

**STUDENT WARNING:** This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.

**School of Public Service and Health**  
**FSMT311**  
Fire Dynamics  
3 Credit Hours  
8-Weeks  
Prerequisite(s): None

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## Instructor Information

*Instructor:*  
*Email:*  
*Phone:*  
*Fax*  
*Office Hours:*

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## Course Description (Catalog)

This course examines the underlying principles involved in structural fire protection systems, building furnishings and fire protection systems including water based fire suppression systems, fire alarm and detection systems, special hazards suppression systems, and smoke management systems.

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## Course Scope

The scope of FSMT311 Fire Dynamics is to meet the levels of mastery established by the National Fire Academy. At the end of this course, you should be able to understand the fundamental principles related to structural fire protection, building furnishings, and fire protection systems.

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## Course Objectives

- ❖ Analyze building structural components for fire endurance and fire resistance
- ❖ Appraise the relationship between the fire service and the scientific community
- ❖ Distinguish between the different types of heat transfer
- ❖ Diagnose the dangers associated with products of combustion for the first responder
- ❖ Estimate the value between installed fire suppression systems and fire spread
- ❖ Understand the flame spread and smoke production properties of building furnishings and materials

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## Course Delivery Method

This B.S. in **Fire Science Management** course delivered via distance learning will enable students to complete academic work in a flexible manner, completely online. Course materials and access to an online learning management system will be made available to each student. Online assignments include forum questions (accomplished in groups through a threaded forum), examinations (graded electronically), and individual assignments (submitted for review by the Faculty Member). Assigned faculty will support the students throughout this eight-week course.

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## Course Materials

1. Quintiere, James G.; **Principles of Fire Behavior**; Delmar Publishers; Fire Edition, 1998; ISBN 0-8273-7732-0

## Evaluation Procedures

Grades for this course will be based upon three grading instruments; capstone, forums and a final exam. There are six forum questions that are provided in the **forum Portion of the Classroom**.

The grade scale and due dates for each of the evaluation are provided below:

<u>Due Date &amp; Grade Instruments:</u>	<u>Points</u>	<u>% of Final Grade</u>
Week One Forum	100pts	10%
Week Two Forum	100pts	10%

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Week Three Forum	100pts	10%
Week Four Forum	100pts	10%
Week Five Forum	100pts	10%
Week Six Forum	100pts	10%
Week Seven Capstone Project	100pts	20%
Week Eight Final Exam	100pts	20%
	800pts	100%

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## Grades

Please see the student handbook to reference the University's grading scale.

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<b>Course Outline</b>				
<b><u>Week</u></b>	<b><u>Topic(s)</u></b>	<b><u>Learning Objective(s)</u></b>	<b><u>Reading(s)</u></b>	<b><u>Assignment(s)</u></b>
1 & 2	Definition, Units, Fire Tetrahedron, Heat Transfer, Heat of Combustion, Ideal Gas Law	<ul style="list-style-type: none"> <li>❖ Understand the definition and history of fire dynamics</li> </ul>	Chapters 1,2, 3,4  Lesson/Lecture 1 & 2	Week One Forum  Week Two Forum
3 & 4	Ignition and Flame Spread of Materials	<ul style="list-style-type: none"> <li>❖ Describe the ignition and fire growth process</li> <li>❖ Explain the process of flame spread in liquid fuels and calculate the burning rate for a liquid fuel fire</li> <li>❖ Explain the process of flame spread over a solid fuel and list variables that affect flame spread rate</li> <li>❖ Predict ignition times for various fuels</li> </ul>	Chapters 5 & 6  Lesson/Lecture 3 & 4	Week Three Forum  Week Four Forum
5 & 6	Plumes and Smoke	<ul style="list-style-type: none"> <li>❖ Define the structure of buoyant plumes and ceiling jets.</li> <li>❖ Explain the impact</li> </ul>	Chapters 7 & 8  Lesson/Lecture	

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		<p>of walls and comers on flames and plumes.</p> <ul style="list-style-type: none"> <li>❖ Estimate operation time of sprinklers and heat detectors.</li> <li>❖ Estimate the heat release rate needed for flashover.</li> <li>❖ Define smoke.</li> <li>❖ Understand the dangers of smoke</li> <li>❖ Describe the effects of visibility in smoke and calculate viewing distance in smoke</li> <li>❖ Discuss the toxicity of smoke</li> </ul>	5 & 6	
5 & 6	Plumes and Smoke	<ul style="list-style-type: none"> <li>❖ Define the structure of buoyant plumes and ceiling jets.</li> <li>❖ Explain the impact of walls and comers on flames and plumes.</li> <li>❖ Estimate operation time of sprinklers and heat detectors.</li> <li>❖ Estimate the heat release rate needed for flashover.</li> <li>❖ Define smoke.</li> <li>❖ Understand the dangers of smoke</li> <li>❖ Describe the effects of visibility in smoke and calculate viewing distance in smoke</li> <li>❖ Discuss the toxicity of smoke</li> </ul>	<p>Chapters 7 &amp; 8</p> <p>Lesson/Lecture 5 &amp; 6</p>	5 & 6

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## Polices

Please see the student handbook to reference all University policies. Quick links to frequently asked question about policies are listed below.

- Drop/Withdrawal Policy
- Plagiarism Policy
- Extension Process and Policy

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## Academic Services

### ONLINE LIBRARY RESEARCH CENTER & LEARNING RESOURCES

The Online Library Resource Center is available to enrolled students and faculty from inside the electronic campus. This is your starting point for access to online books, subscription periodicals, and Web resources that are designed to support your classes and generally not available through search engines on the open Web. In addition, the Center provides access to special learning resources, which the University has contracted to assist with your studies. Questions can be directed to [orc@apus.edu](mailto:orc@apus.edu).

- **Charles Town Library and Inter Library Loan:** The University maintains a special library with a limited number of supporting volumes, collection of our professors' publication, and services to search and borrow research books and articles from other libraries.
- **Electronic Books:** You can use the online library to uncover and download over 50,000 titles, which have been scanned and made available in electronic format.
- **Electronic Journals:** The University provides access to over 12,000 journals, which are available in electronic form and only through limited subscription services.
- **Turnitin.com:** [Turnitin.com](http://Turnitin.com) is a tool to improve student research skills that also detect plagiarism. Turnitin.com provides resources on developing topics and assignments that encourage and guide students in producing papers that are intellectually honest, original in thought, and clear in expression. This tool helps ensure a culture of adherence to the University's standards for intellectual honesty. Turnitin.com also reviews students' papers for matches with Internet materials and with thousands of student papers in its database, and returns an Originality Report to instructors and/or students.
- **Tutor.com:** Tutoring is available through the library portal using the [www.tutor.com](http://www.tutor.com) service.

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## Selected Bibliography

- Cote, Arthur E., P.E., Editor-in-Chief; **Fire Protection Handbook** (Various Editions), National Fire Protection Association, Quincy, Massachusetts, (Various Dates); ISBN 0-87765-378-x.

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- DiNunno, Philip J., P.E., Editor in Chief, SFPE Handbook of Fire Protection Engineering, NFPA, Quincy, MA, ISBN 0-87765-853-4