APPROVAL FORM FOR

DEGREE PROGRAMS

MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

College Arts & Sciences **Department:** Geosciences

Contact Person: John Rodgers **Mail Stop:** 9537 **E-mail:** jcr100@msstate.edu

Nature of Change: Modification **Date Initiated:** August 5, 2024

Current Degree (BS, MS, etc.): MS Geosciences

Current Major:

Current Concentration(s): Environmental Geosciences

Current Campus(es): ☐ Starkville ☐ Meridian ☑ Distance ☐ Gulf Coast*

*Gulf Coast campus for Bagley College of Engineering only

New Degree (BS, MS, etc.):

Effective Date:

Semester	Year
Spring**	2025

**Any new program or modification desiring a starting semester other than fall must include a justification

Proposed Major:

Proposed Concentration(s):

Proposed Campus(es)

☐ Starkville
☐ Meridian
☑ Distance
☐ Gulf Coast*

*Gulf Coast campus for Bagley College of Engineering o

Summary of Proposed Changes:

We offer four organizational changes to reverse the decline in enrollment in ENGS. (1) allow for specified post-baccalaureate certificates to be ingested as a "stackable" degree, providing flexible entry and exit points; (2) a new concentration core comprised of existing courses to provide more structure; (3) making field courses optional instead of mandatory; and (4) replacing Research Methods with a Capstone Course.

Approved:	Date:
John Rodgers, Professor and Head — Digitally signed by John Rodgers, Professor and Head Date: 2024.09.26 17:17:15 -05'00'	09/26/2024
Department Head	
Director of Academic Quality	10/21/2024
Chair, College or School Curriculum Committee	10/22/2024
Dean of College or School	10/22/2024
Chair, University Committee on Courses and Curricula	
Chair, Graduate Council (if applicable)	
Chair, Deans Council	

MASTERS OF SCIENCE DEGREE IN GEOSCIENCES, MODIFICATION OF ENGS CONCENTRATION

CATALOG DESCRIPTION AND CURRICULUM OUTLINE

Degree Modification Outline Form

CURRENT Program Overview	PROPOSED Program Overview
Admission The Department of Geosciences offers graduate study leading to the Master of Science degree in Geoscience and the Doctor of Philosophy degree in Earth and Atmospheric Science. An applicant to the program must have an undergraduate GPA of at least 2.75 on a scale of 4.00 for entry to the master's program and at least 3.00 at both the undergraduate and graduate level for entry to the doctoral program. Although helpful, an undergraduate background in Geosciences is not a prerequisite for admission into the M.S. in Geoscience program. All master's applicants are recommended to have completed Calculus I. Additional course prerequisites may be required depending on the student's emphasis area of interest. For admission to the Applied Meteorology program (AMP), applicants must hold a B.S. degree in a science and have completed GR 4733 or its equivalent. Specific classes in the AMP may require further prerequisites. Applicants to the doctoral program are required to have completed a thesis-based master's degree and have a background in one of the departmental emphasis areas. All applicants for the Doctoral program must identify a mentor (dissertation supervisor) prior to acceptance into the program. Applicants who have not completed a thesis or are from other science disciplines will be considered on a case-by-case basis through a petition, initiated by the identified mentor, to the department's graduate faculty. The doctoral degree student should anticipate a four-year program of study. Depending on the applicant's emphasis area of interest, Calculus I and II may be required for admission. The application package must contain the application for admission; at least three letters of reference; official bachelor's degree transcript; official transcripts from all colleges attended after earning the bachelor's degree (both undergraduate and graduate work); and a statement of purpose. Applicants desiring assistantship funding consideration are strongly advised to submit the assistantship application no later than January 15. Provisional Admission	Admission The Department of Geosciences offers graduate study leading to the Master of Science degree in Geoscience and the Doctor of Philosophy degree in Earth and Atmospheric Science. An applicant to the program must have an undergraduate GPA of at least 2.75 on a scale of 4.00 for entry to the master's program and at least 3.00 at both the undergraduate and graduate level for entry to the doctoral program. Although helpful, an undergraduate background in Geosciences is not a prerequisite for admission into the M.S. in Geoscience program. All master's applicants are recommended to have completed Calculus I. Additional course prerequisites may be required depending on the student's emphasis area of interest. For admission to the Applied Meteorology program (AMP), applicants must hold a B.S. degree in a science and have completed GR 4733 or its equivalent. Specific classes in the AMP may require further prerequisites. Applicants to the doctoral program are required to have completed a thesis-based master's degree and have a background in one of the departmental emphasis areas. All applicants for the Doctoral program must identify a mentor (dissertation supervisor) prior to acceptance into the program. Applicants who have not completed a thesis or are from other science disciplines will be considered on a case-by-case basis through a petition, initiated by the identified mentor, to the department's graduate faculty. The doctoral degree student should anticipate a four-year program of study. Depending on the applicant's emphasis area of interest, Calculus I and II may be required for admission. The application package must contain the application for admission; at least three letters of reference; official bachelor's degree transcript; official transcripts from all colleges attended after earning the bachelor's degree (both undergraduate and graduate work); and a statement of purpose. Applicants desiring assistantship funding consideration are strongly advised to submit the assistantship application no later than January 15. Provisional Admission

