Geosciences

Interim Department Head: Dr. William Cooke
Graduate Coordinator: Dr. Michael Brown
Hilbun 109
Box 5448
Mississippi State, MS 39762
Telephone: 662-325-3915
On-Campus Programs
Email: tina@geosci.msstate.edu
Distance Learning Programs
E-mail: mary@geosci.msstate.edu

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. The general GRE is required of all on-campus applicants.

Although helpful, an undergraduate background in Geosciences is not a prerequisite for admission into the M.S. in Geoscience program. Applicants to the master's program in the Broadcast or Professional Meteorology concentrations are required to have passed Calculus I prior to arrival on campus, and the completion of Calculus II will greatly improve the chances of being accepted. All other master's applicants are recommended to have completed Calculus I.

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 two 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. An applicant for the Main Campus program is required to take the GRE. A student admitted to the Broadcast Meteorology concentration can only begin studies in the fall term. The application deadline for consideration for assistantship funding is January 1.

Provisional Admission

A student with an undergraduate GPA of 2.50 to 2.74 may gain provisional admission to the program. Provisional students must receive a 3.00 GPA on the first 9 hours of graduate-level courses on the program of study taken at MSU in order to achieve regular admission status. Courses with an S grade, transfer credits, or credits earned while in Unclassified status cannot be used to satisfy this requirement.

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 or a grade of D or F for any regular class will result in dismissal from the program. A student in the Broadcast Meteorology concentration who earns a C in the first year of graduate study will be required to take a proficiency exam in the summer before the second year. Unsatisfactory performance on the exam will result in dismissal from the program.

Concentration Descriptions

- The **Broadcast Meteorology** concentration is designed for students intending to pursue meteorology careers in media. This non-thesis master's degree combines meteorology coursework with the Practicum in Broadcast Meteorology sequence.
- The **Professional Meteorology/Climatology** concentration is thesis-based and is intended to prepare students for forecasting careers or further graduate study.
- The **Geology** concentration is thesis-based and intended to prepare students for careers in professional geology or further graduate study.
- The **Geography** concentration is a thesis-based program appropriate for students interested in studying the spatial distribution of cultural and physical features across the Earth's surface. It can be tailored toward specific interests in either human or physical geography.
- The concentration in **Geospatial Sciences** is a thesis-based program designed to prepare students to use geospatial technologies to provide insight into Earth and atmospheric processes.
- The concentration in **Environmental Geosciences** is a thesis-based program intended for students interested in a broader cross-section of the geosciences.

- The **Teachers in Geosciences** concentration is a two-year, 36 credit hour program of study offered through distance learning. It is designed primarily for K-12 science teachers.
- The **Applied Meteorology Program** is designed for individuals with meteorological, environmental or hazards-related careers. This two-year master's degree in Geosciences is offered through distance learning by utilizing DVDs, streamed video, and the internet for course instruction.

Master of Science Programs of Study

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

Both options require competency in statistics or a foreign language. Although the on-campus Broadcast Meteorology, the distance-learning Applied Meteorology, and the Teachers in Geosciences concentrations are typically non-thesis options, a student 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 has on-campus concentrations in:

- Broadcast Meteorology,
- Environmental Geosciences,
- Geography,
- Geology,
- Geospatial Sciences, and
- Professional Meteorology/Climatology.

The department also offers distance-learning concentrations through the Applied Meteorology Program (AMP) and the Teachers In Geosciences (TIG) master's program as well as a certificate in Geographic Information Systems (GIS) by utilizing DVDs, streamed video, and the internet for course instruction. The TIG concentration is primarily designed for in-service teachers, and additional graduate coursework in the Geosciences is available to students who have completed the Teachers in Geosciences program. The AMP is designed for individuals who are already in meteorological, environmental, or hazards-related careers.

A student who is admitted in the graduate program in Geosciences in the broadcast meteorology concentration must successfully complete a background assessment test in meteorology. The test will be administered during the spring of each year. A student failing this test must successfully complete (grade of B or better) GR 1603 from MSU by Distance Learning before starting his or her initial enrollment on campus for study in broadcast meteorology. A student admitted to the Applied Meteorology Program (AMP) must hold a B.S. degree and have completed GR 4713 or its equivalent.

