

Course Outline of Record

Los Medanos College

2700 East Leland Road

Pittsburg CA 94565

(925) 439-2181

Course Title: Fire Behavior and Combustion

Subject Area/Course Number: FIRE-102

Approval Date: 1/16/07

New Course OR Existing Course

Instructor(s)/Author(s): John P. Kelleher

Subject Area/Course No.: FIRE-102

Units: 3

Course Name/Title: Fire Behavior and Combustion

Discipline(s): Fire Technology

Pre-Requisite(s):

Co-Requisite(s):

Advisories: FIRE-101; Eligibility for ENGL-095

Catalog Description: Fundamentals and scientific principles of fire behavior, combustible materials, extinguishing agents, hazardous materials, forms of energy and fire prevention/suppression techniques for all types of fires.

Schedule Description: This is one of the five courses required for an Associates Degree in Fire Technology. It is probably the most important of all the courses because it provides you with critical information concerning the chemistry of fire and its behavior. It goes into detail about how the fire starts, continues and is extinguished. In order to handle fire emergencies, you must know the fundamentals of its makeup. There are all types of fires and each has its own particular danger. This course teaches you on how to suppress the structure, vehicle, rubbish/trash or wildland fire.

This course is accredited by the International Fire Service Training Association (IFSTA), National Fire Protection Association (NFPA), California State Firefighters Association (CSFA), and the Firefighter's Handbook: Essentials of Firefighting and Emergency Response.

Credit Credit Degree Applicable (DA)
 Credit Non-Degree (NDA)
(If Non-Credit desired, contact Dean.)

Grading Credit/Non-Credit (CR/NC)
 Letter (LR)
 Student Choice (SC)

Repeatability 0
 1
 2
 3

Hours/Mode of Instruction: Lecture 3 Lab Composition Activity Total Hours 54
(Weekly hours) (Total for course)

Meets the Following Competency/Graduation Requirement(s):

Please apply for:

Transfer to: CSU UC IGETC CAN Number CAN Sequence Number

Course is Baccalaureate Level: Yes No

Signatures:

Department Chair	_____	Date	_____
Librarian	_____	Date	_____
Dean/Sr. Dean	_____	Date	_____
Curriculum Committee Chair	_____	Date	_____
President/Designee	_____	Date	_____
CCCCD Approval Date (Board or Chancellor's Office)	_____	Date	_____

FOR OFFICE OF INSTRUCTION ONLY. DO NOT WRITE IN THE SECTION BELOW.

Begin in Semester Summer

Catalog year 2007 /2008

Class Max: 50

Dept. Code/Name: Fire

T.O.P.s Code: 2133.00

Crossover course 1/ 2:

ESL Class: - No

DSPS Class: No

Coop Work Exp: No

Class Code A Liberal Arts & Sciences
 B Developmental Preparatory
 C Adult/Secondary Basic Education
 D Personal Development/Survival
 E For Substantially Handicapped
 F Parenting/Family Support
 G Community/Civic Development
 H General and Cultural
 I Occupational Educational

SAM Code A Apprenticeship
 B Advanced Occupational
 C Clearly Occupational
 D Possibly Occupational
 E* Non-Occupational
 F Transfer, Non-Occupational
*Additional criteria needed
 1 One level below transfer
 2 Two levels below transfer
 3 Three levels below transfer
 3+ Four levels below transfer

Remediation Level ES Elementary and Secondary Basic Skills
 P Pre-collegiate Basic Skills
 B Basic Skills
 NBS Not Basic Skills

Course approved by Curriculum Committee as Baccalaureate Level: Yes / No

Course Outline of Record

Los Medanos College

2700 East Leland Road

Pittsburg CA 94565

(925) 439-2181

Course Title: Fire Behavior and Combustion

Subject Area/Course Number: FIRE-102

Distribution: Original: Office of Instruction

Copies: Admissions Office, Department Chairperson

Rev 8-2006

Institutional Student Learning Outcomes

Implementation date: Spring 2007

The development of institutional SLOs is overseen by the Teaching and Learning Project in collaborations with the General Education Committee, the Occupational Education Committee, the Developmental Education Program, the Student Services Advisory Committee, and the faculty and staff representing the Library & Learning Support Services.

