treated by a member of the CALS faculty or staff has the right to complain about the treatment. Some complaints may arise from misunderstandings or communication breakdowns and be easily resolved; others may require formal action. Complaints may concern any of the following:

- To ensure a prompt and fair hearing of any complaint, and to protect the rights of both the person complaining and the person against whom the complaint is directed, the College of Agricultural and Life Sciences (CALS) has established procedures for handling complaints.

https://next-guide.wisc.edu/courseleaf/approve/?role=GRAD SCH Dept. Approver 13/16
The student should first talk with the person at whom the complaint is directed. Most issues can be settled at this level. Others may be resolved by established department if the student is unsatisfied, and the complaint involves any unit outside CALS, the student should seek the advice of the dean or director of that unit to determine how to if the complaint involves an academic department in CALS the student should proceed in accordance with item 3 below.

The student should contact the department’s grievance advisor within 120 calendar days of the alleged unfair treatment. The departmental administrator can provide this attempt to resolve the problem informally within 10 working days of receiving the complaint, in discussions with the student and the person at whom the complaint is dire if informal mediation fails, the student can submit the grievance in writing to the grievance advisor within 10 working days of the date the student is informed of the fail advisor. The grievance advisor will provide a copy to the person at whom the grievance is directed.

The grievance advisor will refer the complaint to a department committee that will obtain a written response from the person at whom the complaint is directed, providing request a hearing before the committee. The grievance advisor will provide both parties a written decision within 20 working days from the date of receipt of the written c if the grievance involves the department chairperson, the grievance advisor or a member of the grievance committee, these persons may not participate in the review.

If not satisfied with departmental action, either party has 10 working days from the date of notification of the departmental committee action to file a written appeal to the subcommittee of this committee will make a preliminary judgment as to whether the case merits further investigation and review. If the subcommittee unanimously denies investigation and review, its decision is final. If one or more members of the subcommittee determined that the case does merit further investigation and review, the subcommittee will continue to consider the appeal. If this mediation attempt fails, the subcommittee will bring the case to the full committee. The committee may seek additional information if necessary and present a written recommendation to the dean who will provide a final decision within 20 working days of receipt of the committee recommendation.

If the alleged unfair treatment occurs in a CALS unit that is not an academic department, the student should, within 120 calendar days of the alleged incident, take his/her Academic Affairs. The dean will attempt to resolve the problem informally within 10 working days of receiving the complaint. If this mediation attempt does not succeed, the dean will refer it to the CALS Equity and Diversity Committee. The committee will seek a written response from the person at whom the complaint is directed, sub item 3 above.

**OTHER**

Students enrolled in this program are not permitted to accept teaching assistantships, project assistantships, research assistantships or other appointments that would program cannot enroll in other graduate programs nor take courses outside the prescribed curriculum.

Discuss expected progress to degree and time to degree. For undergraduate programs discuss considerations for supporting students to complete the degree in four acad The program is an accelerated, 12-month program that begins each fall semester. Completion of degree requirements is expected to take three semesters and therefore will end with a summer semester.

### Program Learning Outcomes and Assessment

List the program learning outcomes.

<table>
<thead>
<tr>
<th>Outcomes - enter one learning outcome per box. Use the green + to create additional boxes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
</tbody>
</table>

*When learning outcomes are changed, a new assessment plan must be uploaded.*

Summarize the assessment plan.

The department chair and program manager will coordinate implementation of the assessment plan annually. All program faculty and staff will be advised on what assessment activities they are responsible for conducting at the beginning of each program year. The program manager will collect and analyze assessment data and compile results into an initial program assessment report. The initial assessment report will be reviewed by the program’s advisory committee and will be presented at the annual Department of Soil Science faculty retreat. At these meetings, the program manager will review enrollment information, course progression, degree completion, and the initial assessment plan.

An annual academic program assessment report will be prepared by the program manager and submitted to the Office of the Provost, in accordance with UW-Madison institutional guidelines on student learning outcomes.
assessment. The faculty chair and program manager will develop a plan to implement recommendations from the annual academic program assessment report and program adjustments will be implemented the following academic year.

