

NEW PROGRAM PROPOSAL

___ Undergraduate X Masters ___ Ph.D. ___ Certificate**

Program Title: MS in Geography

Degree to be Conferred: Master of Science in Geography

Administrative Unit Proposing Program: Geography

Date of Submission: September 30th, 2010

Brief Summary of Proposed Program:

The Department of Geography is proposing a new Master of Science degree (M.S. in Geography). Currently, it offers an M.A. degree only. Geography is a broad discipline, spanning both the social/human and physical sciences. The proposed degree reflects the strength and breadth of the existing curriculum and the research specializations of the faculty in the areas of meteorology/climatology, Geographic Information Science, and physical geography. We propose this degree because students concentrating in the physical-science aspect of Geography are better advantaged in the job market with an M.S. rather than an M.A. This proposal is based on the already existing infrastructure in the Department, and its creation requires no new faculty, facility space, staff, or financial commitments by any party.

Signatures:

Department/School Curriculum Chair*

Yeong Kim

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JAN - 4 2011
Date

College Dean

Approved by:

University Curriculum Council Program Chair

University Curriculum Council Chair

Provost

*Where the proposal originates within a department or school

**Interdisciplinary Certificate Programs should append memos of approval

JAN - 4 2011
Date

Date

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Program Development Plan

1. Program Designation

The Department of Geography at Ohio University is proposing a new Master of Science degree in Geography (M.S. in Geography). Currently, it offers an M.A. degree only. Geography is a broad discipline, spanning both the social/human and physical sciences. This new degree reflects the strength and breadth of the existing curriculum and the research specializations of the faculty in the physical-science aspect of Geography, including physical geography and geospatial technology. Further, the M.S. degree provides better alignment with the undergraduate Geography degrees at Ohio University, where six out of the seven degree options culminate with the B.S. degree. The department is, therefore, well situated to offer graduate students the flexibility to focus on coursework that lead to either an M.A. or an M.S. degree.

The proposed M.S. in Geography is based on the already existing infrastructure in the Department of Geography. As such, its creation requires no new faculty, facility space, staff, or financial commitments by any party. Rather, it is simply recognizing that the current M.A. in Geography degree is not reflective of many of the graduate students' coursework and/or research in the areas of meteorology/climatology, Geographic Information Science (GIScience), biogeography and geomorphology. We propose this degree so that students concentrating on the physical sciences can earn the degree that truly reflects their coursework and best advantages them in the job market. In this regard, having both an M.A. and an M.S. degree option at the graduate level would much better serve the department and its diverse faculty and graduate student body.

2. Education Objectives/Proposed Curriculum

The M.S. in Geography degree would be appropriate for graduate students taking coursework (non-thesis) or conducting research (thesis) in areas of meteorology/climatology, GIScience, and physical geography, including biogeography and geomorphology. Currently, graduate students are only offered the M.A. in Geography degree, which is not indicative of the specializations in physical geography and/or GIScience expected for several students' research theses. Compared to the M.A. degree curriculum, the M.S. degree requires students to take more courses from the list of physical and geospatial geography courses.

A Thesis and Non-Thesis option will be available to all students pursuing the M.S. in Geography degree, with the distinctions outlined below (see Appendix A for semester-based curriculum). The proposed curriculum only includes existing courses; therefore no new course development is required to offer this new degree.

Thesis Option (65 quarter hours minimum)

1) Thesis hours (min. 15 credit hours)

GEOG 695 *Thesis*

2) Two required courses (10 credit hours):

GEOG 580 *History of Geographic Thought*

GEOG 675 *Research and Writing*

3) One methodological course from the following list (5 credit hours):

GEOG 560 *Cartography I*

GEOG 565 *Air Photo Interpretation*

- GEOG 566 *Remote Sensing*
- GEOG 571 *Quantitative Methods*
- GEOG 573 *Qualitative Methods in Geography*
- GEOG 576 *Field Methods*
- GEOG 578 *Principles of GIS*

4) Two seminars (min. 10 credit hours) [With permission, one can be non-Geography]

at least one seminar from:

- GEOG 666 *Seminar in Cartography*
- GEOG 681A *Seminar in Biogeography*
- GEOG 681B *Seminar in Geomorphology*
- GEOG 681C *Seminar in Atmospheric Sciences*
- GEOG 687 *Seminar in GIScience*