An applicant who has not fully met the GPA requirement stipulated by the University may be admitted on a provisional basis. The provisionally-admitted student is eligible for a change to regular status after receiving a 3.00 GPA on the first 9 hours of graduate courses at Mississippi State University (with no grade lower than a C). The first 9 hours of graduate courses must be within the student's program of study. Courses with an S grade, transfer credits, or credits earned while in Unclassified status cannot be used to satisfy this requirement. If a 3.00 is not attained, the provisional student shall be dismissed from the graduate program. Academic departments may set higher standards for students to fulfill provisional requirements; a student admitted with provisional status should contact the graduate coordinator for the program's specific requirements. While in the provisional status, a student is not eligible to hold a graduate assistantship.

Academic Performance

The Department of Geosciences follows the Graduate School guidelines regarding academic dismissal from an academic program. Additionally, a grade of U given for thesis or dissertation research hours, three grades of C, or a grade of D or F for any regular class will result in dismissal from the program.

Process for Petitions

In rare instances where exceptions are needed to the program guidelines set forth herein, the faculty mentor for the graduate student in question may petition the Department of Geosciences graduate faculty. The petition must be completed, in writing, and submitted to the graduate coordinator for dissemination to the full graduate faculty for review and vote. A majority vote will determine the outcome of the petition.

Concentration Descriptions

The thesis option is an on-campus thesis-based program that focuses in one of five possible emphasis areas within Geosciences, including Professional Meteorology, Professional Geology, Geospatial Science, Geography, or Environmental Geosciences.

The non-thesis option is an on-campus non-thesis program that implements coursework in either a single emphasis area or across multiple emphasis areas within Geosciences. It is designed primarily for those with interests in Environmental Geosciences or Broadcast Meteorology, though a non-thesis degree can be developed for any emphasis area or across multiple emphasis areas.

The Applied Meteorology Program is designed for individuals who are already in meteorological,

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The Applied Meteorology Program is designed for individuals who are already in meteorological,