DCS distributes a pre-degree survey to collect feedback on student expectations as they start the program. Student’s familiarity with the program learning outcomes, prior experience with various course formats, work experience, and expected interactions with professors and other students are examples of feedback that will be solicited. This survey provides an important entry benchmark that allows the program to not only compare entry trends over time, but also cohort trends as students complete their program.

The UW-Madison Graduate School conducts a Masters Exit Survey (MES) to provide the Graduate School with post-degree placement information, and to help identify areas for program improvement. The MES measures student perceptions about the academic and career advising they received while enrolled, whether students believe the program met its learning outcomes, and whether students feel prepared for the next step in their career path.

Department Approved  
Assessment Plan MS EnvRem.docx

Related Programs

Provide information on related programs offered by other UW System institutions and explain the extent to which the proposed program is distinct and how it overlaps or

• Master of Natural Resources, UW-Stevens Point: A program focused on ecological principles of natural resources management and not the assessment and remediation of environmental contaminants. The program offers only one course (NRES 776) that is a potential overlap with the proposed program curriculum.
• MS in Environmental Science & Policy, UW-Green Bay: This program includes four areas of emphasis, including environmental policy and administration and environmental technology and analysis. The technology and analysis area prepares students to design and conduct scientific investigations, interpret data to make responsible decisions that solve environmental problems, and communicate effectively. Students can study concepts of environmental modeling and remediation, waste transformation, utilization and disposal as a part of their curriculum. This is a traditional two-year program and does not include field-based characterization and monitoring coursework, nor does it emphasize the project management and communication skills sought by environmental consulting hiring managers.
• MS in Civil and Environmental Engineering, UW-Milwaukee: This program requires a B.S. in engineering from an Accreditation Board for Engineering and Technology (ABET) accredited program, and allows students to take coursework in the environmental engineering and water resources specialty area. While environmental engineers do often work in environmental remediation, they represent only a subset of the discipline. The proposed program will primarily serve students with BS degrees outside of engineering.
• Professional Science Master’s in Conservation Biology from UW-Stout: This program focuses on the sustainability of biodiversity, and includes information on environmental laws and regulations with respect to ecosystems and does not provide training in environmental contamination or remediation.
• MS in Sustainable Management, collaboration between UW-Green Bay, UW-Oshkosh, UW-Parkside, UW-Stout, and UW-Superior: This program is primarily a non-technical management degree and does not include the technical assessment, remediation and compliance outcomes of the proposed program. The curriculum includes a single course in waste management and resource recovery.
• MS in Environmental Conservation, Nelson Institute: This program offers two professional master’s degree options, Environmental Observation and Informatics (EOI) and Environmental Conservation. The conservation option focuses on conservation planning, land use policy and professional skills, while the EOI option offers earth sensing technology, data analytics and modeling, and geospatial analysis. We have discussed the proposed program with the Nelson Institute and have confirmed that there is no overlap in the curriculum and that there are many opportunities for synergistic collaboration between students in both programs.
• MS in Environment and Resources, Nelson Institute: This program allows students to pursue a broad range of environmental studies incorporating physical or biological science research with social sciences and humanities. The program does not include specific depth areas, but allows flexibility for students to create a course plan suited to address environmental problems identified in their individual research. This is an interdisciplinary thesis-based research program and does not offer the technical, communication, and management skills.
Commitments

Courses in the curriculum are numbered 300 or higher.
   Yes

The program faculty/staff will ensure the program website, Advance Your Career materials if applicable, and other presentations are consistent with the Guide information.
   Yes

Credential will not be awarded retroactively to students who completed all of the requirements before the credential was approved.
   Yes

Supporting Information
January 14, 2019

Alfred Hartemink, PhD
Professor and Chair
Department of Soil Science
College of Agricultural and Life Sciences
University of Wisconsin-Madison

Dear Dr. Hartemink,

The Department of Biological Systems Engineering offers our continued support for the development of a professional Master of Science in Environmental Remediation and Management within the Department of Soil Science. We have reviewed the Approval to Plan and are pleased with its collaborative direction. Unless significant changes to the Approval to Plan are made during the campus governance process, our support extends through the full proposal stage.