5) Other courses (min. 25 hours) [With permission, up to two can be non-Geography]

Graduate level; excluding GEOG 504, 505, 585, 593, 690, 694, OPIE

at least three courses from:

- | | | |
|--|--|--|
| GEOG 502 <i>Meteorology</i> | GEOG 511 <i>Adv. Physical Geography</i> | GEOG 560 <i>Cartography I</i> |
| GEOG 503 <i>Climatology</i> | GEOG 515 <i>Landforms & Landscapes</i> | GEOG 561 <i>Cartography II</i> |
| GEOG 506 <i>Synoptic Meteorology</i> | GEOG 516 <i>Biogeography</i> | GEOG 565 <i>Air Photo Interpretation</i> |
| GEOG 507 <i>Mesoscale Meteorology</i> | GEOG 517 <i>Landscape Ecology</i> | GEOG 566 <i>Principles of Remote Sensing</i> |
| GEOG 508 <i>Dynamic Meteorology I</i> | | GEOG 567 <i>Advanced Remote Sensing</i> |
| GEOG 509 <i>Dynamic Meteorology II</i> | | GEOG 568 <i>Cartography III</i> |
| GEOG 510 <i>Physical Meteorology</i> | | GEOG 574 <i>GIS Design & Application Development</i> |
| | | GEOG 575 <i>GIS Modeling & Computation Methods</i> |
| | | GEOG 576 <i>Field Methods in Geography</i> |
| | | GEOG 578 <i>Principles of GIS</i> |
| | | GEOG 579 <i>Geographic Information Analysis</i> |

Non-Thesis Option (75 quarter hours minimum)

Program of study covers three areas; at least one concentration is methods/analytical-based (e.g. GISc, remote sensing), and at least one concentration is systematic (physical, environmental, area studies). A comprehensive exam is required in each concentration.

1) Two required courses (10 credit hours):

- GEOG 580 *History of Geographic Thought*
- GEOG 675 *Research and Writing*

2) One methodological course from the following list (5 credit hours):

- GEOG 560 *Cartography I*
- GEOG 565 *Air Photo Interpretation*
- GEOG 566 *Remote Sensing*
- GEOG 571 *Quantitative Methods*
- GEOG 573 *Qualitative Methods in Geography*
- GEOG 576 *Field Methods*
- GEOG 578 *Principles of GIS*

3) Two seminars (min. 10 credit hours) [With permission, one can be non-Geography]

at least one seminar from:

GEOG 666 *Seminar in Cartography*
 GEOG 681A *Seminar in Biogeography*
 GEOG 681B *Seminar in Geomorphology*
 GEOG 681C *Seminar in Atmospheric Sciences*
 GEOG 687 *Seminar in GIScience*

4) Other courses (min. 50 hours) [With permission, up to two can be non-Geography]
 Graduate level; excluding GEOG 504, 505, 585, 593, 690, 694, OPIE

at least five courses from:

GEOG 502 <i>Meteorology</i>	GEOG 511 <i>Adv. Physical Geography</i>	GEOG 560 <i>Cartography I</i>
GEOG 503 <i>Climatology</i>	GEOG 515 <i>Landforms & Landscapes</i>	GEOG 561 <i>Cartography II</i>
GEOG 506 <i>Synoptic Meteorology</i>	GEOG 516 <i>Biogeography</i>	GEOG 565 <i>Air Photo Interpretation</i>
GEOG 507 <i>Mesoscale Meteorology</i>	GEOG 517 <i>Landscape Ecology</i>	GEOG 566 <i>Principles of Remote Sensing</i>
GEOG 508 <i>Dynamic Meteorology I</i>		GEOG 567 <i>Advanced Remote Sensing</i>
GEOG 509 <i>Dynamic Meteorology II</i>		GEOG 568 <i>Cartography III</i>
GEOG 510 <i>Physical Meteorology</i>		GEOG 574 <i>GIS Design & Application Development</i>
		GEOG 575 <i>GIS Modeling & Computation Methods</i>
		GEOG 576 <i>Field Methods in Geography</i>
		GEOG 578 <i>Principles of GIS</i>
		GEOG 579 <i>Geographic Information Analysis</i>

3. Administrative Structure

The M.S. in Geography degree will be administered in the Department of Geography in the College of Arts and Sciences at Ohio University.