climatological, and hazards-related careers. This non-thesis concentration is offered exclusively through distance education. The Environmental Geosciences concentration offers a broader cross-section of the geosciences and is designed for students with an interest in a wider range of sub-fields including: GIS, environmental science, oceanography, hydrology, and geology. The Environmental Geosciences concentration provides a broad geoscience background for careers in various government agencies, private consulting, education, etc. It is a non-thesis concentration offered exclusively through distance education.	climatological, and hazards-related careers. This non-thesis concentration is offered exclusively through distance education. The Environmental Geosciences concentration offers a broader cross-section of the geosciences and is designed for students with an interest in a wider range of sub-fields including: GIS, environmental science, oceanography, hydrology, and geology. The Environmental Geosciences concentration provides a broad geoscience background for careers in various government agencies, private consulting, education, etc. It is a non-thesis concentration offered exclusively through distance education.
CURRENT Degree Description	PROPOSED Degree Description
Degree: Master of Science Major: Geosciences	No change
Both a thesis track and a non-thesis track are available at the master's level for both on-campus and distance learning delivery methods. General Departmental Requirements All M.S. options require students to take a course in scientific methods. The on-campus thesis option also requires students to take an hour of seminar as part of their program of study. A student enrolled in the non-thesis option may petition the graduate faculty to complete a thesis. The department will not approve the request unless a faculty member has agreed to serve as major professor and a committee can be assembled. The department follows the Graduate School guidelines regarding the minimum number of course hours that must be at 8000-level or higher. Graduate committees must be comprised of 50% or greater graduate faculty from within the Department of Geosciences. Thesis option students are required to complete a thesis proposal defense, signed by their committee, as part of their program of study. The thesis proposal defense should not occur in the same semester as the thesis defense. Concentrations All on-campus programs fall under a general Geosciences major with thesis and non-thesis options. The department also offers the following concentrations through distance education: Applied Meteorology Program (AMP) Environmental Geosciences (ENGS) The AMP is designed for individuals who are already in meteorological, environmental, or hazards-related careers.	Both a thesis track and a non-thesis track are available at the master's level for both on-campus and distance learning delivery methods. General Departmental Requirements All M.S. options require students to take a course in scientific methods. The on-campus thesis option also requires students to take an hour of seminar as part of their program of study. A student enrolled in the non-thesis option may petition the graduate faculty to complete a thesis. The department will not approve the request unless a faculty member has agreed to serve as major professor and a committee can be assembled. The department follows the Graduate School guidelines regarding the minimum number of course hours that must be at 8000-level or higher. Graduate committees must be comprised of 50% or greater graduate faculty from within the Department of Geosciences. Thesis option students are required to complete a thesis proposal defense, signed by their committee, as part of their program of study. The thesis proposal defense should not occur in the same semester as the thesis defense. Concentrations All on-campus programs fall under a general Geosciences major with thesis and non-thesis options. The department also offers the following concentrations through distance education: Applied Meteorology Program (AMP) Environmental Geosciences (ENGS) The AMP is designed for individuals who are already in meteorological, environmental, or hazards-related careers.

The Environmental Geosciences concentration is intended for individuals interested in a *broader cross-section of the geosciences.*		The Environmental Geosciences concentration is intended for individuals interested in **a broader cross-section of the geosciences, with emphasis on interdisciplinary knowledge and practical skills necessary to understand and address complex environmental challenges, promoting sustainable solutions and advancing careers in environmental science and policy.**	
CURRENT CURRICULUM OUTLINE	Required Hours	**PROPOSED CURRICULUM OUTLINE**	Required Hours
Master of Science in Geosciences with Applied Meteorology Concentration		No change	
GR 8553 Research Methods in Geoscience	3		
GR 6303 Principles of GIS	3		
GR 8833 Weather and Society	3		
GR 8453 Quantitative Analysis in Climatology	3		
GR 8573 Research in Applied Meteorology	3		
	9		
Select at least one of the following: GR 6923 Severe Weather GR 6943 Tropical Meteorology			
Select at least nine hours from the following:[1] GR 6313 Advanced GIS GR 6333 Remote Sensing of the Physical Environment GR 6473 Numerical Weather Prediction GR 6603 Climatology GR 6753 Satellite and Radar Meteorology GR 6823 Dynamic Meteorology I GR 6933 Dynamic Meteorology II GR 8203 Ocean Science GR 8233 Environmental Geoscience GR 8613 Hydrology GR 8613 Hydrometeorology GR 8633 Climate Change GR 8813 Advanced Hazards and Disasters GR 8133 Foundations in	9 36		

