ESTABLISHMENT OF A MASTERS DEGREE IN FIRE PROTECTION AND ADMINISTRATION

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

NEW GRADUATE CURRICULUM PROPOSAL

COURSE AND CURRICULUM PROPOSAL FROM: ENGINEERING TECHNOLOGY

A. PROPOSAL SUMMARY AND CATALOG COPY.

1 .SUMMARY

The Department of Engineering Technology and Construction Management proposes the creation of the Master of Fire Protection and Administration (MFPA) degree program. The program will consist of a common core and a concentration in either Fire Protection or Fire Administration. Students enrolled can choose between two concentrations, fire protection or administration. The fire protection concentration prepares fire protection professionals to use modern fire protection methodologies, techniques and tools for fire protection design, fire investigation, industrial fire safety, key infrastructure security, safety assessment, and other fire safety related matters. The administration curriculum prepares those who are engaged in occupations in the fire, emergency services, and safety fields to effectively manage the administrative decision-making requirements of both public and private entities.

The following graduate level courses will be created and developed:

MFPA 5123	Human Behavior in Fire	3 credits
MFPA 5132	Fire and Building Codes, Standards and Practices	3 credits
MFPA 5150	Human Resource Management in Emergency Services	3 credits
MFPA 5223	Industrial Safety and Facilities Management	3 credits
MFPA 6103	Fire Dynamics	3 credits
MFPA 6113	Fire Failure Analysis	3 credits
MFPA 6120	Public and Private Sector Interoperability	3 credits
MFPA 6124	Fire Service and the Community	3 credits
MFPA 6126	Arson	3 credits
MFPA 6144	Fire Protection Systems	3 credits
MFPA 6164	Fire Science Laboratory	3 credits
MFPA 6203	Fire Modeling	3 credits
MFPA 6232	Structural Fire Safety	3 credits
MFPA 6233	Performance-Based Design	3 credits
MFPA 6243	Research Investigation	3 credits
MFPA 6244	Fire Detection and Smoke Management	3 credits
MFPA 6252	Law and Fire Safety	3 credits
MFPA 6255	Leadership/Conflict Management in Public Emergency Services	3 credits
MFPA 6260	Organization and Management of Public Fire Protection	3 credits
MFPA 6270	Budgeting, Grants, Contracts and Finance in Emergency Services	3 credits
MFPA 6800	Independent Study	1-3 credits
MFPA 6900	Thesis	1-6 credits

It is noted that eight courses are offered as requirements of the program. Four courses in this proposal are cross-listed with Master of Public Administration courses. Other courses in this proposal are offered less frequently.

MFPA 5123 Human Behavior in Fire (3) *Prerequisite: ETFS 3103 and ETFS 3113 or permission of department.* Individual decision processes and behavior, modeling of people movement, calculation methods for egress prediction, egress design, and fire safety signs and alarm systems. (Fall) (Alternate years)

MFPA 5132 Fire and Building Codes, Standards and Practices (3) *Prerequisite: ETFS 3103 or permission of department.* History of fire safety regulation development; building fire characteristics, fire test methods, and fire safety of buildings and structures; contemporary building and fire codes, practices, and their enforcement. (Fall) (Alternate years)

MFPA 5150 Human Resources Management in Emergency Services (3) Cross-listed as MPAD 6134. *Prerequisite: permission of department.* A study of the context of public personnel fire/emergency services related administration; basic functions of job evaluation and compensation, employee rights and responsibilities; the legal constraints including equal opportunity, health and safety, collective bargaining; government productivity. (On demand)

MFPA 5223 Industrial Safety and Facilities Management (3) *Prerequisite: ETFS 3123 or permission of department.* Investigation and analysis of hazard control principles relating to the management of personnel, facilities, and equipment, including control procedures, work-task analysis, risk identification and countermeasures, safety training, and pertinent safety management techniques. (Spring) (Alternate years)

MFPA 6103 Fire Dynamics (3) *Prerequisite: ETME 3143 and ETME 3244 or permission of department.* This course introduces students to fundamentals of fire and combustion and is intended to serve as the first exposure to fire dynamics phenomena. The course includes fundamental topics in fire and combustion such as thermodynamics of combustion, fire chemistry, premixed and diffusion flames, solid burning, ignition, plumes, heat release rate curves, and flame spread. (Fall) (Alternate years)

MFPA 6113 Fire Failure Analysis (3) *Prerequisite: MFPA 6103 or permission of department.* This course provides knowledge for the development of fire investigation and reconstruction as a basis for determining fire cause and origin and evaluating and improving fire safety design. Accident investigation theory and failure analysis techniques such as fire re-creation testing and modeling are presented. (On demand)

MFPA 6120 Public and Private Sector Interoperability(3) *Cross-listed as MPAD 6290. Prerequisite: permission of department.* A study of multi-agency interoperability and the effective organization and management of emergency resources at various fire and large-scale emergency incidents. Includes a review of national standards and federal regulations impacting emergency incident management. Case studies of actual and theoretical incidents will be used to reinforce command and control concepts. (Spring) (Alternate years)

MFPA 6124 Fire Service and the Community (3) *Prerequisite: permission of department.* Theoretical concepts of public service to build an understanding of how the fire service fits within the community. (Spring) (Alternate years)

MFPA 6126 Arson (3) *Prerequisite: permission of department.* This course utilizes lecture and case studies of arson fires that were started for various reasons, including financial gain, revenge and to conceal other crimes. The criminal intent and the psychological aspects of the fire setter are discussed. (On demand)

MFPA 6144 Fire Protection Systems (3) *Prerequisite: ETFS 3103, ETFS 3113 or permission of department.* An advanced study of various fire protection systems in regard to contemporary fire and life safety problems. Topics include: process of fire and smoke development, principles of active fire suppression and detection systems, hydraulics, automatic sprinkler systems, passive fire protection systems, structural fire resistance, installation and maintenance of fire protection systems. (Fall) (alternate years)

MFPA 6164 Fire Science Laboratory (3) *Prerequisite: MFPA 6103 or permission of department.* This course provides overall instruction and hands-on experience with fire-science-related experimental measurement techniques. The objective is to expose students to laboratory-scale fire experiments, standard fire tests and state-of-the-art measurement techniques. (On demand)

MFPA 6203 Fire Modeling (3) *Prerequisite: MFPA 6103 or permission from the department.* Modeling of compartment fire behavior is studied through the use and application of two types of models: zone and field. The zone model studied is CFAST. The field model studied is FDS. Focus on the understanding of each of these models is the primary objective in terms of needed input, interpretation of output and limitations. (Spring) (Alternate years)

MFPA 6232 Structural Fire Safety (3) *Prerequisite: ETME 3244, ETGR 2102 or ETME 3244 or permission of department.* This course provides the knowledge needed for structural fire safety design and analysis. Course topics include design philosophies and methods in fire safety engineering, principles of and approaches for structural design for fire safety, behavior of compartment fires, behavior of structural materials in fire, and structural fire safety of typical materials and their components. (On demand)

MFPA 6233 Performance-Based Design (3) *Prerequisite: MFPA 5123, MFPA 5132, MFPA 6203 or permission of department.* This course covers practical applications of fire protection engineering principles to the design of buildings. Both compartmented and non-compartmented buildings will be designed for criteria of life safety, property protection, continuity of operations, operational management and cost. (On demand)

MFPA 6243 Research Investigation (3) *Prerequisite: permission of the department.* This course provides students with opportunities in conducting research to tackle fire safety related real-world problems. With guidance from the instructor, students can work individually or as a team on a one-semester project. (On demand)

MFPA 6244 Fire Detection and Smoke Management (3) *Prerequisite: ETFS 3103 or permission of department.* This course addresses the fundamentals and practices of fire detection and smoke management. Topics include: principles of fire detection, fire alarm technology, and contemporary fire detection and alarm systems; principles applicable to the design and analysis of smoke management systems; factors affecting smoke movement; smoke hazard assessment;

airflow in buildings, performance characteristics of smoke control and management systems. (On demand)

MFPA 6252 Law and Fire Safety (3) *Prerequisite: permission of department.* Responding to natural and manufactured building hazards requires a complex legal environment, including regulation and liability. Key topics include the use of model codes, administrative regulation, retrospective codes, federal preemption, arson, performance based codes, risk based regulation, engineering malpractice, product liability and disaster investigation. (On demand)

MFPA 6255 Leadership/Conflict Management in Public Emergency Services (3) Cross-listed as MPAD 6141. *Prerequisite: permission of department.* The role of the administrator as a focal point in social change and the management of the conflict, which occurs. Perspectives on the negotiation and bargaining process will be reviewed. (On demand)

MFPA 6260 Organization and Management of Public Fire Protection (3) *Cross-listed as MPAD 6104. Prerequisite: permission of department.* A presentation of modern management principles and techniques to the organization and delivery of the array of services that communities have come to expect from the fire service. The traditional and evolving roles of the fire service to protection, prevention, risk analysis and community service are also considered. (On demand)

MFPA 6270 Budgeting, Grants, Contracts and Finance in Emergency Services (3) *Prerequisite: permission of department.* This course works to develop the understanding of strategic planning, contracting and budgeting practices as well as grant proposal writing with the emphasis on contract administration skills necessary to operation of a functioning governmental entity. (On demand)

MFPA 6800 Independent Study (1-3) *Prerequisite: permission of department.* The MFPA program offers independent study and special study courses to allow students to pursue studies in areas for which there are no approved formal courses. Independent study courses can only be taken on a P/F basis. Special study courses can be taken for a grade if the paperwork indicates it will be taken A/F. Each requires a title, justification, and the method of evaluation. Courses taken for A/F grade may be used to satisfy degree requirements. May be repeated for credit. (On demand)

MFPA 6900 Thesis (1-6) *Prerequisite: Consent of graduate committee advisor.* Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(On demand)*

B. JUSTIFICATION.

1. The creation of the MFPA program addresses the need for a graduate level program in the fire discipline in North Carolina. No similar programs have been offered in North Carolina and, nationwide, there are few schools that offer a master's program in fire protection or fire safety. Many fire professionals that work in this field have degrees in other disciplines of engineering or engineering technology, and have been trained in fire protection on the job by their employers. A recent survey conducted by the Society of Fire Protection Engineers indicates that an overwhelming majority of large employers of Fire Protection (FP) engineers indicated they currently have difficulty recruiting enough qualified fire professionals. They also predicted coming

recruitment problems in the next few years.* A similar market demand and supply situation exists for Fire Administration (FA) professionals. This program will serve to encourage many students to continue education at the graduate level as an avenue to enter the fire industry. (* Reference: Careers in Fire Protections Engineering Magazine, published by the SFPE.)

It is estimated that the initial enrollment would range from 15 to 20 students depending upon time of approval and subsequent recruiting efforts. Enrollments are expected to increase to 25-30 per year within a few years. These estimates are considered conservative given the high demand of professionals in fire safety and emergency preparedness areas. For example, The Department of Fire Protection Engineering at Worcester Polytechnic Institute has about 100 active graduate students in fire protection engineering, plus 76 undergraduates who are taking part in a five-year program that leads to a graduate degree in fire protection engineering. WPI typically graduates 30–35 students per year. The same FP program at the University of Maryland typically enrolls 80 undergraduate and 25 graduate students, and about 30 students graduate each year.

The needs in both the private and public sectors in North Carolina and across the southeast region provide unique opportunities for a MFPA program, including outreach and collaboration with local, state and regional fire and emergency related communities. Many fire safety and emergency preparedness practicing professionals (including some recent UNC Charlotte FSET graduates) in the Charlotte metropolitan area have showed strong interest in pursuing a master's degree such as the proposed MFPA program. Internally, there is interest among current students at UNC Charlotte and its College of Engineering for such a program. An informal survey conducted by Prof. Jeff Kimble at UNC Charlotte posted online in October 2004 had 253 responses, 220 out of the 253 indicated they would pursue a degree such as the one proposed if it were available.

2. Admission into the MFPA program will be consistent with the requirements for the graduate school.

In addition the following condition will apply:

- An earned undergraduate degree in engineering, engineering technology, emergency management, or a related technical or scientific discipline. For the Fire Protection concentration, an undergraduate degree in engineering, engineering technology, or a related technical or scientific discipline is acceptable. For the Fire Administration concentration, a degree in engineering, engineering technology, emergency management, or a related discipline is acceptable.
- An undergraduate GPA of 2.75 or better
- Acceptable scores on the verbal, quantitative, and analytical sections of the GRE
- Positive letters of recommendation
- A TOEFL score of 83 (internet based), 220 (computer-based) or 557 (paper-based) is required if the previous degree was from a country where English is not the common language.

- Integral and differential calculus (MATH 1120 or 1121 or ETGR 3171 at UNC Charlotte or equivalent from other institution) is required for students pursuing the fire protection concentration.
- Statistics (STAT 1220 or STAT 3128 at UNC Charlotte or equivalent from other institution) is required for all students.
- An essay detailing the applicant's motivation and career goals, along with any specific research and training interests.
- Other credentials as required by the Graduate School

Acceptability for admission is based upon the applicant's record and background as determined by the department.

3. See attached catalog copy; course numbers are consistent with the University policy on course numbering.

4. The proposed MFPA graduate program meshes nicely with the institutional mission and strategic plan. The program will address the broad areas of concern listed in the mission statement, specifically areas three (Urban and Regional Development) and seven (Applied Sciences and Technologies)

As the first graduate level Fire Protection and Administration program, or more directly, the first fire related graduate program of any description in the state of North Carolina and the entire Southeastern region of the United States, the program will provide opportunities for students all across the region to receive an advanced degree in their chosen field. Moreover this will establish UNC Charlotte as the recognized leader in the southeast in the field of fire protection and administration. Additionally, the graduate program will further assist the Department of Engineering Technology and Construction Management and its faculty in becoming active participants in the institutional goal of raising the University's graduate research and scholarly profile.

C. IMPACT.

1. The primary group of students served by this proposal will be those graduate students who enroll to seek the MFPA degree.