4. Demonstration of Need for the New Degree Program

Within the State of Ohio, University of Akron is the only university that offers an M.S. degree in Geography/GIScience. The Geography Department at The Ohio State University offers a specialized M.S. degree in Atmospheric Science, but only an M.A. in Geography (see Appendix B for geography graduate programs in Ohio). Therefore, if approved, this will be only the second M.S. in Geography being offered in the State of Ohio. There is a strong need for a new M.S. degree in Geography, given the specializations of meteorology/climatology, Geographic Information Science (GIScience), and physical geography programs (including biogeography and geomorphology) offered in the Department.

The Need for an M.S. in Geography Degree for Meteorology/Climatology Students

Students specializing in meteorology/climatology who receive an M.A. instead of an M.S. are at a serious disadvantage in the job market.

- 1) Federal and national guidelines for employment as a meteorologist/climatologist (ametsoc.org/policy/bachelor99.html) require a strong background in the physical sciences at the undergraduate level (including a year of calculus and physics). Therefore, receiving an M.A. at the graduate level contradicts the highly scientific nature of the field.
- 2) Employers (such as the National Weather Service and other federal agencies) want an M.S. degree at the graduate level. Without sufficient experience, students with only an M.A. will be competing with and often losing to M.S. students who are in higher demand.

3) The American Meteorological Society, the national organization of meteorologists, only considers an M.S. degree as an appropriate graduate degree for training in meteorology/climatology. Many federal jobs in meteorology only hire students with M.S. and advanced degrees.

The Need for an M.S. in Geography Degree for GIScience Students

Geographic Information Science (GIScience) is a relatively recent specialization, focusing on the study of theories underlying the generation of geographic information, and the development and application of geographic information systems. A specialized degree in GIScience prepares students with advanced technical skills in systems design and analysis, fosters the ability to critically assess the philosophical foundations and implications of geographic data modeling and system design, and trains students to recognize the general applicability of GIScience theory and techniques to both social and environmental sciences. Students specializing in GIScience who receive an M.A. instead of an M.S. are at a serious disadvantage in the job market.

- 1) The existing M.A. degree in Geography is not reflective of the advanced technical content of GIScience-focused coursework and research undertaken by graduate students. Specialized training in GIScience should therefore lead to the M.S. degree, instead of an M.A. degree.
- 2) There is a renewed focus on science and engineering disciplines in the US; rigorous technical education in GIScience will be desired by many more prospective students since science degrees typically increase employability and lead to higher salaries.
- 3) Many employers prefer graduates who can demonstrate a clear technical focus in GIScience since those skills are easily transferable to a wide variety of problem-solving exercises and decision making scenarios.
- 4) Due to the wide applicability of GIScience skills, an M.S. degree will increase enrollment by attracting undergraduates from other disciplines, as well as international students from developing countries which urgently need but cannot invest in infrastructure to train enough specialists in GIScience.

The Need for an M.S. in Geography Degree for Physical Geography Students

An M.S. in physical geography reflects the curriculum and research specializations in areas of geomorphology and biogeography. All faculty writing research grants in these areas, as well as in meteorology/climatology and GIScience will have a higher likelihood of being funded if clear commitment to training and availability of technically competent students can be demonstrated through an appropriate degree program.

- 1) There is a need for an M.S. in Geography degree in Ohio. Of the seven graduate Geography programs in Ohio, only two offer an M.S. degree: Akron for Geography/GIScience and The Ohio State University for the Atmospheric Science (see Appendix A). Ohio University would therefore be unique in that students can receive an M.S. degree with training in either of these specializations, or in areas of biogeography or geomorphology.
- 2) The strong presence of physical geographers at Ohio University make it an optimum place for offering an M.S. in Geography degree in Ohio.

5. Program Recruitment and Admissions

Without any additional advertising or recruitment, the Department of Geography expects that roughly half of the graduate students in the Department would be pursuing the M.S. in

Geography. This accounts for about twelve Masters students total, or about six incoming students a year.