The Department of Biological Systems Engineering is eager to contribute to addressing the need for professionals with the technical, communication, and project management skills actively sought by national and international employers. This program will support the broad CALS mission to meet the demand for new educational programming, in collaboration with institutional and industry partners, to provide healthy ecosystems, promote health and wellness, and to stimulate economic development.

In summary, we fully support the efforts of my faculty colleagues to participate in the program planning, course development, executive committee leadership and teaching associated with the new Environmental Remediation program. We look forward to offering this exciting new program with you in the future.

Sincerely,

Troy Runge
Associate Professor and Chair
Biological Systems Engineering
115E Ag Engineering | 460 Henry Mall | Madison, WI 53706
April 10, 2019

Alfred Hartemink, PhD
Professor and Chair
Department of Soil Science
College of Agricultural and Life Sciences
University of Wisconsin-Madison

Dear Dr. Hartemink,

The Department of Civil and Environmental Engineering (CEE) has reviewed the proposal and offers our general support for the development of a professional Master of Science degree within the Department of Soil Science on the topic of environmental remediation. We have reviewed the Approval to Plan and are pleased with its collaborative direction. The proposed MS program appears to support the broad CALS mission to meet the demand for new educational programming in collaboration with institutional and industry partners, to provide healthy ecosystems, to promote health and wellness, and to stimulate economic development. Unless significant changes to the Approval to Plan are made during the campus governance process, our general support extends through the full proposal stage.

There are however a number of items that CEE would like to see addressed if this proposal moves forward. Specifically, CEE offers the following additional conditions of support:

- Please consider changing the name/title of the degree program. A degree title comparable to “Science and Management of Environmental Remediation” or “Environmental Remediation Science and Management” or “Practice of Environmental Remediation Science” is suggested. CEE currently has a MS degree program in Geotechnical Engineering in which many of the same courses can be taken. It is important to CEE that there is a clear differentiation between the CEE and Soil Science degree programs. A name change will potentially help better inform the planning process and detailed curriculum requirements as well as clearly differentiate the degree programs.
- Please add the “Geotechnical Engineering” named option MS degree program to the list of degree options in CEE.
- Please add the “Geological Engineering” MS degree program to the list of degree options in CEE.
- If your proposal is approved by campus, CEE requests that the following items be addressed during the planning process:
  - The plan lists a number of employers who are supportive of such a degree program. Provide documentation of this support including a discussion of which types of employees they see taking the new program versus one of our current and relevant engineering programs.
  - Develop a detailed plan for sharing of revenue for those programs expected to provide seats in classes.
Develop a curriculum that emphasizes science with supplemental coursework in engineering and management.

- Provide CVs and expected roles of core faculty and staff to ensure that experience is appropriate and that capacity is available.

CEE would also like to make you aware of the MS and PhD degree program in Environmental Chemistry and Technology which is offered by CEE and makes a significant contribution in this space. CEE is happy to contribute to addressing the needs for professionals with the technical, communication, and project management skills actively sought by national and international employers.

Finally, CEE offers to provide one or more members of our faculty to serve on your planning committee as you move forward. Please reach out when future meetings are scheduled. I fully support my faculty colleagues participating in the program planning, course development, executive committee leadership, and teaching associated with the new MS program.

Please contact me at (608) 265-1882 if I can be of further assistance.

Sincerely,

David A. Noyce, Ph.D., P.E., F.ASCE
January 22, 2019

Alfred Hartemink, PhD
Professor and Chair
Department of Soil Science
College of Agricultural and Life Sciences
University of Wisconsin-Madison

Dear Dr. Hartemink,

The Department of Life Sciences Communication (LSC) offers our continued support for the development of a professional Master of Science in Environmental Remediation within the Department of Soil Science. We have reviewed the Approval to Plan and are pleased with its collaborative direction. Unless significant changes to the Approval to Plan are made during the campus governance process, our support extends through the full proposal stage.

LSC is eager to contribute to addressing the need for professionals with the technical, communication, and project management skills actively sought by national and international employers. This program will support the broad CALS mission to meet the demand for new educational programming, in collaboration with institutional and industry partners, to provide healthy ecosystems, promote health and wellness, and to stimulate economic development.

LSC fully supports the efforts of our faculty colleagues to participate in the program planning, course development, executive committee leadership and teaching associated with the new Environmental Remediation program. We look forward to offering this exciting new program with you in the future.

