I. Locator Information:

Instructor: Dr. Daniel E. Autrey  
Course # and Name: CHEM 490 – 01, Research and Ethics  
Semester Credit Hours: 4.0 credits  
Total Contact Hours:  
15 x 50 min = 12.5 hours (lecture)  
15 x 5 hours = 75 hours (laboratory)  
Day and Time Class Meets: MTWR 8:00 am – 8:50 am LSA 345  
Office Location: Science and Technology Building 314  
Office Phone: 910-672-1354  
Office Hours: MW 3:00 pm – 5:00 pm  
TR 10:00 am – 12:00 pm  
Or By Appointment  
Email address: dautrey@uncfsu.edu

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (username@uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Rules and regulations governing the use of FSU email may be found at:

http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf
II. Course Description:

Research and Ethics (CHEM 490, 4–1–6) is a capstone research course for seniors that offers a comprehensive examination of the chemistry curriculum. The course provides detailed training in ethics education, literature reading and review, research planning, hand-on-research practicing, lab reports, and oral/written presentations. Student must adopt a research area and work with a research advisor.

III. Disabled Student Services: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ADA) of 1990, if you have a disability, please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1222.

IV. Textbook:


V. Student Learning Outcomes:

Upon successful completion of this course, the students will be able to:

1. Describe the basic terms used in ethics
2. Describe, compare, and contrast the viewpoints on ethics of major philosophers.
3. Relate the views of historical philosophers to current ethical issues in chemistry.
4. Draw conclusions on current ethical dilemmas based on the ethical views studied.
5. Operate and interpret data from instrumentation
6. Use library resources to research chemical topics and chemical techniques.
7. Present scientific results orally and in writing.
VI. Course Requirements and Evaluation Criteria:

a. Grading Scale:

I hope that each student experiences an acceptable level of success and accomplishment in this course. This depends not only on academic ability, but also on how much time and commitment a student is willing to invest in the course. Your level of accomplishment in CHEM 490 at the end of the semester is indicated by the grade you receive for the course. The grade you receive will be the grade you earn based on your academic performance. In other words, your grade depends on you and how much quality time you put into the course. Your performance in CHEM 490 is not measured against the performance of other students, but rather against course standards established by the instructor. The course standards upon which grades will be based are listed below.

<table>
<thead>
<tr>
<th>Percentile Points</th>
<th>Letter Grade</th>
<th>Accomplishment Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 - 100%</td>
<td>A</td>
<td>Excellent</td>
</tr>
<tr>
<td>80 - 89.9%</td>
<td>B</td>
<td>Proficient</td>
</tr>
<tr>
<td>70 - 79.9%</td>
<td>C</td>
<td>Acceptable</td>
</tr>
<tr>
<td>60 - 69.9%</td>
<td>D</td>
<td>Poor</td>
</tr>
<tr>
<td>below 59.9%</td>
<td>F</td>
<td>Unacceptable</td>
</tr>
</tbody>
</table>

b. Interim Grades:

Interim grades will be assigned from the first week of the semester until the deadline for class withdrawals. Interim grades are used for informational and warning purposes only; they are not part of your permanent transcript and have no effect on your grade-point average (GPA). In accordance with university policy, the following changes have been implemented:

1. WN (withdrawal due to non-attendance) grades have been discontinued. This means that it is the student’s responsibility to withdraw from classes prior to the published deadline.
2. Final grade FN (failure due to non-attendance). This final grade is assigned to students who are on a class roster, but who never attend the class. An FN grade is equivalent to an F grade and adversely affects your GPA.
3. Interim Grade X (No-show). This grade is assigned to students who are on a class roster, but who never attend class. If you have an X grade, either begin attending class or withdraw from it. If you do not take action in response to an X grade, you will receive a final grade of FN.
4. Interim Grade EA (Excessive Absences). This grade is assigned to students whose class absences exceed 10% of the total contact hours. If you have an EA grade, you are in jeopardy of failure if you do not take immediate actions. Either resume attending the class or withdraw from it.
c. Attendance Requirements:

**Class attendance is required for all students.** Students are expected to attend all class meetings, laboratories, and other instructional sessions for all courses in which they are enrolled. Students are also expected to arrive to class on time and remain in class for the entire scheduled period. When students must miss class(es) for unavoidable reasons, i.e., illness, family emergencies, or participation in official university sponsored activities – they are responsible for informing faculty of the reasons for the absences, in advance if possible, and completing all missed assignments. Faculty members will indicate in their syllabi the conditions for making up missed assignments.

