Instructor: J. Brent Friesen
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Phone: (708) 524-6972
Email: jbfriesen@dom.edu
Webpage: http://domin.dom.edu/faculty/jbfriesen/

Class Format:

Lecture: Monday & Wednesday 6:00 – 9:45
Attendance is MANDATORY at all class meetings!
Each class period will involve one or more components relating to the course theme:
   1) Presentation of the scientific background
   2) Discussion of the textbook and related readings
   3) Science activity
   4) Student contributions

Required Materials:

*Criminalistics: Forensic Science and Crime, 1st edition,*
James E. Girard,

Handouts to be distributed in class. Many handouts will be given in this course. You will want to organize them in a 3-ring binder.

protective safety glasses or goggles.

Optional Materials:

Forensic Chemistry
Suzanne Bell
ISBN: 0-13-147835-4
Publisher: Prentice Hall, Copyright: 2006
Supplemental Materials:

The course webpage has many links to sites organized by chapter/topic. Forensic science related articles will be linked to the course webpage. A bibliography for the course will be linked to the course webpage.

Web Page:

http://domin.dom.edu/faculty/jbfriesen/chem291.htm
Updated grade book and class announcements can be found at http://blackboard.dom.edu/ (Many important resources and readings will be posted on the course web page. You must have reliable access to the World Wide Web for this course.)

CHEM291 Course Description:

Dominican University Bulletin

CHEM291. Forensic Chemical Analysis

The evidence collected at a crime scene can often tell the true story of the criminal act if interpreted properly. This course covers various criminalistic detection and analysis techniques involving DNA, fiber, hair, body fluids, pigments, fingerprints, footprints, toxic substances and illegal drugs. Analytical techniques will be introduced, explained and practiced such as qualitative chemical analysis, refractive index, infra-red spectroscopy, UV/vis spectrophotometry, microscopy, mass spectrometry, thin layer chromatography, and gas chromatography. The proper handling of evidence, careful observation, and logical interpretation of crime scene evidence will also be stressed.

Prerequisite: Chemistry 253 or Chemistry 104.

It is necessary and mandatory for you attend every class meeting and keep up with reading and writing assignments. Successful class participation requires thorough preparation for each meeting in terms of studying, reading, and coming to grips with assignments. Efficient time management is essential for keeping on track.

This course emphasizes class preparation and participation. Each week students will be expected to:

1) complete the basic textbook reading assignment,
2) perform independent research on a topic or problem and
3) prepare a contribution to the next class meeting. The value and impact of this course depends on the preparation of the students!
CHEM291 Course Objectives:

- Students will understand, appreciate and apply the elements of the scientific process of inquiry. Students will develop skills to allow them to function on all four levels of scientific investigation:
  1) experimental design and execution of specific analytical techniques
  2) problem solving
  3) acquisition and manipulation of data
  4) evaluation of data

- Students will be able to reflect the role of science in law enforcement in particular and in society in general.

- Students will appreciate the various analysis techniques that are used to solve criminal cases. They will also be able to think critically about the advantages and disadvantages of a particular analytic technique.

- Finally, students will be expected to take charge of their own liberal arts education. This course requires a significant amount of self-discipline and independent motivation. To get the most out of this course, a student must put their own best effort into the course.

“You can lead a jury to the truth but you can’t make them believe it. Physical evidence cannot be intimidated. It does not forget. It doesn’t get excited at the moment something is happening – like people do. It sits there and waits to be detected, preserved, evaluated, and explained. This is what physical evidence is all about. In the course of the trial, defense and prosecuting attorneys may lie, witnesses may lie, the defendant certainly will lie. Even the judge may lie. Only the evidence never lies”

Herbert Leon MacDonell
“The Evidence Never Lies: The Casebook of a Modern Sherlock Holmes”
CHEM291 Tentative Course Calendar:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading Assignments</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/19</td>
<td>INTRODUCTION: History and Development of Forensic Science CSI “Chasing the Bus”</td>
<td>CHEM291 Syllabus</td>
<td>Areas of Expertise Chain of Evidence Episode analysis Crime Scene conduct</td>
</tr>
<tr>
<td>05/21</td>
<td>Fingerprints I Background CSI “werewolves”</td>
<td>Chapter 1: Investigating the Crime Scene Chapter 6: Fingerprints</td>
<td>Evidence the True Witness Classification and analysis of Fingerprints Latent Prints lab – dusting</td>
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<td>05/26</td>
<td>MEMORIAL DAY</td>
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<tr>
<td>05/28</td>
<td>Fingerprints II CSI “Mea Culpa”</td>
<td>Chapter 2: Investigating and Processing Physical Evidence</td>
<td>Latent Prints lab – chemical treatment</td>
</tr>
<tr>
<td>06/02</td>
<td>DNA I analysis background CSI “harvest”</td>
<td>Chapter 13: Biological Fluids</td>
<td>Isolation of DNA from various sources</td>
</tr>
<tr>
<td>06/04</td>
<td>DNA II CSI “Chimera”</td>
<td>Chapter 14: Forensic DNA Typing</td>
<td>DNA simulation activities</td>
</tr>
<tr>
<td>06/09</td>
<td>Trace I “The Execution of Catherine Willows”</td>
<td>Chapter 3: Soil Chapter 4: Hairs &amp; Fibers</td>
<td>Microscopy Pigment analysis</td>
</tr>
<tr>
<td>06/11</td>
<td>Trace II CSI “Blue Paint Killer”</td>
<td>Chapter 5: Analysis of Glass Lipstick (original) Literature</td>
<td>Lipstick analysis</td>
</tr>
<tr>
<td>06/16</td>
<td>Toxicology I CSI “Friends and Lovers”</td>
<td>Chapter 9: Inorganic Analysis Chapter 11: Drugs of Abuse</td>
<td>Qualitative Tests</td>
</tr>
<tr>
<td>06/18</td>
<td>Toxicology II CSI “organ grinder”</td>
<td>Chapter 12: Forensic Toxicology</td>
<td>Spectroscopy Techniques:</td>
</tr>
<tr>
<td>06/25</td>
<td>Arson CSI “Fahrenheit 932”</td>
<td>Chapter 10: Arson</td>
<td>Analysis of accelerants</td>
</tr>
<tr>
<td>06/30</td>
<td>Anti-Terrorism, Explosives, &amp; Firearms Conclusion Crime TV “Marquis Bombing”</td>
<td>Chapter 7: Questioned Documents Chapter 8: Firearms Chapter 15: Explosives Chapter 16: Weapons of Mass Destruction</td>
<td>Smoke and fire</td>
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**Grading:** The distribution of the grades will be:

<table>
<thead>
<tr>
<th></th>
<th>Points Total</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Quizzes (10x10)</td>
<td>100</td>
<td>20%</td>
</tr>
<tr>
<td>In Class Activities (20x10)</td>
<td>200</td>
<td>40%</td>
</tr>
<tr>
<td>Weekly Assignments (15x10)</td>
<td>150</td>
<td>30%</td>
</tr>
<tr>
<td>Final Project</td>
<td>50</td>
<td>10%</td>
</tr>
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</table>

Letter Grade Assignments:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
<th>Grade Range</th>
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<tbody>
<tr>
<td>100 &gt; A ≥ 92%</td>
<td>92 &gt; A- ≥ 90</td>
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<tr>
<td>90 &gt; B+ ≥ 88</td>
<td>88 &gt; B ≥ 84</td>
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<tr>
<td>82 &gt; C+ ≥ 80</td>
<td>80 &gt; C ≥ 72</td>
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<tr>
<td>70 &gt; D ≥ 60</td>
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**Attendance:**
Class attendance is an essential component of this course. You will lose 5 points for every 15 minutes that you are absent during regular class time. If you are absent you cannot receive the points designated for the in-class quiz and class activity. Two absences will reduce the best grade possible for the course to a “B+.” Three absences will reduce the best grade possible for the course to a “C+.” More than 3 missed class sessions will result in an “F” grade for the course.

**Why Should Students Attend Class?**

1) Attending class allows you to be part of a learning community. Learning has a personal and communal dimension, both of which are critical to the student.
2) Interaction with the instructor is another reason you should attend class. The physical presence of an instructor has a holistic impact on to each student that cannot be duplicated or replaced by a book, video or electronic communication.
3) The presence of students in the classroom is part of the course design. In order to fulfill the purpose for which the course is offered, students must be present in the classroom during class time.
4) The bottom line, you (or someone who loves you) paid for it!

**Quizzes:**
There will be at least 10 in-class quizzes. They will cover the assigned readings, assigned homework and the material presented in the preceding class periods. If a quiz is missed, you will not be able to make it up. There will be some questions directly from the end-of-chapter questions in the textbook. Quizzes will be 10-15 minutes in length. These quizzes are designed to help you keep you up to date in the class, and to encourage you to do practice questions.


**In-Class (Lab) Activities:**
Every week we will be doing exercises and/or performing lab activities in during the class period. The purpose of these activities is to familiarize yourself with the problem-solving skills expected from each unit. Lab handouts will generally be filled out during the class period and handed in at the end of the class period.

**Weekly Assignments:**
Every week there will be an assignment to complete for the next class period. In general, these homework assignments will be shared with the whole class during the next class period. You will often be asked to prepare a handout or an overhead for the rest of the class as part of your assignment.

**Final Presentations:**
The purpose of final presentation is to encourage you to do thoughtful independent research on a topic relating to subjects we are addressing in class. The format may vary depending on the nature of the subject and how you wish to communicate it. The course final will be the presentation of your final research project.

**Academic Integrity Policy**
Students of the university must conduct themselves in accordance with the highest standards of academic honesty and integrity. Failure to maintain academic integrity will not be tolerated. The following definitions are provided for understanding and clarity.

**Definitions of Plagiarism, Cheating and Academic Dishonesty**
Student plagiarism is the deliberate presentation of the writing or thinking of another as the student’s own. In written or oral work a student may make fair use of quotations, ideas, images, etc., that appear in others’ work only if the student gives appropriate credit to the original authors, thinkers, owners or creators of that work. This includes material found on the internet and in electronic databases.

Cheating entails the use of unauthorized or prohibited aid in accomplishing assigned academic tasks. Obtaining unauthorized help on examinations, using prohibited notes on closed-note examinations, and depending on others for writing of essays or the creation of other assigned work are all forms of cheating.

Academic dishonesty may also include other acts intended to misrepresent the authorship of academic work. Deliberate acts threatening the integrity of library materials or the smooth operation of laboratories are among possible acts of academic dishonesty.

**Sanctions for Violations of Academic Integrity**
If an instructor determines that a student has violated the academic integrity policy, the instructor may choose to impose a sanction, ranging from refusal to accept a work product to a grade “F” for the assignment to a grade “F” for the course. When a sanction has been imposed, the instructor will inform the student in writing. The instructor must also inform the student that she/he has the right to appeal this sanction, and refer the student to the Academic Appeals Process described in the Bulletin of the Rosary College of Arts and Sciences. The instructor will send a copy of this letter to the Dean of the Rosary College of Arts and Sciences. The Dean will note whether a student has committed multiple violations of the academic integrity policy over time, and in such cases the Dean may institute a process leading to possible further sanctions, including suspension or expulsion from the university…
Some Reflections On Teaching and Learning: 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 a quiz. Remember, in the end, you are responsible for learning.