Marshall University Syllabus
College of Science
Forensic Science Graduate Program

Course

FSC 622 Forensic Analytical Chemistry

Course Description

Analytical chemistry instrumentation and methods used by forensic scientists for analysis of seized drugs, toxicology, and trace materials. Includes sample collection and processing.

Credits
3 Graduate Credits

Prerequisites
Admission to the Forensic Science Graduate Program

Term/Year

Fall 2024

Class Meeting Days/Times

Mondays and Wednesdays from 10:00 AM to 11:30 AM

Location

Forensic Science Center West Wing classroom

Academic Calendar

For beginning, ending, and add/drop dates, see the Marshall University Academic Calendar (URL: https://www.marshall.edu/academic-calendar/).

Instructor

Dr. Kimberly S. Kunkler

Contact Information

- Office: Forensic Science Center Annex A225
- Office Hours: Tuesdays & Thursdays 1 – 3 PM; Wednesdays 2:30 – 3:30 PM, and by appointment
- Office Phone: 304-733-7864
- Marshall Email: kunkler@marshall.edu

Health and Safety Information

All members of the Marshall University community are expected to always observe health and safety protocols. This includes general health and safety protocols as well as specific protocols that might emerge in response to community and campus health conditions.

Campus Carry Policy

University Policy, UPGA-12 (Campus Carry Policy) derives its authority from West Virginia State law, including the Campus Self-defense Act (W. Va. Code § 18B-4-5b). It pertains to the exercise of Concealed Carry on Marshall University's campus, except in designated areas, by individuals with a valid permit to Conceal Carry.

Individuals who choose to Conceal Carry are responsible for knowing and understanding all applicable federal, state, and local laws and Marshall University Board of Governors Rules, University Policies, and Administrative Procedures. University Policy, UPGA-12 applies to areas of campus and buildings that are directly under the possession or control of Marshall University.

Concealed Handguns are not observable to others and must be holstered and concealed on the body of the permit holder or in a personal carrier, such as a backpack, purse, or other bag that remains under the exclusive and uninterrupted control of the permit holder. This includes wearing the personal carrier with a strap, carrying or holding the personal carrier, or setting the personal carrier next to or within your immediate reach at all times. If your participation in class activities impedes your ability to maintain constant control of your Handgun, please make alternate arrangements prior to coming to class.

Required and/or Recommended Texts and Materials

Required Texts and Materials

None

Recommended/Optional Texts and Materials

Bell, Suzanne. *Forensic Chemistry*, Third Edition. CRC Press, 2022.

Stuart, Barbara H. Forensic Analytical Techniques. Wiley, 2013.

Any good instrumental analysis textbook (e.g., *Principles of Instrumental Analysis* by Skoog, Holler, and coauthors, any edition).

A variety of relevant textbooks and other printed reference materials are available in the Program library. Additional resources, including eBooks and peer-reviewed journals, are available through the Marshall University library system (Marshall University Libraries - Marshall Libraries).

Excerpts from relevant ASTM standards will be referenced and made available on Teams for personal use and study during this course only. These materials are not to be downloaded, printed, copied, or distributed in any format.

Course Student Learning Outcomes

The table below shows the following relationships: How each student learning outcome will be practiced and assessed in the course.

Course student learning outcomes	**How students will practice each outcome in this course**	**How student achievement of each outcome will be assessed in this course**
Students will demonstrate understanding of a variety of fundamental physical, chemical, and statistical concepts related to the analyses performed by forensic chemists.	Class discussions, homework assignments	Homework assignments Written exams
Students will demonstrate understanding of the basic theoretical concepts, major components, function, data interpretation process, strengths, and limitations associated with instrumental analyses commonly used by forensic chemists.	Class discussions, homework assignments	Homework assignments Written exams
Students will demonstrate basic understanding of the types of work performed in trace materials analysis, seized drugs analysis, and forensic toxicology.	Class discussions, homework assignments	Homework assignments Written exams
Students will review portions of published, consensus-based standards related to forensic chemistry.	Class discussions, homework assignments	Homework assignments Written exams
Students will prepare appropriate responses for testimony questions related to forensic chemistry.	Class discussions, homework assignments	Homework assignments Written exams

Course Requirements/Due Dates

Assignment	**Points Toward Final Grade**	**Due Date**
Homework (8 total)	100	Variable, but generally 2-10 days after being assigned.
Exam 1	100	09/18/2024
Exam 2	100	10/16/2024
Exam 3	100	12/04/2024

Total Points Possible: 400

Grading Policy

Grading Scale: A = 360-400 points
B = 320-359 points
C = 280-319 points
D = 240-279 points
F = 0-239 points

Partial Credit Policy: Partial credit amounts to both give and take; students can earn partial credit for the correct portions of an answer, but they can also lose partial credit for adding incorrect or misleading information to an otherwise fully correct answer.

Late Grading Policy: A 10% deduction will be taken for every day an assignment is late.

Attendance/Participation Policy

Attendance is Mandatory: Students enrolled in the Forensic Science Program are expected to attend all classes, laboratories, seminars, internship sessions, and guest speaker presentations. Should you need to miss classes due to an excused absence or other situation governed by the official health or safety policy, appropriate accommodation will be provided.

