

Submit originals (including syllabus) and one copy and electronic copy to the **Faculty Senate Office**
See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL

Attach a syllabus, except if dropping a course.

SUBMITTED BY:

Department	Civil and Environmental Engineering	College/School	CEM
Prepared by	Srijan Aggarwal	Phone	474.6120
Email Contact	saggarwal@alaska.edu	Faculty Contact	Srijan Aggarwal

1. COURSE IDENTIFICATION: As the course now exists.

Dept	ENVE	Course #	F643	No. of Credits	3
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COURSE TITLE	Air Pollution Management
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2. ACTION DESIRED: Check the changes to be made to the existing course.

Change Course	<input checked="" type="checkbox"/>	If Change, indicate below what is changing.	Drop Course	<input type="checkbox"/>
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NUMBER		TITLE		DESCRIPTION	
PREREQUISITES*		FREQUENCY OF OFFERING		<input checked="" type="checkbox"/>	

*Prerequisites will be required before a student is allowed to enroll in the course.

CREDITS (including credit distribution)		COURSE CLASSIFICATION	
ADD A STACKED LEVEL (400/600) Include syllabi.	<input checked="" type="checkbox"/>	Dept. CE	Course # F443

How will the two course levels differ from each other? How will each be taught at the appropriate level?:

While the overall topics for the class remain common for undergraduate and graduate student, for the students earning graduate credit, the course will primarily differ in terms of assignments and exams; reading and discussion on research literature; and quality of group project. (More details provided in the justification section and also in the syllabus). Grading scheme is also different for the two courses (see attached syllabus).

Stacked course applications are reviewed by the (Undergraduate) Curricular Review Committee and by the Graduate Academic and Advising Committee. Creating two different syllabi—undergraduate and graduate versions—will help emphasize the different qualities of what are supposed to be two different courses. The committees will determine: 1) whether the two versions are sufficiently different (i.e. is there undergraduate and graduate level content being offered); 2) are undergraduates being overtaxed?; 3) are graduate students being undertaxed? In this context, the committees are looking out for the interests of the students taking the course. Typically, if either committee has qualms, they both do. More info online – see URL at top of this page.

ADD NEW CROSS-LISTING		Dept. & No.		Requires approval of both departments and deans involved. Add lines at end of form for additional signatures.
STOP EXISTING CROSS-LISTING		Dept. & No.		Requires notification of other department(s) and mutual agreement. Attach copy of email or memo.
OTHER (specify)				

3. COURSE FORMAT

NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council and the appropriate Faculty Senate curriculum committee. Furthermore, any core course compressed to less than six weeks must be approved by the Core Review Committee.

COURSE FORMAT: (check <u>all</u> that apply)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input checked="" type="checkbox"/> 6 weeks to full semester
OTHER FORMAT (specify all that apply)						
Mode of delivery (specify lecture, field trips, labs, etc.)	Lecture					

4. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found in Chapter 12 of the curriculum manual. If justification is needed, attach separate sheet.)

H = Humanities ☐ S = Social Sciences ☐

Will this course be used to fulfill a requirement for the baccalaureate core? YES ☐ NO ☒

IF YES*, check which core requirements it could be used to fulfill:

O = Oral Intensive, ☐ W = Writing Intensive, *Format 7 submitted ☐ X = Baccalaureate Core ☐
*Format 6 also submitted ☐

4. Is course content related to northern, arctic or circumpolar studies? If yes, a "snowflake" symbol will be added in the printed Catalog, and flagged in Banner.

YES ☐ NO ☒

5. COURSE REPEATABILITY:

Is this course repeatable for credit? YES ☐ NO ☒

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

How many times may the course be repeated for credit? TIMES

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course? CREDITS

6. COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking, clearly showing the changes you want made. (Underline new wording strike-through old wording and use complete catalog format including dept., number, title, credits and cross-listed and stacked.)