2. The proposed program will strengthen the existing Fire Safety Engineering Technology undergraduate program and other degree programs in Engineering Technology. The proposed MFPA program will strengthen other Engineering programs at UNC Charlotte. For example, graduate students in the College of Engineering may take MFPA courses to broaden their education in fire protection. In addition, COE graduates may take MPFA courses in preparation for the P.E. exam in fire protection engineering.

a. Once the MFPA degree program is fully established and enrolled, the required core courses will be offered once a year. At initiation, elective courses will be offered on an on-demand basis depending on student interest and enrollment. At steady state enrollment, it is anticipated that most elective courses will be offered once every other year.

b. The delivery of the MFPA will not affect the delivery of the existing undergraduate courses.
c. Anticipated enrollment in the courses should be approximately 10 persons.
d. Enrollment in the MFPA course will have no effect on enrollment in existing undergraduate courses.
e. The only course offered previously is the undergraduate version of CMET 6140 – Building Energy Management. The course (ETGR 3000) was offered as an undergraduate major elective course in Spring 2008. Enrollment in the course was 32 students.
f. Additional catalog copy affected includes degree requirements and curriculum descriptions as indicated below:

Engineering Technology

• MS in Construction and Facilities Management (MSCFM)
• Master of Fire Protection & Administration (MFPA)

Department of Engineering Technology
274 Smith Building
704-687-2305
www.et.uncc.edu

Graduate Director
Dr. Anthony L. Brizendine

Graduate Faculty
Anthony L. Brizendine, Professor & Chair
David S. Cottrell, Assistant Professor
G. Bruce Gehrig, Associate Professor
John Hildreth, Assistant Professor
Maciej Noras, Assistant Professor
Carlos Orozco, Associate Professor
Peter Schmidt, Assistant Professor
Deborah Sharer, Associate Professor
Barry Sherlock, Professor
Jozef Urbas, Associate Professor
Sheng-Gou Wang, Professor
Aixi Zhou, Assistant Professor

Programs of Study
The Department of Engineering Technology provides opportunities for discipline-specific and multidisciplinary graduate-level education in construction management, facility management, fire protection, fire administration and closely related areas.

The Master of Science in Construction & Facilities Management has concentration areas for both construction management and facility management.

The Master of Fire Protection & Administration has concentration areas for both fire protection and fire administration, respectively.

Advanced course work and research are used to enhance professional development, improve technical competency, and initiate a life-long learning experience.

MASTER OF FIRE PROTECTION AND ADMINISTRATION

Admission Requirements
- An earned undergraduate degree in engineering, engineering technology, emergency management, or a related technical or scientific discipline. For the Fire Protection concentration, an undergraduate degree in engineering, engineering technology, or a related technical or scientific discipline is acceptable. For the Fire Administration concentration, a degree in engineering, engineering technology, emergency management, or a related discipline is acceptable.
- An undergraduate GPA of 2.75 or better
- Acceptable scores on the verbal, quantitative, and analytical sections of the GRE
- Positive letters of recommendation
- A TOEFL score of 83 (internet based test), 220 (computer-based) or 557 (paper-based) is required if the previous degree was from a country where English is not the common language
- Integral and differential calculus (MATH 1120 or 1121 or ETGR 3171 at UNC Charlotte or equivalent from other institution) is required for students pursuing the fire protection concentration.
- Statistics (STAT 1220 or STAT 3128 at UNC Charlotte or equivalent from other institution) is required for all students.
- An essay detailing the applicant's motivation and career goals, along with any specific research and training interests.
- Other credentials as required by the Graduate School

Acceptability for admission is based upon the applicant's record and background as determined by the department.

Application Deadline
Applications can be received by the Graduate Admission Office any time prior to their published deadlines. In order to be considered for assistantships and tuition grants for the following academic year, students should apply by February 15 because the Department makes the first round of award decisions by March 15. However, the Department will evaluate admission applications at any time that complete applications are received by the Graduate School.

Assistantships
Research and teaching assistantships are available from the Department on a competitive basis to highly qualified applicants/students.

Tuition Grants
Tuition grants including out-of-state tuition differential waivers and in-state tuition support are available on a competitive basis for both out-of-state and in-state students, respectively.

Degree requirements
The minimum requirement for the MFPA degree is 30 credit hours beyond the baccalaureate degree. This includes a minimum of 24 hours of formal course work. Students enrolled will 1) take a common core of 12 credits which includes study in both fire protection and fire administration; 2) choose additional concentrated study of 6 credits in either fire protection or fire administration, and 3) select 12 credits of directed elective. Students who elect the thesis option must complete 6 credits of MFPA 6900 as part of the directed electives. Students who select the non-thesis option will complete 30 credits of coursework and complete a comprehensive exam. Distance students will be directed toward the non-thesis option while resident students may complete either option.

Admission to Candidacy Requirements
Each student is required to submit a Plan of Study to the Department's Graduate Director before completing 18 hours of graduate credits.

Upon completion of a substantial amount of graduate work, each student must file an Admission to Candidacy to the Graduate School by the published deadline for the semester of graduation.

Application for Degree
Each student should submit an Application for Degree prior to graduation. If a student does not graduate in the semester identified on the Application, the student must complete a new form and repay the application fee to be considered for graduation in a subsequent semester.

Transfer Credit
The Department may accept the transfer of graduate courses (6 credits maximum) taken at another institution or from UNC Charlotte prior to admission to the program. Only courses with grades of B or better will be considered.

Additional Information
Additional requirements may be listed as per the requirements of the UNC Charlotte graduate catalog of the year of the applicant's admission into the program.

Core Courses
All students must complete the following 12 credit common core:

MFPA 5123 Human Behavior in Fire
MFPA 5132 Fire and Building Codes, Standards and Practices
MFPA 5223 Industrial Safety and Facilities Management
MFPA 6144 Fire Protection Systems

Students select one of the following concentration cores:

Fire Administration Concentration Core (6-credit hours):

MFPA 6120 Public and Private Sector Interoperability
MFPA 6124 Fire Service and the Community

Fire Protection Concentration Core (6-credit hours):
MFPA 6103 Fire Dynamics
MFPA 6203 Fire Modeling

Students may select 12 credits from the following directed electives to complete credit hour requirements for the degree:
MFPA 5150 Human Resource Management in Emergency Services
MFPA 6113 Fire Failure Analysis
MFPA 6126 Arson
MFPA 6164 Fire Science Laboratory
MFPA 6232 Structural Fire Safety
MFPA 6233 Performance-Based Design
MFPA 6243 Research Investigation
MFPA 6244 Fire Detection and Smoke Management
MFPA 6252 Law and Fire Safety
MFPA 6255 Leadership/Conflict Management in Public Emergency Services
MFPA 6260 Organization and Management of Public Fire Protection
MFPA 6270 Budgeting, Grants, Contracts and Finance in Emergency Services
MFPA 6800 Independent Study
MFPA 6900 Thesis (6 credits for thesis option)
CMET 5240 Safety & Risk Management
CMET 5270 Operation of Constructed Facilities
CMET 6130 Building Information Modeling
CMET 6140 Building Energy Management

Capstone Experiences

Students pursuing a master's degree in fire protection and administration have two options to complete the 30-credit hour program.

a) 24 hours of course work plus 6 hours of thesis project (MFPA 6900), or
b) 30 hours of course work and a comprehensive examination.

Both options require the formation of a program committee.

The thesis option is reserved for students who are attending the on-campus program and are performing research under formal graduate research or teaching assistantships. Students receiving such assistantships may be required to pursue the thesis option. The thesis option requires students to submit a written thesis and orally defend their work before their program committee.

All non-thesis students must complete 30 credits of coursework and successfully complete a formal comprehensive examination.

The comprehensive examination is a written exam. A student's exam will be scheduled when he/she has at least 24 hours of course credit completed or in progress. The student's graduate advisor and the examining committee will coordinate the examination (to be offered once in the fall and once in the spring semesters), preparing the exam with the assistance of members of the student's program committee. The exam will measure the student's mastery of theories and applications in the selected area of specialization within the discipline. Students will have only two opportunities to receive passing marks on the examination.

Advising

Each student is supervised by his/her graduate advisor and a program committee.

Program Committee

The Program Committee shall consist of at least three graduate faculty members. A graduate faculty from outside the ET department or from outside the student's major area-of-study may serve as a member of the Program Committee. The student's ET graduate advisor shall chair the committee.

Research Opportunity/Experience

Students in the fire protection and administration enjoy a curriculum with opportunities for interdisciplinary research, study abroad, and active participation in a growing research program. Programs of study can be tailored to suit individual needs and interests. The ET web site (www.et.uncc.edu) provides current areas of research conducted by the program faculty.

COURSES IN FIRE PROTECTION & ADMINISTRATION

MFPA 5123 Human Behavior in Fire (3) *Prerequisite: ETFS 3103 and ETFS 3113 or permission of department.* Individual decision processes and behavior, modeling of people movement, calculation methods for egress prediction, egress design, and fire safety signs and alarm systems. (Fall) (Alternate years)

MFPA 5132 Fire and Building Codes, Standards and Practices (3) *Prerequisite: ETFS 3103 or permission of department.* History of fire safety regulation development; building fire characteristics, fire test methods, and fire safety of buildings and structures; contemporary building and fire codes, practices, and their enforcement. (Fall) (Alternate years)

MFPA 5150 Human Resources Management in Emergency Services (3) Cross-listed as MPAD 6134. *Prerequisite: permission of department.* A study of the context of public personnel fire/emergency services related administration; basic functions of job evaluation and compensation, employee rights and responsibilities; the legal constraints including equal opportunity, health and safety, collective bargaining; government productivity. (On demand)

MFPA 5223 Industrial Safety and Facilities Management (3) *Prerequisite: ETFS 3123 or permission of department.* Investigation and analysis of hazard control principles relating to the management of personnel, facilities, and equipment, including control procedures, work-task analysis, risk identification and countermeasures, safety training, and pertinent safety management techniques. (Spring) (Alternate years)

MFPA 6103 Fire Dynamics (3) *Prerequisite: ETME 3143 and ETME 3244 or permission from the department.* This course introduces students to fundamentals of fire and combustion and is intended to serve as the first exposure to fire dynamics phenomena. The course includes fundamental topics in fire and combustion such as thermodynamics of combustion, fire chemistry, premixed and diffusion flames, solid burning, ignition, plumes, heat release rate curves, and flame spread. (Fall) (Alternate years)

MFPA 6113 Fire Failure Analysis (3) *Prerequisite: MFPA 6103 or permission of department.* This course provides knowledge for the development of fire investigation and reconstruction as a basis for determining fire cause and origin and evaluating and improving fire safety design. Accident investigation theory and failure analysis techniques such as fire re-creation testing and modeling are presented. (On demand)

MFPA 6120 Public and Private Sector Interoperability (3) *Cross-listed as MPAD 6290. Prerequisite: permission of department.* A study of multi-agency interoperability and the effective organization and management of emergency resources at various fire and large-scale emergency incidents. Includes a review of national standards and federal regulations impacting emergency incident management. Case studies of actual and theoretical incidents will be used to reinforce command and control concepts. (Spring) (Alternate years)

MFPA 6124 Fire Service and the Community (3) *Prerequisite: permission of department.* Theoretical concepts of public service to build an understanding of how the fire service fits within the community. (Spring) (Alternate years)

MFPA 6126 Arson (3) *Prerequisite: permission of department.* This course utilizes lecture and case studies of arson fires that were started for various reasons, including financial gain, revenge and to conceal other crimes. The criminal intent and the psychological aspects of the fire setter are discussed. (On demand)

MFPA 6144 Fire Protection Systems (3) *Prerequisite: ETFS 3103, ETFS 3113 or permission of department.* An advanced study of various fire protection systems in regard to contemporary fire and life safety problems. Topics include: process of fire and smoke development, principles of active fire suppression and detection systems, hydraulics, automatic sprinkler systems, passive fire protection systems, structural fire resistance, installation and maintenance of fire protection systems. (Fall) (alternate years)

MFPA 6164 Fire Science Laboratory (3) *Prerequisite: MFPA 6103 or permission of department.* This course provides overall instruction and hands-on experience with fire-science-related experimental measurement techniques. The objective is to expose students to laboratory-scale fire experiments, standard fire tests and state-of-the-art measurement techniques. (On demand)

MFPA 6203 Fire Modeling (3) *Prerequisite: MFPA 6103 or permission from the department.* Modeling of compartment fire behavior is studied through the use and application of two types of models: zone and field. The zone model studied is CFAST. The field model studied is FDS. Focus on the understanding of each of these models is the primary objective in terms of needed input, interpretation of output and limitations. (Spring) (Alternate years)

MFPA 6232 Structural Fire Safety (3) *Prerequisite: ETGR 2102 or ETME 3123, ETME 3244 or permission of department.* This course provides the knowledge needed for structural fire safety design and analysis. Course topics include design philosophies and methods in fire safety engineering, principles of and approaches for structural design for fire safety, behavior of compartment fires, behavior of structural materials in fire, and structural fire safety of typical materials and their components. (On demand)

MFPA 6233 Performance-Based Design (3) *Prerequisite: ETFS 6203 or permission of department.* This course covers practical applications of fire protection engineering principles to the design of buildings. Both compartmented and non-compartmented buildings will be designed for criteria of life safety, property protection, continuity of operations, operational management and cost. (On demand)

MFPA 6243 Research Investigation (3) *Prerequisite: permission of the department.* This course provides students with opportunities in conducting research to tackle fire safety related real-world problems. With guidance from the instructor, students can work individually or as a team on a one-semester project. (On demand)

MFPA 6244 Fire Detection and Smoke Management (3) *Prerequisite: ETFS 3103 or permission of department.* This course addresses the fundamentals and practices of fire detection and smoke management. Topics include: principles of fire detection, fire alarm technology, and contemporary fire detection and alarm systems; principles applicable to the design and analysis of smoke management systems; factors affecting smoke movement; smoke hazard assessment; airflow in buildings, performance characteristics of smoke control and management systems. (On demand)

MFPA 6252 Law and Fire Safety (3) *Prerequisite: permission of department.* Responding to natural and manufactured building hazards requires a complex legal environment, including regulation and liability. Key topics include the use of model codes, administrative regulation, retrospective codes, federal preemption, arson, performance based

codes, risk based regulation, engineering malpractice, product liability and disaster investigation. (On demand)

MFPA 6255 Leadership/Conflict Management in Public Emergency Services (3) Cross-listed as MPAD 6141. *Prerequisite: permission of department.* The role of the administrator as a focal point in social change and the management of the conflict, which occurs. Perspectives on the negotiation and bargaining process will be reviewed. (On demand)

MFPA 6260 Organization and Management of Public Fire Protection (3) *Cross-listed as MPAD 6104. Prerequisite: permission of department.* A presentation of modern management principles and techniques to the organization and delivery of the array of services that communities have come to expect from the fire service. The traditional and evolving roles of the fire service to protection, prevention, risk analysis and community service are also considered. (On demand)

MFPA 6270 Budgeting, Grants, Contracts and Finance in Emergency Services (3) *Prerequisite: permission of department.* This course works to develop the understanding of strategic planning, contracting and budgeting practices as well as grant proposal writing with the emphasis on contract administration skills necessary to operation of a functioning governmental entity. (On demand)

MFPA 6800 Independent Study (1-3) *Prerequisite: permission of department.* The MFPA program offers independent study and special study courses to allow students to pursue studies in areas for which there are no approved formal courses. Independent study courses can only be taken on a P/F basis. Special study courses can be taken for a grade if the paperwork indicates it will be taken A/F. Each requires a title, justification, and the method of evaluation. Courses taken for A/F grade may be used to satisfy degree requirements. May be repeated for credit. (On demand)

MFPA 6900 Thesis (1-6) *Prerequisite: Consent of graduate committee advisor.* Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(On demand)*

D. RESOURCES REQUIRED TO SUPPORT PROPOSAL.

1. Personnel
   a. Specify requirements for new faculty, part-time teaching, student assistant and/or increased load on present faculty.

