

Basic Course Information

Semester	Fall		
Course Title & #	Fire Behavior and Combustion FT 104	Email	kenneth.herbert@imperial.edu
CRN #	CRN: 10642	Webpage (optional)	
Room	3201	Office	By appointment
Class Dates	8/18/14-12/8/14	Office Hours	By appointment
Class Days	Mondays	Office Phone #	760-554-5265
Class Times	6:30pm-9:40pm	Office contact if student will be out or emergency	Message or text to 760-554-5265
Units	3		

Course Description

This course provides theory and fundamentals of how and why fires start, spread, and are controlled. An in-depth study of fire chemistry and physics, fire characteristics of materials, extinguishing agents, and fire control techniques will be covered. This is one of six CORE courses required for an associate degree in Fire Technology. (CSU)

Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:

1. Define basic terms and concepts related to fire behavior and chemistry.(ILO2),
2. Analyze physical conditions which determine states of matter and influence fire behavior. (ILO2)
3. Demonstrate how to recall physical and chemical properties of fire.(ILO4)

Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. Demonstrate a working knowledge of matter, energy, the atom, chemical symbols, molecules, energy and work, forms of energy, transformation of energy, and the laws of energy with an overall exam score of 70%.
2. Demonstrate a working knowledge of units of measurements, including international (SI) systems of measurement and English units of measurement with an overall exam score of 70%.
3. Demonstrate a working knowledge of chemical reactions, including physical states of matter, compounds and mixtures, solutions and solvents, and process of reactions with an overall exam score of 70%.
4. Demonstrate a working knowledge of fire and the physical world, including the characteristics of fire, solids, liquids, and gases with an overall exam score of 70%.
5. Demonstrate a working knowledge of heat and its effects, including the production and measurement of heat and the different kinds of heat with an overall exam score of 70%.
6. Demonstrate a working knowledge of the properties of solid materials, including common combustible solids, plastic and polymers, combustible metals and dust with an overall exam score of 70%.
7. Demonstrate a working knowledge of common flammable liquids and gases, including fire characteristics, general properties of gases, the gas laws, classification of gases, and compressed gases with an overall exam score of 70%.
8. Demonstrate a working knowledge of fire extinguishment, including the combustion process, and the

character of flame with an overall exam score of 70%.

9. Demonstrate a working knowledge of the classification of fire and extinguishing agents with an overall exam score of 70%.

10. Demonstrate a working knowledge of gas and halon extinguishing agents with an overall exam score of 70%.

11. Demonstrate a working knowledge of the Department of Transportation hazard classes with an overall exam score of 70%.

12. Demonstrate a working knowledge of placarding with an overall exam score of 70%.

13. Demonstrate a working knowledge of labeling with an overall exam score of 70%.

14. Demonstrate a working knowledge of the hazards of chemicals with an overall exam score of 70%.

15. Participate in the following and receive an overall score of 70%: A. Student will analyze a typical transportation load of hazardous materials, and determine the proper placarding, and determine incompatible loading B. Student will define, in writing, the physical properties of dangerous chemicals. C. Student will explain, analyze, compare and present the theory of fire and compare the applications of various extinguishment techniques.

Textbooks & Other Resources or Links

Ray Shakelford (2009). *Fire Behavior and Combustion Process* (1/e). Delmar Cengage Learning. ISBN: 978-1401880163

Course Requirements and Instructional Methods

Required Information—discretionary language

This section is where faculty would list detailed information related to types of class activities, assignments, tests, homework, etc.

Out of Class Assignments: The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.

Course Grading Based on Course Objectives

Your course grade will be based on the following activities:

• Participation	80 points	12.5%
• Quizzes	80 points	12.5%
• Presentation	80 points	12.5%
• Written Assignment	100 points	15.625%
• Midterm Exam	100 points	15.625%
• Final Exam	200 points	31.25%
• TOTAL	640 points	100%

Participation

- Active participation will enhance the course delivery. Every student is expected to be prepared to discuss the topics covered.

Quizzes

- A quiz shall be administered for each class session chapter.
- Quizzes shall be due prior to the start of the next class. Late quizzes will not receive credit.
- Ten (10) points possible for each quiz.

Presentation

- Each student will present a topic as assigned by the instructor. The presentation time frame will be 10 minutes. Details for completing the assignment will be provided.

Written Assignment

- A three to five page paper will be required to be completed by the 9th class meeting. Details for completing the assignment will be provided.

Final Exam

- A final exam will be given that covers the stated course objectives.

Your final grade will be determined based on the following percentages:

- A 100 – 90
- B 89 – 80
- C 79 – 70
- D 69 – 60
- F 59 – 0

Attendance

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See General Catalog for details.
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.

Classroom Etiquette

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the General Catalog.
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.