Forecasting GR 8143 Advanced Forecasting Techniques Additional graduate-level coursework [2] Total Hours [1] Substitutions may be made with the approval of the major professor and committee with appropriate documentation. They must be noted on the program of study. Note: A split-level course completed at the undergraduate level cannot be repeated on the graduate level for use on the program of study. [2] A research project presentation and a written and oral comprehensive examination are required.			
Master of Science in Geosciences with Environmental Geosciences Concentration *GR 8553 Research Methods in Geoscience* *GR 8410 Field Methods Seminar or* *GR 8423 Virtual Field Methods or* *GR 8503 Landforms* *Select at least 9 hours from the following:* [1] *GG 6033 Resources and the Environment* *GG 6063 Earth and Atmospheric Energy Resources* *GR 6303 Principles of GIS* *GR 6313 Advanced GIS* *GR 6333 Remote Sensing of the Physical Environment* *GR 6863 Forensic Geoscience* *GG 6503 Geomorphology* *GG 6523 Coastal Environments* *GR 6123 Urban Geography*	*3* *3* *9*	**Master of Science in Geosciences with Environmental Geosciences Concentration** **Core Courses (Required):** **GR 8233 Environmental Geosciences** **GG 8613 Hydrology** **GR 8633 Climate Change** **GR 8583 Geoscience Capstone** **Choose one of the following** • **GR 6303 Principles of GIS** • **GR 6313 Advanced GIS** • **GR 6333 Remote Sensing** **Total Core** **Geosciences Electives, 15 hours:** **List of Geosciences Electives (consult your academic adviser):** **GG 6124 Petrology** **GG 6323 Karst Processes & Landforms** **GG 6523 Coastal Environments** **GG 6533 Geo. Study Abroad** **GG 6543 Comm. Eng. Learn. Geo.** **GG 8103 Geology and Geoheritage of National Parks** **GG 8123 Geology II: Earth, Time, and Life**	 **3** **3** **3** **3** **3** **15**

GG 6323 Karst Processes and Landforms *GG 6353 Geodatabase Design* *GR 6363 GIS Programming* *GG 6613 Physical Hydrogeology* *GR 6813 Natural Hazards and Processes* *GR 6603 Climatology* *GR 6613 Applied Climatology* *GG 8203 Ocean Science* *GG 8233 Environmental Geoscience* *GG 8613 Hydrology* *GR 8633 Climate Change* *GR 8813 Advanced Hazards and Disasters* *Additional graduate-level coursework:* [2] *Total Hours:* *[1] A student who has taken any of these 9 hours in an undergraduate Geosciences program, or who has taken other appropriate MSU graduate-level courses, may substitute these with the approval of the major professor and committee. They must be noted on the program of study. Note: A split-level course completed at the undergraduate level cannot be repeated on the graduate level for use on the program of study.* *[2] A capstone research project (oral presentation and paper) and a written and oral comprehensive examination are required.*	*15* *30*	**GG 8133 Rocks and Minerals** **GG 8203 Ocean Science** **GG 8313 History of Life** **GG 8343 Paleontology of Dinosaurs** **GG 8423 Earthquakes & Volcanoes** **GG 8503 Landforms** **GG 8733 Geology of North America** **GR 6133 Political Ecology** **GR 6203 Geography of North America** **GR 6313 Advanced GIS** **GR 6333 Remote Sensing of Physical Environment** **GR 6343 Advanced Remote Sensing** **GR 6353 Geodatabase Design** **GR 6363 GIS Programming** **GR 6603 Climatology** **GR 6613 Applied Climatology** **GR 6643 Physical Meteorology & Climatology 1** **GR 6813 Natural Hazards** **GR 6863 Forensic Geosciences** **GR 8410 Field Methods in Geo.** **GR 8453 Quantitative Analysis** **GR 8803 Weather and Society** **GR 8813 Advanced Nat. Hazards** **GR 8613 Hydrometeorology** **<u>Total Hours:</u>**	**<u>30</u>**
Master of Science in Geosciences (Thesis Option) GG 8571 Geosciences Seminar Select at least 3 hours from the following[1]:	1 3-4	No change	

GR 8453 Quantitative Analysis in Climatology GG 6113 Micropaleontology GG 6414 Structural Geology GG 6633 Introduction to Geochemistry GG 8633 Water Biogeochemistry GG 8743 Basin Analysis GR 6363 GIS Programming GR 8563 GIS Research Applications GR 8553 Research Methods	19-20 6		
Additional graduate-level coursework [2] GR 9000 [3] [1] Substitutions may be made with the approval of the major professor and committee. They must be noted on the program of study. Note: A split-level course completed at the undergraduate level cannot be repeated on the graduate level for use on the program of study. [2] Additional coursework should be established with consultation of major professor and committee in the emphasis area (or areas) for the thesis program. [3] A thesis defense/comprehensive exam is required.	3-4 32-33		
Master of Science in Geosciences (Non-Thesis Option) Select 3 hours from the following[1]: GR 8453 Quantitative Analysis in Climatology GG 6113 Micropaleontology GG 6414 Structural			