It is anticipated that this new enrollment stream will warrant the addition of three new faculty members over the next four years to adequately deliver the program. Faculty in the Fire Science program will be added through the campus' faculty line allocation process. These positions will be justified through enrollment growth and student credit hour production targets being met. Additionally, research capability and production will increase as new faculty and graduate students are added.

No adverse effect is anticipated on current faculty loads. In fact, the addition of new faculty hires in this developing construction group will provide additional catalyst for construction research, scholarly publication, and community outreach activity.

b. List by name qualified faculty members interested in teaching the course(s).

Jozef Urbas, Associate Professor
Aixi Zhou, Assistant Professor
Anthony L. Brizendine, Professor
G. Bruce Gehrig. Associate Professor
David S. Cottrell, Assistant Professor
John Hildreth, Assistant Professor

Additionally, the following faculty members may teach in the program pending interest and/or appointment to the graduate faculty:

Maciej Noras, Assistant Professor
Carlos Orozco, Associate Professor
Peter Schmidt, Assistant Professor
Deborah Sharer, Associate Professor
Barry Sherlock, Professor
Sheng-Gou Wang, Professor
Rosida Coowar, Associate Professor
Chung-Suk Cho, Assistant Professor
Paul Kabengela, Faculty Associate
Jeffrey Kimble, Associate Professor
David Murphy, Associate Professor

2. Physical Facility

The proposed program will share facilities with the existing Fire Safety Engineering Technology (FSET) program in the Smith Building and the Fire Laboratory at Shopton Road. The FSET program already has an established fire research laboratory. The Laboratory houses several pieces of state of the art fire tests apparatus such as a Cone Calorimeter, an Intermediate Scale Calorimeter (ICAL), a Lateral Ignition and Flame Spread Test, a Furniture Calorimeter and an intermediate scale furnace equipped with

load frames. The ICAL is a unique test apparatus and UNC Charlotte has one of the five ICALs currently in use in the United States. In addition, the program recently invested in a structural fire testing facility, one of only a few at U.S. academic institutions. An additional laboratory for small scale fire testing is in development in the Smith Building. In addition, the program will have access to share facilities with the existing Construction Management, Civil ET, Electrical ET and Mechanical ET programs in the Smith Building. These laboratories currently exist with capabilities in construction materials, computer drafting, cost estimating, structures, fluid mechanics and hydraulics, stress analysis, thermodynamics, heat transfer, and instrumentation and controls. Existing facilities are adequate to support the on-campus program at commencement and during the next decade.

3. Equipment and Supplies
   Existing supplies are adequate to support the program.

4. Computer
   Existing information technology services and engineering computing capabilities will need to be upgraded with five standalone state-of-the-art workstations for computational fluid dynamics fire modeling, evacuation modeling, finite element fire resistance computations, and other fire modeling.

5. Audio-Visual

   Existing audio-visual capabilities are adequate to support the program. Additional infrastructure to support future online, distance education delivery of the program is required. Estimates of additional IT infrastructure (hardware and software) to support delivery of the distance component are approximately $150,000 which includes hardware and software. Pilot work is underway by the Department to demonstrate PanOpto lecture capture for distance delivery. Software and hardware have been secured (with support from the Department, College of Engineering Mosaic Computing, and Academic Affairs) to pilot the project and demonstrate for wider implementation on campus. Full implementation will include both real time synchronous and asynchronous delivery via audio and video capture and web streaming. Current plans anticipate distance delivery of this program will be requested once the program has been initiated and all courses developed and delivered on campus. Distance delivery of courses could begin as early as year 2 of operation.

6. Other Resources
   Specify and estimate cost of other new/added resources required, e.g., travel, communication, printing and binding.

   Other additional resources are not required.

7. Indicate source(s) of funding for new/additional resources required to support this proposal.

   Existing facilities and equipment are in place. Any additional new facilities or equipment will be funded through normal university funding sources to include

projected funding from RFPs from General Administration. Supplemental funding from public and private sources to include fire protection industry support will be utilized for program enhancements.

E. CONSULTATION WITH THE LIBRARY AND OTHER DEPARTMENTS OR UNITS

1. Library Consultation
   See attached copy of Library Consultation

2. Consultation with other departments or units

The following departments within the College of Engineering have been consulted concerning this proposal:

- The Department of Civil and Environmental Engineering
- The Department of Electrical and Computer Engineering
- The Department of Mechanical Engineering and Engineering Science

In addition, the following consultations have occurred:

- The Department of Geography & Earth Sciences (consultation / letter appended)
- The Department of Political Science - Master of Public Administration program (consultation and agreement for cross-listing of four courses appended)

Typical letters, memoranda and email correspondence of consultation, endorsement, and/or support from internal units, as well as, representative letters from the professional community are included in Attachment B.

F. INITIATION AND CONSIDERATION OF THE PROPOSAL

1. Originating Unit
   Briefly summarize action on the proposal in the originating unit including information on voting and dissenting options.

This proposal was initiated by the faculty of the Department of Engineering Technology. This Curriculum Proposal was approved unanimously by the Department of Engineering Technology faculty on September 2, 2008.

2. Other Considering Units
   Briefly summarize action on the proposal by each considering unit including information on voting and dissenting options.

   <u>The following were consulted during the initiation of the intent to plan / request to establish / and /or curriculum proposal process for this program</u>:

- Engineering Technology and Fire Science Industrial Advisory Boards – Unanimous Support
- Department of Engineering Technology Faculty – Unanimous Vote in Favor
- Lee College of Engineering Academic Policy & Curriculum Committee (CEAPCC) – incorporated all suggestions
- Lee College of Engineering Graduate Committee (EGC) – incorporated all suggestions
- Lee College of Engineering Dean – incorporated all suggestions
- College of Engineering Faculty

This course and curriculum proposal is subject to the standard faculty governance review processes established by the Department of Engineering Technology, the College of Engineering, the Graduate School, and the University of North Carolina at Charlotte.

G. ATTACHMENTS

1. Attachment A: Graduate Course Descriptions and Syllabi.

2. Attachment B: Consultation Documentation

Attachment A: Graduate Course Descriptions and Syllabi

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 5123. Human Behavior in Fire. (3)

Prerequisite: ETFS 3103 and ETFS 3113 or permission of Department.

Course Description: Individual decision processes and behavior, modeling of people movement, calculation methods for egress prediction, egress design, and fire safety signs and alarm systems. (Fall) (Alternate years)

Objectives: This course covers essential bodies of knowledge on how people tend to react in fire emergencies, and how that affects training, communication, evacuation, and building fire safety design. Upon completion of this course, students will be able to:

- Understand the types of behavior that people exhibit in fire situations
- Describe possible physiological impact on building occupants and emergency respondents
- Perform estimates of occupant evacuation time from buildings
- Know basic knowledge in modeling techniques used to estimate evacuation times in large buildings and transportation facilities
- Understand the fundamentals of egress design
- Know basic knowledge in determining means of egress, exit capacity, exit design and maintenance

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:

a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

Course Policies
Academic Integrity: The UNC-Charlotte Code of Student Academic Integrity governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte

Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition. A current version of the code is available online at http://www.legal.uncc.edu/policies/ps-105.html.

Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**
Mid-Term Exam	100 points	100	320-359	**B**
Project	100 points	100	280-319	**C**
Final Exam	100 points	100	0-279	**U**
	Total	400		

Assignments

All material submitted for credit must be received and acknowledged by the instructor before the relevant deadline.

All material submitted for credit must contain all relevant identification information. Such information may include, but not limit to: course number and section number, first and last names, and the assignment identifier (i.e., assignment name or a number).

Multiple page submissions must have sequential page and total page numbers in a consistent location on each page. Multiple page hardcopy submissions must be stapled or firmly attached within a report binder.

Submissions must be professional in appearance; i.e., not illegible, illogical or with miss information. Failure to comply with these guidelines will result in significant point reductions for each violation.

Blackboard and Email

It is the responsibility of each student to gain access to UNC-Charlotte's Blackboard Vista and read his or her university email frequently. Assignments, announcements, and grading will be handled through Blackboard Vista and frequently distributed through UNCC email service.

Email messages to the instructor will be responded to as soon as possible. You usually get prompt response for emails sent during regular office hours (8AM-5PM) from Monday to Friday. Emails sent after 5PM will likely be answered the next working day. (Emails sent in Friday evening and on weekends will probably be handled on the coming Monday.)

Cell Phone Please set your cell phone in "vibrate" or "silent" mode before each lecture.

Assistance If you have a disability which requires accommodations (such as note takers, readers, or extended time on assignments and exams), please advise me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Probable Textbooks or Resources:

1. *Egress Design Solutions: A Guide to Evacuation and Crowd Management Planning, by Jeffrey Tubbs and Brian Meacham, Wiley, 2007. ISBN-10: 0471719560.*
2. *NFPA Ready Reference: Human Behavior in Fire Emergencies*. NFPA, 2003.

Topical Outline of Course Contents:

Week*	Topic
1	Awareness of fire and decision processes of the individual
2	Occupant behavior actions in fire
3	Evacuation time: components and estimation
4	Calculation methods for travel time
5	Computer modeling of people movement
6	Computer simulation and modeling of egress design
7	Fundamentals of egress design
8	Review of Life Safety Code
9	Influence of Egress
10	Means of egress and exit capacity
11	Exit facilities and arrangements
12	Lighting and signs
13	Alarm systems
14	Emergency egress and relocation
15	Maintenance of the means of egress

*: Only weeks with lectures are shown.

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 5132. Fire and Building Codes, Standards, and Practices (3)

Prerequisite: ETFS 3103 or permission of Department.

Course Description: History of fire safety regulation development; building fire characteristics, fire test methods, and fire safety of buildings and structures; contemporary building and fire codes, practices, and their enforcement. (Fall) (Alternate years)

Objectives: The study of building and fire codes and regulations as they relate to the prevention and incidence of building and structural fires. Upon completion of this course, students will be able to:

- Understand authority, responsibilities and organization issues related to fire prevention and code enforcement;
- Understand concepts and principles of combustion and fire growth
- Know construction and occupancy classifications
- Recognize frequent fire hazards
- Understand access and means of egress requirements
- Understand fire protection and suppression systems
- Demonstrate skill in plans review for fire safety
- Understand how to maintain an acceptable level of building fire safety

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:

a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

Course Policies
Academic Integrity: The UNC-Charlotte Code of Student Academic Integrity governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte

Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition. A current version of the code is available online at http://www.legal.uncc.edu/policies/ps-105.html.

Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**
Mid-Term Exam	100 points	100	320-359	**B**
Project	100 points	100	280-319	**C**
Final Exam	100 points	100	0-279	**U**
	Total	400		

Assignments

All material submitted for credit must be received and acknowledged by the instructor before the relevant deadline.

All material submitted for credit must contain all relevant identification information. Such information may include, but not limit to: course number and section number, first and last names, and the assignment identifier (i.e., assignment name or a number).

Multiple page submissions must have sequential page and total page numbers in a consistent location on each page. Multiple page hardcopy submissions must be stapled or firmly attached within a report binder.

Submissions must be professional in appearance; i.e., not illegible, illogical or with miss information. Failure to comply with these guidelines will result in significant point reductions for each violation.

Email

It is the responsibility of each student to read his or her email. Course notices are frequently distributed through mass mailings.

Email messages to the instructor will be responded to as soon as possible. You usually get prompt response for emails sent during regular office hours (8AM-5PM) from Monday to Friday. Emails sent after 5PM will likely be answered the next working day. (Emails sent in Friday evening and on weekends will probably be handled on the coming Monday.)

Cell Phone

Please set your cell phone in “vibrate” or “silent” mode before each lecture.

Assistance If you have a disability which requires accommodations (such as note takers, readers, or extended time on assignments and exams), please advise me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Probable Textbooks or Resources:

Fire Inspection and Code Enforcement (6th Ed.), IFSTA, 1998. ISBN 0-87939-150-2

Building Codes Illustrated (2nd Ed), by Francis D.K. Ching and Steven R. Winkel, John Wiley & Sons, 2007. ISBN: 0-471-74189-2.

International Building Code, by International Code Council, Delmar Cengage Learning, 2006. ISBN-10: 1580012515.

International Fire Code, by International Code Council, Delmar Cengage Learning, 2006. ISBN-10: 1580012558.

Fire Prevention: Inspection and Code Enforcement (3rd Ed), by David Diamantes, Delmar Learning, 2006. ISBN-10: 141800944X.

Topical Outline of Course Contents:

Week*	Topic
1	Introduction
2	History of fire safety regulation development
3	Building fire characteristics
4	Fire test methods
5	Fire safety of buildings and structures
6	Building codes - I
7	Building codes - II
8	Building codes - III
9	Building codes - IV
10	Building codes - V
11	Building codes - VI
12	Fire codes - I
13	Fire codes – II
14	Fire codes – III
15	Fire codes – IV

*: Only weeks with lectures are shown.

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 5150 Human Resources In Emergency Services (3)

Prerequisite: permission of department.

Course Description:

MFPA 5150 Human Resources Management in Emergency Services (3) Cross-listed as MPAD 6134. A study of the context of public personnel fire/emergency services related administration; basic functions of job evaluation and compensation, employee rights and responsibilities; the legal constraints including equal opportunity, health and safety, collective bargaining; government productivity.

Course Objectives:

- **Define the laws pertaining to employment**
- **List the possible consequences of wrongful termination**
- **Describe at least three effective means of evaluation for promotion**
- **List possible strategies for employment development.**

Instructional method: Lecture, classroom discussion on meaningful level; individual and limited group participation. Pertinent audiovisual media.

Means of Student Evaluation: Graded written reports and oral reports

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:

a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

Course Policies
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standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition. A current version of the code is available online at http://www.legal.uncc.edu/policies/ps-105.html.

Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**
Mid-Term Exam	100 points	100	320-359	**B**
Project	100 points	100	280-319	**C**
Final Exam	100 points	100	0-279	**U**
	Total	400		

Assignments

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and on weekends will probably be handled on the coming Monday.)

Cell Phone Please set your cell phone in "vibrate" or "silent" mode before each lecture.

Assistance If you have a disability which requires accommodations (such as note takers, readers, or extended time on assignments and exams), please advise me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Textbook Handbook of Human Resources in Government. Stephen E. Condrey

Reference Books *Fire Protection Handbook, 19th Edition, National* Fire Protection Association

Supplementary Materials Per Instructor.

Course Contents:

Week*	Topic
1 & 2	The Changing Role of Human Resources
3	Beyond Politics, The Emergence of New Paradigms
4 & 5	Complexities of the Civil Service System
6	Staffing the Bureaucracy, Recruitment and Retention
7	A More Flexible Workplace: Issues and Implications
8	Valuing Diversity, a Changing Workplace
9	Managing an Aging Workforce
10	Using Technology in the Workplace
11	Public Human Resource Management
12	Organizational Development in Employee Development
13 & 14	Understanding Organizational Climate and Culture
15	Understanding and Using Conflict in the Workplace
16	Strategic Planning for Human Resource Managers

*: Only weeks with lectures are shown.

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 5223 Industrial Safety and Facilities Management (3)

Prerequisite: ETFS 3123 or permission of Department.

Course Description:
Investigation and analysis of hazard control principles relating to the management of personnel, facilities, and equipment, including control procedures, work-task analysis, risk identification and countermeasures, safety training, and pertinent safety management techniques.

Course Objectives:

- **Describe why industrial facilities all have inherent dangers**
- **List the steps that can be taken to reduce risk in this environment**
- **Develop action plans for specific hazard situations**
- **Define the steps necessary for assuring interoperability in a time of crisis**

Instructional method: Lecture, classroom discussion on meaningful level; individual and limited group participation. Pertinent audiovisual media.

Means of Student Evaluation: Graded written reports and oral reports

Course Policies
Academic Integrity**:** The UNC-Charlotte Code of Student Academic Integrity governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition. A current version of the code is available online at http://www.legal.uncc.edu/policies/ps-105.html.

Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**
Mid-Term Exam	100 points	100	320-359	**B**

Project	100 points	100	280-319	**C**
Final Exam	100 points	100	0-279	**U**
	Total	400		

Assignments

All material submitted for credit must be received and acknowledged by the instructor before the relevant deadline.

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Cell Phone

Please set your cell phone in "vibrate" or "silent" mode before each lecture.

Assistance

If you have a disability which requires accommodations (such as note takers, readers, or extended time on assignments and exams), please advise me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Prerequisite: none

Textbook: Industrial Fire Protection Handbook. 2nd. Ed. R. Craig Scholl

Reference Books: *Fire Protection Handbook, 19th Edition, National* Fire Protection Association

Supplementary Materials: Per Instructor.

Course Contents:

Week*	Topic
1	Introduction and expectations
2 & 3	Historical perspectives, changes in the workplace
4 & 5	Hazard Assessment & Evaluation
6	Building Construction
7	Occupant Characteristics
8	Occupancy Classification
7	Fundamentals of egress design
8	Review of Life Safety Code
9	Means of Egress Requirements
10	Fire Alarm requirements
11	Prefire Planning
12	Working with outside agencies
13 & 14	Using technology to make the workplace safer
14	Putting it all together
15	Employer and Employee buy in

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6103 Fire Dynamics (3)

Prerequisite: ETME 3143 and ETFS 3244 or permission of Department.

Course Description:

This course introduces students to fundamentals of fire and combustion and is intended to serve as the first exposure to fire dynamics phenomena. The course includes fundamental topics in fire and combustion such as thermodynamics of combustion, fire chemistry, premixed and diffusion flames, solid burning, ignition, plumes, heat release rate curves, and flame spread.

Objectives of the Course: This course is designed to provide students with an understanding of the fundamentals of fire dynamics. It brings together elements of physics, chemistry, fluid mechanics, thermodynamics, heat transfer, combustion, and material science that pertain to fire. The concepts are presented in the form of formulas and charts that can be used in the analysis of fire phenomena. Upon completion of this course, students should be able to:

- Identify and understand different forms of natural fire
- Explain conduction, convection, and radiation heat transfer
- Describe the concept of heat flux and its role in fire hazard assessment
- Understand different modes and criteria for ignition of solid fuels
- Quantify fire spread rates over solids for different configurations
- Predict burning rate and energy release rate of real items
- Calculate flame heights and fire plume characteristics
- Quantify the hazards of combustion products in smoke
- Explain the processes in the development of fire in a compartment

Instructional method: Classroom lectures supported by MS PowerPoint slideshows. Problems will be assigned to students. Students are required to complete problems for the next class following the assignment.

Means of Student Evaluation:
There will be two tests and a comprehensive final exam. The types of questions utilized may include but are not limited to the following:

- True/False
- Multiple Choice
- Essay/Short answer

The tests and exam will be based on material covered in class.

Course Policies
Academic Integrity: The UNC-Charlotte Code of Student Academic Integrity governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists

applicable penalties. A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition. A current version of the code is available online at http://www.legal.uncc.edu/policies/ps-105.html.

Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade

Grading policy

Assignment	Available Points	Total Points	Percentage Range	Point Range	Final Grade
Test (2)	15 points each	30	90 - 100%	90 - 100	**A**
Homework (5)	6 points each	30	80 - 89%	80 - 89	**B**
Final Exam (1)	40 points each	40	70 - 79%	70 – 79	**C**
			0 - 69%	0 - 69	**U**
Total Points		**100**			

Assignments

All material submitted for credit must be received and acknowledged by the instructor before the relevant deadline.

All material submitted for credit must contain all relevant identification information. Such information may include, but not limit to: course number and section number, first and last names, and the assignment identifier (i.e., assignment name or a number).

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and on weekends will probably be handled on the coming Monday.)

Cell Phone Please set your cell phone in "vibrate" or "silent" mode before each lecture.

Assistance If you have a disability which requires accommodations (such as note takers, readers, or extended time on assignments and exams), please advise me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Probable textbooks or resources:
Drysdale, D., *An Introduction to Fire Dynamics,* Second Edition, John Wiley & Sons, 1999

The SFPE Handbook of Fire Protection Engineering, Edited by DiNenno, Philip J. et al., Society of Fire Protection Engineers

Fire Protection Handbook, Edited by Cote, Arthur E. et al., National Fire Protection Association

Supplementary Materials: Per Instructor, Students must have a PC for homework and scientific calculator for homework and class

Course Contents:

Week*	Topic
1	Course introduction: Historical background, Fire statistics, Fire protection engineering, Prescriptive and performance-based fire codes
2	Fire science and combustion
3	Flammability limits
4	Diffusion flames and fire plumes
5	Heat transfer in fires
6	Ignition of Solids
7	Steady burning of liquids and solids
8	Flame Spread
9	Fire growth – pre-flashover, Fire testing – reaction to fire
10	Fire growth – post-flashover, Spatial separation, Fire resistant construction and testing
11	Fire detection and suppression
12	Smoke production and movement
13	Human behavior in fires
14 & 15	Computer fire modeling, Design based on performance

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6113 Fire Failure Analysis (3)

Prerequisite: MFPA 6103 or permission of department.

Course Description:
This course provides knowledge for the development of fire investigation and reconstruction as a basis for determining fire cause and origin and evaluating and improving fire safety design. Accident investigation theory and failure analysis techniques such as fire re-creation testing and modeling are presented.

Objectives of the Course: The course is designed to present students with the scientific approach of fire investigation and reconstruction consistent with present-day expert witness guidelines in federal and state courts. Upon completion of the course, students should be able to:

- Understand principles of fire re-construction
- Apply basic fire dynamics to fire investigation and re-creation problems
- Conduct fire Pattern Analysis
- Document fire scene
- Analyze arson crime scene
- Apply fire modeling to re-create fires
- Understand fire test methods that can be used for fire re-creation
- Apply various scientific tools in case studies

Instructional method: Classroom lectures supported by MS PowerPoint slideshows. Problems will be assigned to students. Students are required to complete problems for the next class following the assignment.

Means of Student Evaluation:
There will be two tests, a comprehensive final exam, and a research paper assigned to individual students or groups of students. The types of questions utilized may include but are not limited to the following:

- True/False
- Multiple Choice
- Essay/Short answer

The tests and exam will be based on material covered in class. The research paper will be based on case studies.

Course Policies
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Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade

Grading policy

Assignment	Available Points	Total Points	Percentage Range	Point Range	Final Grade
Test (2)	15 points each	30	90 - 100%	90 - 100	**A**
Research Paper (1)	30 points each	30	80 - 89%	80 - 89	**B**
Final Exam (1)	40 points each	40	70 - 79%	70 – 79	**C**
			0 - 69%	0 - 69	**U**
Total Points		**100**			

Blackboard and Email

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Assistance

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Probable textbooks or resources: Forensic Fire Scene Investigation, Second Edition, David J. Icove, John D. DeHaan, Pearson, Prentice Hall, 2009

Supplementary Materials: Per Instructor.

Course Contents:

Week*	Topic
1 & 2	Course introduction, Principles of Reconstruction
3	Basic Fire Dynamics
4	Fire Pattern Analysis
5	Fire Scene Documentation
6	Arson Crime Scene Analysis
7	Fire Re-creation as a Means to Verify a Hypothesis
8	Fire Testing
9	Fire Modeling
10	Combination of Fire Testing and Fire Modeling
11- 13	Case Studies
14	Fire Deaths and Injuries
15	Future Tools for the Fire Investigator

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6120 Interoperability in the Public and Private Sectors

Prerequisite: permission of department.

Course Description: **MFPA 6120 - Public and Private Sector Interoperability. (3)** *Cross-listed as MPAD 6290.* A study of multi-agency interoperability and the effective organization and management of emergency resources at various fire and large-scale emergency incidents. Includes a review of national standards and federal regulations impacting emergency incident management. Case studies of actual and theoretical incidents will be used to reinforce command and control concepts.

Objectives:

- Define the problems of multi agency response
- List reasons for communications failure on scene
- Develop mutual aid response guidelines
- Be familiar with new technology to enhance on scene work

Instructional method: Lecture, classroom discussion on meaningful level; individual and limited group participation. Pertinent audiovisual media.

Means of Student Evaluation: Graded written reports and oral reports

Course Policies

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Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**

Mid-Term Exam	100 points	100	320-359	**B**
Project	100 points	100	280-319	**C**
Final Exam	100 points	100	0-279	**U**
	Total	400		

Assignments

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Assistance

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Textbook: TBD

Reference Books:

Supplementary Materials: Per Instructor.

Course Contents:

Week	Topic
1	Overview – and historical perspectives
2	Problems with the communications - it is more than just radios
3	Case Study – 9/11//2001
4	Speaking the same language on the scene
5	A unified command
6	National credentialing
7	Data, telemetry, video, GIS and RFIDs, other new technology
8	Case Study - TBD
9	Using IP for communications
10	NIMS
11	Driven by need or driven by dollars, freeing the spectrum
12	Coordinating a multi agency response
13	Case Study - TBD
14	Planning for the big one
15	Summary

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6124 Fire Service and the Community (3)

Prerequisite: permission of department.

Course Description:
An exploration of time tested and contemporary concepts of successful fire prevention program that interact within the entire community.

Course Objectives:

- **Describe the role the fire service plays in the community**
- **List the steps that can be taken to ensure public acceptance and support of the fire service**
- **Develop action plans for specific hazard situations**
- **Define the steps for a comprehensive fire safe community**

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:
a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

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Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	**10 points each**	**100**	**360-400**	**A**
Mid-Term Exam	**100 points**	**100**	**320-359**	**B**
Project	**100 points**	**100**	**280-319**	**C**
Final Exam	**100 points**	**100**	**0-279**	**U**
Total		**400**		

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Assistance

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arrangements with the instructor for additional assistance.

Textbook: ***How Effective Are Your Community Services? Procedures for Performance Measurement, 3rd ed.***

Reference Books: *Fire Protection Handbook, 19th Edition, National* Fire Protection Association

Supplementary Materials: Per Instructor.

Course Contents:

Week*	Topic
1	Course Expectations, Project emphasis/Literature review discussion Library guest speaker
2 & 3	Historical perspectives, changes in the community
4 & 5	Overview of *America Burning*
6	Improving fire prevention
7	Use of data
8	Community fire education
9	Community empowerment
10	Program evaluation
11	Prefire Planning
12	Working with outside agencies
13-14	Funding for prevention programs
15	Program enactment
16	Putting it all together

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6126 Arson

Prerequisite: permission of department.

Course Description: This course utilizes lecture and case studies of arson fires that were started for various reasons, including financial gain, revenge and to conceal other crimes. The criminal intent and the psychological aspects of the fire setter are discussed.

Course Objectives:

- **List the reasons why people commit arson**
- **Explain how arson can be used to cover another crime**
- **Describe the steps to determine if a fire is intentional versus accidental**

Instructional method: Lecture, classroom discussion on meaningful level; individual and limited group participation. Pertinent audiovisual media.

Means of Student Evaluation: Graded written reports and oral reports

Course Policies

Academic Integrity**:** The UNC-Charlotte Code of Student Academic Integrity governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition. A current version of the code is available online at http://www.legal.uncc.edu/policies/ps-105.html.

Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**
Mid-Term Exam	100 points	100	320-359	**B**
Project	100 points	100	280-319	**C**

Final Exam	100 points	100	0-279	**U**
	Total	400		

Assignments

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Assistance

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Textbook: Not required, class notes will be distributed.

Reference Books:

Supplementary Materials: Per Instructor.

Course Contents:

Week	Topic
1	Defining arson and unlawful burning
2	Historical perspectives
3	Evidence and indicators
4	Criminal intent
5	Arson for financial gain
6	Arson for revenge
7	Arson to cover other crimes
8	Arson for gratification
9	Juvenile fire setters
10	Intervention and treatment programs
11	Case Study Presentations
12	Case Study Presentations
13	Case Study Presentations
14	Case Study Presentations
15	Case Study Presentations

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6144. Fire Protection Systems. (3)

Prerequisite: ETFS 3103 and ETFS 3113 or permission of Department.