Academic Honesty

- Plagiarism is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to 'cite a source' correctly, you must ask for help.
- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the General School Catalog for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

Additional Help – Discretionary Section and Language

- **Blackboard** support center: <http://bbcrm.edusupportcenter.com/ics/support/default.asp?deptID=8543>
- **Learning Labs:** There are several ‘labs’ on campus to assist you through the use of computers, tutors, or a combination. Please consult your college map for the Math Lab, Reading & Writing Lab, and Study Skills Center (library). Please speak to the instructor about labs unique to your specific program.
- **Library Services:** There is more to our library than just books. You have access to tutors in the Study Skills Center, study rooms for small groups, and online access to a wealth of resources.

Disabled Student Programs and Services (DSPS)

Required Language: Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313, if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Required Language: Students have counseling and health services available, provided by the pre-paid Student Health Fee. We now also have a fulltime mental health counselor. For information see <http://www.imperial.edu/students/student-health-center/>. The IVC Student Health Center is located in the Health Science building in Room 2109, telephone 760-355-6310.

Student Rights and Responsibilities

Students have the right to experience a positive learning environment and due process. For further information regarding student rights and responsibilities, please refer to the IVC General Catalog available online at http://www.imperial.edu/index.php?option=com_docman&task=doc_download&gid=4516&Itemid=762

Information Literacy

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. Students can access tutorials at <http://www.imperial.edu/courses-and-programs/divisions/arts-and-letters/library-department/info-lit-tutorials/>

Anticipated Class Schedule / Calendar

Date	Time	Subject
8/18/14	6:30-9:40pm	Fire Behavior and Combustion <ul style="list-style-type: none"> • Introductions • Syllabus Review • Textbook/Handout Review • Fire and Emergency Service Higher Education

		<ul style="list-style-type: none"> • Death and Injury Rates
8/25/14	6:30-9:40pm	I. Introduction <ul style="list-style-type: none"> A. Matter and Energy B. The Atom and its Parts C. Chemical Symbols D. Molecules E. Energy and Work F. Forms of Energy G. Transformation of Energy H. Laws of Energy
9/1/14	No class	Holiday
9/8/14	6:30-9:40pm	II. Units of Measurements <ul style="list-style-type: none"> A. International (SI) Systems of Measurement B. English Units of Measurement III. Chemical Reactions <ul style="list-style-type: none"> A. Physical States of Matter B. Compounds and Mixtures C. Solutions and Solvents D. Process of Reactions
9/15/14	6:30-9:40pm	IV. Fire and the Physical World <ul style="list-style-type: none"> A. Characteristics of Fire B. Characteristics of Solids C. Characteristics of Liquids D. Characteristics of Gases
9/22/14	6:30-9:40pm	V. Heat and its Effects <ul style="list-style-type: none"> A. Production and Measurement of Heat B. Different Kinds of Heat
9/29/14	6:30-9:40pm	VI. Properties of Solids Materials <ul style="list-style-type: none"> A. Common Combustible Solids B. Plastic and Polymers C. Combustible Metals D. Combustible Dust
10/6/14	6:30-9:40pm	Midterm
10/13/14	6:30-9:40pm	VII. Common Flammable Liquids and Gases <ul style="list-style-type: none"> A. General Properties of Gases B. The Gas Laws C. Classification of Gases D. Compressed Gases

10/20/14	6:30-9:40pm	<p>VIII. Fire Behavior</p> <p>A. Stages of Fire</p> <p>B. Fire Phenomena</p> <ol style="list-style-type: none"> 1. Flashover 2. Backdraft 3. Rollover 4. Flameover <p>C. Fire Plumes</p>
10/27/14	6:30-9:40pm	<p>Fire Extinguishment</p> <p>A. The Combustion Process</p> <p>B. The Character of Flame</p> <p>C. Fire Extinguishment</p> <p>Paper Due</p>
11/3/14	6:30-9:40pm	Project Presentations
11/10/14	6:30-9:40pm	<p>IX. Extinguishing Agents</p> <p>A. Water</p> <p>B. Foams and Wetting Agents</p> <p>C. Inert Gas Extinguishing Agents</p> <p>D. Halogenated Extinguishing Agents</p> <p>E. Dry Chemical Extinguishing Agents</p> <p>F. Dry Powder Extinguishing Agents</p>
11/17/14	6:30-9:40pm	<p>Hazards By Classification Types</p> <ul style="list-style-type: none"> • Hazards of Explosives • Hazards of Compressed and Liquefied Gases • Hazards of Flammable and Combustible Liquids
11/24/14	No class	
12/1/14	6:30-9:40pm	<ul style="list-style-type: none"> • Hazards of Flammable Solids • Hazards of Oxidizing Agents • Hazards of Poisons • Hazards of Radioactive Substances • Hazards of Corrosives
12/8/14	6:30-9:40pm	Final