FACULTY CURRICULUM COMMITTEE
SIGNATURE PAGE

- In section A, list ALL of the forms covered by this signature page. If you submit a form that is not listed in A, your proposal will be held back until we receive a new, updated signature page.
- You must obtain the signature of your department chair and dean before submitting your proposal.

A. FORMS COVERED BY THIS SIGNATURE PAGE. List each form you are submitting—for instance, PSYC 383, Course Form; PSYC, Change of Major Form; PSYC, Change of Minor Form.

ENVT Minor Form

B. APPROVAL AND SIGNATURES.

1. Signature of Department Chair or Program Director:

2. Signature of Academic Dean:

3. Signature of Provost:

4. Signature of Business Affairs (only for course fees):

5. Signature of Curriculum Committee Chair:

6. Signature of Budget Committee Chair (only for new programs):

7. Signature of Academic Planning Committee Chair (only for new programs):

8. Signature of Faculty Senate Secretary:

Date Approved by Faculty Senate: 

☐ fee approved on ________
☐ BOT approval pending

School of HSS
OCT 20 2015
DEAN'S OFFICE
RECEIVED DATE
MEMORANDUM

TO: Provost and Faculty Curriculum Committee
FROM: Todd LeVasseur, RELS faculty and Director of ENVT minor
DATE: 25 September 2015
RE: Add GEOL-441 to list of approved courses for the ENVT minor

I wish to add GEOL-441 Pollution in the Environment to the approved list of courses that meet the requirement for the category I. Natural Sciences and Mathematics Environmental Courses for the ENVT minor.

This course meets the current guidelines for interdisciplinary programs by having a significant focus (i.e., >1/3 of course content) on environmental topics.

Enclosed is a note from Dr. Mitchell Colgan, Department Chair of Geology, approving this change, a completed FACULTY CURRICULUM COMMITTEE MINOR FORM and finally the complete curriculum for the minor (including the description and course list, exactly as it should appear in the catalog).

Please let me know if further information is required.
FACULTY CURRICULUM COMMITTEE
MINOR FORM

Instructions:
- Please fill out all of the portions of the form that are specified in section B. **You must do this before your request can move forward!**
- Remember that your changes will not be implemented until the next catalog year at the earliest.
- If you have questions, please start by checking the detailed instructions on the website. Please feel free to contact the committee chair with any remaining questions you might have.

A. CONTACT INFORMATION.

Name: Todd LeVasseur Phone: 3911
Email: levasseurtj@cofc.edu

School: HSS  Department or Program: ENVT

Name and Acronym of Minor: Environmental Studies/ENVT

B. TYPE OF REQUEST. Please check all that apply, then fill out the specified parts of the form.

☐ Add a New Minor (complete all portions)

☐ Change an Existing Minor (complete C, D, E, G, H, and I)
  ☒ Add existing course or courses to requirements or electives
  ☐ Add new course(s) to requirements or electives (attach completed course form for each)
  ☐ Delete courses from requirements or electives

☐ Terminate a Minor (complete E, G, H, and I)

C. GENERAL INFORMATION.

Number of Current Credit Hours (for existing minors): __19__
Number of Proposed Credit Hours (for new or changing minors): ______

Catalog year in which changes will take effect: FALL ______2016_____

☒ Interdisciplinary (please see guidelines on the Curriculum Committee website and include acknowledgments from relevant departments)

According to academic policy, students may not obtain a major/concentration and minor in the same subject. Will students in specific majors be prohibited from declaring this minor because of this policy?

☐ Yes—Which major(s) or concentration(s)? ____________

☒ No

D. CURRICULUM. For a changed minor, please list every change you are making below AND attach the current catalog entry for this minor (from the Minor Requirements section) with changes marked in RED. Additions should show where the course will be inserted, deletions should be noted by crossing out the course, and moves indicated with arrows. Distinguish between required and elective courses, and note any prerequisites, co-requisites, sequencing, or other restrictions. For each new course, submit the Curriculum Committee’s Course Form and a sample syllabus. For

This form was last updated on 6/6/2013 and replaces all others.
a new program, please submit the complete curriculum and catalog description exactly as they should appear in the catalog.