Sincerely,

Dominique Brossard, Ph.D.
Professor and Chair
Department of Life Sciences Communication
25 February 2019

To Parties Concerned:

I write in my capacity as de facto chair of the Academic Programs in support of the proposal to obtain permission to plan the program: Master of Science in Environmental Remediation. Overall we think that will be useful addition to the offerings at UW Madison. In its present form we see it as compatible with our own professional programs. I note the disclaimer that this support is issued without detailed consideration the appropriate governance bodies in Nelson. This is done in the expectation of the opportunity to conduct a thorough review of the proposal when it will become available in Lumen.

We have met with Dr. Ed Boswell to discuss this proposal. We explored potential areas of competition and collaboration. In the balance, the Nelson Institute believes that the proposed program and our professional programs in Environmental Conservation are more likely to be collaborative than competitive.

The collaborative prospects for the proposed program arise because of intersection in at least two areas. The technical issues of soil remediation are relevant to many EC students interested in ecological restoration who could benefit from a soils expertise that is not presently part of the curriculum of EC. The named option in EC, Environmental Observation and Informatics (EOI), emphasizes the applied aspects of GIS and remote sensing, both topics that will of interest to students in the proposed program. We discussed the possibility of synergisms for example: sharing guest speakers, EC students doing laboratory visits to learn about how the detailed work of remediation is conducted, remediation students perhaps taking EOI courses or participating with EC students in field visits to areas of conservation interest, and the like.

We discussed that if in the future they drift toward a field generally known as “ecological restoration” there could be issues. This field is more general and of interest to a significant number of our current EC students. It has an emphasis on complete ecosystem restoration including the manipulation of macroscopic organisms (plants, animals) whereas the proposed degree would focus more on the soils, soil biota, and topography. We were assured that such a shift will not happen in the short run and if considered in the future would not be undertaken without in-depth consultation.

Sincerely,

Paul H. Zedler
Associate Director for Research and Education
January 15, 2019

Alfred Hartemink, PhD
Professor and Chair
Department of Soil Science
College of Agricultural and Life Sciences
University of Wisconsin-Madison

Dear Dr. Hartemink,

The Department of Planning and Landscape Architecture in the College of Letters and Sciences offers our continued support for the development of a professional Master of Science in Environmental Remediation within the Department of Soil Science. We have reviewed the Approval to Plan and are pleased with its collaborative direction. Unless significant changes to the Approval to Plan are made during the campus governance process, our support extends through the full proposal stage.

While we offer a MS in Landscape Architecture, with a specialization in Restoration Ecology and Ecological Design, we believe the proposed MS in Environmental Remediation will complement more than compete with our Restoration program. We will be happy to explore potential collaborations to provide restoration expertise and courses as desired.

We support your efforts addressing the need for professionals with the technical, communication, and project management skills actively sought by national and international employers. The Environmental Remediation program will support the broad CALS mission to meet the demand for new educational programming, in collaboration with institutional and industry partners, to provide healthy ecosystems, promote health and wellness, and to stimulate economic development.

I fully support the efforts of my faculty colleagues to participate in the program planning, course development, executive committee leadership and teaching associated with the new Environmental Remediation program. We look forward to offering this exciting new program with you in the future.

Sincerely,

Ken Genskow, Department Chair
Notice of Intent
Master of Science-Environmental Remediation and Management

Program Details
Degree name/major: Master of Science - Environmental Remediation & Management
Academic home: Department of Soil Science, College of Agricultural and Life Sciences
Mode of delivery: Face-to-face
Primary contact: Jocelyn Milner, Vice Provost for Academic Affairs

Program Description

In the US and internationally, thousands of abandoned commercial and industrial sites exist that have unknown levels of soil and groundwater contamination presenting complex situations for public and private interests. In addition to their potential for affecting community health, these sites present significant barriers to the growth and revitalization of urban neighborhoods. As outlined in the US Environmental Protection Agency roadmap, remediation and redevelopment of these sites involves understanding state and federal regulations, conducting site assessments and investigations, and, if required, selecting soil and groundwater remediation or containment technologies to achieve case closure.

