LONG SIGNATURE SHEET

UNC CHARLOTTE

Proposal Number: GES 01-12-2012

Proposal Title: Proposal to Establish a Graduate Course in Atmospheric Chemistry

Originating Department: Geography and Earth Sciences

TYPE OF PROPOSAL: UNDERGRADUATE_____ GRADUATE_X_____ UNDERGRADUATE & GRADUATE__X__
(Separate proposals sent to UCCC and Grad. Council)

DATE RECEIVED	DATE CONSIDERED	DATE FORWARDED	ACTION	SIGNATURES
6/4/12	1/12/12	6/28/12	Approved	DEPARTMENT CHAIR Assoc. Chair [Craig Allan]
			Approved	COLLEGE CURRICULUM COMMITTEE CHAIR [print name here]
			Approved	COLLEGE FACULTY CHAIR (if applicable) [print name here]
		11/20/12	Approved	COLLEGE DEAN C. Brady [print name here]
			Approved	GENERAL EDUCATION (for General Education courses) [print name here]
			Approved	UNDERGRADUATE COURSE & CURRICULUM COMMITTEE CHAIR (for undergraduate courses)
6-28-12	9-4-12	1-3-13	Approved	GRADUATE COUNCIL CHAIR (for graduate courses) Rob Roy McGregor
			Approved	FACULTY GOVERNANCE ASSISTANT (Faculty Council approval on Consent Calendar)
				FACULTY EXECUTIVE COMMITTEE (if decision is appealed)

Revised 08/01/11
OAA/lz

UNC CHARLOTTE

LONG FORM
COURSE AND CURRICULUM PROPOSAL

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*To: Graduate Council

From: Brian I. Magi

Date: June 27, 2012

Re: New course proposal: ESCI 5220 Atmospheric Chemistry

The Long Form is used for major curriculum changes. Examples of major changes can include: creation of a new major, creation of a new minor, creation of a new area of concentration, or significant changes (more than 50%) to an existing program (Note: changing the name of an academic department does not automatically change the name(s) of the degree(s). The requests must be approved separately by the Board of Governors.)

*****Proposals for undergraduate courses should be sent to the Undergraduate Course and Curriculum Committee Chair. Proposals related to both undergraduate and graduate courses, (e.g., courses co-listed at both levels) must be sent to both the Undergraduate Course and Curriculum Committee and the Graduate Council.

University of North Carolina at Charlotte

New Graduate Course Proposal

Department of Geography and Earth Sciences

I. TITLE. : Proposal to Establish a Graduate Course in Atmospheric Chemistry

II. CONTENT OF PROPOSALS

A. PROPOSAL SUMMARY.

1. SUMMARY. State clearly and concisely the actions proposed (e.g., "the Biology Department proposes to add four new elective courses to the undergraduate curriculum: BIO 2222, BIO 3456, BIO 2345, and BIO 3210).

The Department of Geography and Earth Sciences proposes to add a new course to the graduate curriculum: ESCI 5220: Atmospheric Chemistry. This course would be open to graduate students in Earth Sciences and may be of interest to students in Chemistry as well.

B. JUSTIFICATION.

1. Identify the need addressed by the proposal and explain how the proposed action meets the need.

The timely addition of ESCI 5220 Atmospheric Chemistry would enhance the MS in Earth Sciences with topics related to the chemistry of the lower and upper atmosphere. Examples of topics are air quality, ozone depletion, and current issues in climate science related to atmospheric chemistry. Atmospheric Chemistry has emerged as a major sub-discipline of Meteorology and Earth Sciences and is essential to a complete education in Meteorology.

2. Discuss prerequisites/corequisites for course(s) including class-standing.

Open to students with gradate standing.

3. Demonstrate that course numbering is consistent with the level of academic advancement of students for whom it is intended.

Designed to serve Master's level students, this course will be appropriately numbered at the 5000 level.