GEOL 441 will count as an elective course that will meet category I: Natural Sciences and Mathematics offerings for the minor. The course, 3 hours of lecture and 1 of lab, will count towards the minor, although students who matriculate into GEOL 441 will need to meet GEOL prerequisite requirements.

E. RATIONALE AND EXPLANATION. Please provide a narrative addressing the request you are making and why you are making it. In addition, for a new minor, please address its objectives, provide evidence of student interest (e.g., interviews with student focus groups, enrollment in special-topics courses in this area), and explain how the minor supports the liberal arts tradition as well as the mission of the institution.

This course offers essential coverage of a key environmental metric and how it is studied, measured, and regulated: pollution (atmospheric, aquatic, terrestrial). Part of the ENVT is to help students understand basic biogeochemical processes, and then how humans relate to and interact with these. The physics, chemistry, and geology of various pollutants, and strategies to regulate and manage such pollutants in the natural environment, are germane to this key objective of the ENVT minor. Understanding human/nature dynamics, with a goal at regulating environmental burdens, in this case, pollutants, through science, policy, and ethics fits into a liberal arts tradition.

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT.

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the minor? Attach a Curriculum Map.</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. develop a solid understanding of environmental processes and pollutant behavior in the environment,</td>
<td>Problem-solving exercises, lab reports</td>
</tr>
<tr>
<td>2. develop the requisite skills to apply you theoretical knowledge to solve environmental problems,</td>
<td>Group case study work, lab reports</td>
</tr>
<tr>
<td>3. know how to make quantitative predictions about outcomes of chemical reactions that occur in context of geological processes,</td>
<td>Problem-solving exercises, lab reports</td>
</tr>
<tr>
<td>4. be able to work in small teams and actively present research results in both written and oral formats.</td>
<td>Group case study work, lab paper, presentations to class</td>
</tr>
</tbody>
</table>

This form was last updated on 6/6/2013 and replaces all others.
How does this minor align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this minor?

Program level outcomes supported by this class include: Lab based skills; quantitative skills especially related to measuring atmospheric, terrestrial, and aquatic chemicals; understanding policy and regulations and how these manage atmospheric pollution; understanding basic earth systems and biogeochemical processes

G. IMPACT ON EXISTING PROGRAMS AND COURSES. Please describe the impact of this request on other programs and courses. If you are deleting a minor, please identify all programs that will be affected. If you are adding or changing a minor, please explain any overlap with existing programs at the College.

None, outside of possibly increased enrollment for the course

H. COSTS. List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.

None

I. CHECKLIST.

☐ I have completed all relevant parts of the form.

☐ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☐ I have attached a Course Form for each newly-created or modified course.

☐ (For proposals that affect other departments in any way) I have attached an acknowledgement from the relevant department.

☐ I have provided the complete curriculum for the minor, including the description and course list, exactly as it should appear in the catalog.

☐ I have submitted one Signature Form that lists all of the different forms I am submitting.
Environmental Studies Minor

Phone: 843.953.5995

Seth Pritchard, Director

The environmental studies minor is offered for students who have an interest in learning more about the natural environment and the ecology of the planet, as well as understanding the relationship of political, social, cultural, and economic activities to that environment.

