

**CENTRAL TEXAS COLLEGE  
SYLLABUS FOR FIRT 1347  
INDUSTRIAL FIRE PROTECTION I**

**Semester Hours Credit: 3**

**INSTRUCTOR:**\_\_\_\_\_

**OFFICE HOURS:**\_\_\_\_\_

**I. INTRODUCTION**

- A. This course is designed to understand Industrial emergency response teams and specific needs related to hazards in business and industrial facilities, while providing practical guidance that may be implemented to improve fire prevention and protection within any given work environment. The emphasis is on practices and methods that can be applied to improve actual performance. The primary focus of this course is in the industrial/workplace setting; however, much of the material applies to fire protection issues in any type of occupancy.
- B. This is a required course for an Associate of Applied Science Degree in Fire Protection Technology.
- C. This course is occupationally related and serves as preparation for careers in Fire Protection and Fire Service.
- D. Prerequisites: None

**II. LEARNING OUTCOMES**

Upon successful completion of this course, Industrial Fire Protection I, the student will be able to:

- A. Describe the fire protection challenges that are present in industrial occupancies
- B. Discuss fire behavior in the industrial setting
- C. Explain the importance of Loss Control Programs.
- D. Discuss plant fire hazards and protection.
- E. Discuss extinguishing factors, techniques, and the equipment used for this purpose.
- F. Explain the importance of care, maintenance, and inspection of plant fire protection

equipment and how to set up a program to accomplish the same.

- G. Discuss the importance of Emergency Planning.
- H. Discuss the value of Plant Fire Brigades/Emergency Response Teams
- I. Identify hazards common to industrial facilities
- J. Identify concerns of management regarding fire protection
- K. Examine planning considerations for emergencies at industrial facilities
- L. Identify Occupational Safety and Health Administration (OSHA) requirements for fire protection.

### **III. INSTRUCTIONAL MATERIALS**

The instructional materials identified for this course are viewable through [www.ctcd.edu/books](http://www.ctcd.edu/books)

### **IV. COURSE REQUIREMENTS**

- A. Your first responsibility is scholarship. The grade you receive for this course will not be the grade of the instructor, but rather the grade you and you alone earn.
- B. You should attend class regularly and be prepared to participate in classroom discussions and to take unannounced quizzes relating to text assignments and lecture material presented from the beginning of the course.
- C. You are encouraged to give your best effort throughout the semester. From the beginning, you should plan for a steady, organized, and continuous effort, which in the long run will prove more effective for your final grade than a last minute crash-cram policy. Your course grade is not determined solely by exam grade. Such factors as class participation, initiative, attendance, and individual research papers will be considered in grade computation.
- D. From time to time, special library and/or outside assignments will be made to members of class individually and/or in groups. You are expected to read all assignments and fulfill your responsibilities to any group assignment.
- E. You are expected to read all assigned materials and bring your textbook to class. Keep informed on all assignments, especially after an absence.
- F. Good class notes are indispensable for earning a good grade, since both the material assigned and that discussed in class will be the basis for examination material.

- G. You will be present for all examinations. (Changes may be made to course requirements or more may be added)
- H. Special Work: A term paper or other research project, per requirements of the instructor, will be required. The subject must be appropriate for the course material. Check with the instructor when you have made a selection. The value is indicated in semester grade computation.

**EXAMINATIONS**

- A. There will be a minimum of two major examinations, as follows:
  - 1. Three-week exam (optional)
  - 2. Mid-Term examination
  - 3. Final examination
- B. A student must be present for all examinations. No make-up examinations will be given. Students who know in advance that they will be absent from an examination do to valid reasons must arrange to take an early examination. Unexpected absences due to illness or extenuating circumstances will require the student to see the instructor about individual make-up work.
- C. Students without excused absences will be given a zero for the missed examination.
- D. Examinations may consist of objective (true/false, multiple choice, fill-in-the-blank, and matching) or subjective (short answer and essay) questions, or a combination of both types. Students majoring in Fire Protection and Prevention must be able to communicate both orally and in written form, thus some questions requiring the composition and writing of an essay answer will be required.

