

**San José State University**  
**CoSS/Department of Justice Studies**  
**FS 176 Introduction to Fire and Explosion Investigations,**  
**Spring 2023**

<b>Instructor</b>	Samantha Peek
<b>Instructor Email</b>	Samantha.peek@sjsu.edu
<b>Course Website</b>	Course documents will be posted on Canvas <a href="https://sjsu.instructure.com/">https://sjsu.instructure.com/</a>
<b>Office Hours</b>	Tuesdays 11:00AM-1:00PM, <a href="#">Zoom Appointments Only</a> email or chat to schedule appointment
<b>Class Times, &amp; Location</b>	Tuesdays and Thursdays – 4:00PM-5:45PM
<b>Prerequisites</b>	FS 11, Chem 1B, Chem 55 & 55L
<b>Library Subject Liaison</b>	Nyle Monday nyle.monday@sjsu.edu
<b>FS LibGuide</b>	<a href="http://libguides.sjsu.edu/content.php?pid=57768&amp;sid=2450175">http://libguides.sjsu.edu/content.php?pid=57768&amp;sid=2450175</a>

### **Course Description**

Introduction to the process of fire scene investigation and specifics of bombing scene examination, including explosives collection and analysis. Topics include conducting an exterior and interior survey, analyzing fire patterns, discriminating the effects of explosions, examining and removing fire debris, reconstructing the area of origin, documenting the scene, constructing investigative notes, processing evidence and maintaining chain of custody, processing victims and fatalities, and preparing a fire investigation report.

### **Course Goals and Student Learning Objectives**

Upon successful completion of this course, students will be able to:

- LO1 Explain the fundamentals of interpreting and completing fire and explosion investigations.
- LO2 Exhibit competence in scene documentation, report writing, and evidence collection for fire and explosion investigations.
- LO3 Explain rules of evidence admissibility and court testimony.

### **Required Texts/Readings**

Icove, D. & Haynes, G. (2017). *Kirk's Fire Investigation (Brady Fire), 8th Edition*. Pearson. ISBN-13: 78-0134237923

### **Other Readings** (will be provided by the instructor)

NFPA 921 by National Fire Protection Association (2021)

ISBN-10 : 1455926469

ISBN 13 : 978-1455926466

*Tutorials, journal articles, links to additional readings, and lab exercises will be posted on the Canvas class website. It is the student's responsibility to check the website frequently for new postings.*

## **Assignments**

1. Exams - 20 points (20%)

Two cumulative exams will be given in this course. Exams may include multiple choice, matching, true/false, short answer, diagrams, drawings and sketches, short essay and/or long essay. (LO1, LO3)

2. Homework - Reading, Review Questions, and Other Assignments - 15 points (15%)

Homework will be included throughout the course. Assignments will be given from the textbook or other related readings. Review questions will be associated with the reading assignments from the end of the chapters or given by the instructor. There will be other assignments such as data tables, research topics, and a short essay. (LO1, LO3)

3. Labs/Activities/Lab (Investigative) Reports - 25 points (25%)

Working in pairs, students will write investigation reports with an emphasis on certain fire and explosion concepts. Additionally, students will be tasked with creating photo and evidence logs. Lab activities/other reports will also be held in a digital course notebook throughout the semester. Included will be demonstrations of fire dynamics, interpretation of fire patterns, analysis of fire debris including accelerants, and examination of black and smokeless powder and other types of explosives. During the semester, at least twice, notebooks from each team will be collected and reviewed. At the end of the semester all notebooks and written reports will be collected in the form of a digital notebook. (LO1, LO2)

### Grading Rubric:

- 30% - Documenting and clearly explaining all the relevant information in a methodically written account, including associated fire and explosive analyses. Proficient use of references, images or other aids to help describe their results.
- 30% - Performing all the proper steps of the investigative process and summarizing the available information in an expert report. Clearly explaining obtained results and their evaluation using core and independent knowledge.
- 20% - Interpretation of the results (e.g. discussing potential confirmation and expectation biases). The students will articulate their problem-solving skills through the ability to interpret investigative and experimental results in the context of case scenario.
- 10% - Professional layout: clear and concise layout written in plain English without grammatical errors.
- 10% - Relevance of the information in the case (e.g. only the relevant information should be recorded).

