

FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: FES 3780

COURSE TITLE: Analytical Approaches to Public Fire Protection

PREREQUISITE(S): junior level status or above

COREQUISITE(S): None

CREDIT HOURS: 3

CONTACT HOURS/WEEK: 3

CONTACT HOUR BREAKDOWN:

 Lecture/Discussion: 3

 Laboratory:

 Other _____:

FACULTY WORKLOAD POINTS: 3

STANDARDIZED CLASS SIZE ALLOCATION: 30

CATALOG COURSE DESCRIPTION:

This course examines design principles involved in structural fire protection and automatic suppression systems, including fire resistance and endurance, flame spread evaluation, smoke control, alarm systems, sprinkler innovations, evaluation of sprinkler system designs, and specialized suppression systems.

SUGGESTED TEXT(S): Fire Protection Structures and Systems Design Course Guide, National Fire Academy

IMPLEMENTATION DATE: Fall Term, 2006 (20071)

REVIEW OR MODIFICATION DATE: Spring Term, 2007 (20072)

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Introduction	3
A. Describe the importance of analytical thinking.	
B. Describe the basic elements of analytical methods.	
C. Be able to evaluate others' research.	
D. Define rational decision making.	
E. Recognize subjective factors that influence rational decision making.	
II. Databases	4
A. Recognize when a database might be useful.	
B. Identify some advantages and disadvantages of using a database	
C. Become familiar with the structure and use of databases.	
III. Descriptive Statistics	4
A. Construct and interpret graphs of functions using a spreadsheet other computer programs, or graph paper	
B. Transform data that are not linear	
C. Combine two functions	
D. Write an equation for a function that approximates a stream of data	
E. Construct and interpret histograms for collected data	
F. Use the mean, median, mode, and standard deviation for a sample	
G. Compute proportions, percentages, and rates	
H. Understand and use standardized scores	
IV. Inferential Statistics	4
A. Use the two of the most important discrete distributions--binomial and Poisson	
B. Use one of the most important continuous distributions--normal.	
C. Display collected data	
D. Interpret estimates made using samples	
E. Use random samples for estimating means and for monitoring a system on a continuing basis	
F. Assess quality management programs by calculating and interpreting Statistical Process Control (SPC) data	
V. Probability	4
A. Compute probabilities of simple and compound events	
B. Apply Bayes' Theorem in decision making situations	
C. Determine the number of possible permutations and combinations	
D. Develop the basic skills necessary to solve simple probability problems to make decisions in the real world	

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
VI. Decision Analysis <ul style="list-style-type: none"> A. Develop event trees to aid in decision making. B. Develop decision trees to aid in decision making. C. Combine the probabilities of various events. D. Apply system analysis techniques to decision making. E. Apply strategic planning concepts to decision making 	4
VII. Mathematical Modeling <ul style="list-style-type: none"> A. Understand the concepts of mathematical modeling. B. Understand how fire service managers use mathematical modeling to assist in decision making. C. Discuss how the ISO Fire Suppression Rating Schedule is an example of utility modeling that can be applied to the fire service. D. Describe Define input conditions and constraints. E. Make reasonable predictions about the system being modeled, using mathematical techniques 	4
VIII. Resource Allocation <ul style="list-style-type: none"> A. Describe considerations for fire station location, including B. Different approaches and corresponding models for run distance and travel time C. The relation to strategic issues, such as companies in service, allocation of companies by district location of individual companies, and the number of firefighters assigned per company D. Company workload influence on station location E. Components of response time, and pros and cons of run time as a figure of merit F. Describe data sources and methods for measuring company workload G. Estimate run distances, travel times, and company workload using graphing techniques and a hand calculator H. List several personal computer programs that can assist in the analysis of fire station location issues describe features and applicability of the programs and use the programs to estimate run distance travel time, and company workload I. Assess comparative travel time and company workload estimates for alternative locations for a station and prepare recommendations supported by analysis 	4