Course Description: An advanced study of various fire protection systems in regard to contemporary fire and life safety problems. Topics include: process of fire and smoke development, principles of active fire suppression and detection systems, hydraulics, automatic sprinkler systems, passive fire protection systems, structural fire resistance, installation and maintenance of fire protection systems. (Fall) (alternate years)

Objectives: Upon completion of this course, students will be able to:

- Understand the process of fire and smoke development in a compartment fire
- Understand the principles of active fire suppression and detection systems
- Understand the principles of hydraulics and automatic sprinkler systems
- Understand the principles passive fire protection systems and structural fire resistance
- Understand installation and maintenance requirements of fire protection systems

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:

a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

Course Policies
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Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**
Mid-Term Exam	100 points	100	320-359	**B**
Project	100 points	100	280-319	**C**
Final Exam	100 points	100	0-279	**U**
	Total	400		

Assignments

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Probable Textbooks or Resources:

Fire Protection Systems, by A. Maurice Jones, Delmar Cengage Learning, 2008. ISBN-10: 1401862624.

Fire Detection and Suppression Systems (3rd Ed), by Ted Boothroyd, Intl Fire Service Training Assn, 2005. ISBN-10: 0879392673.

Topical Outline of Course Contents:

Week*	Topic
1	Fire development in a compartment fire
2	Smoke development in a compartment fire
3-4	Active fire suppression and detection systems
5-6	Hydraulics
7-8	Automatic sprinkler systems
9-11	Passive fire protection systems
12-13	Structural fire resistance
14-15	installation and maintenance of fire protection systems

*: Only weeks with lectures are shown.

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6164 Fire Science Laboratory (3)

Pre- or Co-requisite: MFPA 6103 or permission of department.

Course Description:
This course provides overall instruction and hands-on experience with fire-science-related experimental measurement techniques. The objective is to expose students to laboratory-scale fire experiments, standard fire tests and state-of-the-art measurement techniques.
Objectives of the Course: In this course students will learn general measurement techniques used in a typical fire research laboratory. Upon completion the students should be able to:

- Make temperature and heat flux measurements in fire environments
- Understand and conduct standard ignition and flame spread tests
- Understand oxygen consumption calorimetry
- Understand and conduct tests on the Cone Calorimeter and Intermediate Scale Calorimeter
- Apply oxygen calorimetry to full-scale and fire re-creation testing
- Understand the principles of fire resistance testing

Instructional method: Classroom lectures supported by MS PowerPoint slideshows and work in a fire research laboratory. Problems will be assigned to students. Students are required to complete problems for the next class following the assignment.

Means of Student Evaluation:
There will be two tests, a comprehensive final exam, and a practical problem of a laboratory measurement assigned to individual students or groups of students. The types of questions for the tests utilized may include but are not limited to the following:

- True/False
- Multiple Choice
- Essay/Short answer

The tests and exam will be based on material covered in class. The practical problem will require a written report.

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Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Percentage Range	Point Range	Final Grade
Test (2)	15 points each	30	90 - 100%	90 - 100	**A**
Written Laboratory Report (1)	30 points each	30	80 - 89%	80 - 89	**B**
Final Exam (1)	40 points each	40	70 - 79%	70 – 79	**C**
			0 - 69%	0 - 69	**U**
Total Points		**100**			

Assignments

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Probable textbooks or resources: Per Instructor.

Course Contents:

Week*	Topic
1	Course introduction, introduction to a fire science laboratory
2	Uncertainty of fire related measurements, data acquisition and reduction techniques
3	Ignitability measurements
4 & 5	Flame spread measurements
6	Oxygen consumption concept
7	Mass loss rate and heat release rate measurements
8	Cone calorimeter
9	Intermediate Scale Calorimeter (ICAL)
10	Large-scale testing and room fire test
11	Measurements of temperature and heat flux
12	Fire-recreation testing
13	Tests to obtain input data in fire models
14	Alarm systems
14 & 15	Fire resistance test methods

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6203 Fire Modeling (3)

Prerequisite: MFPA 6103 or permission of the department.

Course Description:

Modeling of compartment fire behavior is studied through the use and application of two types of models: zone and field. The zone model studied is CFAST. The field model studied is FDS. Focus on the understanding of each of these models is the primary objective in terms of needed input, interpretation of output and limitations.

Objectives of the Course: Upon completion of this course, students should be able to:

- Understand the principles of zone fire modeling
- Understand the principles of field fire modeling
- Use a zone model to conduct modeling of a room fire and interpret the outputs of the model
- Obtain input data for FDS from literature
- Write a simple input file for FDS
- Run FDS to model to model a simple fire scenario, and interpret the model outputs

Instructional method: Classroom lectures supported by MS PowerPoint slideshows. Problems will be assigned to students. Students are required to complete problems for the next class following the assignment.

Means of Student Evaluation:
There will be two tests and a comprehensive final exam. The types of questions utilized may include but are not limited to the following:

- True/False
- Multiple Choice
- Essay/Short answer

The tests and exam will be based on material covered in class.

The students will be required to complete a model of a simple fire scenario and present a complete report.

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Grading policy

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Test (2)	15 points each	30	90 - 100%	90 - 100	**A**
Modeling Report (1)	30 points each	30	80 - 89%	80 - 89	**B**
Final Exam (1)	40 points each	40	70 - 79%	70 – 79	**C**
			0 - 69%	0 - 69	**U**
Total Points		**100**			

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Probable textbooks or resources: Karlsson, Björn and Quintiere, James G., *Enclosure Fire Dynamics,* CRC Press, 1999

An Introduction to Mathematical Fire Modeling, 2nd edn., Marc L. Janssens, Technomic Publishing Co., Lancaster, PA, USA

Richard D. Peacock, Walter W. Jones, Paul A. Reneke, Glenn P. Forney, *CFAST – Consolidated Model of Fire Growth and Smoke Transport (Version 6) User's Guide*, NIST Special Publication 1041, National Institute of Standards and Technology, Gaithersburg, MD., December, 2005.

McGrattan, Kevin B.; Klein, Bryan; Hostikka, Simo; Floyd, Jason; *Fire Dynamics Simulator (Version 5) – Users Guide*, NIST Special Publication 1019-5, National Institute of Standards and Technology, Gaithersburg, MD., January 8, 2008.

Forney, Glenn P., *User's Guide for Smokeview Version 5 - A Tool for Visualizing Fire Dynamics*, NIST Special Publication 1017-1, National Institute of Standards and Technology, January 2008.

Supplementary Materials: Per Instructor, Students must have a PC for homework and scientific calculator for homework and class

Course Contents:

Week*	Topic
1	Course introduction, Basic Compartment Fire Theory
2	Introduction to mathematical Compartment Fire Modeling
3	ASET-QB: A simple Room Fire Model
4	Modifications to ASET-QB
5	The CFAST model: Model description, Case Studies
6	CFD Models – Basic Characteristics
7	Fire Modeling using CFD Models
8	Fire Dynamics Simulator (FDS) - Description
9	FDS User's Guide
10 - 13	FDS Input File
14	Smokeview and FDS Output
15	FDS Case Study

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6232. Structural Fire Safety. (3)

Prerequisite: ETME 3244, ETGR 2102 or ETME 3244, or permission of Department.

Course Description: This course provides the knowledge needed for structural fire safety design and analysis. Course topics include design philosophies and methods in fire safety engineering, principles of and approaches for structural design for fire safety, behavior of compartment fires, behavior of structural materials in fire, and structural fire safety of typical materials and their components. (on demand)

Objectives: Upon completion of this course, students will be able to:

- Understand design philosophies and methods in fire safety design
- Understand principles of and approaches for structural design for fire safety
- Know basics in behavior of compartment fires
- Understand the behavior of structural materials in fire
- Apply principles to estimating structural fire safety of typical materials and their components
- Demonstrate skills in calculations, computer models for predicting fire resistance ratings of structural components
- Know basics in assessment and repair of fire-damaged structures

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:

a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

Course Policies
Academic Integrity: The UNC-Charlotte Code of Student Academic Integrity governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte

Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition. A current version of the code is available online at http://www.legal.uncc.edu/policies/ps-105.html.

Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**
Mid-Term Exam	100 points	100	320-359	**B**
Project	100 points	100	280-319	**C**
Final Exam	100 points	100	0-279	**U**
	Total	400		

Assignments

All material submitted for credit must be received and acknowledged by the instructor before the relevant deadline.

All material submitted for credit must contain all relevant identification information. Such information may include, but not limit to: course number and section number, first and last names, and the assignment identifier (i.e., assignment name or a number).

Multiple page submissions must have sequential page and total page numbers in a consistent location on each page. Multiple page hardcopy submissions must be stapled or firmly attached within a report binder.

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Blackboard and Email

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Cell Phone Please set your cell phone in "vibrate" or "silent" mode before each lecture.

Assistance If you have a disability which requires accommodations (such as note takers, readers, or extended time on assignments and exams), please advise me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Probable Textbooks or Resources:

Fire Safety Engineering: Design of Structures (2nd Ed.), J.A. Purkiss, Butterworth-Heinemann, 2006.

Structural Design for Fire Safety, A.H. Buchanan, John Wiley & Sons, 2001.

Topical Outline of Course Contents:

Week*	Topic
1	Introduction to Structural Fire Safety
2	Design Philosophies for Structural Fire Safety
3	Prescriptive Approach for Structural Fire Safety
4	Behavior of Compartment Fires
5	Properties of Materials at Elevated Temperatures - I
6	Properties of Materials at Elevated Temperatures - II
7	Properties of Materials at Elevated Temperatures - II
8	Calculation Approach for Structural Fire Safety
9	Structural Fire Safety of Concrete Elements
10	Structural Fire Safety of Steel Elements
11	Structural Fire Safety of Composite Elements
12	Structural Fire Safety of Timber Elements
13	Structural Fire Safety of Masonry, Aluminum, Plastics, and Glass
14	Structural Fire Safety of Special Structures
15	Assessment and Repair of Fire-damaged Structures

*: Only weeks with lectures are shown.

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6233 Performance-Based Design (3)

Prerequisite: MFPA 5123, MFPA 5132 and MFPA 6203, or permission from the department

Course Description:
This course covers practical applications of fire protection engineering principles to the design of buildings. Both compartmented and non-compartmented buildings will be designed for criteria of life safety, property protection, continuity of operations, operational management and cost.

Objectives of the course:
The primary objectives of this course are:

1. To document and acknowledge the pioneering efforts of earlier workers and events that made worldwide interest in performance-based fire safety analysis and design possible.
2. To describe basic concepts and to propose a systematic approach to performance-based fire protection engineering.
3. To suggest a role for codes and standards in performance-based design for fire protection.
4. To discuss fire protection engineering tools and skills in the context of performance-based fire protection analysis and design.
5. To understand and be able to describe the steps in performance-based design.
6. To perform a simple building example performance-based design and prepare a Fire Protection Engineering Design Brief.

Instructional method: Classroom lectures supported by MS PowerPoint slideshows. Problems will be assigned to students. Students are required to complete problems for the next class following the assignment.

Means of Student Evaluation:
There will be two tests, a comprehensive final exam, and a performance-based design assigned to individual students or groups of students. The types of questions utilized may include but are not limited to the following:

- True/False
- Multiple Choice
- Essay/Short answer

The tests and exam will be based on material covered in class. The performance-based design report will be evaluated.

Course Policies
Academic Integrity: The UNC-Charlotte Code of Student Academic Integrity governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte Code of Student Academic Integrity. This Code may be modified from time to time. Users are

advised to contact the Office of the Dean of Students to assure they consult the most recent edition. A current version of the code is available online at http://www.legal.uncc.edu/policies/ps-105.html.

Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy

Assignment	Available Points	Total Points	Percentage Range	Point Range	Final Grade
Test (2)	15 points each	30	90 - 100%	90 - 100	**A**
Performance-based design report (1)	30 points each	30	80 - 89%	80 - 89	**B**
Final Exam (1)	40 points each	40	70 - 79%	70 – 79	**C**
			0 - 69%	0 - 69	**U**
Total Points		**100**			

Assignments

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Cell Phone Please set your cell phone in "vibrate" or "silent" mode before each lecture.

Assistance If you have a disability which requires accommodations (such as note takers, readers, or extended time on assignments and exams), please advise me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Probable textbooks or resources: *SFPE Engineering Guide to Performance-Based Fire Protection – Second Edition,* National Fire Protection Association, Society of Fire Protection Engineers, 2OOO

The SFPE Handbook of Fire Protection Engineering, Edited by DiNenno, Philip J. et al., Society of Fire Protection Engineers

Fire Protection Handbook, Edited by Cote, Arthur E. et al., National Fire Protection Association

Custer, Richard L.P. and Meacham Brian J.,*Introduction to Performance-Based Fire Safety,* Society of Fire Protection Engineers, National Fire Protection Association, 1997

Supplementary Materials: Per Instructor, Students must have a PC for homework and scientific calculator for homework and class

Course Contents:

Week*	Topic
1 & 2	Course introduction, Overview of the Performance-Based Fire Protection Analysis and Design Process
3	Defining Project Scope
4	Identifying Goals
5	Defining Stakeholder and Design Objectives
6	Developing Performance Criteria
7	Developing Design Fire Scenarios
8 & 9	Developing Trial Designs
10 -11	Evaluating Trial Designs
12	Selected Key Events in Fire Spread/Growth
13	Developing a Fire Protection Engineering Design Brief
14 -15	Developing a Fire Protection Engineering Design Brief

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6243. Research Investigation. (3)

Prerequisite: permission of the department.

Course Description: This course provides students with opportunities in conducting research to tackle fire safety related real-world problems. With guidance from the instructor, students can work individually or as a team on a one-semester project. (on demand)

Objectives: Upon completion of this course, students will be able to:

- Identify practical problems in fire safety related services
- Construct project requirements and project objectives
- Plan project tasks and project management
- Collect, analyze, and interpret research data
- Report and present research results in a professional fashion

Instructional Method
Independent research on a specific topic under the instructor's supervision.

Means of Student Evaluation
The followings are required for successful completion of this course: A project outline in the beginning of the semester (25%), a middle term progress report (25%), a final project report (25%), and a project presentation (25%) as the final exam.

Regular communication with the instructor is required for successful completion of this course. Instructor may contact students for further information to help student's project(s).

Course Policies
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Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Final Point Range	Final Grade
Project Outline	100	100	360-400	**A**
Middle Term Progress Report	100	100	320-359	**B**
Final Report	100	100	280-319	**C**
Final Exam (Presentation)	100	100	0-279	**U**
	Total	400		

Assignments

All material submitted for credit must be received and acknowledged by the instructor before the relevant deadline.

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Cell Phone

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Assistance

In the event a student requires extra help or assistance, please feel free to schedule an appointment.

Probable Textbooks or Resources:

Not required.