Check the institutional student learning outcomes (or category of outcomes) below that are reflected in your course:

- General Education SLOs (Recommended by GE Committee)**
At the completion of the LMC general education program, a student will:
1. Read critically and communicate effectively as a writer and speaker.
 2. Understand connections among disciplines and apply interdisciplinary approaches to problem solving.
 3. Think critically and creatively
 4. Consider the ethical implications inherent in knowledge, decision-making and action.
 5. Possess a worldview informed by diverse social, multicultural and global perspectives.
- (Each of the above student learning outcomes for the general education program has a written explanation with illustrations and examples of its application within courses, as well as specific assessment criteria. Consult the GE program information pages.)
- Occupational Education SLOs (Recommended by Occupational Education Committee)**
At the completion of the LMC occupational certificate or degree, a student will:
1. Be academically prepared to **obtain an entry-level or a mid-level position** in their industry.
 2. Apply **critical thinking** to research, evaluate, analyze and synthesize information.
 3. Demonstrate strong **communication skills** (written and/or oral) and **interpersonal skills** (customer service and team work).
 4. Appropriately apply **industry materials and technology**.
 5. Demonstrate the skills and knowledge necessary to take and pass **certification exams** for career **advancement** in their industry.
- (Individual certificates or degree programs in occupational education may adopt some or all of these SLOs. Please check all those that apply to this course.)
- Developmental Education SLOs (Recommended by Developmental Education Committee)**
At the completion of the LMC Developmental Education Program, a student will:
1. Demonstrate the skills necessary for the first transfer level courses in English and Math or for the English and Math competencies for the Certificate of Achievement.
 2. Think critically to construct meaning and solve problems.
 3. Read with comprehension.
 4. Communicate effectively both in writing and orally.
 5. Demonstrate the characteristics, habits, and attitudes of an effective learner.
- Student Services SLOs**
(SLOs are currently being developed)
- Library and Learning Support Services SLOs**
(SLOs are currently being developed)
- None of the Above**

Course Outline of Record

Los Medanos College

2700 East Leland Road

Pittsburg CA 94565

(925) 439-2181

Course Title: Fire Behavior and Combustion

Subject Area/Course Number: FIRE-102

Program-Level Student Learning Outcomes (PSLOs)

Identify the program (eg. Nursing, Engineering), major (eg. Music, Chemistry), or sequence of courses (eg. ESL) to which this course belongs. List 3-8 over-arching or broad student learning outcomes for the program, major, or course sequence that this course is designed to help students attain.

Implementation date: Spring 2007

Students graduating from the Fire Technology Department can graduate with an A.S. degree in Fire Science.

By the end of this degree, the student will be able to:

- 1) Be academically prepared to be an entry-level Firefighter in the Fire Service.
- 2) Apply critical thinking to research, evaluate, analyze and synthesize Fire Service information.
- 3) Comprehend a broad knowledge of Fire History, Fire Chemistry and Behavior, Fire Prevention and Building Construction for Firefighters.
- 4) Be able to apply the information attained in this degree for success and advancement in the Fire Service.
- 5) Identify what particular area would be best suited for an individual's career in the Fire Service.
- 6) Implement this degree as potential advancement in the Fire Service.

Course-Level Student Learning Outcomes (CSLOs): What abilities will the student have at the end of this course?

List 3-8 over-arching or broad student learning outcomes for this course. These are the course "objectives" written in terms of what the student will know or be able to do at the end of the course. Title V requires that courses for Associate Degree credit must have SLOs that "reflect critical thinking and the understanding of application of concepts determined by the curriculum to be at college level".

Relate these course-level SLOs to the program-level SLOs and/or Institutional SLOs, as appropriate.

By the end of this course, the student will be able to:

- 1) Comprehend the chemistry of fire and its behavior. (PSLO 1 and 3)
- 2) Distinguish between the different types of fires and its make-up: sources of heat, stages of fire, modes of heat transfer, classes of fire. (PSLO 2 and 3)
- 3) Determine the methods and dangers of fire suppression (flashover, backdraft color of smoke). (PSLO 2 and 3)
- 4) Identify and implement differences between firefighting strategy and Firefighting Tactics. (PSLO 2 and 3)
- 5) Differentiate the Behavior between wildland fires and structure fires. (PSLO 2 and 3)
- 6) Introduce and determine what a hazardous material is and how to deal with it. (PSLO 2 and 3)

Course Outline of Record

Los Medanos College

2700 East Leland Road

Pittsburg CA 94565

(925) 439-2181

Course Title: Fire Behavior and Combustion

Subject Area/Course Number: FIRE-102

Assessment Criteria: How will the student demonstrate these abilities?