4. Presentation - 20 points (20%)

Throughout the semester, students will present case studies pertaining to fire and explosion scene investigations. Each student will be tasked with creating a short presentation summarizing the case, discussing fire and explosion scene investigation concepts, and the outcomes. (LO2)

#### Grading Rubric:

- (30%) Disciplinary knowledge
    - Accuracy and completeness of information
  - (30%) Professional skills
    - Ability to convey knowledge and understanding of the underlying scientific principles clearly and concisely to peers.
  - (15%) Communication skills
    - Clear and engaging presentation of information.
    - Use of essential digital media principles to enhance communication of the topic.
    - Creativity – how the presentation approach enhances comprehension of the topic.
  - (15%) Enquiry and innovation
    - Research using available resources (textbooks, recent peer-reviewed papers).
  - (10%) Professional layout
    - Clear and concise presentation in plain English without grammatical or stylistic errors (e.g. no jargon).
5. Final Moot Court Testimony - 20 points (20%)

For the final, you will be given a case and will build a PowerPoint presentation to bring to mock court for the final two days. You will present your case to a “jury of your peers” with a prosecutor (Lecturer) and a guest defense expert. You will complete the voir dire process, be asked questions about specific terminology and your case, and be cross-examined by the defense expert.

#### Grading Rubric:

- (30%) Disciplinary knowledge
  - Accuracy and completeness of information
- (30%) Professional skills
  - Ability to convey knowledge and understanding of the underlying scientific principles clearly and concisely to peers.
- (15%) Communication skills
  - Clear and engaging presentation of information.
  - Use of essential digital media principles to enhance communication of the topic.
  - Creativity – how the presentation approach enhances comprehension of the topic.
- (15%) Enquiry and innovation
  - Research using available resources (textbooks, recent peer-reviewed papers).
- (10%) Professional layout
  - Clear and concise presentation in plain English without grammatical or stylistic errors (e.g. no jargon).

#### Grading Scale for All Assignments

A plus	97 to 100
A	94 to 96.9
A minus	90 to 93.9
B plus	87 to 89.9
B	84 to 86.9
B minus	80 to 83.9
C plus	77 to 79.9
C	74 to 76.9

C minus	70 to 73.9
D plus	67 to 69.9
D	64 to 66.9
D minus	60 to 63.9
F	<60

All assignments are graded based on adherence to directions, thoroughness, thoughtfulness, accuracy, clarity, and logic.

**Note: A grade of C or better is required for all Justice Studies and Forensic Science major and minor coursework.**

### **Credit Hour Policy**

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of forty- five hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practicums. Other course structures will have equivalent workload expectations as described in the syllabus.

### **Class Policies**

- No cell phones in class: Turn them off and put them away.
- Plagiarized work and/or cheating on assessments will result in a 0 grade on the assignment, and the incident will be reported to the [Office of Student Conduct](http://www.sjsu.edu/studentconduct/facultyandstaff/Reporting/): <http://www.sjsu.edu/studentconduct/facultyandstaff/Reporting/>
- Please note, late assignments will lose 10% for every calendar day that they are late, including weekend days and holidays, unless instructor is provided with documented extenuating circumstances.
- Make-ups for exams will generally not be possible unless extraordinary, documented circumstances exist.
- Lab exercises cannot be made up. Don't miss them!
- Handle personal business before you begin an exam. A student who leaves the classroom *for any reason* during an exam will be presumed finished with the exam.
- If you are in any doubt about the requirements of an assignment, or due dates/times, please re-read the directions of the assignment and/or schedule. If your question is still unanswered, contact me for clarification.

### **Student Resources**

#### **Forensic Science Student Group (FSS)**

Forensic Science Students is a campus group open to all students interested in forensic science. The group meets biweekly during the semester and offers friendship, forensic science-related activities, networking opportunities, and mentorship. Members of the FSS participate and assist at conferences, CSI camps, guest speaking events, and other extra-curricular activities. FSS Peer Mentors assist forensic science students in navigating the major, understanding requirements and prerequisites, and making wise choices in their college careers. Mentors may also offer limited tutoring, and facilitate educational and professional opportunities. Contact [sjsu.fss@gmail.com](mailto:sjsu.fss@gmail.com) for more information, or to get an application for membership.

