# BROWARD COLLEGE
# COURSE OUTLINE

**LAST REVIEW:** 2008 - 2009 **NEXT REVIEW:** 2013 - 2014 **STATUS:** A

**COURSE TITLE:** Introduction to Fire Science

**COMMON COURSE NUMBER:** FFP 1000

**CREDIT HOURS:** 3

**CONTACT HOUR BREAKDOWN**
*(per 16 week term)*

**CLOCK HOURS:**
*(Voc. Course ONLY)*

Lecture: 48 Lab:

Clinic: Other: 12 (as needed)

**PREREQUISITE(S):** High School Diploma or GED

**COREQUISITE(S):** None

**PRE/COREQUISITE(S):**

**COURSE DESCRIPTION** *(750 characters, maximum)*:

This introductory course will examine the evolution of the modern fire department, chemistry and physics of fire, fire hazard properties of materials, combustion, theory of fire control, importance of fire protection, public fire defenses, and other materials pertinent to fire service.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): Area
General Education Requirements – Associate in Science Degree (AS), meets Area(s): Area
General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s): Area

**UNIT TITLES**

1. Evolution of the Fire Service
2. Fire Behavior
3. Portable Extinguishers
4. Ropes and Knots
5. Self Contained Breathing Apparatus
6. Ladders
7. Forcible Entry
8. Rescue
9. Water Supply
10. Fire Streams
11. Hose
12. Ventilation
13. Salvage and Overhaul
14. Fire Cause Determination
15. Sire Supervision Techniques
16. Communications
17. Automatic Sprinkler Systems
18. Fire Inspections

## EVALUATION:

Please provide a brief description (250 characters maximum) that details how students will be evaluated on the course outcomes.

1. **Quizzes, Test, and/or Final Exam (cumulative/comprehensive);**
2. **Selected faculty may assess homework, projects, class participation/attendance, and/or extra credit projects.**

****** Complete the following only if course is seeking general education status ******

## GENERAL EDUCATION Competencies and Skills *:

Please highlight in green font all Competencies/Skills from the list below that apply to this course. In the box to the right of the Competency/Skill, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 5.12) that apply.

| | |
|---|---|
| **1. Read with critical comprehension** | |
| **2. Speak and listen effectively** | |
| **3. Write clearly and coherently** | |
| **4. Think creatively, logically, critically, and reflectively (analyze, synthesize, apply, and evaluate)** | |
| 5. **Demonstrate and apply literacy in its various forms:** *(highlight in green ALL that apply)* ( 1. technological, 2. informational, 3. mathematical, 4. scientific, 5. cultural, 6. historical, 7. aesthetic and/or 8. environmental ) | |
| **6. Apply problem solving techniques to real-world experiences** | |
| **7. Apply methods of scientific inquiry** | |
| **8. Demonstrate an understanding of the physical and biological environment and how it is impacted by human beings** | |
| **9. Demonstrate an understanding of and appreciation for human diversities and commonalities** | |
| **10. Collaborate with others to achieve common goals.** | |
| **11. Research, synthesize and produce original work** | |
| **12. Practice ethical behavior** | |
| **13. Demonstrate self-direction and self motivation** | |
| **14. Assume responsibility for and understand the impact of personal behaviors on self and society** | |
| **15. Contribute to the welfare of the community** | |

* *General Education Competencies and Skills endorsed by '05-'06 General Education Task Force*

Common Course Number: FFP 1000

## UNITS

### Unit 1 Evolution of the Fire Service

**General Outcome:**

1.0 The students should be able to discuss origins of organized fire departments, the evolution of fire protection, and recognize Florida standards for firefighter certification.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

1.1 Systematically describe the history of organized fire protection and fire prevention activities.

1.2 Detail the major developments in the evolution of fire apparatus and equipment.

1.3 Identify the role of government, business, and the public in fire protection.

1.4 Recognize the applicable Florida standards and certification requirements for firefighters.

Common Course Number: FFP 1000

## Unit 2 Fire Behavior

**General Outcome:**

2.0 The students should be able to define the theory of combustion and describe the various stages of burning, including definition of particular hazards and appropriate precautions.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

2.1 Define the fire triangle and fire tetrahedron theory of combustion.

2.2 Describe the stages of fire and hazards associated with each.

2.3 Identify products of combustion and their toxic properties.

2.4 Explain the terms flash point, fire point, and ignition temperature for fuels.

2.5 Explain the terms upper explosive limit (UEL) and lower explosive limit (LEL) as it applies to flammable vapors in air.

