Course Approval Form

For approval of new courses and deletions or modifications to an existing course.

registrar.gmu.edu/facultystaff/curriculum

Action Requested:

- [X] Create new course
- [ ] Inactivate existing course
- [ ] Modify existing course (check all that apply)
  - [ ] Title
  - [ ] Credits
  - [ ] Repeat Status
  - [ ] Grade Type
  - [ ] Prereq/coreq
  - [ ] Schedule Type
  - [ ] Restrictions
  - [ ] Other: _____

Course Level:

- [X] Undergraduate
- [ ] Graduate

College/School: College of Science
Department: Chemistry and Biochemistry
Submitted by: Paul Cooper
Ext: 3-2403
Email: pcooper6@gmu.edu

Subject Code: CHEM
Number: 439
(Do not list multiple codes or numbers. Each course proposal must have a separate form.)

Effective Term:

- [ ] Fall
- [X] Spring
- [ ] Summer

Year 2015

Title:
Current:
Banner (30 characters max including spaces): Atmospheric Chemistry II
New: Atmospheric Chemistry II: Air Analysis Techniques

Credits: (check one)

- [X] Fixed: 3
- [ ] Variable: to

Repeat Status: (check one)

- [X] Not Repeatable (NR)
- [ ] Repeatable within degree (RD)
- [ ] Repeatable within term (RT)

Maximum credits allowed: 3

Grade Mode: (check one)

- [X] Regular (A, B, C, etc.)
- [ ] Satisfactory/No Credit
- [ ] Special (A, B C, etc. +IP)

Schedule Type: (check one) LEC can include LAB or RCT

- [X] Lecture (LEC)
- [ ] Lab (LAB)
- [ ] Recitation (RCT)
- [ ] Internship (INT)
- [ ] Independent Study (IND)
- [ ] Seminar (SEM)
- [ ] Studio (STU)

Prerequisite(s):
CHEM 438 or permission of instructor

Corequisite(s):

Instructional Mode:

- [X] 100% face-to-face
- [ ] Hybrid: ≤ 50% electronically delivered
- [ ] 100% electronically delivered

Restrictions Enforced by System: Major, College, Degree, Program, etc. Include Code.

Are there equivalent course(s)?

- [ ] Yes
- [X] No

If yes, please list _____

Catalog Copy for NEW Courses Only (Consult University Catalog for models)

Description (No more than 60 words, use verb phrases and present tense)	**Notes** (List additional information for the course)
The theory, design and implementation of air sampling and analysis techniques for investigating George Mason University and regional air quality.	

Indicate number of contact hours: Hours of Lecture or Seminar per week: 1 Hours of Lab or Studio: 6

When Offered: (check all that apply) [X] Fall [ ] Summer [X] Spring

Approval Signatures

Department Approval _____ Date _____

College/School Approval _____ Date _____

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

For Graduate Courses Only

Graduate Council Member _____ Provost Office _____ Graduate Council Approval Date _____

For Registrar Office's Use Only: Banner_____Catalog_____

revised 11/8/11

Course Proposal Submitted to the Curriculum Committee of the College of Science

Notes: Will qualify as an undergraduate research course for degree purposes. Once approved, I will apply for course development grant from OSCAR which will lead to RS designation.

1. COURSE NUMBER AND TITLE: CHEM 439 – Atmospheric Chemistry II – Air Analysis Techniques

Course Prerequisites: CHEM 438 – Atmospheric Chemistry I or permission of instructor

Catalog Description: The theory, design and implementation of air sampling and analysis techniques for investigating George Mason University and regional air quality.

2. COURSE JUSTIFICATION:

Course Objectives: The course will give students the necessary theory (in lecture) of design, deployment and analysis techniques (in lab) to set up an air quality analysis program for GMU.

Course Necessity: The course will provide an alternative option to independent research courses for chemistry seniors to participate in undergraduate research.

Course Relationship to Existing Programs: As far as I am aware, other programs (e.g., Earth Science, Global and Environmental Change and Environmental Science) do not offer a similar course.

Course Relationship to Existing Courses: This course follows Atmospheric Chemistry I (CHEM 438) – a lecture-based course that I already teach. CHEM 438 is cross-listed with CLIM 438, but given the intensive laboratory part of the course, enrollment will not be open non-chemistry students.

3. APPROVAL HISTORY:

4. SCHEDULING AND PROPOSED INSTRUCTORS:

Semester of Initial Offering: Spring 2015

Proposed Instructors: Cooper

5. TENTATIVE SYLLABUS:

Prerequisites: CHEM 438 or permission of instructor.
Credits: 3 (1 hour of Lecture and 6 hours of Lab work per week)

Instructor: Dr. Paul D. Cooper
Course Description: The theory, design and implementation of air sampling and analysis techniques for investigating GMU and regional air quality.

Lecture Content: Lecture time will consist of both formal instructor lecture and interactive group discussions in the planning and testing of air sampling and analysis. Lecture topics to be covered will include: Air quality chemistry, incl. SO_2, NO_x, O_3, CO, particulate matter, non-methane hydrocarbons, volatile organic compounds; EPA air quality standards and regulations, and; standard procedures for air pollution analysis. Additionally, it is expected that students will review literature, analytical procedures and actively discuss the planning, testing and implementation of the air sampling program.

Laboratory Content: Students will use part of this time in the field, setting up instruments, acquiring data, and scouting new locations. The remaining time in the laboratory will be used to test, calibrate and analyze air samples returned from the field.

Assessment: Assessment will consist of: a detailed technical report of the semester's work; a presentation at the department's end of semester research colloquim; participation in classroom discussions; an end of semester exam.

Grades: Technical Report (40%), Presentation (20%), Final Exam (30%), In-Class Discussion (10%)

Required Texts: Students will not be required to purchase a textbook, however they will be expected to use the following texts that will be placed on closed reserve in the library. Additionally students will be expected to access EPA documents, journal articles, and other technical reports.
Physical Chemistry 9th Ed., Peter Atkins and Julio de Paula. New York, Oxford University Press, 2006.
Atmospheric Chemistry, Ann M. Holloway and Richard P. Wayne, RSC Publishing, 2010.
Introduction to Atmospheric Chemistry, Daniel J. Jacobs, Princeton University Press, 1999.