Class absences will only be excused when valid documentation is provided for participation in university sponsored activities, serious illness, and family emergencies. Other absences may be excused at the discretion of the instructor, who may require documentation. The latter may be in the form of a note from a doctor or the university’s student health clinic in the event of serious illness, a note from another Fayetteville State faculty or the athletic department indicating your involvement in an official university-sanctioned event, a bulletin from a funeral service, a note from an employer, etc. In all cases, contact information (i.e., a phone number), must be included. Students must notify the instructor, in advance when possible, of the reasons for the class absence. When prior notification is not possible, students are required to explain the reason for their absence by the next class meeting. When students fail to explain class absences, those absences are unexcused. The university policy concerning absences from class will be strictly enforced. Class attendance is important because of the pace of the course and the abstract nature of many of the topics covered. It is the students’ responsibility to make up any and all missed work. **It is the student’s responsibility to obtain class notes, assignments, and announcements when a lecture is missed.**

**Students are required to be punctual for each class session.** Class will begin promptly at the scheduled time. Students are expected to be in class and ready to learn at the scheduled time and remain in class until dismissed by the instructor. In my experience, regular class attendance is a necessary, but not sufficient, indicator of success. Attendance does not count as part of your grade in class because you do not get course credit for merely following University policy. However, I will take attendance as necessary to accomplish the critical task of verifying the accuracy of the official course roster.

d. Assignments and Point Distribution:

Final grades will be based on the following point distribution:

- Class Participation/Case Studies: 10 percent
- Ethics Paper: 20 percent
- Oral Presentation of Ethics Paper: 5 percent
- Meaningful Research Effort: 25 percent
- Research Poster: 20 percent
- Research Presentation: 10 percent
- Final Exam: 10 percent
- Total: 100 percent total
Your final grade will consist of class participation and a discussion/debate of ethical case studies, an ethics paper, your effort towards meaning research progress, and an oral presentation of your research by means of a poster.

Prior to each class, I fully expect each student to have read the assigned chapter in the textbook and any case studies assigned through Blackboard. We will discuss the case studies in class, and small one-page case study analysis may be assigned. This class participation and case study discussion will account for 10% of your course grade.

Your class grade will also include an Ethics Paper on a relevant ethics dilemma in chemical research. This paper will between 7 – 10 pages (double-spaced) or of an appropriate length to adequately address the key issues. You will present a summary of your ethics paper in a 10 minute Powerpoint™ presentation. The Ethics paper and oral presentation will account for 20% and 5% of your grade, respectively.

You will be required to spend a minimum of FIVE hours per week conducting research under the guidance of a chemistry faculty member. Ideally, you should aim to spend this time in 2-3 hour blocks of time, so that you can make meaningful research progress. You will be required to turn in weekly time sheets that must be signed by your research advisor. Your research advisor will assess the quantity and quality of this research time and they will submit a grade to me that evaluates your effort. My reason for this is that your faculty advisor best knows what constitutes meaningful research in their research field. This also gives you the opportunity to work closely with a research mentor, who can hopefully write a good letter of recommendation for you in the future. Your research advisor’s evaluation will account for 25% of your course grade.

Rather than writing a thesis of your work, you (in consultation with your research advisor) will prepare of poster that presents your research project, abstract, materials and methods, results, and conclusions. Guidelines for preparing the poster will come later in the course. During the last week of classes, we will setup a “Research Symposium” in which you will present your posters to faculty, students, and any visiting scientists. The Chemistry and Physics faculty will evaluate your poster and your ability to describe your research project and answer questions. The quality of your research poster and your oral presentation will account for 20% and 10% of your course grade, respectively.

Your class grade will also include a comprehensive final exam given during finals week. The exam will deal with differences between ethical theories, compare/contrast between scientific and ethical theories, and an analysis of specific case studies. The final exam will account for 10% of your course grade.
e. Policy on Missed or Late Assignments / Make-ups Exams:

The following policies have been implemented as a matter of fairness for all students in the course:

You are expected to turn in all assignments at the scheduled times. Should an illness, family emergency, official university-sanctioned event or other unavoidable problem necessitate your missing a scheduled due date, you may turn in an assignment provided that (1) the instructor is notified prior to the due date, and (2) you show verifiable evidence for the condition/situation/event that resulted in your missing the regularly scheduled due date. The latter may be in the form of a note from a doctor or the university’s student health clinic in the event of serious illness, a note from another Fayetteville State faculty or the athletic department indicating your involvement in an official university-sanctioned event, a bulletin from a funeral service, a note from an employer, etc. In all cases, contact information (i.e. a phone number) must be included.

