I. LOCATOR INFORMATION:

Semester Course is Offered: Spring
Year: Every year
Semester Hours of Credit: 4
Section: 01
Prerequisite: FORS 420 with a grade of C or better
Lecture time & location: WR 10:00 AM – 11:15 PM, ST 338
Laboratory time & location: W 3:00 PM – 5:50 PM, ST 338

Instructor: Marcus A. Hunt, Ph.D.
Office location: ST 323
Office phone: 910-672-2304
E-mail: mhunt4@uncfsu.edu
Office hours: M – R 11:30 – 1:30 or by appointment

II. COURSE DESCRIPTION:

Applications of separation methods to forensic science. Techniques covered will include gas chromatography, liquid chromatography, and capillary electrophoresis. May only be taken by students majoring in forensic science with a concentration in chemistry.
Prerequisite: FORS 420

III. TEXTBOOK & LABORATORY MANUAL:


IV. SPECIFIC COURSE OBJECTIVES:

Criminal investigators and forensic scientists have to acquire the knowledge of the techniques and capabilities of the crime laboratories. This course offers a broad survey of such laboratory techniques and methodologies in the forensic sciences. The objectives of this course are to provide the students with:

1. To understand atomic spectrometry techniques and how to obtain data from the techniques for forensic samples
2. To apply atomic spectrometry to the study of glass, gunshot residues and toxicological samples
3. To understand inductively coupled plasma-mass spectrometry (ICP-MS) and how to obtain data from the technique for forensic samples
4. To apply ICP-MS to the study of glass, gunshot residue and paint
5. To understand X-ray fluorescence spectroscopy and how to obtain data from the technique for forensic samples
6. To apply X-ray fluorescence spectroscopy to the study of glass, gunshot residue and paint
7. To understand particle induced X-ray emission spectroscopy and how to obtain data from the technique for forensic samples
to apply particle induced X-ray emission spectroscopy to the study of glass
8. To understand the origins of mass spectrometry techniques and how to obtain data from such techniques for forensic samples
9. To apply mass spectrometry to the study of drugs and explosives
10. To understand the origins of ion mobility spectrometry and how to obtain data from the technique for forensic samples
11. To apply ion mobility spectrometry to the study of explosives and drugs

V. EVALUATION CRITERIA/GRADING SCALE:

The progress of each student will be evaluated by means of two one-hour examinations given during the semester, laboratory reports, homework, and quizzes.

A. Grade distribution

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two one-hour exams</td>
<td>20</td>
</tr>
<tr>
<td>Lab reports</td>
<td>70</td>
</tr>
<tr>
<td>Homework and quizzes</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

B. Grading scale

The final letter grade assigned to the student will be based upon the following numerical equivalencies.

- A = 90 – 100
- B = 80 – 89
- C = 70 – 79
- D = 60 – 69
- F = 59 or less

VI. COURSE REQUIREMENTS:

Students are required to take all exams on the date they are scheduled. Make-up exams will not be given unless a student presents a written excuse before the third class period following the initial date of a test or unless special arrangements have been made with the instructor prior to the exam date. Only in very unusual cases will any exceptions to these rules be made.

As a student in this course, you are responsible for all work assigned, whether or not you are present. You are, of course, also expected to complete your assignments on time. Work handed in or reported late will receive a lower grade than that handed in on time. You are also responsible for demonstrating (by means of make-up work or in class discussion) an understanding of content covered in class on the day of the absence.
Students are required to attend all class regularly and to keep appointments when they are scheduled. It is the responsibility of each student to be informed of the academic requirements of the instructor. An absence, excused or unexcused, does not relieve the student of any course requirement.

**Attendance policy:** Attendance is mandatory.

**Incompletes**
The grade of “I” will be given only under exceptional circumstances, such as an extended illness certified by a practicing physician. To receive an incomplete, the student must have a passing grade on all completed work. Thus, students who are projected to fail the course cannot receive an incomplete. The student must complete all the requirements within one academic semester to remove the incomplete grade from their records; otherwise the “I” will automatically be replaced with an “IF” (or “IU”).

**Academic Dishonesty**
Cheating or disruptions in the classroom will not be tolerated. Any attempts to cheat on examinations (or quizzes) will result in a zero for that exam (or quiz), and possibly an “F” for the course, depending on the severity of the cheating. Students receiving an “F” as a result of academic misconduct will receive an “FF” on their record, and will be referred to the Dean’s Office for further action (including possible expulsion from the University).

**Disability Accommodations**
Any student with a disability is encouraged to meet with the instructor privately during the first week of class to discuss accommodations. Each student must bring a current Memorandum of Accommodations from the Office of Student Disability Services, which is prerequisite for receiving accommodations. Accommodated examinations through the Office of Student Disability Services require two weeks notice. All course documents are available in alternate format if requested in the student’s Memorandum of Accommodations.

**VII. TEACHING STRATEGIES:**

A variety of formats will be used in this class. Typically, the class will begin with answering your questions about the homework or a ten-minute quiz, then new material in a lecture format and then in-class exercises, with discussion in an interactive format.

My job is to identify and develop the major conceptual issues for the course and then to show how those concepts are used in understanding energy consumption and its impact on our lifestyle. In addition, I hope to articulate the connections between concepts in this course and other courses that you are taking and have taken. I would also like to share with you some of the exciting modern advances in forensic investigations and their applications. In order to accomplish these goals, I would like to have an interactive classroom with feedback from you. This possibility means less lecturing and more discussion with a focus on problem solving and conceptual understanding. Hopefully, we can create an environment where it is possible to ask questions, take risks and even fail. Listed below are some suggestions, which will help us to have a successful learning experience.
1. Come to class. Regular attendance is expected. You are responsible for all information disseminated at all class meetings. If you are not there, you will miss the flow of events, the questions and discussion of your peers, and information given in the lecture.

2. Do the end-of-chapter questions. Try to answer the questions in a reflective manner. Test your understanding of concepts. Don't rush through the questions. As the quizzes will test your ability to apply what you learned to new situations and problems, it is critical that you understand the concepts. Please ask for clarification if you feel that you do not understand the question.

3. Do the reading assignments. The study questions are intended as a guide to what you are supposed to be getting out of the reading. However, feel free to think for yourself and develop opinions about the topics presented in the reading.

4. Study diagrams and tables. They are more than pretty pictures. They can pull together what is being described in the text in a very vivid way.

5. It is essential that you learn the vocabulary of our subject material. Make a vocabulary list of terms and definitions that you find key.

6. If you are in trouble, ask for help. I have posted office hours at which time I will be available to answer questions. I will also be glad to make an appointment for other times. If you have a quick question, feel free to contact me by email. In addition, I will organize help sessions if a group of students are having difficulty with a particular topic or if the class requests a review session before an exam. Remember, in the end, you are responsible for learning.

VIII. REFERENCES:

Books:


Journals:

1. Analytical Chemistry
2. Journal of Chromatography A
3. Journal of Chromatography B
4. Journal of Separation Science
5. Journal Analytical and Bioanalytical Chemistry
6. Journal of Chromatographic Science
7. Chromatographia
8. Electrophoresis
9. Trends in analytical Chemistry
10. Journal of Liquid Chromatography and Related Technologies
11. Journal of forensic science

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.