Excused Absences: Both notification and formal documentation are required for Excused Absences. No exams, labs, or other formal exercises will be made up without an Excused Absence. With an Excused Absence, the student may be asked to take an exam BEFORE the scheduled date.

Unexcused Absences: Any unexcused absence during which a student misses a graded activity or assignment identified in this syllabus may result in a zero for the activity or assignment.

Punctuality: On-time arrival is expected of all students. A deduction of 20 points will be made if a lack of punctuality is persistent (more than 3 times during the semester).

Generative Artificial Intelligence (AI) Policy for Use in the this Course

Students are allowed to use Generative AI in some ways but are prohibited from using it in other ways. Keep in mind that any content produced by generative AI can "hallucinate" (produce false information), so students are responsible for ensuring the accuracy of any AI-generated content. For information on citing AI, please see MU Library's citation website (URL: https://libguides.marshall.edu/plagiarism-AI/cite). Students should not use generative AI in any way that would violate the Student Code of Conduct (URL: https://www.marshall.edu/student-conduct/files/Student-Code-of-Conduct-2023.pdf).

Students ***are permitted*** to use generative AI in the following ways:

- ***Brainstorming***: You may use generative AI to stimulate creativity, generate ideas, or brainstorm topics for papers, presentations, and discussions. The generated content must serve as a stepping stone, not a final product.
- ***Citation Assistance***: AI tools can be used to manage, format, and organize citations and references, promoting adherence to academic writing standards and specific style guides required for individual assignments.

- ***Grammar and Style Checking***: AI-powered writing enhancement tools may be used to help with spelling, grammar, syntax, and stylistic errors.
- ***Concept Understanding***: Generative AI can be used to explain, enhance, or simulate concepts taught in class, aiding in a deeper understanding. However, students are cautioned, as AI is not always correct.
- ***Research Assistance***: AI can be used to conduct initial research, compile data, and summarize articles, books, or papers. It should not replace traditional research methods but rather enhance them.

Students ***are NOT permitted*** to use generative AI in coursework in the following ways:

- ***Plagiarism***: Using AI-generated content as your original work without attribution. This includes essays, papers, presentations, and exam answers.
- ***Data Manipulation***: Using AI tools to alter data or create misleading information.
- ***Misrepresentation of Skills***: Using generative AI to complete tasks that are meant to assess your knowledge and skills.
- ***Confidentiality Breach***: Using AI tools that might violate university policies or laws related to data privacy and confidentiality.

See individual assignment instructions for additional details that may apply.

In addition to a proper citation, you should include the following statement with any assignment where generative AI is used for assistance:

"I used generative AI platform [INSERT NAME OF PLATFORM, SUCH AS CHAT GPT] for assistance in the following ways on this assignment: [INSERT WAYS USED, such as brainstorming, citation assistance, grammar and style checking, concept understanding, and research assistance, etc.]."

University Policies

By enrolling in this course, you agree to the University Policies. Please read the full text of each policy (listed below) by going to MU Academic Affairs: University Policies. (URL: https://www.marshall.edu/academic-affairs/policies/)

- Academic Dishonesty Policy
- Academic Dismissal Policy
- Academic Forgiveness Policy
- Academic Probation and Suspension Policy
- Affirmative Action Policy
- Pre-Finals Week Policy
- D/F Repeat Rule
- Excused Absence Policy for Undergraduates
- Inclement Weather Policy
- Sexual Harassment Policy- Title IX prohibits the harassment of students based on sex, which includes pregnancy, childbirth, and related conditions. This includes that students will not be penalized for taking medically necessary leave related to pregnancy, childbirth, or related conditions. Marshall's Title IX Office may be contacted at TitleIX@marshall.edu
- Students with Disabilities (Policies and Procedures)
- University Computing Services Acceptable Use Policy

Course Schedule

While every effort will be made to adhere to the following course schedule, the topics and order of presentation are subject to change. Students will be notified of any course schedule changes.

Week	Monday	Wednesday
1	8/19 Course Introduction / Separations 1	8/21 Separations 2
2	8/26 Chromatography Theory	8/28 Spectroscopy Theory
3	9/2 **NO CLASS**	9/4 Measurements 1
4	9/9 Measurements 2	9/11 Measurements 3
5	9/16 Discussion	9/18 **Exam 1**
6	9/23 GC	9/25 LC
7	9/30 MS 1	10/2 MS 2 / UV-Vis
8	10/7 IR 1	10/9 IR 2 / Raman
9	10/14 Discussion	10/16 **Exam 2**
10	10/21 Trace 1	10/23 Trace 2
11	10/28 Trace 3	10/30 Drugs 1
12	11/4 Drugs 2	11/6 Drugs 3
13	11/11 Tox 1	11/13 Tox 2
14	11/18 Tox 3	11/20 Discussion
15	11/25 **NO CLASS**	11/27 **NO CLASS**
16 (PF)	12/2 Review / Wrap-Up	12/4 **Exam 3**
17 (F)	---	---