Master of Science in Geosciences, Broadcast Meteorology Concentration - Non-Thesis

GR 8553	Research Methods in Geoscience	3
Select at least 9 hours from the following: [1]		9
GR 6402	Weather Analysis I	
GR 6412	Weather Analysis II	
GR 6422	Weather Forecasting I	
GR 6432	Weather Forecasting II	
GR 6502	Practicum in Broadcast Meteorology I	
GR 6512	Practicum in Broadcast Meteorology II	
GR 6522	Practicum in Broadcast Meteorology III	
GR 6532	Practicum in Broadcast Meteorology IV	
GR 6613	Applied Climatology	
GR 6623	Physical Meteorology	
GR 6733	Synoptic Meteorology	
GR 6753	Satellite and Radar Meteorology	
GR 6823	Dynamic Meteorology I	
GR 6203	Geography of North America	
GR 6813	Natural Hazards and Processes	
GR 8843	Advanced Mesoscale Meteorology	
GR 8453	Quantitative Analysis in Climatology	

Additional graduate coursework	24
Total Hours	36

[1] Substitutions may be made with the approval of the major professor and committee and with appropriate documentation. They must be noted on the program of study.

A research project presentation and a written and oral comprehensive examination are required.

Note: A split-level course completed at the undergraduate level cannot be repeated on the graduate level for use on the program of study.

Master of Science in Geosciences with Professional Meteorology/Climatology Concentration - Thesis

GG 8561	Geoscience Seminar	1
GR 8542	Geographic Literature	2
or GG 8572	Geologic Literature	
Select at least 9 hours from the following: [1]		9
GR 6402	Weather Analysis I	
GR 6412	Weather Analysis II	
GR 6422	Weather Forecasting I	
GR 6432	Weather Forecasting II	
GR 6613	Applied Climatology	
GR 6623	Physical Meteorology	
GR 6733	Synoptic Meteorology	
GR 6753	Satellite and Radar Meteorology	
GR 6823	Dynamic Meteorology I	
GR 6933	Dynamic Meteorology II	
GR 6813	Natural Hazards and Processes	
GR 8843	Advanced Mesoscale Meteorology	
GR 8453	Quantitative Analysis in Climatology	
Additional 8000-level coursework		12
GR 8000	Thesis Research/ Thesis in Geography	6
Total Hours		30

[1] Substitutions may be made with the approval of the major professor and committee and with appropriate documentation. They must be noted on the program of study.

Thesis defense / comprehensive exam is required.

Master of Science in Geosciences with Geology Concentration -Thesis

GG 8561	Geoscience Seminar	1
GR 8542	Geographic Literature	2
or GG 8572	Geologic Literature	
Select at least 9 hours from the following: [1]		9
GG 6033	Resources and the Environment	
GG 6063	Development of Fossil Fuel Resources	
GG 6114	Mineralogy	
GG 6123	Petrology	
GG 6133		
GG 6153	Engineering Geology	
GG 6201	Practicum in Paleontology	
GG 6203	Principles of Paleobiology	
GG 6233	Applied Geophysics	
GG 6304	Principles of Sedimentary Deposits I	
GG 6333	Geowriting	

GG 6403	Gulf Coast Stratigraphy	
GG 6413	Structural Geology	
GG 6433	Subsurface Methods	
GG 6443	Principles of Sedimentary Deposits II	
GG 6503	Geomorphology	
GG 6523	Coastal Environments	
GG 6613	Physical Hydrogeology	
GG 6623	Chemical Hydrogeology	
GG 8223		
GG 8443		
GG 8713	Regional Geology of Eastern North America	
Additional 8000-level coursework		12
GG 8000	Thesis Research/ Thesis in Geosciences	6
Total Hours		30

[1] Substitutions may be made with the approval of the major professor and committee and with appropriate documentation. They must be noted on the program of study.

Thesis defense / comprehensive exam is required.

Master of Science in Geosciences with Geography Concentration - Thesis

GG 8561	Geoscience Seminar	1
GR 8542	Geographic Literature	2
or GG 8572	Geologic Literature	
Select at least 9 hours from the following: [1]		9
GR 6123	Urban Geography	
GR 6203	Geography of North America	
GR 6213	Geography of Latin America	
GR 6223	Geography of Europe	
GR 6233	Geography of Asia	
GR 6243	Geography of Russia and the Former Soviet Republics	
GR 6253	Geography of Africa	
GR 6263	Geography of the South	
GR 6283	Geography of Islamic World	
GR 8313	Advanced Cultural Geography	
Additional 8000-level coursework		12
GR 8000	Thesis Research/ Thesis in Geography	6
Total Hours		30

[1] Substitutions may be made with the approval of the major professor and committee and with appropriate documentation. They must be noted on the program of study.