Example of a complete description:

PS F450 Comparative ~~Aberiginal~~Indigenous Rights and Policies (s)

3 Credits

Offered As Demand Warrants

~~Case-study~~Comparative approach in ~~assessing~~analyzing ~~Aberiginal~~Indigenous rights and policies in different nation-state systems. ~~Seven~~Multiple ~~Aberiginal~~countries and ~~specific~~policy ~~developments~~examined for factors promoting or limiting self-determination. Prerequisites: Upper division standing or permission of instructor. (Cross-listed with ANS F450.) (3+0)

ENVE F643 Air Pollution Management

3 Credits

Offered As Demand Warrants

Air pollution topics including the quantity and quality of atmospheric emissions and their effects on the human environment. Identification and location of sources, measurement of quality and conformance with standards. Legal considerations of Clean Air Act and Amendments and local regulations. Evaluation of stationary and moving sources. Meteorology and modeling requirements. Control mechanisms for gases and particulates; and engineering economics. Recommended: CHEM 106X or equivalent; MATH F201X; graduate standing; or permission of instructor. (3+0)

7. COMPLETE CATALOG DESCRIPTION AS IT SHOULD APPEAR AFTER ALL CHANGES ARE MADE:

ENVE F643/CE F443 Air Pollution Management

3 Credits

Offered Spring of Odd-numbered Years~~Offered As Demand Warrants~~

Air pollution topics including the quantity and quality of atmospheric emissions and their effects on the human environment. Identification and location of sources, measurement of quality and conformance with standards. Legal considerations of Clean Air Act and Amendments and local regulations. Evaluation of stationary and moving sources. Meteorology and modeling requirements. Control mechanisms for gases and particulates; and engineering economics. Recommended: CHEM 106X or equivalent; MATH F201X; graduate standing; or permission of instructor. (3+0)

8. GRADING SYSTEM: Specify only one.

LETTER: ☒ PASS/FAIL: ☐

9. ESTIMATED IMPACT

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

None

10. LIBRARY COLLECTIONS

Have you contacted the library collection development officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No ☐ Yes ☒ 9/12/2014

11. IMPACTS ON PROGRAMS/DEPTS:

What programs/departments will be affected by this proposed action?

Include information on the Programs/Departments contacted (e.g., email, memo)

Civil Engineering, Environmental Engineering, Atmospheric Sciences

12. POSITIVE AND NEGATIVE IMPACTS

Please specify **positive and negative** impacts on other courses, programs and departments resulting from the proposed action.

Will offer opportunity for students in CNSM and CEM to enroll in a semester long dedicated course on air quality issues.

13. JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you ask for a change in # of credits, explain why; are you increasing the amount of material covered in the class? If you drop a prerequisite, is it because the material is covered elsewhere? If course is changing to stacked (400/600), explain higher level of effort and performance required on part of students earning graduate credit. Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the course is not compromised as a result.

This class has been on "no print" status since no faculty member was available to teach the course. With recent hire of new faculty, this class shall be offered again, in the Spring of odd numbered years, and it shall be listed in the catalogue again.


As for the need for stacking: Air Quality is an important issue and a topic of increasing concern and involvement for environmental engineers. Many schools routinely offer an introductory course on air quality issues for undergraduates in "Civil and Environmental Engineering". Currently none exists in the Civil and Environmental Engineering curriculum here at UAF and this stacked course will fill this important need for the undergraduate students. This course could also be used as a required technical elective for the UG curriculum.

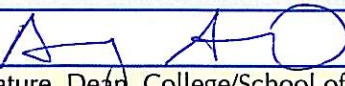
While the overall topics for the class remain common for undergraduate and graduate student, for the students earning graduate credit, the course will primarily differ in following three ways.

1. First, the homework assignments and exams will be handed out in two categories requiring demonstration of deeper understanding of the concepts for the graduate students.
2. Second, while all students will participate in weekly journal article discussions, graduate students will be leading the discussion (as assigned) along with presenting a critical summary to the class.
3. Third, the project/term paper topic for graduate students would require demonstration of graduate level competence and effort.

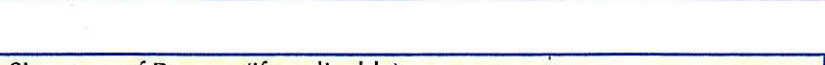
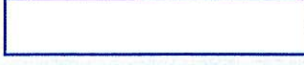
APPROVALS: (Forms with missing signatures will be returned. Additional signature blocks may be added as necessary.)