**VI. SEMESTER GRAD COMPUTATION**

<u>EXAM</u>	<u>POINTS</u>	<u>TOTAL POINTS</u>	<u>GRADES</u>
Three-week (opt)	100 – 0	900-1,000	A=4pts/sem hr
Mid-Term exam	200 – 250	800- 899	B=3pts/sem hr
Final examination	300 – 350	700- 799	C=2pts/sem hr
Special Work	150 – 150	600- 699	D=1pt/sem hr
*Incentive Points	<u>50 – 50</u>	0- 599	F=0pts/sem hr
TOTAL	1000 1000		

\* Incentive points are earned by doing special work on your own initiative, participating in class discussions, completing outside assignments, and having a good attendance record. Three points are deducted for each unexcused absence. Military assignments or unavoidable circumstances will be evaluated upon notification of the instructor.

**VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM COURSE INSTRUCTOR**

- A. Withdrawal from Course: It is the student's responsibility to officially drop a class if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file an Application for Withdrawal or an Application for Refund. The withdrawal form must be signed by the student.

Application for Withdrawal will be accepted at any time prior to Friday of the 12th week of classes during the 16 week fall and spring semesters. The deadline for sessions of other lengths is as follows.

11 week session	Friday of the 8th week
8 week session	Friday of the 6th week
5 ½ week session	Friday of the 4th week

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

Students who officially withdraw will be awarded the grade of "W", provided the student's attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the college before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for nonattendance.

- B. An Administrative Withdrawal: An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on the Administrative Withdrawal Form for submission to the registrar.
- C. An Incomplete Grade: The College catalog states, "An incomplete grade may be given in those cases where the student has completed the majority of the course work but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course..." Prior approval from the instructor is required before the grade of "I" is recorded. A student who merely fails to show for the final examination will receive a zero for the final and an "F" for the course.
- D. Cellular Phones and Beepers: Cellular phones and beepers will be turned off while student is in the classroom or laboratory.
- E. Americans With Disabilities Act (ADA): Disability Support Services provides services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Explore the website at [www.ctcd.edu/disability-support](http://www.ctcd.edu/disability-support) for further information. Reasonable

accommodations will be given in accordance with the federal and state laws through the DSS office.

## VIII. COURSE OUTLINE

### A. Unit One: Nature of the Problem

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:

- a. Explain the scope of the fire loss problem
- b. Define fire loss potential
- c. Identify trends and factors that affect fire loss
- d. Discuss strategies where personnel can have a positive impact

on losses

2. Learning Activities:

- a. Classroom lecture/discussion
- b. Reading assignments – pages 1-8
- c. Student homework study

3. Unit Outline:

- a. Scope of the fire loss problem
- b. Past losses
- c. Loss potential
- d. Case Histories
  1. Plywood manufacturing plant
  2. Paint warehouse
  3. Poultry processing plant
  4. Flammable liquid spill
- e. Factors that affect fire loss
- f. The impact of loss prevention and control

### B. Unit Two: Fire Behavior

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:

- a. Explain what a fire is and how it behaves and grows
- b. Identify the elements necessary for fire to occur
- c. Explain the following:
  1. Types/characteristics of fuel classes
  2. Types/characteristics of ignition sources
  3. Measures of flammability

4. Characteristics of flammable liquids
- d. Describe the process of heat transfer during a fire
- e. Identify products of combustion
- f. Explain extinguishing agents and methods

2. Learning Activities:

- a. Classroom lecture/discussion
- b. Reading assignments – pages 9-25
- c. Student homework/study

3. Audio Visual Aids:

Instructor Preference

4. Unit Outline:

- a. Definition of fire
- b. Elements of fire
- c. Classes of fire
- d. Ignition sources
- e. Measures of flammability
- f. Characteristics of flammables
- g. Methods of heat transfer
- h. Products of combustion
- i. Extinguishing agents and methods

C. Units Three and Four: Loss Control Programs

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:

- a. Explain the reasons loss control programs are necessary
- b. Identify the major components of a loss control program
- c. Discuss the major approaches to loss prevention and control
- d. Explain the loss control process

2. Learning Activities:

- a. Classroom lecture/discussion
- b. Reading assignments – pages 27-50
- c. Student homework study

3. Unit Outline:

- a. Definition of a loss control program
- b. Value of loss control programs
- c. Requirements and statutes
  - 1. U.S. Laws
  - 2. State/local laws and ordinances
  - 3. National standards
  - 4. Insurance company requirements
- d. Approaches to loss control
- e. Loss control process and essential elements
- f. Organizing for loss control
- g. Implementation and management of loss control

D. Unit Five: Life Safety

- 1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
  - a. Identify general principles concerning life safety
  - b. Explain human behavior under emergency conditions
  - c. Identify the components of evacuation plans and exits
  - d. Describe strategies related to smoke and fire control as related to life safety
  
- 2. Learning Activities:
  - a. Classroom lecture/discussion
  - b. Reading assignments – pages 51-68
  - c. Student homework/study
  
- 4. Audio Visual Aids:

Instructor Preference
  
- 4. Unit Outline:
  - a. General principles and methods of loss control
  - b. Statutory requirements and standards
  - c. Human response to emergency situations
  - d. Exit requirements/standards
  - e. Importance of evacuation planning
  - f. Smoke and fire control methods and systems
  - g. Necessity of training personnel – responders and general workers

E. Units Six and Seven: Hazard Control

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
  - a. Identify principles of hazard control
  - b. Identify types of hazards
  - c. Explain human factors in & general principles of hazard control
  
2. Learning Activities:
  - a. Classroom lecture/discussion
  - b. Reading assignments – pages 59-95
  - c. Student homework study
  
3. Unit Outline:
  - a. Difference between hazard control and fire prevention
  - b. Hazard control hierarchy
    1. Eliminate
    2. Substitute
    3. Isolate
    4. Engineering controls
    5. Administrative controls
    6. Personal protective equipment
  - c. Types of hazards
    1. Smoking
    2. Housekeeping
    3. Heat-producing equipment
    4. Electrical
    5. Flammable/combustible liquids
    6. Flammable gases
    7. Welding and cutting
    8. Machinery and processes
    9. Arson
  - d. Hazard analysis
  - e. Hazard Control policies and procedures

F. Unit Eight, Nine, and Ten: Installed Fire Protection

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
  - a. Identify construction features that affect fire protection
  - b. Identify different types of installed fire protection
  - c. Explain the basic features of each type of installed fire protection
  - d. Discuss the operation of installed fire protection
  - e. Evaluate and justify the need for installed fire protection



f. Inspect installed fire protection systems

2. Learning Activities:

- a. Classroom lecture/discussion
- b. Reading assignments – 97-144
- c. Student homework/study

5. Audio Visual Aids:

Instructor Preference

4. Unit Outline:

- a. Importance of installed fire protection
- b. Justifying installed fire protection
- c. Fire walls and opening protection in fire walls
- d. Alarm systems
- e. Standpipe systems
  - 1. Class 1
  - 2. Class 2
  - 3. Class 3
- f. Automatic sprinklers
  - 1. Wet-pipe
  - 2. Dry-pipe
  - 3. Sprinkler heads
  - 4. System inspection and maintenance
- g. Water-spray systems
- h. Foam systems
- i. Water supplies for installed fire protection
- j. Carbon dioxide systems
- k. Halon systems in use and Halon substitutes
- l. Dry chemical systems
- m. Flammable vapor detection systems
- n. Explosion venting and suppression systems
- o. Inspection and maintenance of systems
- p. Evaluation of system needs

G. Units Eleven and Twelve: Portable Fire Extinguishers

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:

- a. Identify the types of extinguishers
- b. Describe the performance characteristics of extinguishers
- c. Discuss selection, placement, and use of extinguishers

- d. Discuss inspection and maintenance requirements
- e. Discuss employee training requirements
- f. Develop an extinguisher inspection program
- g. Inspect fire extinguishers