Geology GG 6633 Introduction to Geochemistry GG 8633 Water Biogeochemistry GG 8743 Basin Analysis GR 6363 GIS Programming GR 8563 GIS Research Applications GR 8553 Research Methods Additional graduate-level coursework [2] [1] Substitutions may be made with the approval of the major professor and committee. They must be noted on the program of study. Note: A split-level course completed at the undergraduate level cannot be repeated on the graduate level for use on the program of study. [2] Additional coursework should be established with consultation of major professor and committee in the emphasis area (or areas) for the non-thesis program.			

JUSTIFICATION AND STUDENT LEARNING OUTCOMES

Justification and Student Learning Outcomes – M.S. programs (on-campus)

No changes.

Justification and Student Learning Outcomes – M.S. program in Applied Meteorology (online program)

No changes.

Justification and Student Learning Outcomes – M.S. program in Environmental Geosciences

Justification

This proposed certificate does not require any additional resources, and therefore, we believe that we are in a good position to start offering the certificate with a January 2025 start date. The necessary faculty are already in place, and the courses are currently offered. The proposal merely provides a new organizational framework, demanding minimal time and effort.

The primary motivation to modify the Environmental Geosciences Master's degree program is the significant decline in enrollment numbers. In Fall 2021, there were 97 students; by Fall 2023, the number had dropped to 49, and in Fall 2024, there are only 41 students (only six of these are new students). We believe this decline is partly due to the current program structure, which requires the completion of all 30 credit hours. To address this, we propose transitioning to a stackable degree model. This model will allow students to earn a post-baccalaureate certificate after completing the first 15 credit hours, with the option to complete an additional 15 credit hours to earn the full MS degree. There are accompanying degree modification proposals to this proposal for creation of post-baccalaureate certificates in Geology and Climate Change. Plus, there is already a post-baccalaureate certificate in existence already called "Geospatial and Remote Sensing Technologies". This approach provides faster credentialing, enabling students to enter the workforce or achieve promotions more quickly. It also encourages students hesitant to commit to a full master's program to start with the certificate, potentially leading to increased enrollment. Additionally, the flexibility to stop and start the program as needed may attract more applicants. The stackable degree model also continues to supports students who prefer to complete the entire 30-hour program upfront by allowing them to choose from various geoscience elective courses. This flexibility ensures that students can tailor their education to their interests and career goals.

Another proposed change is to enhance the structure of required core courses, creating more uniformity in students' coursework. The original program required two core courses (GR 8553 and GR 8410), nine hours from a list of 21 courses, and 15 hours of departmental electives, which was too unstructured. The new plan will require five core courses (15 credit hours) for everyone, including Environmental Geosciences, Hydrology, Principles of GIS, Climate Change, and a Geosciences Capstone project. These five courses represent the foundation of an environmental geosciences degree. This consistency will facilitate tracking institutional effectiveness and foster camaraderie among student cohorts.

We also propose making the field methods course optional. A fieldwork requirement may introduce unnecessary barriers to program accessibility for students who are unable to spend extended periods in field settings for physical, economic, or psychological reasons. By allowing students to self-select into the field course, we accommodate those with financial, time, or personal constraints. This change ensures that students have alternative options if they are unable to undertake conventional fieldwork.

Additionally, we propose replacing GR 8553 Research Methods with GR 8583 Geosciences Capstone. Our graduates have diverse career aspirations, and not all are interested in general academic research methodologies. The capstone experience will allow students to synthesize their coursework into a project, enhancing their resumes and aiding in employment.

Lastly, we propose removing the statement "A capstone research project (oral presentation and paper).... Is required" and incorporating the capstone project into the GR 8583 Geosciences Capstone course. This integration ensures that students receive academic credit, faculty receive compensation, and group participation and presentations are encouraged.

Student Learning Outcomes: (accompanying this proposal is an outcome map that describes how the outcomes will be assessed for institutional effectiveness reporting.