#### **Student Technology Resources**

Computer labs for student use are available in the Academic Success Center located on the 1<sup>st</sup> floor of Clark Hall and on the 2<sup>nd</sup> floor of the Student Union. Additional computer labs may be available in your

department/college. Computers are also available in the Martin Luther King Library. A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include digital and VHS camcorders, VHS and Beta video players, 16 mm, slide, overhead, DVD, CD, and audiotape players, sound systems, wireless microphones, projection screens and monitors.

### **Learning Assistance Resource Center**

The [Peer Connections - Student Affairs](https://www.sjsu.edu/peerconnections/index.php) (<https://www.sjsu.edu/peerconnections/index.php>) assists students in the development of their full academic potential and motivates them to become self-directed learners. The center provides support services, such as skill assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development.

### **SJSU Writing Center**

The [SJSU Writing Center](http://www.sjsu.edu/writingcenter/) located in Room 126 in Clark Hall offers a variety of resources to help students become better writers, including one-on-one tutoring sessions and numerous writing workshops. All services are free for SJSU students: <http://www.sjsu.edu/writingcenter/>

### **University Policies**

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](https://www.sjsu.edu/curriculum/courses/syllabus-info.php) at <https://www.sjsu.edu/curriculum/courses/syllabus-info.php>

### **Consent for Recording of Class and Public Sharing of Instructor Material**

Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.

### **Academic integrity**

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at <http://www.sjsu.edu/studentconduct/>

### **Instructor**

Samantha Peek is a San Jose State University graduate with a Bachelor's of Science in Forensic Science with a Concentration in Chemistry and obtained her Master's in Business Administration from Arizona State University. She completed an internship with the Bureau of Alcohol, Tobacco, Firearms, and Explosives researching explosives and fire debris analysis. She later worked as a Lab Assistant for the Santa Clara County Crime Lab.

Currently, she works as a Fire Investigator for her company, Fire Investigation Industries, where she completes fire investigations, conducts training, and researches in the area of fire and explosions. Samantha Peek has been a fire investigator for 8 years and has conducted over 300 fire investigations. She is the Chairman of the Board of Directors for SLO FIST, Inc. and is currently a lecturer at San Jose State University teaching FS 166 Forensic Chemistry.

## FS 176 Introduction to Fire and Explosion Investigations. Course Schedule

Schedule is subject to change.

<b>Week</b>	<b>Date</b>	<b>Topics</b>	<b>Readings, Homework, and Assignments with Deadlines</b>
1	1/27	Introductions, Course Overview, Safety Guidelines, and Scientific Method	
2	1/31	Fire Chemistry and Dynamics	Homework - YouTube videos demonstrating fire chemistry and dynamics comment + guided notes.  Homework: Table of vocabulary terms, definitions, and affiliate images showing specific fire terms.
	2/2	Lab: Fire Behavior	Due: Table of vocabulary terms, definitions, and affiliate images showing specific fire terms.  Homework: Group Lab Reports + Post Lab Questions Completed
3	2/7	Structure Fire Investigation	Due: Group Lab Reports + Post Lab Questions Completed  Homework: Chapter reading 1 “Principles of Fire Investigations” + review questions 1-6 P. 54
	2/9	Lab: Structure Fire Investigation/Point of Origin Determination	Due: Chapter reading 1 “Principles of Fire Investigations” + review questions 1-6 P. 54

<b>Week</b>	<b>Date</b>	<b>Topics</b>	<b>Readings, Homework, and Assignments with Deadlines</b>
			Homework: NFPA 921 - Chapter 18 “Origin Determination” + questions associated with origin determination.
4	2/14	Lab: Scene Documentation	Due: NFPA 921 Chapter 18 “Origin Determination” + questions associated with origin determination.  Homework: Group Lab Report + Post-Lab Questions + Photo Log
	2/16	Accidental Ignition Sources	Due: Group Lab Report + Post-Lab Questions + Photo Log  Homework: Within Consumer Product Safety Commission Products- find 10 different products that have been recalled and the description as to why.
5	2/21	Electrical Ignition Sources	Due: CPSC Recalled Products Assignment  Homework: Breakdown of basic electricity + drawing + research and provide a list of common failures and contributing factors.
	2/23	Lab: Electrical Ignition Sources	Due: Electrical Review Assignment  Homework: Group Lab Report + Post-Lab Questions
6	2/28	Arson + Arson Fire Indicators/Incendiary Devices	Due: Group Lab Report + Post-Lab Questions