Topical Outline of Course Contents:

Week*	Topic
1	Introduction and topic selection
2	Research plan outline and abstract
3-4	Research plan development
5	Presentation about research plan: objectives, tasks, approach, available data, and expected outcomes
6-11	Research plan execution
12	Research progress presentation
13-14	Research plan execution
15	Research report and final presentation

*: Only weeks with lectures are shown.

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6244. Fire Detection and Smoke Management. (3)

Prerequisite: ETFS 3103 or permission of Department.

Course Description: This course addresses the fundamentals and practices of fire detection and smoke management. Topics include: principles of fire detection, fire alarm technology, and contemporary fire detection and alarm systems; principles applicable to the design and analysis of smoke management systems; factors affecting smoke movement; smoke hazard assessment; airflow in buildings, performance characteristics of smoke control and management systems. (Spring) (alternate years)

Objectives: Upon completion of this course, students will be able to:

- Understand principles of fire detection, fire alarm technology, and contemporary fire detection and alarm systems
- Apply principles to the design and analysis of smoke management systems
- Understand factors affecting smoke movement
- Demonstrate skills in smoke hazard assessment
- Understand airflow in buildings, performance characteristics of smoke control and management systems
- Demonstrate skills in design of smoke management systems

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:

a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

Course Policies
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Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**
Mid-Term Exam	100 points	100	320-359	**B**
Project	100 points	100	280-319	**C**
Final Exam	100 points	100	0-279	**U**
	Total	400		

Assignments

All material submitted for credit must be received and acknowledged by the instructor before the relevant deadline.

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Assistance If you have a disability which requires accommodations (such as note takers, readers, or extended time on assignments and exams), please advise me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Probable Textbooks or Resources:

Design of Special Hazards and Fire Alarm Systems (2nd Ed), by Robert Gagnon, Delmar Cengage Learning, 2007. ISBN-10: 1418039500.
Principles of Smoke Management, by John H Klote, ASHRAE, 2002. ISBN-10: 1883413990.

Topical Outline of Course Contents:

Week*	Topic
1	Principles of fire detection and alarm
2	Gas and vapor detection
3	CO detection
4	Fire detectors
5	Fire alarm systems
6	Fire alarm system interfaces
7	Design of detection systems
8	Fire plumes, flame height and air entrainment
9	Toxicity assessment of smokes
10	Smoke movement in buildings
11	Smoke and heat venting
12	Smoke control
13-15	Design of smoke management systems

*: Only weeks with lectures are shown.

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6252 Law and Fire Safety (3)

Prerequisite: permission of department.

Course Description:
Responding to natural and manufactured building hazards requires a complex legal environment, including regulation and liability. Key topics include the use of model codes, administrative regulation, retrospective codes, federal preemption, arson, performance based codes, risk based regulation, engineering malpractice, product liability and disaster investigation.

Course Objectives:

- **Demonstrate an understanding of personal and departmental liability**
- **Describe applicability of the Fair Labor Standards Act.**
- **Describe what constitutes sexual harassment and step to prevent it**
- **Be able to list relevant court cases that pertain the class topics**

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:
a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

Course Policies
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Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	**10 points each**	**100**	**360-400**	**A**
Mid-Term Exam	**100 points**	**100**	**320-359**	**B**
Project	**100 points**	**100**	**280-319**	**C**
Final Exam	**100 points**	**100**	**0-279**	**U**
Total		**400**		

Assignments

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Cell Phone

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Assistance

If you have a disability which requires accommodations (such as note

takers, readers, or extended time on assignments and exams), please advise me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Textbook: Legal Considerations for Fire and Emergency Services. J. Curtis Verone. ISBN: 978-1-4018-6571-9

Reference Books: Fire Officer's Legal Handbook. J. Curtis Verone. ISBN: 978-1-4283-9590-9

Supplementary Materials: Per Instructor.

Course Contents:

Week*	Topic
1	Course Expectations, Project emphasis/Literature review discussion, Library guest speaker
2 & 3	Civil Actions against Fire & Emergency Services
4 & 5	Negligence Actions
6	ADA
7	Use of data
8	Worker's Compensation
9	Fair Labor Standards Act
10	Family Medical Leave Act
11	OSHA
12	Working with outside agencies
13 & 14	Other Codes and Standards
15	Labor Laws/Collective Bargaining
16	Putting it all together, how does this affect you

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6255 Leadership/Conflict Management in Public Emergency Services (3)

Prerequisite: permission of department.

Course Description: **MFPA 6255 - Leadership/Conflict Management in Public Emergency Services (3)** Cross-listed as MPAD 6141. The role of the administrator as a focal point in social change and the management of the conflict, which occurs. Perspectives on the negotiation and bargaining process will be reviewed. (On demand)

Course Objectives:

- **Demonstrate an understanding of personal and departmental liability**
- **Describe steps to lead to conflict resolution**
- **Explain the importance of accurate documentation**
- **List proactive steps to prevent conflict within the workplace**

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:
a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

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Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	**10 points each**	**100**	**360-400**	**A**
Mid-Term Exam	**100 points**	**100**	**320-359**	**B**
Project	**100 points**	**100**	**280-319**	**C**
Final Exam	**100 points**	**100**	**0-279**	**U**
Total		**400**		

Assignments

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Textbook: Functional Boss Behaviors. Alan Brunacini

Organizational Leadership, Volume 12: Fire Services in the United States . Charles Kime

Managing the Unexpected: Assuring High Performance in an Age of Complexity. Weick & Sutcliffe

Reference Books: Fire Officer's Legal Handbook. J. Curtis Verone. ISBN: 978-1-4283-9590-9

Supplementary Materials: Per Instructor.

Course Contents:

Week*	Topic
1	Course Expectations, Project emphasis/Literature review discussion, Library guest speaker
2 & 3	Effective Communication within the workplace
4 & 5	Organizing and orchestrating teams
6	Planning for employee development
7	Use of data
8	Compute Coordinating team activities
9	Instilling the safety attitude
10	Establishing clear Command/Control
11	Leading by example
12	Working with outside agencies
13 & 14	Conflict Management
15	Role playing as a way to develop leadership skills
16	What's on the horizon?

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6260 Organization and Management of Public Fire Protection (3)

Prerequisite: permission of department.

Course Description: **MFPA 6260 - Organization and Management of Public Fire Protection (3)** *Cross-listed as MPAD 6104.* A presentation of modern management principles and techniques to the organization and delivery of the array of services that communities have come to expect from the fire service. The traditional and evolving roles of the fire service to protection, prevention, risk analysis and community service are also considered. (On demand)

Course Objectives:

- **Demonstrate an understanding of modern management theories**
- **Describe the problems within the modern fire service**
- **List the elements of a comprehensive public fire protection program**
- **Develop an action for community involvement in the reducing the fire problem**

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:
a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

Course Policies
Academic Integrity: The UNC-Charlotte Code of Student Academic Integrity governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition. A current version of the code is available online at http://www.legal.uncc.edu/policies/ps-105.html.

Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**
Mid-Term Exam	100 points	100	320-359	**B**
Project	100 points	100	280-319	**C**
Final Exam	100 points	100	0-279	**U**
Total		400		

Assignments

All material submitted for credit must be received and acknowledged by the instructor before the relevant deadline.

All material submitted for credit must contain all relevant identification information. Such information may include, but not limit to: course number and section number, first and last names, and the assignment identifier (i.e., assignment name or a number).

Multiple page submissions must have sequential page and total page numbers in a consistent location on each page. Multiple page hardcopy submissions must be stapled or firmly attached within a report binder.

Submissions must be professional in appearance; i.e., not illegible, illogical or with miss information. Failure to comply with these guidelines will result in significant point reductions for each violation.

Blackboard and Email

It is the responsibility of each student to gain access to UNC-Charlotte's Blackboard Vista and read his or her university email frequently. Assignments, announcements, and grading will be handled through Blackboard Vista and frequently distributed through UNCC email service.

Email messages to the instructor will be responded to as soon as possible. You usually get prompt response for emails sent during regular office hours (8AM-5PM) from Monday to Friday. Emails sent after 5PM will likely be answered the next working day. (Emails sent in Friday evening and on weekends will probably be handled on the coming Monday.)

Cell Phone

Please set your cell phone in "vibrate" or "silent" mode before each lecture.

Assistance

If you have a disability which requires accommodations (such as note

takers, readers, or extended time on assignments and exams), please advise me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Textbook: Emergency Management: Principles and Practice for Local Government, 2 nd ed.

Reference Books: National Fire Protection Handbook , 20th ed. N.F.P.A.

Supplementary Materials: Per Instructor.

Course Contents:

Week*	Topic
1	Course Expectations, Project emphasis/Literature review discussion, Library guest speaker
2 & 3	Development of standards for emergency management and the professionalization of the field
4 & 5	Mitigation, preparedness, response, and recovery at the local level
6	Ideas and strategies for organizing and managing local actvities
7 & 8	Emergency management planning, organization, staffing, training, and emergency operations centers (EOCs)
9	Development of a response management strategy
10	Develop and collaborate with networks of public, private, and nonprofit entities
11	Multi Agency coordination
12	Critical issues that shape local emergency management
13 & 14	Understanding the needs of populations with high social vulnerability
15	Building sustainable communities that will be resilient in the event of disaster
16	Define recovery and discuss the recovery planning process

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
The William States Lee College of Engineering
Fire Protection and Administration

MFPA 6270 Budgeting, Grants, Contracts and Finance in Emergency Services (3)

Prerequisite: permission of department.

Course Description:
This course works to develop the understanding of strategic planning, contracting and budgeting practices as well as grant proposal writing with the emphasis on contract administration skills necessary to operation of a functioning governmental entity.

Course Objectives:

- **Describe the politics of public budgeting**
- **Explain the process of writing grants**
- **Explain the process of administering contracts**
- **Define the steps in the procuring goods and services for a public agency**

Instructional Method
Classroom lectures supported by PowerPoint slideshows and in-class activities such as quizzes, case studies, and group discussions.

Means of Student Evaluation
The followings are required for successful completion of this course:
a. Ten in-class quizzes (25%)
b. A mid-term exam (25%)
c. A final exam (25%)
d. A project assignment (25%)

The exams will be based on materials covered. They are to be taken on the day they are given, and no "make-ups" will be allowed without prior arrangement with the instructor. The types of questions utilized in the mid-term and final exams may include but are not limited to the following: True/False, Multiple Choice, Essay/Short Answer, and Analysis and Calculations.

Course Policies
Academic Integrity: The UNC-Charlotte Code of Student Academic Integrity governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition. A current version of the code is available online at http://www.legal.uncc.edu/policies/ps-105.html.

Attendance: Regular attendance and participation is required for successful completion of this course. Attendance records will be scrutinized for 12 class meetings. Each documented unexcused miss will result in a deduction of 5 points from your total grade.

Grading Policy:

Assignment	Available Points	Total Points	Point Range	Final Grade
Quiz (10)	10 points each	100	360-400	**A**
Mid-Term Exam	100 points	100	320-359	**B**
Project	100 points	100	280-319	**C**
Final Exam	100 points	100	0-279	**U**
Total		400		

Assignments

All material submitted for credit must be received and acknowledged by the instructor before the relevant deadline.

All material submitted for credit must contain all relevant identification information. Such information may include, but not limit to: course number and section number, first and last names, and the assignment identifier (i.e., assignment name or a number).

Multiple page submissions must have sequential page and total page numbers in a consistent location on each page. Multiple page hardcopy submissions must be stapled or firmly attached within a report binder.

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Email messages to the instructor will be responded to as soon as possible. You usually get prompt response for emails sent during regular office hours (8AM-5PM) from Monday to Friday. Emails sent after 5PM will likely be answered the next working day. (Emails sent in Friday evening and on weekends will probably be handled on the coming Monday.)

Cell Phone

Please set your cell phone in "vibrate" or "silent" mode before each lecture.

Assistance

If you have a disability which requires accommodations (such as note takers, readers, or extended time on assignments and exams), please advise

me during the first two weeks of the course so we may arrange reasonable accommodations. It is the responsibility of each student to make arrangements with the instructor for additional assistance.

Textbook: *Capital Budgeting and Finance: A Handbook For Local Government, 4th ed. (ICMA)*

Reference Books: *National Fire Protection Handbook , 20th ed. N.F.P.A.*

Supplementary Materials: Per Instructor.

Course Contents:

Week*	Topic
1	Course Expectations, Project emphasis/Literature review discussion Library guest speaker
2	Introduction to the problems
3	The role of budgeting in local government
4	The economic nature of government services
5	Factors influencing local budgets
6	Preparation phase
7	Legislative approval
8	Legislative approval -cont
9	Grant writing
10	Managing conflict through a budget policy
11	Communicating budget information
12	Maintaining budget compliance
13	Budgeting in times of fiscal crisis
14	The accounting system, financial reporting
15	Performance measurement

PROPOSED COURSE DESCRIPTION AND SYLLABUS
MFPA 6800 – INDEPENDENT STUDY (3)

Catalog Description: MFPA 6800 - Independent Study (1-3) The MFPA program offers independent study and special study courses to allow students to pursue studies in areas for which there are no approved formal courses. Independent study courses can only be taken on a P/F basis. Special study courses can be taken for a grade if the paperwork indicates it will be taken A/F. Each requires a title, justification, and the method of evaluation. Courses taken for A/F grade may be used to satisfy degree requirements. May be repeated for credit. (On demand)

Pre- or Co-requisites: Permission of Department.

Objectives of the Course: By the completion of this course students will be able to demonstrate proficiency in independently researching and completing a directed project in fire protection or fire administration.

Instructional Method: No formal lecture. However, students will meet periodically over the course of the semester with their graduate advisor for mentoring and direction on their selected project.

Means of Student Evaluation: Students will be evaluated based on the technical accuracy and completeness of their directed project.

Specific Course Policies:

The following policies apply to students in this course:

1. Academic Integrity

All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Definitions and examples of plagiarism are set forth in the Code. The Code is available from the Dean of Students Office or online at: http://www.legal.uncc.edu/policies/ps-105.html. A set of links to various resources on plagiarism and how to avoid it is available at the UNCC Library website: http://library.uncc.edu/display/?dept=instruction&format=open&page=920.

2. Grading Policy

Grades will be assigned on the following scale:

A = 90-100%
B = 80-90%
C = 70-80%
U = 0-70%

Proposed Text: None

Proposed Course Outline: None

PROPOSED COURSE DESCRIPTION AND SYLLABUS
MFPA 6900 –THESIS

Catalog Description: **MFPA 6900 Thesis (1-6)** *Prerequisite: Consent of graduate committee advisor.* Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(On demand)*

Pre- or Co-requisites: Consent of graduate committee advisor.