Requirements

Credit Hours: 19 hours (from the following three categories)

I. Natural Sciences and Mathematics Environmental Courses

Three or more courses (at least nine credit hours) plus prerequisites selected from:

- BIOL 204 Man and the Environment
- BIOL 209 Marine Biology, with lab
- BIOL 301 Plant Taxonomy
- BIOL 340 Zoogeography
- BIOL 341 General Ecology, with lab
- BIOL 342 Oceanography, with lab
- BIOL 360 Introduction to Biometry
- BIOL 406 Conservation Biology
- BIOL 410 Applied & Environmental Microbiology, with lab
- BIOL 444 Plant Ecology
- BIOL 503 Special Topics in Ecology
- CHEM 422 Environmental Chemistry
- CHEM 422L Environmental Chemistry Lab
- GEOL 103 Environmental Geology, with lab
- GEOL 107 Introduction to Coastal and Marine Geology
- GEOL 213 Natural Hazards
- GEOL 257 Marine Geology
- GEOL 275 Geomorphology, with lab
- GEOL 288 Climate Change: A Global Perspective
- GEOL 312 Environmental Field Methods, with lab
- GEOL 320 Earth Resources
- GEOL 438 Hydrogeology, with lab
- GEOL 449 Geographical Information Systems, with lab
- MATH 250 Statistical Methods I
- PHYS 105 Introduction to Meteorology
- PHYS 308 Atmospheric Physics
- PHYS 350 Energy Production
- PHYS 456 Air Pollution Meteorology
- PHYS 457 Satellite Meteorology
- PHYS 458 Climate Change

Special topics courses offered by departments may be approved on a course-by-course basis.

NOTE: Only one course in the student's major department may be applied to the minor. Only one mathematics course may be chosen.

II. Social Sciences and Humanities Environmental Courses

Two courses (plus prerequisites) selected from:

- ANTH 318 Theories for the Origin of Agriculture
- ECON 311 Environmental Economics
- ENTR 407 Ecopreneurship
- PHIL 150 Nature, Technology and Society
- PHIL 155 Environmental Ethics
- PHIL 245 Environmental Philosophy
- POLI 294 Sustainability
European Studies Minor

Phone: 843.953.5930

William Olejniczak, Director

European studies is an interdisciplinary area studies minor that introduces students to the diverse cultures and nations of Europe through the study of history, literature, languages, visual arts, economics, business, politics, religion and society.

Requirements
Credit Hours: 18

Cluster A: History and Ideas (3 credit hours)
Cluster B: Languages, Literature, Culture (3 credit hours)
Cluster C: Economics, Politics, Society (3 credit hours)
Electives (6 credit hours)

European Studies 400 Capstone Course (3 credit hours)

NOTE: Six credit hours of electives must be taken from Cluster A, B, or C with the following restrictions: no more than 6 credit hours from one cluster, no more than 3 credit hours from one discipline, and no more than 6 credit hours devoted to the study of one country may count towards the 18-hour minor. In order to complete this minor, students will take HIST 101 and 102 (or HONS 121/122 and HONS 131/132) or their equivalents and a European language.

NOTE: Each semester, departments offer relevant special topics courses. When appropriate, special topics courses will count towards the minor. Students should consult with the director of the program to determine if a special topics course may count towards the minor. Students may also need to fulfill prerequisites before they take certain upper-level courses in some departments.

Cluster A: History and Ideas

Choose one 3-credit-hour course from the following:

HIST 231  Ancient Greece
HIST 232  Ancient Rome
HIST 234  Early Middle Ages
HIST 235  High Middle Ages
HIST 242  History of Modern France
HIST 244  Political and Social History of Germany from 1866 to Present
HIST 252  Women in Europe
HIST 256  History of Science and Technology
HIST 291  Disease, Medicine, and History
Pollution in the Environment  
Fall 2015 Syllabus  
Instructor: Dr. Vijay M. Vulava

1 Contact Information

Office: SSMB 250, MF 13:30-16:00 h (or by appoint.)
Lecture: SSMB 253, MWF 12:00-12:50 h
Laboratory: SSMB 241, W 14:00-17:00 h
Phone: 843.608.9628
Email: vulavav@cofc.edu
Lectures, readings, & links: “OAKS” on http://my.cofc.edu/

2 Course Goals and Structure

This course focuses on theoretical skills required to understand how natural and anthropogenic factors influence pollutant behavior on Earth’s near-surface environments. While we primarily focus on fresh water (i.e. streams, lakes, and groundwater) and shallow geological environments (soils and sediments), this year Dr. Ian Rumsey of the Physics Department will introduce atmospheric pollution concepts as well.