<b>Week</b>	<b>Date</b>	<b>Topics</b>	<b>Readings, Homework, and Assignments with Deadlines</b>
			Homework: Study for Exam + Prepare Notebooks for Review.
	3/2	Exam 1	Due: Digital Course Notebooks Collected Homework: No Homework
7	3/7	Legal Aspects of Fire Investigations/Arson Law	Homework: Case Study Presentation: Legalities of Fire Investigations and Arson Law
	3/9	Case Study Presentations	Due: Case Study Presentation: Legalities of Fire Investigations and Arson Law Homework: No Homework
8	3/14	Investigative Report Writing	Homework: Case Scenario - Will complete an investigative report based on case scenario information.
	3/16	Wildland Fire Investigation	Due: Case Scenarios Homework: Chapter 7.5 Reading "Wildland Fires" + Questions 1-10 under "Chapter Review - Wildland Fires" p. 557
9	3/21	Vehicle Fire Investigations	Due: Chapter 7.5 Reading "Wildland Fires" + Questions 1-10 Homework: Chapter 7.6 Reading "Vehicle Fires" + Questions 1-10 under "Chapter Review - Motor Vehicle Fires" p. 558
	3/23	Explosions	Due: Chapter 7.6 Reading "Vehicle Fires" + Questions 1-10



<b>Week</b>	<b>Date</b>	<b>Topics</b>	<b>Readings, Homework, and Assignments with Deadlines</b>
			Spring Break- No Homework Assigned
10	3/28	<b>Spring Recess - No instruction</b>	
	3/30		
11	4/4	Explosions  Lab Demonstrations: Trailers, Devices, Etc.	Homework: Chapter 3 Reading “Chemical Fires and Explosions” + Questions 1-20 p. 232
	4/6	Explosions  Evidence Recognition, Collection, and Preservation	Due: Chapter 3 Reading “Chemical Fires and Explosions” + Questions 1-20  Homework: Case Study Presentations: Explosions
12	4/11	Case Study Presentations - Explosions  Finish Evidence Recognition, Collection, and Preservation	Due: Case Study Presentations: Explosions  Homework: Review Questions from Lecture Prepared by Lecturer
	4/13	Lab: Evidence collection practice of fire debris and devices	Due: Review Questions from Lecture Prepared by Lecturer

<b>Week</b>	<b>Date</b>	<b>Topics</b>	<b>Readings, Homework, and Assignments with Deadlines</b>
			Homework: Group Lab Report + Post Lab Questions. Study for Exam II. Prepare notebooks for Review.
13	4/18	Exam 2	Due: Digital Course Notebooks Collected Homework: No Homework
	4/20	Mechanism of Injury and Fatal Fires	Homework: Chapter Reading 12 “Fire Deaths and Injuries” + Review Questions 1-4 p. 730
14	4/25	Chemical Fires and Hazardous Material Fires	Due: Chapter Reading 12 “Fire Deaths and Injuries” + Review Questions 1-4  Homework: Current Event Search on Recent Chemical Fire and Hazardous Materials Fires (i.e. Lithium Ion Battery fires, butane honey oil explosions) + synopsis of events and pertinent topics of chemical fire and hazardous materials.
	4/27	Other Investigative Topics – Discussion of Legal Considerations, Spoliation and Chain of Custody	Due: Current Event Search  Homework: NFPA 921- Chapter 12 “Legal Considerations” + Scenario Based Questions
15	5/2	Guest Speaker - Interview and Interrogation	Due: Legalities and Scenario Questions  Homework: Questions from Guest Speaker
	5/4	Search and Seizure pertaining to fire and explosion scenes.	Due: Questions from Guest Speaker

<b>Week</b>	<b>Date</b>	<b>Topics</b>	<b>Readings, Homework, and Assignments with Deadlines</b>
			Homework: Summary of case law specifically leading to the definition of “exigent circumstances” and recent use of “exigent circumstances”.
16	5/9	Ethics and Ethical Debates (Arson Innocence Project) pertaining to arson and explosion investigations.	Due: Case Law Review  Homework: Short Essay – Research of Arson Innocence Project and discussion of case and wrongful convictions.
	5/11	Mock Crime Scenes	Due: Short Essay  Homework: Prepare Case Study Presentation and for Moot Court.
Final Exam	5/15	Final: Case Presentations and Moot Court Testimony	Due: Case Study Presentation and for Moot Court.