4. In general, how will this proposal improve the scope, quality and/or efficiency of programs and/or instruction?

Currently, no course exists at UNC Charlotte addressing Atmospheric Chemistry. The course will provide a foundational understanding of the atmospheric and chemistry principles for Earth Science students interested in topics such as air pollution, acid rain and ozone depletion.

C. IMPACT.

1. What group(s) of students will be served by this proposal? (Undergraduate and/or graduate; majors and/or non-majors, others? Explain). Describe how you determine which students will be served.

Cross-listed as METR 4220, the course will serve both undergraduates majoring in Meteorology and Chemistry as well as graduate students majoring in Earth Sciences. The letter of support from the Chemistry Department indicates that the course can serve as an extra-departmental elective who, in recent years, have had very few options to fulfill this requirement.

2. What effect will this proposal have on existing courses and curricula?

a. When and how often will added course(s) be taught?

We anticipate the course will be offered every spring semester.

b. How will the content and/or frequency of offering of other courses be affected?

We anticipate no impact on the frequency/content of other courses. Dr. Magi will teach this course as part of his regular teaching load.

c. What is the anticipated enrollment in course(s) added (for credit and auditors)?

We anticipate graduate enrollment of about 5-10 students per semester after a few years. Initial enrollment was 2 graduate students, but it is important to point out that the number of graduate students working on degrees that emphasize Meteorology is limited by 3 graduate faculty

members in Meteorology. Brian Magi has been at UNC Charlotte since August 2011 and expects to be advising 3-4 Masters/PhD students at any one time in the future. The anticipated enrollment is thus based on expected graduate student pool growth.

d. How will enrollment in other courses be affected? How did you determine this?
We do not anticipate a significant impact on enrollment in other courses because it will not be a required course for those students pursuing the M.S. in Earth Sciences.

e. If course(s) has been offered previously under special topics numbers, give details of experience including number of times taught and enrollment figures.

The proposed course was offered as a topics course in Spring 2012. A total of 19 students were enrolled, 17 of which were undergraduates and 2 of were graduate students.

f. Identify other areas of catalog copy that would be affected, including within other departments and colleges (e.g., curriculum outlines, requirements for the degree, etc.)

We do not anticipate other areas of catalog copy to be affected.

III. RESOURCES REQUIRED TO SUPPORT PROPOSAL.

When added resources are not required, indicate "none". For items which require "none" explain how this determination was made.

A. PERSONNEL. Specify requirements for new faculty, part-time teaching, student assistant and/or increased load on present faculty. List by name qualified faculty members interested in teaching the course(s).

This course will not require new personnel for its offering. It will be taught by an existing faculty member, Brian Magi, as part of his standard course load. This course, therefore, does not affect other course offerings in the Department, noting that Brian Magi began teaching the course as a topics course in the Spring semester of his first year at UNC Charlotte..

B. PHYSICAL FACILITY

Current facilities and classroom space in the Department of Geography and Earth Sciences are sufficient to conduct this course.

C. EQUIPMENT AND SUPPLIES

Equipment and supplies required for this course are currently available in the Department of Geography and Earth Sciences and are provided under its regular operating budget.

D. **COMPUTER.** Specify requirements for computer usage by students and/or faculty, and include an assessment of the adequacy of computing resources by Computing Services.
Computer facilities required for this course are currently available in the Department of Geography and Earth Sciences and are provided under its regular operating budget. Students will need internet access for Moodle.

E. **AUDIO-VISUAL**. Specify requirements for audio and/or visual equipment and media production services from Media Services.

Audio-Visual facilities required for this course are currently available in the Department of Geography and Earth Sciences and are provided under its regular operating budget.

F. **OTHER RESOURCES**. Specify and estimate cost of other new/added resources required, e.g., travel, communication, printing and binding.

No other resources are required.

G. **SOURCE OF FUNDING**. Indicate source(s) of funding for new/additional resources required to support this proposal.

None necessary.

IV. CONSULTATION WITH THE LIBRARY AND OTHER DEPARTMENTS OR UNITS

A. **LIBRARY CONSULTATION**. Indicate written consultation with the Library Reference Staff at the departmental level to ensure that library holdings are adequate to support the proposal prior to its leaving the department. (Attach copy of ***Consultation on Library Holdings***).