Since this may be the only environmental chemistry-themed course you may take at the College, it is a broad survey course and will cover a lot of topics. Paradoxically, you will find that “environmental pollution” is so broad, that we barely touched a fraction of all aspects of this topic in this course. You will, however, have the opportunity to pursue and research topics related to pollution in detail on your own over the course of this class. Some examples of case studies/topics that are covered are shown in Figure 1. Depending on your interests more cases could be studied.

This course will take a quantitative approach to understanding environmental pollution issues. Over the course of the semester, you will also be introduced to tools such as (i) PHREEQC, a very powerful hydrogeochemical modeling tool (http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/), (ii) Visual MINTEQ, a visual chemical equilibrium model (http://www2.1wr.kth.se/English/OurSoftware/vminteq/), (iii) Wolfram Alpha, a very powerful visual mathematics programming language (http://www.wolframalpha.com/), (iv) Excel, to solve and visualize equilibrium chemical problems, (v) \LaTeX, an intelligent and very powerful scientific text-typesetting program (http://latex-project.org/).

Some of you may be uncomfortable with your math, chemistry, and/or geology background – I assure you that most of you are in the same boat. Just be open to learning lots of new concepts and don’t stress out – environmental chemistry and sciences are more fun than you can imagine!

Unlike most other science courses you have in Geology or other science classes, this course is a bit different in two regards:

1. A case study approach: The traditional approach of top-down incremental knowledge approach seems too contrived for this kind of a class. Instead, this class takes an unstructured case study approach to understanding environmental pollution issues. This approach will help you focus on the “big picture” and develop a context for using basic science concepts to understand how environments work. As you try to unravel specific environmental pollution issues, you will learn core science skills necessary to understand and predict outcomes in similar situations. Since this is a significantly different approach than what you probably see in other classes, I expect all of you to fully participate and give me periodic feedback on
what is working and what isn’t. I will gratefully accept and welcome all comments (positive and negative) and will attempt to incorporate any changes necessary to make your learning experience successful. I expect you to be a full partner in this course.

2. **No examinations:** One of the main goals of this course is to enhance your understanding of environmental pollution issues and be able to both qualitatively and quantitatively predict various outcomes. This requires critical thought and practice in both group settings and in individual settings. A traditional way to test your understanding is to have an exam and test your competence, but this is not the best approach for this course. Hence, there will be no exams (or a final exam) in this class, instead, there will be group and solo problem-solving activities and assignments. There will be several collaborative opportunities in this class on research and problem-solving activities.

For the laboratory component of this course, attendance is mandatory as these labs are hard to make up if missed (some of these are field trips.) The first half of the semester, you will learn basic environmental analytical techniques and familiarize yourselves with advanced instrumentation available in my lab. You will hand in brief reports (up to 1500 words including figures and data tables) that contain critical analysis of the experiments conducted. The second half of the semester will focus on your lab-based project. Upon completion of this project, you will turn in a 4000-word
research paper (including references, figures, and tables.)

There will be 2-3 field trips during the semester that may require more than the allocated class time. Hence, plan on spending 3-4 h during two weekends (if class-time field trip is not possible) to attend these field trips. Two of these trips will focus on conducting water quality surveys in Filbin Creek, North Charleston and another to Shem Creek in Mt. Pleasant. If you have other ideas for potential field trips, let me know in advance. On these trips you will have hands-on opportunities to learn about techniques that are used to assess basic environmental parameters in the field.

Since this class is about the environment and ultimately related to sustainable practices, we’ll limit use of paper as much as possible. Upload all your assignments and project reports in MS Word (PC format) or PDF format to OAKS. I encourage you to learn how to use the free \LaTeX\ software to create your documents. This software allows you to easily typeset complex equations, tables, figures, tables of content, bibliography, etc. while you focus on content of your document. \LaTeX\ is free and is available for PC, Mac, and Linux platforms (http://latex-project.org/). If you bring your laptop, I can help you setup the software. I can also show you how to create simple \LaTeX\ documents.