Give the criteria that will be used to judge whether students have attained the course level student learning outcomes.

Implementation date: Spring 2007

Course Outline of Record

Los Medanos College

2700 East Leland Road

Pittsburg CA 94565

(925) 439-2181

Course Title: Fire Behavior and Combustion

Subject Area/Course Number: FIRE-102

Assessments: What instruments will be used to assess student learning outcomes? (Eg. Tests, papers, projects, assignments etc.)

For each CSLO, list the assessment instrument/s that will be used to evaluate student achievement of the knowledge and abilities described in the CSLO.

Provide one sample assessment instrument that will be used to evaluate student achievement and indicate which CSLO it is assessing.

For a degree applicable course, give an example of an essay question or a problem-solving exercise and indicate which CSLO it is assessing.

Homework Assignments: *The student has eight reading assignments and must write a one-two page paper on what was read.*

Quizzes: *There are 10 quizzes during the course. Each quiz covers the weekly lecture, presented visual media and additional reading. One of the quizzes' exclusively involves the additional reading material.*

Midterm and Final Exams: *Each exam covers half of the course and involves all of the material covered.*

Class Project: *Each student must give a written or oral presentation relevant to the course. The student must either write a paper and present it to the Instructor or stand in front of the class and give a five-minute speech on their respective topic.*

Class Discussion: *Every week at the beginning of the class students give updates on upcoming Firefighter Tests and share information relevant to a Fire Service career. It gives the student a chance to network and help each other get a job in the profession.*

Notebook: *The student keeps a complete and neat notebook of all materials used in the class. It is kept as a reference so that it can be used while working in the Fire Service.*

Method of Evaluation/Grading: *Explain how "the course provides for measurement of student performance in terms of stated course objectives", Title V. (LMC calls "objectives", CSLOs.)*

Class Participation	Points worth:200
Homework Assignments	Points worth:100
Quizzes	Points worth:100
Midterm	Points worth:200
Class Project	Points worth:200
Final Exam	Points worth:200
Notebook	Points worth:100
	Total: 1000 points

Course Outline of Record

Los Medanos College

2700 East Leland Road

Pittsburg CA 94565

(925) 439-2181

Course Title: Fire Behavior and Combustion

Subject Area/Course Number: FIRE-102

Course Content: *Provide the detailed content of the course.*

Orientation to the Course 1 hours

Fire Behavior and Chemistry:

Fire Tetrahedron, Fire Pyramid and Relevant Measurements 4 hours

Sources of Heat, Combustion/Ignition 4 hours

Vapor Density, Boiling Point and Flammable/Explosive Limits 3 hours

Burning Process and Modes of Heat Transfer 4 hours

Fire Suppression:

Physical States of Fuel, Thermal Balance and Extinguishment 4 hours

Classes of Fire, Fire Extinguishers and Classes of Smoke 3 hours

Firefighting Tactics and Strategy 6 hours

Wildland Firefighting:

Differences: Behavior and Weather 4 hours

Hazardous Materials (Basic):

What is a HazMat and its Classes 3 hours

Methods of Control 3 hours

Class Projects

Student's Presentations/Tours 7 hours

Exams

Review and Midterm/Final Exams 6 hours

Course Outline of Record

Los Medanos College

2700 East Leland Road

Pittsburg CA 94565

(925) 439-2181

Course Title: Fire Behavior and Combustion

Subject Area/Course Number: FIRE-102

Instructional Methods: Check all the instructional methods that will be used in teaching this course. Keep in mind that the method of instruction and activities should relate to the CSLOs.

- Lecture
- Lab
- Activity
- Problem-based Learning/Case Studies
- Collaborative Learning/Peer Review
- Demonstration/Modeling
- Role-Playing
- Discussion
- Computer Assisted Instruction
- Other (explain) _____

Textbooks: Indicate name of text (or list of text choices), author, publisher and date of publication. For degree applicable courses, text should be **College Level**. Include sample pages and the contents page of the instructor designed module if it is the only text.

Firefighters Handbook: Essentials to Firefighting and Emergency Response
CSFA Articles
NFPA Standards and References from IFSTA Handbook