Many phases of environmental assessment, remediation, and redevelopment work are within the purview of environmental scientists within consulting companies driven to efficiently meet regulatory compliance for their clients prior to property transfer or redevelopment. This work often requires a diverse skillset to meet not only the technical requirements of environmental compliance but also to address community concerns, understand and facilitate funding opportunities for site cleanup and redevelopment, and manage field personnel and projects. To address these needs, the program will provide advanced training in the technical aspects of environmental assessment and remediation, address the need for effective written and oral communication, and provide personnel and project management training. The program will provide in-depth physical science knowledge related to soil and groundwater and, through coursework in project management, provide a foundation for rising to project management and business development level positions within the field of environmental remediation. Additionally, Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) 40-hour training, required for workers involved in remediation work, will be provided as part of the program, streamlining the hiring and training process for employers.

Need for Program

There is strong national market demand for the environmental science skills proposed within this program. A market analysis using Burning Glass Technologies real-time job market analytics software and found over 9,000 jobs that require one or more of the environmental remediation-related skills and that are open to applicants with a Master’s degree. These jobs are in a variety of occupations and industries and most of those occupations are projected to grow between 2016 and 2026. In Wisconsin, Madison has an approximately four times higher demand than the national average, while at the same time, there is a gap
in graduate programs specializing in environmental remediation in the Midwest (see below), indicating that the Madison-Milwaukee region will be a good location for employment of graduates.

A market analysis shows that over 93 institutions offer Masters programs in environmental health and engineering-related fields nationally, but market share is dispersed geographically and most programs are at institutions on the east and west coasts. The proposed program will capitalize on the Midwest market for students and is also distinguished among available programs by offering field, project management, and communication experience through professionally-driven case studies.

Professional practitioners from within environmental consulting and engineering firms (SCS Engineers, True North Consultants, TRC Companies, Ayers and Associates, Cornerstone Environmental, Pace Analytical, WPS, Jacobs Consultancy, Cascade Environmental) and the Wisconsin Department of Natural Resources Remediation and Redevelopment Program have shown support and enthusiasm for the initial program design. Input from practitioners identified in-demand skills often lacking in new employees including field experience, OSHA 40-hour HAZWOPER training, regulatory knowledge, written and oral communication skills, and personnel and project management skills. We plan to develop the curriculum to include these skills and intend to maintain a working relationship with environmental professionals and regulators throughout the development and delivery of the program.

**Complement to existing offerings within the UW System**

No existing programs serve graduates with BS degrees outside of engineering by offering the in-depth technical, project management, and communications focus specific to a specialization in environmental assessment and remediation of the proposed program. Programs of interest within UW System include:

- **Master of Natural Resources, UW-Stevens Point**: A program focused on ecological principles of natural resources management and not the assessment and remediation of environmental contaminants. The program offers only one course (NRES 776) that is a potential overlap with the proposed program curriculum.
- **MS in Environmental Science & Policy, UW-Green Bay**: This program includes four areas of emphasis, including environmental policy and administration and environmental technology and analysis. The technology and analysis area prepares students to design and conduct scientific investigations, interpret data to make responsible decisions that solve environmental problems, and communicate effectively. Students can study concepts of environmental modeling and remediation, waste transformation, utilization and disposal as a part of their curriculum. This is a traditional two-year program and does not include field-based characterization and monitoring coursework, nor does it emphasize the project management and communication skills sought by environmental consulting hiring managers.
- **Professional Science Master’s in Conservation Biology from UW-Stout**: This program focuses on the sustainability of biodiversity, and includes information on environmental laws and regulations with respect to ecosystems and does not provide training in environmental contamination or remediation.
- **MS in Sustainable Management, collaboration between UW-Green Bay, UW-Oshkosh, UW-Parkside, UW-Stout, and UW-Superior**: This program does not include the technical assessment, remediation and compliance outcomes of the proposed program. The curriculum includes a single course in waste management and resource recovery.