Overarching Program Outcome: The Master of Science in Environmental Geosciences, offered as a non-thesis, distance learning program, aims to equip students with a comprehensive understanding of the Earth's environmental systems and the complex interactions within them. The program covers a broad spectrum of geoscience-related topics, including environmental history, which provides a contextual foundation for current environmental issues and discussions. It delves into the pressing matter of climate change, examining its causes, impacts, and mitigation strategies. The curriculum also encompasses hydrology, focusing on the distribution and movement of water on Earth, and geospatial methods, which enable students to analyze and interpret spatial data crucial for environmental research and decision-making. The program culminates in a comprehensive capstone project, allowing students to apply their acquired knowledge and skills to a real-world environmental problem, demonstrating their ability to synthesize information and propose viable solutions.

Student Learning Outcome 1: **Comprehension of Earth's Environmental Systems and Interactions Within Them:** Graduates of the Master of Science in Environmental Geosciences program will demonstrate a comprehensive understanding of Earth's environmental systems, including the atmospheric, hydrospheric, lithospheric, and biospheric components. They will be able to analyze the complex interactions among these systems, evaluate the impacts of natural and anthropogenic changes, and apply this knowledge to develop sustainable solutions for environmental challenges. This outcome ensures that graduates can effectively integrate scientific principles and methodologies to address real-world environmental issues and contribute to informed decision-making and policy development.

Student Learning Outcome 2: **Comprehension of Water Resources:** Graduates of the Master of Science in Environmental Geosciences program will have a thorough understanding of hydrology, encompassing the fundamental principles of the water cycle, the distribution and movement of surface and groundwater, and the complex interactions between water and various environmental systems. They will be adept at analyzing hydrological data, utilizing geospatial and modeling tools to assess water resources, predict hydrological responses to environmental changes, and develop sustainable water management practices. Through this expertise, graduates will be prepared to address critical water-related challenges in both natural and urban environments, contributing to informed decision-making and effective environmental stewardship.

Student Learning Outcome 3: **Problem-Solving and Critical Thinking with Geospatial Analysis:** Graduates will apply critical thinking skills to explaining and identifying geographic patterns and proposing informed solutions to challenges related to spatial analysis.

Student Learning Outcome 4: **Comprehension of Climate Change:** Graduates of the Master of Science in Environmental Geosciences program will possess a deep understanding of climate change, including the scientific principles underlying climate systems, the factors driving climate variability and long-term changes, and the socio-economic and environmental impacts of climate change. They will be skilled in analyzing climate data and assessing the effectiveness of mitigation and adaptation strategies. The will be familiar with climate models. Equipped with this knowledge, graduates will be capable of contributing to policy development, advocating for sustainable practices, and implementing solutions to mitigate the adverse effects of climate change on both local and global scales.

Student Learning Outcome 5: **Critical Thinking of Terrestrial, Coastal, and/or Marine systems.** Graduates of the Master of Science in Environmental Geosciences program will have a comprehensive understanding of land, coastal, and marine systems, including the physical, chemical, and biological processes that govern these environments. They will be proficient in analyzing the interactions between terrestrial and aquatic environments, assessing the impacts of human activities on these systems, and utilizing geospatial and remote sensing technologies to monitor and manage environmental changes.

Student Learning Outcome 6: **Application of Environmental Science:** Graduates of the Master of Science in Environmental Geosciences program will successfully complete a comprehensive capstone course, demonstrating their ability to integrate and apply interdisciplinary knowledge and skills acquired throughout the program to a real-world environmental problem. This outcome involves conducting research, utilizing advanced geospatial, hydrological, and climate analysis tools, and developing practical, evidence-based solutions. Graduates will exhibit project management, critical thinking, and communication skills, culminating in a professional presentation and detailed report that showcases their capability to address complex environmental challenges and contribute meaningfully to the field of environmental geosciences.

Programmatic Review Assessment

The modifications proposed here aim to bolster enrollment and prevent further decline. There are no changes in credit hours nor additions of new courses, although two courses are currently being approved for online instruction. Our proposal focuses on reshuffling existing courses and integrating post-baccalaureate certificates to provide greater flexibility and enhanced job opportunities for our students. By doing so, we intend to halt the enrollment decline and instead offer a more attractive program that will stimulate growth. These targeted changes address immediate needs without necessitating an expansive review of other programs.