Objectives of the Course: By the completion of this course students will be able to demonstrate proficiency in independently researching, completing and defending a thesis quality project in fire protection or fire administration.

Instructional Method: No formal lecture. However, students will meet periodically over the course of the project with their graduate advisor for mentoring and direction on their research project.

Means of Student Evaluation: Students will be expected to prepare a formal written research thesis and to successfully present and defend their research in front of their graduate committee.

Specific Course Policies:

The following policies apply to students in this course:

1. Academic Integrity

All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Definitions and examples of plagiarism are set forth in the Code. The Code is available from the Dean of Students Office or online at: http://www.legal.uncc.edu/policies/ps-105.html. A set of links to various resources on plagiarism and how to avoid it is available at the UNCC Library website: http://library.uncc.edu/display/?dept=instruction&format=open&page=920.

2. Grading Policy

Grades will be assigned on the following scale:

A = Successful defense of research thesis
U = Unsuccessful defense of research thesis

Proposed Text: None

Proposed Course Outline: None

Attachment B: Consultation Documentation

Internal Consultation Letters:

- Alison Bradley – UNC Charlotte Library
- Charles Brody, Department of Geography & Earth Sciences
- Robin Cogar – Interim Chair, Dept. of Mechanical Engineering & Engineering Science, UNC Charlotte
- Yogi Kakad - Interim Chair, Dept. of Electrical & Computer Engineering, UNC Charlotte
- James Douglas, Director of MPA program

Representative External Industry Consultation Letters:

- Denis Onieal, Superintendent, National Fire Academy, United States Fire Administration, US Department of Homeland Security
- Richard J. Davis, President-Elect, National Society of Fire Protection Engineers (SFPE)
- Jon B. Hannan, Chief, Charlotte Fire Department
- Doug Stewart, VP of Engineering, The Reliable Automatic Sprinkler Company, Inc.
- David A. Lowery, Chief Fire Investigator, Charlotte Fire Investigation Task Force
- James A. Oldham, Fleet Lead Fire Protection Engineer, Duke Energy
- William C. Ours, Safety Manager, Phillip Morris, USA
- Chris Sharp, Business Development Manager, Tyco Fire & Building Products
- Jonathan G. Byers, Fire Investigator, Travelers Fire Investigation Unit
- Nacia May Lipton, Loss Control Manager, RelMark
- Mark Nelson, Senior Consultant, Rimkus Consulting Group, Inc.
- Luther Fincher, Past-President, International Association of Fire Chiefs
- Miles G. Myers, Myers Risk Services
- Lisa Bossert, Manager, Charlotte Office of Schirmer Engineering
- Doug Brandes, Chair, Board of Governors, Society of Fire Protection Engineers Educational & Scientific Foundation

UNCCHARLOTTE
J. Murrey Atkins Library

Consultation on Library Holdings

To: **David Murphy**

From: **Alison Bradley**

Date: **4/21/08**

Subject: **Masters of Fire Protection and Administration program**

Summary of Librarian's Evaluation of Holdings:

Evaluator: ___ Alison Bradley _____ Date: ____4/21/08_____

Check One:

1.	Holdings are superior	_____
2.	Holdings are adequate	**___x__**
3.	Holdings are adequate only if Dept. purchases additional items.	_____
4.	Holdings are inadequate	_____

Comments:
Atkins Library's holdings should be adequate to support study and research in fire protection and administration at the Master's level. The library currently holds over 1,100 books and government documents with relevant subject headings, and over 200 print and electronic periodical holdings (see second page for details). We also have extensive holdings in the areas of public policy and administration which may be of interest to students in this interdisciplinary program. Student who participate in this degree program as distance education students will be able to take advantage of our full-time distance education librarian's access services, and all students in the program will have access to a subject specialist librarian as well. Students will also have access to interlibrary loan to request material not held by the UNCC libraries, and to the National Learning Academy through the USFA-NFA.

Alison Bradley
_____
Evaluator's Signature

4/21/2008
_____
Date

Library Holdings for MFPA Proposal

Subject Heading	Total Catalog Entries	Books and Government Documents	Periodicals	Electronic Resources
Fire Prevention	292	281	7	26
Fires and Fire prevention (subheading)	366	351	0	112
Fire Protection Engineering	18	16	0	2
Building, Fireproof	33	30	0	0
Fire Extinction	143	122	3	29
Fireproofing/Fireproofing Agents	62	33	0	2
[Specific fire types] -- Prevention and Control	135	126	1	27
Firetesting	118	113	0	5
Fire Resistant Materials	17	17	0	1
Firescaping	4	4	0	0
Flame Spread	28	28	0	2
Totals	1216	1121	11	206

From: Brody, Charles
Sent: Thursday, November 20, 2008 10:51 AM
To: Brizendine, Tony; Campbell, Harrison
Subject: RE: MS Fire Protection & Administration Proposal

Tony,

I am sorry for the delay in responding. Following our meeting with you and review of the proposal, Harry Campbell and I consulted with other department faculty. Consistent with our view at that meeting, our colleagues did not see conflicts between any of our programs and your proposed MS Fire Protection and Administration degree. We wish you the best as you move the proposal forward.

Regards,
Charlie

Charles J. Brody, Interim Chair
Geography and Earth Sciences
University of North Carolina at Charlotte
9201 University City Blvd.
Charlotte, NC 28223-0001
(704) 687-5937

From: Brizendine, Tony
Sent: Wednesday, November 19, 2008 11:06 PM
To: Brody, Charles; Campbell, Harrison
Subject: RE: MS Fire Protection & Administration Proposal

Charles and Harrison,

I'm following up on our meeting regarding the MSFPA. I need your assistance to get this moving again. Can you provide a letter or email indicating support / clearance regarding our consultation on the MS Fire Protection & Administration proposal?

Thanks for your consideration and support.

Best regards,
Tony

UNC CHARLOTTE
The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, NC 28223-001

THE WILLIAM STATES LEE
COLLEGE OF ENGINEERING

Department of Mechanical Engineering
and Engineering Science
704/687-8253
FAX: 704/687-8345

September 19, 2008

Dear Tony:

This letter is to offer strong support of your proposal for the Masters Degree in Fire Protection and Administration program. The course and curriculum proposed captures a need that your department is uniquely positioned to fulfill for the University and for related industries. Furthermore it is clear that the details of the planned degree program are well thought out, such that overlaps with existing programs in the William States Lee College of Engineering are avoided.

On behalf of the Department of Mechanical Engineering and Engineering Science I offer my strong endorsement to this Masters Degree proposal.

Robin N. Coger, Ph.D.
Interim Chair, Department of Mechanical Engineering and Engineering Science

UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

To: Dr. Tony Brizendine, Chair

Engineering Technology Department

From: Y. P. Kakad, Interim Chairman

Department of Electrical and Computer Engineering

Date: September 18, 2008

Subject: Support Letter for the Proposals ET 9-02-08a & ET 9-02-08b

On behalf of the Electrical and Computer Engineering I would like to express our strong support for the proposals to establish (a) Master of Science Program in Construction and Facilities Management (MSCFM), (b) Master of Fire Protection and Administration (MFPA). Both the programs are long overdue and provide the department faculty to engage in graduate education as well as provide an opportunity for the practicing engineers to pursue advanced education. The department realizes that the establishment of these programs is consistent with the long term mission of your department and I hope we can work together for the successful implementation of these programs.

Brizendine, Tony

From: Kakad, Yogendra
Sent: Thursday, September 18, 2008 12:14 PM
To: Brizendine, Tony
Cc: Kakad, Yogendra
Subject: RE: Letter of Support for Master of Fire Protection & Administration
Attachments: ET Department.docx

Hello Tony,

I am attaching a letter of support for the two proposals. Let me know if you need anything additional. I can also send a hard copy of this if you need.
With best wishes.

Yogi

From: Brizendine, Tony
Sent: Wednesday, September 03, 2008 6:16 PM
To: Young, David; Coger, Robin; Kakad, Yogendra
Cc: Smelser, Ron; Johnson, Bob; Brizendine, Tony; Tolley, Patty
Subject: Letter of Support for Master of Fire Protection & Administration

Fellow COE Department Chairs,

As you know, I am on the CAC schedule to discuss the following curriculum proposals tomorrow morning:

1) Master of Science in Construction & Facilities Management, and
2) Master of Fire Protection & Administration.

I would like to engage each of you to request letters of support for each of these two programs which are now being forwarded through the curriculum process. An email, if you prefer, will be acceptable. The programs, which we have discussed at CAC previously at the intent to plan and request to establish stages, are fairly straightforward. Both programs have gone through the Intent to Plan process early in 2008. Requests to Establish were developed in April 2008. Curricula have been developed for each program this summer. I am attaching an electronic copy of the curriculum proposals for your convenience and will answer any questions you may have at CAC tomorrow morning.

I will entertain any questions or concerns you may have regarding the proposals. Thank you for your consideration.

best regards,
Tony

p.s. I will bring copies of the attachments tomorrow for your convenience.

UNC CHARLOTTE
The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001

Department of Political Science
Telephone 704/687-2571
Fax 704/687-3497

Memorandum

Date: November 20, 2008

To: Anthony L. Brizendine, Chair, Department of Engineering Technology

From: James W. Douglas, MPA Director

Re: Support for a Master of Fire Protection & Administration (MFPA) curriculum proposal

The faculty of the Master of Public Administration (MPA) Program have reviewed the Department of Engineering Technology's responses to our concerns regarding the creation of the MFPA Program. The MPA faculty are satisfied with the responses and therefore have no further issue concerning the creation of the MFPA Program.

Please consider this memorandum the MPA Program's letter of support for the proposed MFPA Program. This support is, of course, contingent upon compliance with the agreement to properly crosslist the MPAD courses specified in the Department of Engineering Technology's response document. This agreement should be specified in the official proposal for the creation of the MFPA Program.

UNCCHARLOTTE

The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001

THE WILLIAM STATES LEE
COLLEGE OF ENGINEERING

Department of Engineering Technology
704/687-2305 Fax: 704/687-6653
www.et.uncc.edu

Construction Management
Civil Engineering Technology
Electrical Engineering Technology
Fire Safety Engineering Technology
Mechanical Engineering Technology

Memorandum

Date: November 5, 2008

To: James W. Douglas, Director, Master of Public Administration Program
Robert S. Kravchuk, Chair, Department of Political Science

From: Anthony L. Brizendine, Chair, Department of Engineering Technology

Subject: Consultation / Response to MPA for Master of Fire Protection & Administration (MFPA) curriculum proposal

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Jim and Bob,

Thank you for your insights at our meeting earlier this week. I appreciate the opportunity to discuss our program initiatives. I would like to summarize our discussion as well as respond to Jim's comments and concerns identified in his email of October 10th. Attached, please find the concerns and response to each concern.

I look forward to the opportunity for cross-listing the four courses agreed upon in our discussion. I would kindly request a letter or email acknowledging our consultation, and if possible, supporting our Master of Fire Protection & Administration curriculum proposal.

Again, thank you, and I look forward to future collaborations.

Best regards,
Tony

- *Concern: There seems to be overlap between the proposed degree and existing programs that could be exploited….*

Response: The proposed Master of Fire Protection & Administration degree requires several courses which are closely related to courses in your Master of Public Administration program. These courses must be delivered online for our distance education students who will pursue the degree. As discussed earlier this week, we agree with your suggestion to cross-list courses as identified in the four categories below:

1) **Human Resource Management**

MFPA 5150 Human Resources Management in Emergency Services (3)
A study of the context of public personnel fire/emergency services related administration; basic functions of job evaluation and compensation, employee rights and responsibilities; the legal constraints including equal opportunity, health and safety, collective bargaining; government productivity.

MPAD 6134. Human Resources Management. (3)
Corequisite: POLS 1110, Introduction to American Government (or the equivalent). Study of the context of public personnel administration; basic functions of job evaluation and compensation, employee rights and responsibilities; the legal constraints including equal opportunity, health and safety, collective bargaining; government productivity.

2) **Emergency Management**

MFPA 6120 Public and Private Sector Interoperability (3)
A study of multi-agency interoperability and the effective organization and management of emergency resources at various fire and large-scale emergency incidents. Includes a review of national standards and federal regulations impacting emergency incident management. Case studies of actual and theoretical incidents will be used to reinforce command and control concepts.

MPAD 6290. Emergency Management. (3) This course focuses on the principles and practices of emergency management at the local, state, and national levels and will explore the concepts of preparedness, mitigation, response and recovery. The course will also be conducted from the perspective of emergency management's impact on local government and infrastructure, and the community's ability to prepare for, respond to, and recover from a wide array of catastrophes.

3) **Organizations and Management**

MFPA 6260 Organization and Management of Public Fire Protection (3)
A presentation of modern management principles and techniques to the organization and delivery of the array of services that communities have come to expect from the fire service. The traditional and evolving roles of the fire service to protection, prevention, risk analysis and community service are also considered.

MPAD 6104. Public Organizations and Management. (3)
Changing images of people, organizations and organizational environments; research findings and applications related to organization structure, motivation, leadership, communications, decision-making, group dynamics, interpersonal skills; ethics and values important to the study and practice of organizational leadership; and assessment of value systems and the impact of competing value systems on public and organizational policy making.

4) **Conflict Management**

MFPA 6255 Leadership/Conflict Management in Public Emergency Services (3)
The role of the administrator as a focal point in social change and the management of the conflict, which occurs. Perspectives on the negotiation and bargaining process will be reviewed.

MPAD 6141. Conflict Management in Public Organizations. (3) The role of the administrator as a focal point in social change and the management of the conflict that occurs. Perspectives on the negotiation and bargaining process will be reviewed.

- *Concern: Several of the new masters courses being proposed mimic undergraduate course already being offered in the Fire Safety program. How is the content in the new masters courses different from the existing undergraduate courses?*

Response: Many of the undergraduate courses serve as introductory courses or survey courses that cover broad aspects of the subject. The proposed courses for the MFPA deepen the student's knowledge of the subject by being more specific and localized. An example of this would be the ETFS 3144 and the graduate counterpart MFPA 6144. In the 3144 course, students are introduced to the different types of suppression and detections systems and the basic principles of operation. In the graduate level course, students will perform calculations for flows and design of complex systems. Another example would be ETFS 3103 in which students are introduced to the principles of fire behavior and the MFPS 6103 Fire Dynamics in which those principles are applied to real world materials, mathematical models for fire phenomena are developed, and complex analysis occurs.