 Date 10/12/14 ^{9? - sk}
Signature, Chair, Program/Department of: CEE

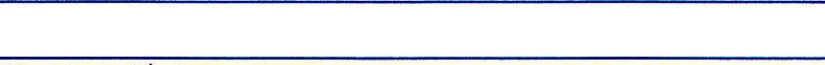

 Date 9-25-14
Signature, Chair, College/School Curriculum Council for: CEM

 Date 10/22/14
Signature, Dean, College/School of: CEM

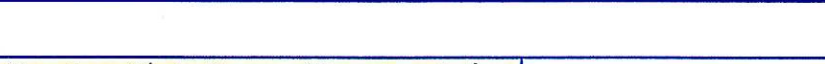


Offerings above the level of approved programs must be approved in advance by the Provost (e.g., non-graduate level program offering of a 600-level course):




 Date 
Signature of Provost (if applicable)




ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE.

 Date 
Signature, Chair
Faculty Senate Review Committee: ☐ Curriculum Review ☐ GAAC
☐ Core Review ☐ SADAC

ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking; add more blocks as necessary.)

 Date 
Signature, Chair, Program/Department of: 

 Date 
Signature, Chair, College/School Curriculum Council for: 

 Date 
Signature, Dean, College/School of: 

Note: If removing a cross-listing, you may attach copy of email or memo to indicate mutual agreement of this action by the affected department(s).

If degree programs are affected, a Format 5 program change form must also be submitted.

RECEIVED

SEP 25 2014

College of Arts & Sciences
Department of Curriculum & Instruction

ATTACH COMPLETE SYLLABUS (as part of this application). This list is online at:

<http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/uaf-syllabus-requirements/>

The Faculty Senate curriculum committees will review the syllabus to ensure that each of the items listed below are included. If items are missing or unclear, the proposed course (or changes to it) may be denied.

SYLLABUS CHECKLIST FOR ALL UAF COURSES

During the first week of class, instructors will distribute a course syllabus. Although modifications may be made throughout the semester, this document will contain the following information (as applicable to the discipline):

1. Course information:

☐ Title, ☐ number, ☐ credits, ☐ prerequisites, ☐ location, ☐ meeting time
(make sure that contact hours are in line with credits).

2. Instructor (and if applicable, Teaching Assistant) information:

☐ Name, ☐ office location, ☐ office hours, ☐ telephone, ☐ email address.

3. Course readings/materials:

☐ Course textbook title, ☐ author, ☐ edition/publisher.
☐ Supplementary readings (indicate whether ☐ required or ☐ recommended) and
☐ any supplies required.

4. Course description:

☐ Content of the course and how it fits into the broader curriculum;
☐ Expected proficiencies required to undertake the course, if applicable.
☐ Inclusion of catalog description is *strongly* recommended, and
☐ Description in syllabus must be consistent with catalog course description.

5. ☐ Course Goals (general), and (see #6)

6. ☐ Student Learning Outcomes (more specific)

7. Instructional methods:

☐ Describe the teaching techniques (eg: lecture, case study, small group discussion, private instruction, studio instruction, values clarification, games, journal writing, use of Blackboard, audio/video conferencing, etc.).

8. Course calendar:

☐ A schedule of class topics and assignments must be included. Be specific so that it is clear that the instructor has thought this through and will not be making it up on the fly (e.g. it is not adequate to say "lab". Instead, give each lab a title that describes its content). You may call the outline Tentative or Work in Progress to allow for modifications during the semester.

9. Course policies:

☐ Specify course rules, including your policies on attendance, tardiness, class participation, make-up exams, and plagiarism/academic integrity.

10. Evaluation:

☐ Specify how students will be evaluated, ☐ what factors will be included, ☐ their relative value, and ☐ how they will be tabulated into grades (on a curve, absolute scores, etc.) ☐ Publicize UAF regulations with regard to the grades of "C" and below as applicable to this course. (Not required in the syllabus, but is a convenient way to publicize this.) Link to PDF summary of grading policy for "C":

[http://www.uaf.edu/files/uafgov/Info-to-Publicize-C Grading-Policy-UPDATED-May-2013.pdf](http://www.uaf.edu/files/uafgov/Info-to-Publicize-C%20Grading-Policy-UPDATED-May-2013.pdf)

11. Support Services:

☐ Describe the student support services such as tutoring (local and/or regional) appropriate for the course.

12. Disabilities Services: Note that the phone# and location have been **updated**. <http://www.uaf.edu/disability/> The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials.