2. Learning Activities:

- a. Classroom lecture/discussion
- b. Reading assignments – pages 145-182
- c. Student homework study

3. Unit Outline:

- a. Types of fire extinguishers
  - 1. Water extinguishers
  - 2. Foam extinguishers
  - 3. Dry Chemical extinguishers
  - 4. Carbon Dioxide extinguishers
  - 5. Halon, Halotron, FE-36 extinguishers
  - 6. Dry powder extinguishers
  - 7. Wet chemical extinguishers
- b. Ratings and regulations of extinguishers
- c. Selection and placement of extinguishers
- d. Use of various types of fire extinguishers
- e. Personnel training issues
- f. Inspection and maintenance of extinguishers

H. Unit Thirteen: Emergency Planning

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:

- a. Explain the different types of planning
- b. Describe a systematic approach to promulgating emergency plans
- c. Discuss the development and use an emergency plan

2. Learning Activities:

- a. Classroom lecture/discussion
- b. Reading assignments – pages 183-192
- c. Student homework/study

6. Audio Visual Aids:

Instructor Preference

4. Unit Outline:
  - a. Importance of planning
  - b. Participation of key personnel in a planning process
  - c. Developing plans
    1. When to plan and when changes are needed
    2. How to develop a plan
    3. Use of templates/other plans
  - d. Systematic emergency planning and tactical surveys
  - e. Action plan components and location
  - f. Involvement of outside agencies
  - g. Recovery planning
    1. Accounting records
    2. Personnel records
    3. Business formulation records
    4. Customer records
    5. Supplier records
    6. Regulatory records (OSHA injury log, etc.)
    7. Product and process design information

I. Unit Fourteen: Emergency Teams and Fire Brigades

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:

- a. Identify OSHA requirements
- b. Discuss the principles of organization
- c. Discuss:
  1. Personnel issues
  2. Training requirements
  3. Equipment needs
  4. Management concerns
- d. Describe emergency operations
- e. Prepare an organizational statement
- f. Develop policies, procedures, and an organizational chart
- g. Discuss the organization of an emergency team, to include all of

the necessary elements

2. Learning Activities:

- a. Classroom lecture/discussion
- b. Reading assignments – pages 193-222
- c. Student homework study

3. Unit Outline:

- a. Determining the need for emergency team and their functions
- b. Organization of the team
  - 1. Organizational statement
  - 2. Planning for start-up
  - 3. Personnel numbers, selection, qualifications and records
  - 4. Training of members and leaders
  - 5. Equipment
  - 6. Daily operations management
- c. Non-emergency team functions
  - 1. Fire Prevention
  - 2. Fire Protection Equipment and Systems
  - 3. Role in overall emergency planning
- d. Emergency operations
  - 1. Standard Operating Procedures
  - 2. Incident Command System
- e. Industry/Fire Department partnerships

J. Unit Fifteen: Coping With Fire

- 1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
  - a. Discuss issues regarding incident concerns
  - b. Describe the recovery process
  - c. Discuss incident documentation
  - d. Describe the value of public relations during an incident
  - e. Discuss incident evaluation techniques
  - f. Prepare an incident plan
  - g. Document an incident
  - h. Evaluate the cause of the incident
- 2. Learning Activities:
  - a. Classroom lecture/discussion
  - b. Reading assignments – pages 223-228
  - c. Student homework/study
- 3. Unit Outline:
  - a. Justification for actions taken
  - b. Notification of essential personnel/agencies
  - c. Prioritizing salvage efforts
  - d. Documenting an incident
  - e. Media relations
  - f. Human issues
  - g. Insurance issues

- h. Cause determination
- i. Evaluation of economic impact

K. Unit Sixteen: Review and Final Exam

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
  - a. Discuss Industrial Fire Protection procedures
  - b. Pass the Final Exam
2. Learning Activities:
  - a. Classroom Review
  - b. Administration of Final Exam
4. Unit Outline:
  - a. Review of Material covered
  - b. Take Final Exam