A group of five graduate students at Duke University have utilized the popularity of forensic television shows to develop forensic science seminars directed towards first year non-chemistry majors. Throughout the two year process, the student instructors have created, revised, and instructed this course. In addition to the professional development of the instructors, a variety of pedagogical techniques including lectures, in-class demonstrations, laboratories, student presentations and mock crime scenes were used to provide a course with a substantial basis in chemistry.

Here, we share our experiences in developing an effective course structure with the goals of providing hard sciences through forensics, while enhancing the students’ development of other essential skills, including critical thinking and public speaking.

Educational Objectives for a First-Year Seminar

By the end of the semester each student should be able to:

- Define, explain and correctly use common terms and concepts to describe crime scene analysis and forensic chemistry techniques.
- Locate primary literature on forensic chemistry techniques.
- Think critically to distinguish fact and speculation in forensic investigation
- Present a chemistry technique used in forensic science and report a criminal case in which the results of this technique were used in a trial.
- Collect evidence from a mock crime scene, use basic chemical techniques to examine the evidence in the laboratory, and write a logical and coherent formal report on his/her analysis of the crime scene.

Outline of the Course

1. Lectures, Case Studies and Laboratories
   - Introduction to Forensic Science
   - Physical Evidence
   - Inorganic Chemistry & Forensics
   - Organic Chemistry & Forensics
   - Biological Chemistry & Forensics

2. Student Presentation

3. Final Case Study and Laboratory

The course was divided into the three unique sections, listed above. The first 20 class periods were dedicated to introducing key concepts of forensics and the scientific background, presented through lectures, in-class activities, case studies and laboratories.

The students then guided the direction of the course, through selecting and developing group presentations on a chosen topic in forensics not covered in the earlier lectures.

The final two weeks were dedicated to the application of the ideas and techniques learned throughout the semester in a final case study and laboratory experience.

Find Case Study Format

Goal:
To utilize all aspects of information and techniques of the course to solve a murder case (case derived from www.crimescene.com)

References


Acknowledgements

Dr. James Bonk
For countless contributions to our professional development and doing everything to provide us with this opportunity
Duke University & The Department of Chemistry
For funding and trusting us to develop a quality course for the undergraduate curriculum
Drs. Baldwin, Crumbliss and Franz
For allowing us time away from research for this worthwhile teaching and professional development experience
Each other
For dedicating so much time to help completely develop the course and help us understand what it is like to group teach a course