Several UW-Madison programs focus on environmental issues and the Department of Soil Science expects to partner with many of these programs by incorporating courses into the proposed program. These programs include:
• MS in Environmental Conservation, Nelson Institute: This program offers two professional master’s degree options, Environmental Observation and Informatics (EOI) and Environmental Conservation. The conservation option focuses on conservation planning, land use policy and professional skills, while the EOI option offers earth sensing technology, data analytics and modeling, and geospatial analysis. We have discussed the proposed program with the Nelson Institute and have confirmed that there is no overlap in the curriculum and that there are many opportunities for synergistic collaboration between students in both programs.

• MS in Environment and Resources, Nelson Institute: This program allows students to pursue a broad range of environmental studies incorporating physical or biological science research with social sciences and humanities. The program does not include specific depth areas, but allows flexibility for students to create a course plan suited to address environmental problems identified in their individual research. This is an interdisciplinary thesis-based research program and does not offer the technical, communication, and management skills in the proposed program.

• MS in Landscape Architecture, College of Letters and Science: This program offers a specialization in Restoration Ecology and Ecological Design, which focuses on natural landscaping and plant community restoration and not the identification, assessment, and remediation of environmental contamination.

The mission of the College of Agricultural and Life Science is to advance and share knowledge, discover solutions and promote opportunities in food, agriculture, bioenergy, health and environment, and human wellbeing. A specific focus for healthy ecosystems is managing landscapes to help provide clean water and air, mitigate climate change and promote biodiversity while building communities and offering economic gain. Similarly, CALS is committed to safe healthy food supply by ensuring runoff from soils and water supplies and the impact on human health. Lastly, economic and community development promotes the increasing ways our local economy is influenced by global markets. The proposed program will support CALS mission by preparing environmental scientists to apply technical and collaborative decision-making skills to promote community and economic development.

Program Learning Outcomes and Curriculum

Upon completing the program, students will be able to:

1. Identify the nature, source, and mobility of environmental contaminants.
2. Demonstrate understanding of the regulatory requirements pertinent to the assessment, investigation and remediation of environmental contamination.
3. Create reports for the assessment, investigation, and closure of environmentally contaminated sites.
4. Collect environmental samples, prepare samples for analysis, and interpret analytical data.
5. Assess contaminated soil and groundwater remediation strategies.
6. Communicate project information to technical and non-technical stakeholders.
7. Manage projects in environmental assessment, investigation, and remediation.

The program is a 30-credit accelerated program with a duration of 12 months of full-time enrollment to include a fall, spring, and summer semester. The program staff will assist with internship placement to the extent of fostering relationships with internship companies and offering those connections to students. The program will work closely with students and placement partners to identify and match goals and expected outcomes.

Required Courses (all are graduate-level):
Toxicants in the Environment: Sources Distribution and Fate (Soil Science 631)
Assessment of Environmental Impact (Soil Science 575)
Scientific Writing (LSC 560)
Risk Communication (LSC 625)
Project Management (EPD 784)
Presentation for Professionals (EPD 702)
Financial and Business Acumen (EPD 781)
Remediation Geotechnics (CEE/GLE 635)
Hydrogeology (Goesci/GLE 627)
HAZWOPER Training (existing online training or may incorporate as a 1-credit soil sci. course)
Colloquium (new 2-credit course in soil science)
Soil Science for Environmental Professionals (new 3-credit course in soil science)
Characterization and Monitoring Technologies (new 3-credit course in soil science)

Enrollment

Enrollment in the program will start with 15 new students in Fall 2020 and will grow to enroll 50 new students annually by the five year mark. Students who are graduates from UW-Madison’s BS-Environmental Sciences program (currently about 60 graduates annually) would be well prepared as would students from similar programs across the UW System and nationally.

Faculty and Staff

An Executive Program Committee with participation from the Department of Soil Science faculty will provide governance over program and academic issues. The core faculty and staff supporting development of this program include:

- Professors Alfred Hartemink, Joel Pedersen, and Steve Ventura, Department of Soil Science. Edward Boswell, Geoff Siemering, Department of Soil Science.
- Professors Steven Loheide, Matthew Ginder-Vogel, and Jim Tinjum, College of Engineering.
- Professor Troy Runge, Biological Systems Engineering.

Funding

This program is expected to be self-funded through tuition revenue within three years of development. Enrollment will begin with 15 students and increase until at least 50 students are supported each cohort by the fifth year of the program. Revenue captured will be used to cover all program instructional and direct support costs.