The University of Georgia

University Council
Athens, Georgia 30602

November 24, 2009

UNIVERSITY CURRICULUM COMMITTEE – 2009-2010
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Graduate Student Representative – Robert Shostak

Dear Colleagues:

The attached proposal to change the requirements for the Undergraduate Certificate in Atmospheric Sciences will be an agenda item for the December 4, 2009, Full University Curriculum Committee meeting.

Sincerely,

David Shipley

David E. Shipley, Chair
University Curriculum Committee

cc: Dr. Arnett C. Mace, Jr.
Professor Jere W. Morehead

1785
The University of Georgia

Franklin College of Arts and Sciences
Office of the Dean

October 5, 2009

Fiona Liken
Director
Curriculum Management
116 B Franklin House
CAMPUS

Dear Fiona:

The Franklin College of Arts and Sciences Curriculum Committee has reviewed the following proposal and submits it for University Curriculum Committee for approval.

> *Proposal for changes to the Interdisciplinary Undergraduate Certificate in Atmospheric Sciences*

If you have any questions or need any further information, please contact my office.

Sincerely,

Hugh Ruppersburg
Senior Associate Dean

HR/dg

Attachments

The proposed changes to the **Interdisciplinary Undergraduate Certificate in Atmospheric Sciences** are detailed below. Please see the subsequent pages for the lists of existing and proposed requirements.

1. Required credit hours and certificate structure
    a. The total number of credit hours will increase from 21 to 30. This will accommodate new courses that are necessary to meet the Certified Broadcast Meteorologist (CBM) requirements[1] by the American Meteorological Society (AMS) and to be fully compliant with the Federal civil service requirements in meteorology[2]. Candidates for the CBM must have completed a program that meets AMS requirements.
    b. The new structure will be simplified. The existing certificate has two tracks (Operational and General) with multiple options under the General track. The new requirements will include a core (21 hours) plus four possible tracks (9 hours), one of which is Operational/Applied Meteorology. We believe the new structure will be easier for students and advisers to follow. Most students will select the Operational/Applied Meteorology track.
2. New course requirements
    a. GEOG 4170/L: Mesoscale and Radar Meteorology/Climatology (proposed) will be added as a required course in the Operational/Applied Meteorology track. This course is required at peer institutions and is necessary to meet AMS requirements. This course also complements the existing courses in the track.
    b. An advanced dynamics course will be required. Students will be able to choose GEOG 4114: Atmospheric Dynamics II or GEOG 4116: Introduction to Data Assimilation (proposed) to meet this requirement. This change is not necessary to meet the AMS requirements, but a survey of peer programs found a majority of the programs require a similar class. Furthermore, we believe this requirement is critical for students who later pursue a graduate degree in this discipline.
    c. A research/internship requirement was added to satisfy AMS requirements. We expect that students in the Franklin College will use GEOG 3990: Internship in Geography or GEOG 4910: Collaborative Research in Atmospheric Sciences. The ENGR 4920 and ENVE 4920 courses were added to encourage participation by Engineering majors.
3. Changes to tracks
    a. The Atmospheric Chemistry and Air Quality and the Physical Oceanography options/tracks were eliminated because of a lack of student interest. No students have completed those tracks in nine years.

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[1] http://www.ametsoc.org/POLICY/statement_2005_BS_degree_atmospheric_science.html

[2] http://www.ametsoc.org/policy/bachelor99.html

b. The Hydrology track was split into Natural Resources Hydrology and Engineering Hydrology to encourage participation by Engineering majors. A Geology course (GEOL 4220: Hydrogeology) was added as an option to the Natural Resources Hydrology track. With the exception of GEOL 4220, all courses in these tracks are taught in the Warnell School of Forest and Natural Resources, the College of Agriculture and Environmental Science or the Faculty of Engineering. All affected departments have been notified of these proposed changes.

4. Participation by academic units

   a. Several academic units have been removed. Crop and Soil Sciences, Environmental Health Sciences, Marine Sciences, Physics and Astronomy, and Statistics were all part of the original proposal. No students from any of these programs have participated in the certificate. The director of the certificate program queried the heads of these units in February 2009, and all agreed to have their units removed from the certificate.

   b. The Faculty of Engineering was added as a participant because of the addition of ENVE 4920 (see 2.c. above) and ENVE 4460 (see 3.b. above).