Required Questions

1. Will this program change meet local, state, regional, and national educational and cultural needs? If so, please describe.

A Master of Science degree in Environmental Geosciences addresses educational and cultural needs at local, state, regional, and national levels by equipping graduates with the expertise to tackle pressing environmental challenges. Locally, graduates can contribute to sustainable community planning and natural resource management, fostering environmental stewardship and resilience. At the state level, they can engage in policy development and implementation, ensuring that environmental regulations protect ecosystems and public health. Regionally, the program prepares professionals to address issues like water scarcity, land use changes, and coastal erosion, promoting sustainable development across diverse landscapes. Nationally, graduates become valuable assets in addressing climate change, advancing renewable energy initiatives, and supporting national conservation efforts. Through interdisciplinary training and applied research, the program cultivates a workforce capable of leading environmental initiatives, promoting public awareness, and driving cultural shifts towards sustainability and environmental responsibility.

2. Will this program change result in duplication in the System? If so, please describe.

We are not aware of any duplication specifically related to "Environmental Geosciences" that will result from this program change. No other interdisciplinary Department of Geosciences comprised of our expertise areas exists within the state.

3. Will the program change/advance student diversity within the discipline? If so, please describe.

A Master of Science in Environmental Geosciences promotes diversity by fostering an inclusive educational environment that attracts students from various backgrounds, including underrepresented groups in the sciences. The program emphasizes the importance of diverse perspectives in understanding and addressing complex environmental issues, encouraging collaborative problem-solving and innovation. By integrating global environmental challenges into the curriculum, the program prepares graduates to work effectively in diverse cultural and geographic settings. Additionally, a focus on environmental justice ensures that students are aware of and committed to addressing the disproportionate impacts of environmental degradation on marginalized communities. Through community engage learning opportunities, the program actively supports the participation and success of diverse students, cultivating a new generation of environmental leaders who are equipped to create equitable and sustainable solutions.

4. Will the program change result in an increase in the potential placement of graduates in MS, the Southeast, and the U.S.? If so, please describe.

Converting an existing 30-credit-hour Master's degree in Environmental Geosciences into a stackable degree model, where students can earn a post-baccalaureate certificate after the first 15 credit hours and then complete an additional 15 credit hours to receive the full MS degree, significantly enhances the potential placement of graduates across various regions, including the Midwest, Southeast, and the broader U.S. This flexible approach allows students to gain recognized credentials more quickly, making them immediately marketable and able to enter the workforce with specialized skills sooner. The initial certificate can serve as a stepping stone for career advancement or transition, appealing to working professionals and those looking to upskill or pivot their careers. Additionally, the stackable model caters to diverse learning needs and schedules, making advanced education more accessible and affordable. By creating multiple entry and exit points, the program can attract a wider pool of students, including those who might be hesitant to commit to a full master's program upfront. Ultimately, this approach increases the overall number of qualified professionals in the field, addressing regional and national demand for expertise in environmental geosciences and enhancing the employability and career growth opportunities for graduates.

5. Will the program change result in an increase in the potential salary of graduates in MS, the Southeast, and the U.S? If so, please describe.

A stackable degree in Environmental Geosciences offers substantial benefits for increasing graduate salaries in the workforce. By allowing students to earn a post-baccalaureate certificate after the first 15 credit hours, they can quickly gain specialized skills and credentials that enhance their employability and earning potential. This early credential can lead to immediate job opportunities or promotions, providing a salary boost even before completing the full master's degree. As students continue their education and obtain the full MS degree, they further increase their qualifications and expertise, positioning themselves for higher-level roles and corresponding salary increases. The flexibility of the stackable model also supports continuous professional development, enabling graduates to adapt to evolving industry demands and pursue higher-paying positions as they accrue more knowledge and experience. This incremental approach to education ensures that graduates are consistently advancing their careers and increasing their income potential over time.

SUPPORT

A letter of support from the Department of Geosciences Curriculum Committee is attached to this proposal.