Library consultation dated 01/06/12 indicates library holdings are adequate. See attached consultation for METR 4220.

B. **CONSULTATION WITH OTHER DEPARTMENTS OR UNITS**. List departments/units consulted in writing and dates consulted. Summarize results of consultation and attach correspondence. Provide information on voting and dissenting opinions (if applicable).

Consultation with Chemistry Department dated 01/23/2012 indicates support for the proposed course. See attached consultation for METR 4220.

V. INITIATION, ATTACHMENTS AND CONSIDERATION OF THE PROPOSAL

A. **ORIGINATING UNIT**. Briefly summarize action on the proposal in the originating unit including information on voting and dissenting opinions.

The Department of Geography and Earth Sciences received this proposal and passed it unanimously on August 19, 2011.

B. **ATTACHMENTS**

1. CONSULTATION: Attach relevant documentation of consultations with other units. **(See Attached)**
2. COURSE OUTLINE: For undergraduate courses attach course outline(s) including basic topics to be covered and suggested textbooks and reference materials with dates of publication. **(N/A)**
3. SYLLABUS: For Graduate Courses attach a course syllabus. Please see Boiler Plate for Syllabi for New/Revised Graduate Courses. **(See Attached)**
4. PROPOSED CATALOG COPY: Copy should be provided for all courses in the proposal. Include current subject prefixes and course numbers, full titles, credit hours, prerequisites and/or corequisites, concise descriptions, and an indication of when the courses are to be offered as to semesters and day/evening/weekend. Copy and paste the current catalog copy and use the Microsoft Word "track changes" feature (or use "~~strikethrough~~" formatting in red text for text to be deleted, and adding and highlighting any new text in blue font).

ESCI 5220. Atmospheric Chemistry. (3) Prerequisites: CHEM 1251 and MATH 1242 with a grade of C or above, or permission of instructor. Basic physical chemistry and a survey of major topics in atmospheric chemistry including fundamental properties of the atmosphere, tropospheric chemistry, air pollution, acid rain, stratospheric chemistry and the ozone hole, and the role of chemistry in the Earth's climate. Three hours of combined lecture and lab per week. (Spring)

a. For a new course or revisions to an existing course, check all the statements that apply:

__X__ This course will be cross listed with another course.
__X__ There are prerequisites for this course.
____ There are corequisites for this course.
____ This course is repeatable for credit.
____ This course will increase/decrease the number of credits hours currently offered by its program.
____This proposal results in the deletion of an existing course(s) from the degree program and/or catalog.

For all items checked above, applicable statements and content must be reflected in the proposed catalog copy.

If overall proposal is for a new degree program that requires approval from General Administration, please contact the facultygovernance@uncc.edu for consultation on catalog copy.

5. ACADEMIC PLAN OF STUDY: Please indicate whether the proposed change will impact an existing Academic Plan of Study. If so, provide an updated Academic Plan of Study in template format (Academic Plan of Study templates can be found online at provost.uncc.edu/resources-and-reports).

   This course will not affect any existing Academic Plans of Study.

PROPOSED SYLLABUS FOR METR 4220/ ESCI 5220

METR 4220/ ESCI 5220
Atmospheric Chemistry
Spring 2012

Place and Times: TBD

Final Exam: TBD

Prerequisites: CHEM 1251 and MATH 1242 (or permission of instructor)

Instructor: Dr. Brian Magi, McEniry 232, 704-687-5917, Brian.Magi@uncc.edu

Office Hours: TBD

Required Text: *Introduction to Atmospheric Chemistry*, P. V. Hobbs

Supplementary Texts: *Atmospheric Chemistry and Physics: From Air Pollution to Global* Change, J. H. Seinfeld and S. Pandis; *Chemistry of the Upper and Lower Atmosphere*, B. J. Finlayson-Pitts and J. N. Pitts; *Basic Physical Chemistry for the Atmospheric Sciences*, P. V. Hobbs; *Introduction to Atmospheric Chemistry*, D. J. Jacob; *Earth Under Siege*, R. P. Turco

Website: moodle.uncc.edu

Description

Atmospheric chemistry directly and indirectly impacts climate and meteorology, but is in turn dictated by the principles of chemistry and meteorology. In this course, we will discuss how basic physical chemistry and the Earth's atmosphere are related. We will examine topics that include air quality, acid rain, stratospheric chemistry, the ozone hole, and the role of atmospheric chemistry in climate science and global warming.