Thesis defense / comprehensive exam is required.

Master of Science in Geosciences with Geospatial Sciences Concentration - Thesis

GG 8561	Geoscience Seminar	1
GR 8542	Geographic Literature	2
or GG 8572	Geologic Literature	
Select at least 9 hours from the following: [1]		9
GR 6303	Principles of GIS	
GR 6313	Advanced GIS	
GR 6323	Cartographic Sciences	
GR 6333	Remote Sensing of the Physical Environment	
GR 6363	Geographic Information Systems Programming	

GR 6411	Remote Sensing Seminar	
GR 8303	Advanced Geodatabase Systems	
Additional 8000-level coursework		12
GR 8000	Thesis Research/ Thesis in Geography	6
Total Hours		30

1 Substitutions may be made with the approval of the major professor and committee and with appropriate documentation. They must be noted on the program of study.

Thesis defense / comprehensive exam is required.

Master of Science in Geosciences with Environmental Geosciences Concentration - Thesis

GG 8561	Geoscience Seminar	1
GR 8542	Geographic Literature	2
or GG 8572	Geologic Literature	
Select at least 9 hours from the following: [1]		9
GG 6033	Resources and the Environment	
GG 6063	Development of Fossil Fuel Resources	
GG 6503	Geomorphology	
GG 6523	Coastal Environments	
GR 6123	Urban Geography	
GG 6613	Physical Hydrogeology	
GR 6813	Natural Hazards and Processes	
GG 6613	Physical Hydrogeology	
Additional 8000-level coursework		12
GG 8000	Thesis Research/ Thesis in Geosciences	6
Total Hours		30

1 Substitutions may be made with the approval of the major professor and committee and with appropriate documentation. They must be noted on the program of study.

Thesis defense / comprehensive exam is required.

Master of Science in Geosciences with Teachers in Geosciences Concentration - Non-Thesis

GR 8553	Research Methods in Geoscience	3
Select 15 hours from the following: [1]		15
GR 8123	Meteorology II: Forecasting and Storms	
GG 8123	Geology II: Earth, Time and Life	
GR 6603	Climatology	
GG 8203	Ocean Science	
GG 8333	Planetary Science	
GG 8233	Environmental Geoscience	
GR 8400	Field Methods in Geosciences	
GR 8410	Field Methods Seminar [2]	
Additional 8000-level coursework		18
Total Hours		36

1 Substitutions may be made with the approval of the major professor and committee and with appropriate documentation. They must be noted on the program of study.

2 Four (4) credits required, may also be repeated for 3 hours of electives.

A research project presentation and a written and oral comprehensive examination are required.

Master of Science in Geosciences with Applied Meteorology Concentration - Non-Thesis

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
Select at least one of the following:		3
GR 6923	Severe Weather	
GR 6943	Tropical Meteorology	
Select at least nine hours from the following:		9
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	
GG 8203	Ocean Science	
GG 8233	Environmental Geoscience	
GG 8613	Hydrology	
GR 8613	Hydrometeorology	
GR 8613	Hydrometeorology	
GR 8633	Climate Change	
GR 8813	Advanced Hazards and Disasters	
GR 8133	Foundations in Forecasting	
GR 8143	Advanced Forecasting Techniques	
Graduate-level coursework		9
Total Hours		36

[1] Substitutions may be made with the approval of the major professor and committee and with appropriate documentation. They must be noted on the program of study.

A research project presentation and a written and oral comprehensive examination are required.

Note: A split-level course completed at the undergraduate level cannot be repeated on the graduate level for use on the program of study.

Doctoral Program of Study

Doctor of Philosophy in Earth and Atmospheric Sciences

GG 8913	Research, Readings, and Techniques in Geosciences	3
GR 8913	Philosophy and Ethics in Geosciences	3
GG 9000	Dissertation Research /Dissertation in Geology	20
Additional 8000-level courses offered within the Department of Geosciences [1]		10
Total Hours		36

[1] At the discretion of the student's Ph.D. committee, other 8000-level courses offered from MSU may also be used to satisfy this requirement.

The doctoral program will include 36 hours beyond the master's and the completion of a dissertation. Written and oral comprehensive examinations are administered at the end of required coursework. A dissertation proposal defense is also required.

Note: A split-level course completed at the undergraduate level cannot be repeated on the graduate level for use on the program of study.