EXISTING REQUIREMENTS – NOV 2000

Requirements (21 hours)

Common Core Required in Both Tracks (only the home department is shown)
GEOG 3120: Weather Analysis and Forecasting
ENGR 4111: Atmospheric Thermodynamics
GEOG 4112: Atmospheric Dynamics
ENGR 4131: Introductory Atmospheric Physics
A 3000/4000 level course in Climatology (see below)

Additional courses for Operational Meteorology Track
GEOG 4120: Synoptic Meteorology/Climatology
GEOG 4140: Satellite Meteorology/Climatology

Additional courses for General Atmospheric Sciences Track
Choose 6 hours of course work from the list below. With permission from the program director, appropriate atmospheric science courses from participating departments may be approved to meet this requirement. The selected courses must present a coherent whole. The following list indicates those options that we expect to be most common for the general atmospheric sciences track.

Atmospheric Chemistry and Air Quality (select two courses)
EHSC 4080: Environmental Air Quality
EHSC 4100-4100L: Industrial Hygiene
EHSC 4350-4350L: Environmental Chemistry
ENGR 4480: Instrumentation for Environmental Quality

Climatology (select two courses)
ENGR 4161: Environmental Microclimatology
GEOG 3110: Climatology
GEOG 4160: Applied Climatology
GEOG 4150: Physical Climatology (new course)

Hydrology (select two courses)
CRSS 3060-3060L: Soils and Hydrology
ENGR 2150: Fluid Mechanics
ENGR 3050: Soil and Water Conservation
FORS 4110: Forest Hydrology
FORS 4120: Quantitative Methods in Hydrology
FORS 4130-4130L: Field Methods in Hydrology

Physical Oceanography
MARS 4100: Physical Processes of the Ocean
MARS 4500: Field Study in Oceanography and Marine Methods

PROPOSED REQUIREMENTS – OCT 2009

Requirements (30 hours total)

a. All students are required to complete 21 hours of core requirements

GEOG 3120/L: Weather Analysis and Forecasting (3 hours)
ENGR 4111/L: Atmospheric Thermodynamics (3 hours)
GEOG 4112: Atmospheric Dynamics (3 hours)
ENGR 4131/L: Introductory Atmospheric Physics (3 hours)

Select ONE 3000- or 4000-level course in climatology (3 hours)
- GEOG 3110: Climatology,
- GEOG 4150: Physical Climatology,
- GEOG 4160: Applied Climatology in the Urban Environment, or
- ENGR 4161: Environmental Microclimatology

Select ONE 4000-level course in advanced atmospheric dynamics (3 hours)
- GEOG 4114: Atmospheric Dynamics II, or
- GEOG 4116: Introduction to Data Assimilation [proposed]

Select ONE of atmospheric science research or internship course (2-4 hours)
- GEOG 3990: Internship in Geography (or a related internship class in another discipline by approval of the director) (3 hours),
- GEOG 4910: Collaborative Research in Atmospheric Sciences (3 hours),
- ENGR 4920: Engineering Design Project (topic must be approved by the director) (4 hours), or
- ENVE 4920: Environmental Engineering Design IV (topic must be approved by the director) (2 hours)

b. All students must complete 9 hours from ONE of the following four tracks

i. Operational/Applied Meteorology (9 hours)
GEOG 4120: Synoptic Meteorology/Climatology
GEOG 4140/L: Satellite Meteorology/Climatology
GEOG 4170/L: Mesoscale and Radar Meteorology/Climatology [proposed]

ii. Climatology (select 9 hours beyond the core)
ENGR 4161: Environmental Microclimatology
GEOG 3110: Climatology
GEOG 4150: Physical Climatology
GEOG 4160: Applied Climatology in the Urban Environment

iii. Natural Resources Hydrology (select 9 hours)
FORS 4110: Forest Hydrology
FORS 4120: Quantitative Methods in Hydrology
FORS 4130-4130L: Field Methods in Hydrology
GEOL 4220: Hydrogeology

iv. Engineering Hydrology (select 9 hours)
ENGR 3160: Fluid Mechanics
ENGR 3410: Introduction to Natural Resource Engineering
ENVE 4460: Groundwater Hydrology for Engineers

A number of prerequisite courses must be completed prior to or coincident with enrollment in several of the required certificate courses, particularly ENGR 4111, ENGR 4131, GEOG 4112 and GEOG 4114 (or 4116). Students will be provided an advising sheet listing the course prerequisites.