Unexcused late work will receive a 10% reduction in grade. Work submitted after the assignment has been returned will receive a grade of zero.

f. Other Student Expectations:

The instructor will respect all students and will make every effort to maintain a classroom climate that promotes learning for all students. Students must accept their responsibility for maintaining a positive classroom environment by abiding by the following rules:

1. Each student is expected to read the assigned chapters in the textbook. This will help in understanding key concepts and learning necessary factual material. Due to time constraints, it is not possible to cover each topic fully in lecture. Students are responsible for reading the text to fill in the details that are not covered specifically during class meetings

2. Students are expected to refrain from disruptive behavior during class. Such behavior is rude and may cause you or those around you to miss an important point or announcement made in class. Examples of disruptive behavior that have been noted by myself and other faculty include, but are not limited to, habitually walking into class late, chatting with other students while the instructor or another student is talking to the class, packing up and leaving class early (unless the instructor is notified first that you must leave early for a certain reason), sleeping, and talking on cell phones. Cell phones and pagers also should be turned off before class begins.

3. Participate actively in classroom discussions and activities.
4. Take examinations at the scheduled dates and times.
5. Refrain from all forms of academic misconduct (see below).
g. FSU Policy on Disruptive Behavior in the Classroom:

The *Code of the University of North Carolina* (of which FSU is a constituent institution) and the *FSU Code of Student Conduct* affirm that all students have the right to receive instruction without interference from other students who disrupt classes.

FSU Core Curriculum Learning Outcome under Ethics and Civic Engagement (6.03): All students will “prepare themselves for responsible citizenship by fulfilling roles and responsibilities associated with membership in various organizations.” Each classroom is a mini-community. Students learn and demonstrate responsible citizenship by abiding by the rules of classroom behavior and respecting the rights all members of the class.

The FSU Policy on Disruptive Behavior (see FSU website for complete policy) identifies the following behaviors as disruptive:

1. Failure to respect the rights of other students to express their viewpoints by behaviors such as repeatedly interrupting others while they speak, using profanity and/or disrespectful names or labels for others, ridiculing others for their viewpoints, and other similar behaviors;
2. Excessive talking to other students while the faculty member or other students are presenting information or expressing their viewpoints.
3. Use of cell phones and other electronic devices
4. Overt inattentiveness (sleeping, reading newspapers)
5. Eating in class (except as permitted by the faculty member)
6. Threats or statements that jeopardize the safety of the student and others
7. Failure to follow reasonable requests of faculty members
8. Entering class late or leaving class early on regular basis
9. Others as specified by the instructor.

The instructor may take the following actions in response to disruptive behavior. Students should recognize that refusing to comply with reasonable requests from the faculty member is another incidence of disruptive behavior.

1. Direct student to cease disruptive behavior.
2. Direct student to change seating locations.
3. Require student to have individual conference with faculty member. At this meeting the faculty member will explain the consequences of continued disruptive behavior.
4. Dismiss class for the remainder of the period. (Must be reported to department chair.)
5. Lower the student’s final exam by a maximum of one-letter grade.
6. File a complaint with the Dean of Students for more severe disciplinary action.

Students who believe the faculty member has unfairly applied the policy to them may make an appeal with the faculty member’s department chair.
h. Academic Misconduct:

As members of an academic community, each student is expected to preserve his or her personal integrity by refraining from all forms of academic dishonesty. Academic fraud includes, but is not limited to, the following:

1. Copying answers on an exam, quiz, or homework assignment from another student.
2. Plagiarism of written work from the textbook, internet webpage, laboratory manual, or other published work.
3. Using notes or a crib sheet on an exam or quiz without the consent of the instructor. This includes writing notes on any part of your body.
4. Asking another student for help or answers during an exam, or providing such help to another student.
5. Having another person take an exam or quiz for you.
6. Stealing or having in one’s possession without permission a copy of an exam or quiz generated by the instructor prior to its administration.

Evidence of academic misconduct in any form will result in an "F" (0 points) for that assignment. (After all, how horrible would it be to be guilty of academic misconduct in a Research and Ethics course?) Any student caught cheating more than once could face more severe disciplinary measures, including expulsion from the university, in accordance with university policies as outlined under Disciplinary System and Procedures in the Fayetteville State University Student Handbook. The handbook may be obtained from the Office of Student Affairs located in the Collins Administration Building.

i. Drop Deadline:

No student will be allowed to drop the class after the official university drop deadline listed in the Academic Calendar, 2013-2014, which is Friday November 8th, 2013 for this term. If a student stops attending class after this date, they will receive a final grade of FN (failure due to non-attendance). An FN grade is equivalent to an F grade in the calculation of your grade-point average (GPA).