☐ State that you will work with the Office of Disabilities Services (208 WHITAKER BLDG, 474-5655) to provide reasonable accommodation to students with disabilities.

5/21/2013

ENVE 643, CE 443
Air Pollution Management

Instructor	Dr. Srijan Aggarwal, Ph.D., Assistant Professor Department of Civil and Environmental Engineering Email: saggarwal@alaska.edu Office: Duckering 271, Tel: 907-747-6120
Class time	Tuesday and Thursday 11:30 am – 1 pm
Class location	Duckering 345
Office hours	M,W, F: 2:00 PM -3:00 PM
Course description	<p>Introduction to air pollution problems and solutions, at scales ranging from local to global. Qualitative and quantitative analysis of chemistry and physics of atmospheric pollutants and their effects on the human environment.</p> <p><i>Main topics:</i> Sources (stationary and moving sources) and sinks of air pollution, atmospheric transport and transformation, air quality management and regulations (clean air act), health impacts; global issues; meteorology and modeling requirements; control mechanisms for gases and particulates.</p>
Textbook	<p><i>Atmospheric Pollution: History, Science and Regulation</i>, M.Z. Jacobson. Cambridge University Press, 2002. (Required textbook).</p> <p><i>Atmospheric Chemistry and Physics: From Air Pollution to Climate Change</i> (2nd ed), J. H. Seinfeld and S. N. Pandis. Wiley-Interscience, 2006. A detailed, scholarly text and reference manual.</p> <p>Air Pollution Engineering Manual (2nd ed), W.T. Davis (editor). Wiley-Interscience, 2000. Useful overview for practitioners; discusses issues and controls for many sectors.</p> <p>Other reading material in the form of scientific journal articles, which will be electronically made available through UAF library and provided on Blackboard.</p>
Prerequisites	Recommended: CHEM 106X or equivalent; MATH F201X; or permission of instructor.
Objectives	<ul style="list-style-type: none">• Understand the chemistry and physics behind air pollution• Apply mathematical principles to air pollution modeling• Become familiar with regulations in air quality field• Learn techniques for air quality assessment and control• Develop skills in reading and criticism of primary scientific literature• Develop literature research, writing and oral presentation skills
Course format	Lectures with supporting reading from textbooks and primary scientific literature will form the knowledge base of the course. Relevant journal articles will be assigned for critical group discussion.

Grading Policy

Graduate students:

Homeworks.....	20%
Quizzes and Class Participation.....	10%
Journal article discussion.....	10%
Midterm Exam	20%
Term Paper/project.....	20%
Final Exam	20%

Undergraduate students:

Homeworks.....	25%
Quizzes and Class Participation.....	10%
Midterm Exam	25%
Term Paper/project.....	15%
Final Exam	25%

Final grades will be awarded according to the following scale:

95-100 **A**; 90- <95 **A-**; 85 - <90 **B+**; 80 - <85 **B**; 75-<80 **B-**;
70 - <75 **C+**; 65 - <70 **C**; 55-<65 **D**; <55 **F**

Either the weighted percentages or a curve maybe used, whichever gives best grades.

Additional Notes and Policies

1. **Academic integrity.** Each student must become aware of UAF's policy on academic integrity as detailed in the *Student Code of Conduct*, p. 50 of the 2014-2015 catalog. The **FIRST** violation of the student code will result in immediate failure of the course and/or disciplinary action as per UAF policy.
2. **Communication.** Outside of scheduled lectures and office hours, email is the official form of communication. When sending a message to the instructor, please use ENVE643/CE443 in the subject line. Students are expected to check their UAF email accounts for course updates. In addition, UAF Blackboard will be used for general announcements, distribution of course materials and posting of grades.
3. **Exams.** One mid-term exam and a final will be given during the semester. Each will be designed to test your understanding of critical concepts and your ability to solve problems. Exams are closed book/closed notes, however you may use a **single** 8.5" by 11" cheat sheet of your own creation.
4. **Quizzes.** Six to eight quizzes (open book and notes) will be conducted during the course of the semester. Best five quizzes will be considered for the final grade. No make-up quizzes.
5. **Homeworks.** Weekly homework problems will be assigned throughout the semester. Homework assignments are due at the 5:00 PM on the due date. Late homework will **NOT** be accepted without prior approval from the professor.
6. **Make up exams:** Exams must be taken on the dates and in general there will be no makeup exams. Makeups will be given only under extreme circumstances. It is expected that the student

will contact the instructor sufficiently in advance of an exam or have sufficient reason that they could not do so. Valid reasons include severe sickness (attested by physician's certificate), bereavement, or travel on university business (a letter in advance from the supervisor or responsible official).