6. Special Recruitment Efforts

The degree will be promoted annually at the annual American Meteorological Society Student Conference, during the Student Career Fair. Promoting the graduate meteorology program at this venue in January 2010 resulted in ten meteorology graduate applications, more applications than in the last three years combined. Five of the ten applicants were female and one was an international student. Thus, 60 percent of these recruits were from an underrepresented population in meteorology. Similar recruiting efforts can also occur at the annual meeting for the American Association of Geographers, to recruit students who also would come for the M.S. in Geography degree with research interests in GIScience and physical geography. Further, the faculty who would advise in the M.S. in Geography degree area have been successful at receiving external research funding to support graduate education; in 2010-2011 three graduate students will be funded from NSF grants. In recruiting graduate students to work on these grants, the faculty in the Department of Geography will remain diligent to seek out qualified individuals from underrepresented groups.

7. Proposed Program Support by Current Faculty, Staff, Facilities

The Department of Geography has five full-time faculty (Dyer, Fogt, Lein, Sack and Sinha) who will be teaching and advising the M.S. in Geography degree. Each of these faculty currently advises students pursuing the M.A. in Geography degree, and it is expected that the majority, if not all, of their graduate advisees will switch to the M.S. in Geography degree once approved. Thus, the new program does not hinder the availability of these faculty members to advise students. These faculty members are also adequately prepared for advising in this program, given their research focus, their history in successfully advising former graduate students, and success in receiving external money for research and scholarly development.

Further, all of the existing research facilities within the Department of Geography will be used primarily for graduate research in the M.S. in Geography program: The Information Technology Laboratory (Clippinger 105), the Scalia Laboratory for Atmospheric Analysis (Clippinger 402), the Ohio University Cartographic Center (Clippinger 104), the Carl Ross Geomorphology Research Laboratory (Ridges), the OhioView Laboratory for Applied Geomatics Research (118 Morton), and the Long-Term Social and Ecological Research Room (Morton 425).

8. Need for Additional Facilities and Staff

The new M.S. in Geography program requires no additional facilities or staff. It rather recognizes the ongoing strengths and research focus of many of the Geography faculty and graduate curriculum and students.

9. Financial Plan

The formation of the M.S. in Geography program will have no extra costs to the University, College of Arts and Sciences, or the Department of Geography.

10. Proposed Community, Foundation, Government & Industry Sources of Support - none

11. External Consultants and Advisors - none

12. Relationship of the Proposed Program to Other Programs in the Unit and College

The proposed M.S. in Geography is to better utilize the already existing faculty and infrastructure in the Department of Geography. It will not conflict with or duplicate any existing programs in terms of educational objectives, curriculum and program requirements.

Appendix A

Semester-Based Curriculum for MS in Geography

Thesis Option (40 hours minimum)

Thesis hours (min. 12 credit hours)

GEOG 6950 *Thesis*

One required course (4 credit hours):

GEOG 5000 *Geographical Research and Writing*

One methodological course from the following list (4 credit hours):

GEOG 5600 *Cartography I*
GEOG 5650 *Air Photo Interpretation*
GEOG 5660 *Remote Sensing*
GEOG 5710 *Quantitative Methods*
GEOG 5711 *Qualitative Methods in Geography*
GEOG 5712 *Field Methods*
GEOG 5730 *Principles of GIS*

Two seminars (min. 8 credit hours) [With permission, one can be non-Geography]

MS: at least one seminar from:

GEOG 6010 *Seminar in Atmospheric Sciences*
GEOG 6160 *Seminar in Biogeography*
GEOG 6150 *Seminar in Geomorphology*
GEOG 6660 *Seminar in Cartography*
GEOG 6730 *Seminar in GIScience*

Other courses (min. 12 hours) [With permission, up to one can be non-Geography]

Graduate level; discounting 5030, 5040, 5910, 5911, 6950, OPIE

MS: at least two courses from:

GEOG 5010 <i>Meteorology</i>	GEOG 5110 <i>Adv. Physical Geography</i>	GEOG 5600 <i>Cartography I</i>
GEOG 5020 <i>Climatology</i>	GEOG 5150 <i>Landforms & Landscapes</i>	GEOG 5610 <i>Cartography II</i>
GEOG 5060 <i>Synoptic Meteorology</i>	GEOG 5160 <i>Biogeography</i>	GEOG 5650 <i>Air Photo Interpretation</i>
GEOG 5070 <i>Mesoscale Meteorology</i>	GEOG 5170 <i>Landscape Ecology</i>	GEOG 5660 <i>Principles of Remote Sensing</i>
GEOG 5080 <i>Dynamic Meteorology I</i>		GEOG 5670 <i>Advanced Remote Sensing</i>
GEOG 5090 <i>Dynamic Meteorology II</i>		GEOG 5740 <i>GIS Design & Application Development</i>
GEOG 5050 <i>Physical Meteorology</i>		GEOG 5750 <i>GIS Modeling & Computation Methods</i>
		GEOG 5712 <i>Field Methods in Geography</i>
		GEOG 5730 <i>Principles of GIS</i>
		GEOG 5760 <i>Geographic Information Analysis</i>

Non-Thesis Option (40 hours minimum)

Program of study covers 3 areas, at least one concentration is methods/analytical-based (e.g. GISc, remote sensing), and at least one concentration is systematic (human, physical, environmental, area studies). Comprehensive exam held in each concentration.

One required course (4 credit hours):

GEOG 5000 *Geographical Research and Writing*

One methodological course from the following list (4 credit hours):

GEOG 5600 *Cartography I*
GEOG 5650 *Air Photo Interpretation*
GEOG 5660 *Remote Sensing*
GEOG 5710 *Quantitative Methods*
GEOG 5711 *Qualitative Methods in Geography*
GEOG 5712 *Field Methods*
GEOG 5730 *Principles of GIS*

Two seminars (min. 8 credit hours) [With permission, one can be non-Geography]

MS: at least one seminar from:

GEOG 6010 *Seminar in Atmospheric Sciences*
GEOG 6160 *Seminar in Biogeography*
GEOG 6150 *Seminar in Geomorphology*
GEOG 6660 *Seminar in Cartography*
GEOG 6730 *Seminar in GIScience*

Other courses (min. 24 hours) [With permission, up to two can be non-Geography]

Graduate level; discounting 5030, 5040, 5910, 5911, 6950, OPIE

MS: at least three courses from:

GEOG 5010 <i>Meteorology</i>	GEOG 5110 <i>Adv. Physical Geography</i>	GEOG 5600 <i>Cartography I</i>
GEOG 5020 <i>Climatology</i>	GEOG 5150 <i>Landforms & Landscapes</i>	GEOG 5610 <i>Cartography II</i>
GEOG 5060 <i>Synoptic Meteorology</i>	GEOG 5160 <i>Biogeography</i>	GEOG 5650 <i>Air Photo Interpretation</i>
GEOG 5070 <i>Mesoscale Meteorology</i>	GEOG 5170 <i>Landscape Ecology</i>	GEOG 5660 <i>Principles of Remote Sensing</i>
GEOG 5080 <i>Dynamic Meteorology I</i>		GEOG 5670 <i>Advanced Remote Sensing</i>
GEOG 5090 <i>Dynamic Meteorology II</i>		GEOG 5740 <i>GIS Design & Application Development</i>
GEOG 5050 <i>Physical Meteorology</i>		GEOG 5750 <i>GIS Modeling & Computation Methods</i>
		GEOG 5712 <i>Field Methods in Geography</i>
		GEOG 5730 <i>Principles of GIS</i>
		GEOG 5760 <i>Geographic Information Analysis</i>

Appendix B

University System of Ohio: Survey of Geography Graduate Programs

University	Department	Graduate Degree Options
University of Akron	Geography & Planning	MA in Geography MA in Geography / Urban Planning MS in Geography/GIScience
Bowling Green State University	Geography	No Master's degree offered
Central State University	N/A	N/A
Cleveland State University	N/A	N/A
University of Cincinnati	Geography	PhD in Geography MA in Geography
Kent State University	Geography	PhD in Geography MA in Geography
Miami University	Geography	MA in Geography
The Ohio State University	Geography	PhD in Geography MA in Geography PhD in Atmospheric Science MS in Atmospheric Science
Shawnee State University	N/A	N/A
University of Toledo	Geography & Planning	MA in Geography PhD in Spatially Integrated Social Science (<i>with several other social science departments</i>)
Wright State University	Urban Affairs and Geography	Master of Public Administration (MPA)
Youngstown State University	Geography	No Master's degree offered