Department of Chemistry Plan to Address:
Commission on Graduate Studies and Policies, Resolution 2012-13B:
Resolution to Include a Scholarly Ethics and Integrity Component in Graduate Education
Submitted April, 15 2014 by John R. Morris

The following topics (*1-4 are the required topics*) will be taught to every first-year graduate student as an integral part of our required course, CHEM 5004: Orientation to Graduate Research. The syllabus for this course is attached. The required topics, as well as several *optional topics*, fit well within the current structure of this course. Beginning in the Fall of 2014, these topics will be explicitly taught in a series of two or three lectures. Each topic will be accompanied by required reading material identified by the instructor, some of which is outlined below.

1. **Plagiarism and other violations of the Graduate Honor Code**
2. **Proper use of professional conventions in citation of existing research and scholarship, accurate reporting and ownership of findings, and acknowledgement of contributions to the work**

   Plagiarism, falsification, and other violations of the Graduate Honor Code will be clearly defined and discussed in detail. Examples of plagiarism and falsification of data will be provided (there are, unfortunately, several famous examples), along with a description of the response of the scientific community, journals, and funding agencies to such cases. Further, the course will explain how allegations of academic misconduct are managed within the Virginia Tech Graduate Honor System (GHS).

3. **Ethical standards in teaching, mentoring, and professional activities**

   Ethical standards in teaching, mentoring, and professional activities, within a scientific setting, will be provided. For this section of the course, material from the American Chemical Society's (ACS) *Chemical Professional's Code of Conduct* will be distributed and discussed.

4. **Available avenues for reporting alleged misconduct**

   There are multiple resources within the Department, the College, the Graduate School, and the University for reporting misconduct. Those resources will be provided and the hierarchical structure of the various points of contact (e.g., Advisor, Graduate Program Director, Departmental Chair, the Office of the Vice President of Research, etc.) will be described and discussed.

5. **Appropriate lab procedures and maintenance of lab notebooks and other research documentation**

   The National Science Foundation mandates documentation protocols as part of any new research proposal. We will discuss the new NSF policy and the reasons behind the policy. Several active plans from researchers within our department will be provided and discussed.

6. **Fair use of publications, software, and equipment**

   This topic will be discussed as part of the Ethical Standards (#3) section.

7. **Guidelines for determination of authorship**

   The PI of most projects serves as the primary editor of manuscripts and is responsible for final decisions regarding authorship. Examples of how different PIs assess authorship will be provided and discussed. Instances of disagreements and the best practices for resolving those conflicts will be discussed. In addition, we will discuss important aspects of the *Publication Agreement* from ACS.

CHEM 5004 – Orientation to Graduate Research – Syllabus

Instructor of Record: Prof. John R. Morris; HHS 1101; jrmorris@vt.edu.

Schedule: Fridays 3:45-5:00 PM in HHN 140; meetings announced in advance. **Textbook:** None.

Overview: Chemistry students need specific training in areas outside the normal range of traditional lecture course subject matter, including safety, waste handling, environmental regulations, chemical hygiene, library skills, expectations for scholarship and independence in academic work, consequences of plagiarism and other academic misconduct, procedures for handling research misconduct, the organizational and administrative infrastructure of the department, procedures for annual evaluations, standards for ethical behavior in chemistry including record-keeping and authorship, and policies and procedures of the doctoral degree program in Chemistry. This course presents a series of seminars and informal discussions to introduce these topics while ensuring that critical training obligations of the department have been met.

Student Learning Objectives: Having successfully completed this course, the student will be able to:

- Demonstrate a sufficient knowledge of laboratory safety (including protocols for chemical storage and hazardous waste handling) to serve as GTAs in chemistry laboratory courses.
- Summarize Department of Environmental Quality (DEQ) regulations that impact daily activities in academic chemistry research and teaching laboratories.
- Describe the role of CHPs and MSDSs in managing lab safety and mitigating common hazards.
- Describe chemistry-specific services and functions available through VT University Libraries.
- Define plagiarism and falsification
- Explain how allegations of academic misconduct are managed within the Virginia Tech Graduate Honor System (GHS).
- Describe the organizational structure of the Chemistry Department and explain the roles of administrators, faculty members, and classified staff members in departmental operations.
- Explain the function of the Graduate Student Association and its role in University governance.
- Locate forms and other programmatic information using the CHEM Grad Program Scholar site and the Graduate School's website (http://graduateschool.vt.edu).
- Describe the current research projects available to first-year graduate students in the laboratory of each research-active faculty member.
- Describe departmental academic policies and procedures for annual evaluations of graduate students.
- Describe the timetable of expectations of the doctoral degree in Chemistry.
- Find appropriate policy information in the Orange Book.
- Compare and contrast avenues for reporting academic or research misconduct.
- Describe professional conventions in citation of existing research and scholarship, accurate reporting and ownership of findings, and acknowledgement of contributions to one's work.
- Apply appropriate ethical standards to one's research, teaching, and mentoring activities.

Grading: The course is graded Pass-Fail. In order to pass you must accomplish <u>all</u> of the following:

- Attend each CHEM 5004 class session, arrive on time, and participate.
- Attend all scheduled evening research symposia, arrive on time, and participate.
- Attend any EHSS (safety) training session assigned to you, including online training.
- Attend all required GTA meetings or GTA training sessions.
- Pass the written / online EHSS safety quiz.
- Complete and pass the CITI online course for responsible research conduct.
- Turn in your Faculty Interview Form and Research Director Request Form by the deadline.