COURSE TOPICS

CONTACT HOURS
PER TOPIC

IX. Cost-Benefit Analysis	4
<ul style="list-style-type: none"> A. Understand basic concepts of CBA's B. Understand basic assumptions of CBA C. Understand the five steps of CBA: <ul style="list-style-type: none"> 1. Conduct a risk assessment 2. Identify assumptions, costs, and benefits 3. Collect data 4. Calculate costs and benefits 5. Analyze results 	
X. Linear Programming	4
<ul style="list-style-type: none"> A. Understand the concept of linear programming. B. Graph linear equations. C. Set up linear programming problems. D. Determine the feasible region of linear programming problems. E. Determine the point at which two linear equations intersect. F. Apply minimum and maximum constraints to linear programming problems. G. Solve fire- and EMS-related linear programming problems 	
XI. Putting It All Together	3
<ul style="list-style-type: none"> A. Through a careful review of this unit and by referring back to examples and explanations in previous units as needed, the student will be able to select three distinct analytical approaches to apply to a local issue or decision in emergency services management. B. By following the structure and procedures outlined for each of these three techniques, the student will be able to analyze the local decision options, gain insight into the complexity of the problem, and support a recommended solution with quantitative evidence 	
XII. Conclusion	3
<ul style="list-style-type: none"> A. Understand the relationship between analytical methods and data requirements. B. Identify major steps in systems thinking. C. Make specific outlines for problem-solving. D. Develop a process by which you can perform a step-by-step analysis of a problem. 	



NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.

<i>Section 1</i>		
COURSE PREFIX AND NUMBER: <u>FES 3780</u>		SEMESTER CREDIT HOURS: <u>3</u>
COURSE TITLE: <u>Analytical Approaches to Public Fire Protection</u>		
<i>Section 2</i>		
TYPE OF COURSE: (Click on the box to check all that apply)		
<input type="checkbox"/> AA Elective	<input type="checkbox"/> AS Required Professional Course	<input type="checkbox"/> College Prep
<input type="checkbox"/> AS Professional Elective	<input type="checkbox"/> AAS Required Professional Course	<input type="checkbox"/> Technical Certificate
<input checked="" type="checkbox"/> Other <u>BAS Required Professional Course</u>		
<input type="checkbox"/> General Education: (For General Education courses, you must also complete Section 3 and Section 7)		
<i>Section 3 (If applicable)</i>		
INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:		
<input type="checkbox"/> Communications	<input type="checkbox"/> Social & Behavioral Sciences	<input type="checkbox"/> Mathematics
<input type="checkbox"/> Natural Sciences	<input type="checkbox"/> Humanities	
<i>Section 4</i>		
INTELLECTUAL COMPETENCIES:		
<input checked="" type="checkbox"/> Reading	<input checked="" type="checkbox"/> Speaking	<input checked="" type="checkbox"/> Critical Analysis
<input checked="" type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input checked="" type="checkbox"/> Information Literacy
<input checked="" type="checkbox"/> Quantitative Skills	<input type="checkbox"/> Scientific Method of Inquiry	
<input checked="" type="checkbox"/> Ethical Judgment	<input checked="" type="checkbox"/> Working Collaboratively	
<i>Section 5</i>		
	LEARNING OUTCOMES	METHOD OF ASSESSMENT
• 1	Describe the importance of analytical thinking	verbal exam
• 2	Identify some advantages and disadvantages of using a database	exam
• 3	construct and interpret graphs of functions using a spreadsheet, other computer programs, or graph paper	Practice exams
• 4	Interpret estimates made using samples	exams
• 5	compute probabilities of simple and compound events	exams
• 6	Apply Bayes' Theorem in decisionmaking situations	practical application in project work
• 7	Apply system analysis techniques to decisionmaking	exam
• 8	define input conditions and constraints	exam
• 9	describe data sources and methods for measuring	exam
• 9	Understand basic concepts of CBA's	exam
<i>Section 6</i>		

Name of Person Completing This Form: Richard Nelson

Date: 8-23-05