VII. Academic Support Resources:

The Learning Center in the H. T. Chick building in Room 216 C is available to assist the students with writing, mathematics, and reading comprehension.
VIII. Course Outline and Assignment Schedule:

In its “Guidelines for the Teaching of Professional Ethics,” the ACS Committee of Professional Training recommends that instruction of professional ethics be a part of the undergraduate curriculum. The Committee suggests student training in professional ethics in chemistry should include:

- “Responsible treatment of data: Since no scientist uses or reports all the data, students need to learn when data can be discarded. They also need to learn how to use and report data.
- Reporting scientific information: Science is based on a principle of open communication. Students must learn the standards related to publication of scientific results, including proper citation of others’ work and questions of intellectual property.
- Responsibilities of the peer review system.
- Conflicts of interest: All scientists have conflicts of interest. Some involve financial interests; others do not. Students should learn to recognize a conflict of interest situation and how to deal with it.
- When and how questions of possible ethical misconduct should be raised.
- Use of animals and humans in scientific research: While the use of animals and humans are relatively rare in chemical research, at least a brief discussion of these questions is important.
- Relationship of chemistry to society: What are the responsibilities of a chemist to society both as a chemist and as a citizen?”

Other documents that we will consider can be found at The Online Ethics Center for Engineering and Research website: (http://www.onlineethics.org), and include:

- Academic Professional Guidelines of the American Chemical Society
- American Chemical Society – Professional Employment Guidelines
- The Chemist’s Code of Conduct
- Ethical Guidelines to Publication of Chemical Research
- American Society of Civil Engineers (ASCE) Code of Ethics
### Tentative Outline of Topics

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic/Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/28/2013</td>
<td>Course Overview, Course Syllabus</td>
</tr>
<tr>
<td>2</td>
<td>9/4/2013</td>
<td>Chapter 1: Research Ethics: The Best Ethical Practices Produce the Best Scientists</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Types of Ethical Theories</td>
</tr>
<tr>
<td>3</td>
<td>9/11/2013</td>
<td>Chapter 2: How Corrupt is Science?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Select a Research Advisor</td>
</tr>
<tr>
<td>4</td>
<td>9/18/2013</td>
<td>Chapter 3: Plagiarize and Perish</td>
</tr>
<tr>
<td>5</td>
<td>9/25/2013</td>
<td>Chapter 6: Research Misconduct: Fabricating Data</td>
</tr>
<tr>
<td>6</td>
<td>10/2/2013</td>
<td>Chapter 7: Research Misconduct: Falsification and Whistleblowing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Research Abstract Due</td>
</tr>
<tr>
<td>7</td>
<td>10/9/2013</td>
<td>Chapter 8: Authorship: Who is an Author on a Scientific Paper and Why</td>
</tr>
<tr>
<td>8</td>
<td>10/16/2013</td>
<td>Chapter 9: Grant Proposals: Ethics and Success Intertwined</td>
</tr>
<tr>
<td>9</td>
<td>10/23/2013</td>
<td>Chapter 10: Peer Review and the Ethics of Privileged Information</td>
</tr>
<tr>
<td>10</td>
<td>10/30/2013</td>
<td>Chapter 11: Data and Data Management: The Ethics of Data</td>
</tr>
<tr>
<td>11</td>
<td>11/6/2013</td>
<td>Chapter 12: Conflicts of Interest</td>
</tr>
<tr>
<td>13</td>
<td>11/20/2013</td>
<td>Ethics Paper Presentation</td>
</tr>
<tr>
<td>14</td>
<td>11/27/2013</td>
<td>Ethics Paper Presentation</td>
</tr>
<tr>
<td>15</td>
<td>12/4/2013</td>
<td>Research Symposium/Poster Presentations</td>
</tr>
<tr>
<td>16</td>
<td>12/11/2013</td>
<td>Final Exam (graduating seniors take early)</td>
</tr>
</tbody>
</table>

### IX. Teaching Strategies:

The primary means of instruction for CHEM 490 will be through instructor-led discussions of case studies, either in-class or on Blackboard.

### X. Bibliography:


### XI. Disclaimer:

To accommodate emergent circumstances, the professor reserves the right to make reasonable changes in the syllabus while the course is in progress. Any understandings between a student and the professor including, but not limited to, changes, expectations, or modifications to course requirements or procedures must be in writing and must be signed by both parties. Any question of interpretation of course requirements or of understandings between a student and the professor will be at the discretion of the professor.