3 Learning Outcomes:

On successful completion of this course, you will:

1. develop a solid understanding of environmental processes and pollutant behavior in the environment,
2. develop the requisite skills to apply you theoretical knowledge to solve environmental problems,
3. know how to make quantitative predictions about outcomes of chemical reactions that occur in context of geological processes, and
4. be able to work in small teams and effectively present research results in both written and oral formats.

4 Prerequisites

This course is designed for students that have had a two-course sequence of chemistry (CHEM 111 and 112) and college level introductory math courses. Students that are deficient can also do well in this course, provided they spend additional time getting up to speed with basic principles. Simple arithmetic is used throughout this class (logarithms, manipulating and solving simultaneous equations, etc.), so if you’re out of practice, either look up basic math (Math 101/102) textbooks or come and see me if you need additional help.

5 Textbooks

There is no required textbook for this class. All required readings will come from journal articles, textbook chapters, and other sources. These readings or links to sources will be made available as PDFs on OAKS.


6 Tentative Class Schedule and Deadlines

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<thead>
<tr>
<th>Dates</th>
<th>Lecture Topics</th>
<th>Event and Deadlines</th>
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<tbody>
<tr>
<td>8/26-8/28</td>
<td>Introduction</td>
<td>9/25, Project abstract &amp; outline due Individual student conference</td>
</tr>
<tr>
<td>8/31-9/4</td>
<td>Cr contamination</td>
<td></td>
</tr>
<tr>
<td>9/7-9/11</td>
<td>Chemical concepts</td>
<td></td>
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<tr>
<td>9/14-9/18</td>
<td>Soils/ groundwater</td>
<td></td>
</tr>
<tr>
<td>9/21-9/25</td>
<td>A Civil Action/ TCE contamination</td>
<td></td>
</tr>
<tr>
<td>9/28-10/2</td>
<td>Air Pollution/ Ian Rumsey</td>
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<tr>
<td>10/5-10/9</td>
<td>Climate change/Ocean acidification</td>
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<tr>
<td>10/12-10/16</td>
<td>Research presentations</td>
<td>10/19 - Fall Break Individual student conference</td>
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<tr>
<td>10/19-10/23</td>
<td>Research presentations</td>
<td>10/30, First draft of paper due Individual student conference</td>
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<tr>
<td>10/26-10/30</td>
<td>Research presentations</td>
<td></td>
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<tr>
<td>11/2-11/6</td>
<td>Research presentations</td>
<td>11/25-27 - Thanksgiving</td>
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<td>11/9-11/13</td>
<td>Research presentations</td>
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<tr>
<td>11/16-11/20</td>
<td>Research presentations</td>
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<tr>
<td>11/23-11/27</td>
<td>Research presentations</td>
<td></td>
</tr>
<tr>
<td>11/30-12/4</td>
<td>Research presentations</td>
<td>Last Day of class, Final paper due</td>
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<tr>
<td>12/7</td>
<td>Research presentations</td>
<td></td>
</tr>
</tbody>
</table>
7 Student Expectations

I expect all of you to have working knowledge of basic sciences (biology, physics, and/or chemistry) and basic math, including algebra. If you feel deficient, you will take the opportunity to brush up on some basics as required. Since you are in a senior-level class, expect to get into a habit of writing papers and making oral presentations in front of peer audiences. Even if your experiences are limited, this course will help you to polish up your writing and presentation skills. You are also expected to participate or lead a group projects or be able to work independently as required. This class is preview of what graduate-level classes will be like.

I don’t expect anyone to fail in this class, but, you need to put in some effort! Class attendance is most important part of this class and you may not do well if you miss classes. *All deadlines will be strictly enforced,* unless you have a very good excuse (death in family, contagious illness, etc.)