2.6 Identify units of heat measurement, sources of heat energy, and methods of heat transfer.

2.7 Recognize and distinguish between signs of flashover and back draft.

Common Course Number: FFP 1000

## Unit 3 Portable Extinguishers

**General Outcome:**

3.0 The students should be able to identify extinguishers according to classification and intended use, and shall demonstrate effective extinguishing methods for each type.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

3.1 Identify method of extinguisher classifications.

3.2 Define the extinguisher rating system.

3.3 Discuss extinguisher limitations.

3.4 Demonstrate proper extinguisher use and application for various fire scenarios.

3.5 Describe proper inspection, care, and maintenance of fire extinguishers.

Common Course Number: FFP 1000

## Unit 4 Ropes and Knots

**General Outcome:**

4.0 The students should be able to identify typical ropes and knots used in the fire service, and demonstrate the purpose for which they would be used.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

4.1 Describe the bight, loop, round turn, and half-hitch.

4.2 Select the proper size and type of rope for various fire scenarios.

4.3 Demonstrate tying a bowline, bowline on a bight, clove hitch, half-hitch, becket bend, and rescue knot within established time frames.

4.4 Correctly tie tools and equipment for hoisting and securing.

4.5 Perform inspection, cleaning, and general maintenance of rope.

Common Course Number: FFP 1000

## Unit 5 Self-Contained Breathing Apparatus

**General Outcome:**

5.0 The students should be able to recognize the importance of wearing self-contained breathing apparatus in fire and toxic environments.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

5.1 Identify at least four hazardous respiratory environments encountered in firefighting.

5.2 Recognize the physical requirements of the wearer, the limitations of the self-contained breathing apparatus (SCBA), and the safety features of the equipment.

5.3 Demonstrate donning self-contained breathing apparatus (SCBA) while wearing full protective clothing with allotted time frames.

5.4 Demonstrate emergency breathing techniques to: assist another firefighter, conserve air, and failed regulator scenarios.

5.5 Demonstrate daily inspection and maintenance of self-contained breathing apparatus (SCBA).

5.6 Demonstrate changing bottles and local recharging procedure.

**Common Course Number: FFP 1000**

## Unit 6 Ladders

**General Outcome:**

6.0 The students should be able to identify the types of fire department ladders and describe their uses.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

6.1 Identify materials used in the construction of fire department ladders.

6.2 Conduct inspection and maintenance for different types of ground and aerial ladders.

6.3 State the safe load capacity of fire department ladders in various working situations.

6.4 Operating as an individual and as a team member, correctly raise each type and size of ground ladder using different raises for each ladder.

6.5 Climb every type of ground and aerial ladder.

6.6 Demonstrate climbing ladders with tools, and working off the ladder with and without a lifebelt.

6.7 Demonstrate bringing down a victim.

Common Course Number: FFP 1000

## Unit 7 Forcible Entry

**General Outcome:**

7.0 The students should be able to describe fire ground conditions which necessitate forcible entry and shall describe appropriate tools and methods to gain access under emergency conditions.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

7.1 Identify materials and construction features of doors, windows, roofs, floors, and vertical barriers.

7.2 Demonstrate the safe use of each types of forcible entry tool.

7.3 Demonstrate proper care and maintenance for each type of forcible entry tool.

**Common Course Number: FFP 1000**

## Unit 8 Rescue

**General Outcome:**

8.0 The students should be able to demonstrate safe and effective methods to search, locate, remove, and treat victims in an emergency situation.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

8.1 Demonstrate searching for and locating victims in a smoke filled environment.

8.2 Demonstrate removal of victims by using various drags, lifts, and carries.

8.3 Demonstrate standard first responder techniques to stabilize and prepare a victim for transport.

8.4 Describe the purpose and use of trenching and shoring equipment.

8.5 Properly tie a rescue knot and lower a victim from the upper floor of a structure.

8.6 Work as part of an extrication team to remove a victim from a vehicle accident.

**Common Course Number: FFP 1000**

## Unit 9 Water Supply

**General Outcome:**

9.0 The students should be able to identify various sources and distribution systems of water supplies.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