7. **Absence.** If you are absent from any class it is your responsibility to inform yourself about the class material or any announcements. If you miss a quiz or homework you receive a "zero grade", except when you have made arrangements beforehand for reasons as stated above.
8. **Attendance.** Class attendance at all lectures is **required** and will be monitored. The professor reserves the right to adjust final grades up or down based on a student's course participation. You are welcome to ask questions in class or during office hours. Class participation and discussion makes the course lively and interesting for everyone.
9. **Homework Format:** It is imperative that engineering work be well organized and neatly presented in order to convey the desired information to peers, clients, and other interested parties in a clear, logical manner. Developing these skills of written communication is critical to career development. Pay close attention to these while submitting homework and exams.
10. **Group Project.** The course includes a group project, evaluated in the form of an oral presentation at the end of the semester. Students may work in groups of up to 3 people. Projects must have a clear research question or problem statement, and then provide quantitative analysis addressing that question. Presentation will approximately be 10 minutes. Each student will provide an evaluation of the contribution of other students in his or her group and of the quality of other group's projects.

Deadline for group projects:

1. March 1 – By class time, decide groups and topics.
 2. April 1 – By 5:00 PM, turn in a sheet with project title and a half page summary of proposed research question and analysis approach.
 3. Group presentations will occur approximately during the last two weeks of classes; the exact date will be selected later in the semester.
11. **Incomplete.** An "incomplete" will not be given unless severe illness, family tragedy, or a sudden transfer is involved. A written explanation and the completion of the appropriate UAF paperwork must be submitted in all cases..
 12. **Disabilities.** If you have specific physical, psychiatric or learning disabilities and require reasonable accommodations, please let me know early in the semester so that your learning needs may be appropriately met. You will need to provide documentation of your disability to 'Disability Services' in room 208 of the Whitaker Building and request a letter of accommodation.

ABET Criteria 3 – Program Outcomes:

This course helps students meet the following outcomes:

- a) An ability to apply knowledge of mathematics, science, and engineering.
- b) An ability to identify, formulate, and solve engineering problems.
- c) A recognition of the need for, and an ability to engage in life-long learning.
- d) An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Tentative syllabus is as below :

Theme	Topics	Readings (APHSR)	Other readings	Lectures
Introduction	Unit conversions, mass balance, characteristic lifetimes	Preface, 1.1, 1.2, 1.5, 1.6, 2.2; Ch , Ch8.4.1	a) AQ for GPs. Hardin, <i>Tragedy of the commons</i>	4
	Regulation : Clean Air Act			
	How are we doing ?			
Air pollution and health	Epidemiology & toxicology	Class handouts	a) Brunekreef and Holgate et al. <i>Air Pollution and Health</i> b) Pope et al. <i>Lung Cancer...</i> c) Marshall and Nazaroff, <i>Intake fraction</i>	3
	Intake fraction			
Combustion	Stoichiometry	Ch 1.3	a) Smith, <i>In prise of petroleum ?</i>	4
	Fuels			
	Emissions			
	Emission controls			
Particulate matter	Size distributions	Ch 5	a) Pope and Dockery, <i>Health effects of fine particulate air pollution: lines that connect</i>	3
	Secondary formation			
	Cogaulation/deposition			
	Particle removal technologies			
Atmospheric chemistry : Ozone	Chemical kinetics	1.4; 4.2-4.5		4
	Ozone reduction (EKMA)			
Modeling	Meteorology; stability	6.6-6.8		2
	Gaussian plume			
	Urban airshed models			
Measurement methods	Particulate matter			3
	Other Pollutants			
	Source apportionment			
Global warming	Science of warming	2.2, Ch12.	a) IPCC, Summary for Policymakers b) Pacala & Socolow, <i>Stabilization Wedges</i>	3
	IPCC			
	Wedges			
	Prediction; impulse response			
	Current issues			2