8 Evaluation

You performance in this course will be assessed based on your understanding of basic environmental pollution concepts and the demonstration of your ability to apply this knowledge. This will involve a combination of (i) group problem-solving exercises – you will work in groups or by yourself, (ii) individual problem-solving exercises, (iii) paper and presentation associated with your research projects and case studies, and (iv) laboratory reports.

1. Group (2-3 students) problem-solving exercises will include solving problems and synthesis and interpretation of published data - there will be 6-7 of these – 15% of total grade. Notes: All students in the group get identical grade and hence it is important to work well together. Note that it is not necessary to work in a group, but, it is strongly encouraged. In some cases, I’ll pre-assign groups and all students within the group will work together. I’ll clearly specify if the exercise can be worked as a group assignment.

2. Individual problem-solving exercises include similar problems as above - there will be about 5-6 exercises total – 20% of total grade.

3. Brief, but in-depth, pollution case studies in areas that I do not plan to cover or of specific interest to you. This will be a small group (2-3 students) exercise. Each self-selected group identifies appropriate research papers ahead of time and shares these papers with entire class and then leads a discussion of 15-min each. Two of these exercises over the semester – 10% of total grade (entire group gets same grade.)

4. A 4000-word lab-research paper that is comprehensive and original in scope and takes a good look at specific aspect of a pollution related topic. You may work with another geology student on this project. Come and see me before you create an outline to discuss your topic. Use the journal “Environmental Pollution” as a model for your paper (see http://bit.ly/qyZfng for instructions on preparing the project report in a manuscript form) – 30% of total grade. Notes: Grade includes grades for all aspects of the paper, including the outline, the draft, and the final paper. Check course schedule for deadlines. I will provide detailed formatting and grading criteria over the next few weeks.

5. A 15 minute presentation of your project to the class during last week of class – 10% of total grade. Grading rubric will be provided over the last third of the semester.

6. Laboratory reports based on scheduled lab periods (includes partial grade for journal keeping and lab work) – 15% of total grade. Some weekly projects are collaborative efforts, but each of you will synthesize and submit your own reports. Formatting instructions and grading criteria will be provided during first lab period.

Vijay M. Vulava

Updated August 25, 2015
The grade you earn by the end of the semester will be based on this scale:

<table>
<thead>
<tr>
<th></th>
<th>B+</th>
<th>87-89</th>
<th>C+</th>
<th>77-79</th>
<th>D+</th>
<th>67-69</th>
<th>F</th>
<th>&lt; 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
<td></td>
<td>B</td>
<td>83-86</td>
<td>C</td>
<td>73-76</td>
<td>D</td>
<td>63-66</td>
</tr>
</tbody>
</table>

9 Course Product (or What you will get from this course)

On successful completion of this course, you will be able to
- Critically understand processes related to environmental contamination
- Interpret the behavior of naturally complex environmental systems
- Critically analyze environmental data and explain your findings and conclusions to your peers
- Integrate various basic sciences (chemistry, biology, geology, etc.) and mathematical skills to solve multidisciplinary problems
- Collaboratively develop research projects
- Develop other ancillary skills:
  - Become familiar with journals and technical sources in subject area
  - Become proficient in conducting literature reviews
  - Improve your presentation and science writing skills
  - Learn how to use software (Excel, LATEX, etc.) to analyze, visualize, and present chemical/physical data

10 CofC’s Honor Code and Academic Integrity

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student’s actions are clearly related more to a misunderstanding will handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed by both the instructor and the student will be forwarded to the Dean of Students and placed in the student’s file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the X to be expunged. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration—working together without permission—is a form of cheating. Unless the instructor specifies that students can work together on an assignment and/or test, no collaboration is permitted. Other forms of cheating include possessing or using an unauthorized study aid (such as an iPhone or other smartphones), copying from others’ exams, fabricating data, and giving unauthorized assistance.

Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.