9.1 Identify parts of a distribution system.

9.2 Identify different types of hydrants.

9.3 Define the difference between types of pressures associated with pumping of water from a hydrant.

**Common Course Number: FFP 1000**

## Unit 10 Fire Streams

**General Outcome:**

10.0 The students should be able to correctly identify, select, and utilize any fire department nozzle.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

10.1 Demonstrate the correct use of nozzles, adapters, and appliances carried on standard fire department pumpers.

10.2 Define a fire stream.

10.3 Explain water hammer and how to prevent it.

10.4 Explain the characteristics of each type of fire stream.

10.5 Describe observable results obtained when fire streams are correctly applied.

10.6 Demonstrate proper inspection, care, and maintenance of fire department nozzles, adapters, and appliances.

**Common Course Number: FFP 1000**

## Unit 11 Hose

**General Outcome:**

11.0 The students should be able to identify the various sizes, types, uses, and amounts of hose typically carried on fire department apparatus.

**Specific Measurable Learning Outcomes:**
**Upon successful completion of this unit, the student shall be able to:**

11.1 Operate as an individual and as a member of a team to properly advance all pre-connects and different hose sizes for various fire ground scenarios.

11.2 Advance charged and uncharged lines for various fire scenarios.

11.3 Demonstrate standard rolls, carries, and drags.

11.4 Demonstrate various methods of packing hose.

11.5 Demonstrate proper care, cleaning, and maintenance of fire department hose.

11.6 Demonstrate working off a ladder with charged line.

11.7 Demonstrate replacing a burst section of hose.

**Common Course Number: FFP 1000**

## Unit 12 Ventilation

**General Outcome:**

12.0 The students should be able to describe the principles of ventilation and identify the advantages and effects of properly applied ventilation techniques.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

12.1 Describe the principles of ventilation.

12.2 Identify different ventilation techniques.

12.3 Discuss the advantages and effects of the different ventilation techniques.

Common Course Number: FFP 1000

## Unit 13 Salvage and Overhaul

**General Outcome:**

13.0 The students should be able to identify the purpose of salvage and overhaul and its value to the public and the department.

**Specific Measurable Learning Outcomes:**
**Upon successful completion of this unit, the student shall be able to:**

13.1 Identify the purpose of salvage.

13.2 Identify the purpose of overhaul.

13.3 Describe the circumstances when salvage and/or overhaul should be considered, for the public good or for the benefit of the department.

**Common Course Number: FFP 1000**

## Unit 14. Fire Cause Determination

**General Outcome:**

14.0 The students should be able to identify organizational responsibilities for determining cause and origin of a fire and the preservation of evidence.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

14.1 Describe the responsibilities of the first responder in determining the cause of a fire.

14.2 Describe the responsibilities of the first responder in terms of preserving evidence at a fire scene.

14.3 Describe the typical procedural steps in the investigation of a fire's origin and cause.

Common Course Number: FFP 1000

## Unit 15. Fire Suppression Techniques

**General Outcome:**

15.0 The students should be able to describe appropriate suppression techniques for a variety of fire ground scenarios.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

15.1 Describe different fire suppression techniques.

15.2 Determine which techniques should be used in different fire scenarios.

Common Course Number: FFP 1000

## Unit 16. Communications

**General Outcome:**

16.0 The students should be able to describe the procedure for proper reporting of a fire or other emergency, and demonstrate proper fire department radio procedures.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

16.1 Describe the procedure for reporting a fire or emergency.

16.2 Demonstrate familiarity with fire department radio procedures.

Common Course Number: FFP 1000

## Unit 17. Automatic Sprinkler Systems

**General Outcome:**

17.0 The students should be able to recognize the various types of fire protection systems including their operating requirements and limitations.

**Specific Measurable Learning Outcomes:**
**Upon successful completion of this unit, the student shall be able to:**

17.1 Recognize and identify various fire protection and suppression systems.

17.2 Describe the operating requirements of such systems.

17.3 Describe the advantages and limitations of such systems when considering different fire scenarios.

Common Course Number: FFP 1000

## Unit 18. Fire Inspections

**General Outcome:**

18.0 The students should be able to describe the importance of a properly conducted fire inspection program including the identification of common fire causes and their prevention.

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

18.1 Describe why fire inspections are conducted and the role fire inspections play in fire prevention.

18.2 Describe the relationship between fire inspections and the identification of common fire causes in fire prevention.