PROPOSED 4-LETTER ABBREVIATIONS (STARRED REMAIN UNCHANGED):

Master of Science in Geosciences (GEOS)*
Applied Meteorology Concentration (AMP)*
Environmental Geosciences Concentration (ENGS)*

EFFECTIVE DATE

Spring 2025

Explanation for January 2025 Start: This proposed certificate does not require any additional resources, and therefore, we believe that we are in a good position to start offering the certificate immediately. The necessary faculty are already in place, and the courses are currently offered. The proposal merely provides a new organizational framework, demanding minimal time and effort.

CIP NUMBER

40.0601

MISSISSIPPI STATE
UNIVERSITY

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September 12, 2024

College of Arts and Sciences and the University Courses and Curriculum Committees

Mississippi State University

RE: Department of Geosciences – Modifications – ENGS MS DL Program

Dear Curriculum Committee,

The Department of Geosciences Curriculum Committee has reviewed and supports the proposed modifications to the distance learning Environmental Geosciences MS online curriculum. These modifications will update the ENGS curriculum information outlined below:

- allow for specified post-baccalaureate certificates to be ingested as a "stackable" degree, providing flexible entry and exit points
- new concentration core comprised of existing courses to provide more structure
- making field courses optional instead of mandatory
- replacing Research Methods with a Capstone Course

We fully support these modifications to the DL ENGS MS curriculum. If you have any questions or need additional information, please do not hesitate to contact us.

Respectfully,

Andrew Mercer — Digitally signed by Andrew Mercer Date: 2024.09.12 12:21:47 -05'00'

Andrew Mercer (Committee Member)

Brian Williams — Digitally signed by Brian Williams Date: 2024.09.12 12:15:32 -05'00'

Brian Williams (Committee Member)

Boniface O Fosu — Digitally signed by Boniface O Fosu Date: 2024.09.12 13:15:07 -05'00'

Boniface Fosu (Committee Member)

Varun Paul — Digitally signed by Varun Paul Date: 2024.09.12 14:37:57 -05'00'

Varun Paul (Committee Member)

Sarah Lalk, PhD — Digitally signed by Sarah Lalk, PhD Date: 2024.09.12 12:07:24 -05'00'

Sarah Lalk (Committee Chair)

Cc: Dr. John C. Rodgers, Department Head of Geosciences

Subject: Degree Modification GEO Grad MS ENGS Campus 5
Date: Friday, October 11, 2024 at 2:34:41 PM Central Daylight Time
From: Rodgers, John
To: DeanAS-Curriculum
Attachments: ENGS Concentration Final Revised Degree Cover Sheet Accessible jr.pdf, ENGS degree table Modified to include Cains suggestion on formating with Mercers previous changes already accounted for.docx, LoS_Geo_ENGS_MS_mods_SL_BW_aem_BF_VP[24].pdf

I am submitting a degree modification proposal to amend the Campus 5 graduate degree Environmental Geosciences (ENGS). We are changing the required courses with the hope of salvaging the degree, which has seen considerable decline in enrollment during the last few years.

Attached are the degree proposal, the coversheet, and the letter of support from the department. Please let me know if there is anything else that is required. Also, if the list of ENGS electives is too complex, I am amenable to just delete the list and simplify with "15 hrs Geo electives" and leave it at that.

Note that the Geo grad degree had a proposal to modify Campus 1 MS program that was submitted last year, 2023-2024. That proposal got hung-up at Grad Council until recently, but according to Dana Franz, the issues have been resolved and the proposal has passed. Dr. Franz's email is below. Therefore this submission does not overlap with the previous.

From: Franz, Dana <DFranz@oire.msstate.edu>
Date: Tuesday, October 8, 2024 at 9:48 AM
To: Rodgers, John <rodgers@geosci.msstate.edu>, Mercer, Andrew <mercer@ngi.msstate.edu>
Subject: RE: Confirmation of UCCC Grad MS changes last year
Hi John,
My understanding is that the change will appear on the next Change Notice that should be out today or tomorrow. I talked with Andy about this, and he agreed, go ahead and start the new degree modifications. No problem.

Dana

Sincerely,

John Rodgers, Professor and Head
Department of Geosciences
Mississippi State University
662-325-1393
Jcr100@msstate.edu