Objectives

1. Develop an understanding of the chemical processes in the atmosphere that are important to weather, climate, and the environment
2. Develop an understanding of how chemical processes in the atmosphere are part of the Earth System.
3. Hone critical thinking skills through observations and problem solving

Course Components

Participation Attend class, do the assigned readings, ask questions, listen and respond to your peers, and be prepared to discuss your observations during class.

Problem Sets There will be 5 homework assignments. Assignments will be longer for graduate students.

Lecture Recaps Lecture recaps will be done in a group and will be 10 minute presentations of what was covered in lectures since the last recap. To do the recap, you can use powerpoint, PDF, the internet, or the chalkboard. After your recap in class, you will email me a written summary of your recap and I will post this for the class on Moodle. The goal of lecture recaps is not simply review of the material, but to gain respect for how each individual in the course can contribute to our collective knowledge and mastery of the material.

Exams There will be two midterm exams and a final exam. Each will test your qualitative and quantitative knowledge of the concepts discussed in class and on the problem sets.

Grades

Letter grades will be assigned according to the percentage of points earned for the assignments below. Percentage categories are 90-100, 80-89, 70-79, 60-69, 0-59 and earn A, B, C, D, F, respectively. Assignments must be turned in on time and exams must be taken as scheduled. I will accept assignments turned in early, but not late except under unusual circumstances.

Description	***Percent of grade***
Participation	10%
Lecture Recaps	15%
Problem Sets	25%
Exam 1	15%
Exam 2	15%
Final exam	20%

Course Outline

This schedule is subject to change and is intended to provide a general framework for the course. Time spent on specific topics will depend on the backgrounds and interests of the students.

Weeks	***Topics***
1-2	Fundamentals of chemistry, direction and rates of reactions, acid-bases, oxidation-reduction
3-4	Atmospheric composition, vertical structure, and radiation
4-6	Tropospheric chemistry, sources, sinks, transport and deposition, trace gases, aerosols
6-10	Clouds, biogeochemical cycles, air quality, acid rain, environmental issues
10-12	Stratospheric chemistry, ozone depletion, ozone hole
13-end	Climate, global warming, and chemistry

University Policies

Academic Integrity Students are responsible for knowing and following The Code of Student Academic Integrity and The Code of Student Responsibility. These can be found at http://www.legal.uncc.edu/policies/ps-105.html and http://www.legal.uncc.edu/policies/ps-104.html respectively. Standards of academic integrity will be enforced in this course. **Questions regarding the policies and enforcement of the policies should be addressed to me during class or during office hours.**

Accommodations UNCC abides by interpretations of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 that stipulates no student shall be denied the benefits of an education "solely by reason of a handicap." Disabilities covered by law include, but are not limited to, learning disabilities, hearing, sight or mobility impairments, and other health related impairments. This course will gladly provide accommodations for students with documented needs. If you feel you need an accommodation, please contact the Office of Disability Services, Fretwell 230, Phone 704-687-4355 for the necessary evaluation and documentation.

Diversity The University of North Carolina at Charlotte is committed to equality of educational opportunity and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, sexual orientation, age or disability. In keeping with this commitment, UNC Charlotte actively seeks to promote diversity in its educational environment through its recruitment, enrollment and hiring practices.

IMPORTANT NOTE: A Microsoft Word version of the final course and curriculum proposal should be sent to facultygovernance@uncc.edu upon approval by the Undergraduate Course and Curriculum Committee and/or Graduate Council chair.