- *Concern: The Proposal emphasizes the importance of the fire research laboratory and the fire testing facility. Will distance education students be required to come to campus to gain access to these facilities? If not, how will their inability to utilize these facilities affect their coursework and learning experience?*

Response: The core academic program is the same for both on-campus and distance education students. Where some differentiation occurs is between the thesis research and coursework only option. The proposal offers two paths to the degree, one as coursework only and one with thesis research requirements. Students opting for the thesis option will typically conduct work in the fire testing and research laboratories and benefit from these unique capabilities. Students pursuing the thesis research option are required to be on-campus; thus, distance education students will pursue the coursework only option.

- *Concern: The Proposal claims that the new program will not adversely affect the delivery of existing courses. The Proposal lists 7 faculty who will teach in the program. However, only 4 of these are actually listed on the syllabi as potential instructors-Kimble, Murphy, Urbas, and Zhou. Four of the faculty listed are also listed as instructors for the new Masters in Construction & Facilities Management degree-Zhou, Briendine, Coowar, Gehrig. Additionally, the new program requires a minimum of 10 courses (not including theses) be offered every year. These courses are in addition to the 20 undergraduate courses offered by the Fire Safety undergraduate program. Compounding this problem further, courses need to be offered both on-campus and in a distance format, potentially doubling the courseload. Evidence needs to be provided to show that courses can be covered adequately with existing resources.*

Response: Course delivery occurs through a combination of tenure-stream faculty, full-time faculty associate (lecturers) and part-time instructors from the professional community. Currently, the Department has approximately 30 full time faculty members and 20 part-time instructors (including emeritus faculty) from which to staff our course offerings. This proposal identified four tenure-track fire protection / administration faculty members who will be the primary instructors for most of the initial offerings of the graduate courses with MFPA prefix; however, courses with the CMET prefix will be taught by other faculty members identified in the proposal. Some lower division courses referenced in the concern will be covered by other full-time faculty members and part-time instructors as is the case for many programs in the University. Another point of clarification is that the Department delivers lower division fire courses once every two years, so the course delivery requirements are not as intense as was depicted in the concern.

- *….the Proposal states that 3 new faculty members need to be hired over the next 4 years. …. the Council would like to see some evidence of support from the Dean of the College of Engineering for making these hires within the next 4 years.*

Response: I have requested a response from Dean Johnson and will provide to the Graduate Council upon receipt. As indicated in our conversation, staffing of programs in the COE is an ongoing strategic activity based on identified needs, appropriate justification, and achievement of deliverables (e.g., student enrollment, SCH generation, etc. The University and College have provided adequate staffing for previous initiatives in our Department. Specifically, Dean Johnson has been very supportive of new initiatives in ranking them competitively with his resource requests to Academic Affairs. I have no reason to believe this trend won't continue.

United States Fire Administration
U.S. Department of Homeland Security
16825 South Seton Avenue
Emmitsburg, Maryland 21727

FEMA

April 17, 2008

Professor Jeff Kimble
Associate Professor, Program Coordinator
Fire Safety Engineering Technology
The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001

Dear Professor Kimble:

I recently learned that the University of North Carolina at Charlotte is considering establishing a Master's degree program in Fire Protection and Administration. I want to commend you and the University for this exemplary effort. The United States Fire Administration's National Fire Academy has been encouraging the professional development of the fire and emergency services in this country since its founding in 1974.

This could not come at a more opportune time. As a nation, we will begin to face serious challenges attendant to the aging of the "baby-boom" generation. This group of citizens began turning 62 in January, 2008, and the end of the generation turns 85 years old in 2050. This 62+ age group is well known to be at high risk for fire death and injury and accidents and will place a tremendous demand on the delivery of emergency medical services for the next 42 years! Currently, there seems to be little interest in the demand that this age group will place on the emergency services. This demand will be equal to (and in some cases exceed) the demand they placed on maternity hospitals and school systems when they were young. This advanced degree program could not have come at a more opportune time.

As a former member of the faculty in the Steinhardt Graduate School of Education at New York University, and the retired fire chief of Jersey City NJ, I can assure you that this kind of education will have value for communities across the nation for decades to come.

Two local experts that I might recommend you contact are Chief Luther Fincher, the retired Fire Chief of Charlotte, NC and Timothy Bradley, the North Carolina State Fire Training Director. Both are known nationally as leaders in fire service education. They may be able to provide you with guidance, insight or support as you move toward.

I wish the University and it's future students much success.

Sincerely,

Denis Onieal, Superintendent
National Fire Academy
U.S. Fire Administration

cc: Chief Luther Fincher
Tim Bradley, State Fire Training Director

Society of Fire Protection Engineers

The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001
The William States Lee College of Engineering
Fire Protection Engineering Technology
Attention: Jeff Kimble
Associate Professor, Program Coordinator

Subject: Need for Higher Education in Fire Protection Engineering

Dear Professor Kimble:

I am Chair of the Society of Fire Protection Engineer's (SFPE) Higher Education Task Group. I am writing to support your proposed master's program in Fire Safety and Administration.

There is currently a great shortage of fire protection engineers in the United States. There are few schools that offer a bachelor's or master's program in fire protection or fire safety. Many engineers that work in this field now have degrees in other engineering disciplines, and are trained in fire protection on the job by their employers.

A great effort has just begun to heighten the awareness of, and the interest in, fire protection engineering. In partnership with SFPE, Discovery Education has sent a DVD and Teacher's Kit entitled, "The Chemistry of Fire", to *every high school chemistry department in the country*. Efforts are also being made to improve on existing information for high school counselors on careers in fire protection engineering.

In addition, The National Council of Examiners for Engineering and Surveying (NCEES) has changed their model law effective in the year 2015. At that time, engineers desiring to sit for the P.E. exam will be required to have a B.S. degree plus an additional 30 credits. A recent survey conducted by SFPE has shown that Fire protection engineers who have a P.E. license earn between $10,000.00 and $15,000.00 more per year than their counterparts without a P.E. license, but with similar length of experience. This will encourage many students to continue education at the graduate level as an avenue to pursue professional licensure.

The timing for such a program has never been better. Speaking on behalf of SFPE, we strongly support your proposed program and wish you every success. If there is anything SFPE can do to help you, please contact me.

Very truly yours,
Richard J. Davis, P.E., FSFPE
President-elect, SFPE

Charlotte Fire Department
Jon B. Hannan
Fire Chief
Homeland Security Director
228 E. 9th Street
Charlotte, NC 28202

April 17, 2008

Jeff Kimble
Associate Professor, Program Coordinator
Fire Safety Engineering Technology
The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001

Dear Mr. Kimble,

I am writing this letter in support of the proposal for the establishment of a Master of Fire Protection and Administration (MFPA) degree program at UNC Charlotte.

Over the years, several members of the Charlotte Fire Department have graduated from UNC Charlotte with a Bachelor of Science degree in Fire Safety Engineering Technology. I have been extremely pleased with the program and the caliber of students that have been produced. The creation of a Master's degree program would grant our members an additional opportunity to further their education in the field of fire protection and/or administration, which in turn would greatly benefit the department.

As the Charlotte Fire Department searches for additional opportunities to further prepare our firefighters, we will continue to look upon UNC Charlotte as our partner in this endeavor. The objective of the UNC Charlotte MFPA program appears to closely mirror the recommended skill set that we look for in our members; therefore I offer my support to you and the Fire Safety Engineering Technology program as you seek to create the Master of Fire Protection and Administration Degree.

Sincerely,

Jon B. Hannan

Jon B. Hannan
Fire Chief

Mr. Jeff Kimble
Associate Professor, Program Coordinator
Fire Safety Engineering Technology
The University of North Carolina at Charlotte

Dear Mr. Kimble

I hope this email would be sufficient to express our support for the master's program being proposed at UNC Charlotte. Reliable Automatic Sprinkler Company is an eighty plus year old company who is a manufacturer of sprinkler devices and control valves for the sprinkler industry. We have been located in New York State for many years before moving our manufacturing operations to Liberty, South Carolina about three years ago. Reliable is one of the four major manufacturers of these products in the US and overseas.

Chris McCameron of Carolina Sprinkler sent me a copy of the information that you sent out, hoping that we might commit to supporting your program at UNC Charlotte. Reliable Automatic Sprinkler Company would be very supportive of the proposed master's program and would be very interested in persons who might have their graduate degrees in Fire Protection and Administration in the future for potential employment with our company. Our Product Development Group at Reliable consist of about twenty people which includes development engineers, technicians and solid modeling CAD designers for sprinkler and valve design and development. We have over 600 people employed at the Liberty plant alone, and we have sales offices and distribution centers all over the world. We have a "state of the art" manufacturing facility and hydraulic laboratory that is surpassed by none in the sprinkler industry. The possibility exist that Reliable may offer opportunities to your graduates because of the excellent hydraulic lab in Engineering that we use extensively in preparation for testing and approvals at Underwriters Laboratories, Factory Mutual and other approval agencies all over the world.

Please accept our support and expertise in any way to help promote this program at UNC Charlotte. If I can be of additional help or need to be contacted, please call me at (864) 843-5245 or email me at dstewart@reliablesprinkler.com.

Sincerely,

Doug Stewart
V. P. of Engineering
The Reliable Automatic Sprinkler Company, Inc.
1470 Smith Grove Road
Liberty, South Carolina 29657
(864) 843-5245

April 17, 2008

Mr. Jeff Kimble, Associate Professor. Program Coordinator
Fire Safety Engineering Technology
The University Of North Carolina at Charlotte

Dear Mr. Kimble,

Since 1986, I have served the Charlotte Fire Department in the position of Chief Fire Investigator. Before being appointed to that position, I observed all aspects of the fire service continue to develop in new technology for better service delivery to the citizens we serve. As you are keenly aware, the demands to keep pace with this scientific development place broader more technological requirements on all fire service professionals. For this reason, the Charlotte Fire Department and the surrounding region's fire service community continue to support the University's four year Fire Safety Engineering Technology Program.

The science behind the basic principles of fire investigation now requires both forensics and engineering to solve the simplest of cases. Continuing State and Supreme court decisions not only require but demand fire investigation professionals both public and private to support their theories concerning fire origin, growth and development using scientific and engineering methodology. If we are to keep pace with these requirements we must provide additional educational opportunities to the personnel that are to perform these tasks. I firmly believe that creating a Masters level Program will help to satisfy the demands required in the fire investigation profession and improve the service of fire professionals throughout the state.

I support the establishment of the Master's program in Fire Protection and Administration at our University and am excited about the opportunity to provide educational opportunities and learning experiences to students enrolled in the program through the Charlotte Fire Investigation Task Force.

Sincerely,

David A. Lowery
Chief Fire Investigator
Charlotte Fire Investigation Task Force

April 18, 2008

Jeff Kimble
Associate Professor, Program Coordinator
Fire Safety Engineering Technology
The University of North Carolina at Charlotte

Dear Jeff,

It is good news to hear that UNCC is proposing to establish a master's program in Fire Protection and Administration. The discipline of fire protection engineering is vital in our every day existence for ensuring safety in our homes as well as work places. The pursuit of advancement in this field is critical in maintaining an understanding of how our changing environment impacts our safety.

As a fire protection engineer working in the nuclear industry, I realize that each day offers new opportunities to utilize the training I've received from college as well as on-the-job. As fire protection professionals, it is critical that modern methodologies, techniques and tools for fire protection design, fire investigation, industrial fire safety, etc. are available through local universities such as UNCC. Many times I've utilized more well-informed individuals to assist me in determining resolutions to issues. But like myself, these well-informed individuals are adding years and looking forward to retirement. Without trained replacements, those that take my place in the workforce will not have the benefits I had.

I applaud UNCC's foresight in the development of this master's program.

James A Oldham

James A. Oldham
Duke Energy
Fleet Lead Fire Protection Engineer

PhilipMorrisUSA
an Altria Company

Cabarrus Manufacturing Center
2321 Concord Parkway South
Concord, NC 28027

April 16, 2008

Jeff Kimble
Associate Professor, Program Coordinator
Fire Safety Engineering Technology
The University of North Carolina at Charlotte
9201 University City Blvd
Charlotte NC 28223

Professor Kimble:

This letter is submitted in support of the Department of Engineering Technology at UNC Charlotte proposed creation of a Master of Fire Protection and Administration (MFPA) degree program.

The implementation of a MFPA program would provide an opportunity to enhance the skills and capabilities of those engaged in the field of fire protection and/or administration, as well as other safety and emergency services related occupations. A strong MFPA program would be a cornerstone in the development of potential leaders in these fields, to support communities and commerce.

I look forward to the opportunities and emergency leadership this UNC Charlotte MFPA program will provide.

Sincerely:

William C. Ours, CPE
Safety Manager
Cabarrus Manufacturing Center
Philip Morris USA

tyco / Fire & Building Products

Chris Sharp
Business Development
Manager - Southeast

Tyco Fire & Building Products
5249 Murrayhill Road
Charlotte, NC 28210

chris.sharp@tycofp.com

April 16, 2008

Professor Jeff Kimble
Associate Professor, Program Coordinator
Fire Safety Engineering Technology
The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, NC 28223

Re: Master of Fire Protection and Administration (MFPA) Degree Program

Dear Professor Kimble:

I am writing to offer my support of your proposal for the establishment of a master's program in Fire Protection and Administration. As president of the Carolinas Chapter of the Society of Fire Protection Engineers, I am contacted with increasing frequency by various firms looking for experienced Fire Protection Engineers and Designers.

The lack of well trained fire protection designers is posing a significant challenge for both fire protection contractors and engineering firms alike. The increased acceptance of and code requirements for automatic sprinkler systems has led to rapid growth in the fire protection and the industry is beginning to outgrow its skilled workforce.

Additionally, with the advancements in fire protection technologies and design approaches, it is extremely important to have individuals entering the workforce that are well trained in the new design methodologies and applications of the latest technology.

Please do not hesitate to contact me if I may be of further assistance in support of your efforts to establish this much needed program.

Best regards,

Chris Sharp
Chapter President
Society of fire Protection Engineers – Carolinas Chapter

TRAVELERS

Travelers Fire Investigation Unit
11440 Carmel Commons Blvd.
Charlotte, North Carolina 28247
Office (704) 948-5838

Jeff Kimble
Associate Professor / Program Coordinator
The University of North Carolina at Charlotte
Fire and Safety Engineering Technology
9201 University City Boulevard
Charlotte, North Carolina 28223

Dear Mr. Kimble,

I am writing you this letter to show my support for the establishment of the Masters Program in Fire Protection and Administration. This program is greatly needed not only in the private sector but also in the public sector as well.

I have spoken with several of my professional contacts with public fire departments throughout the Carolinas as well as the private sector, which includes the fire protection industry, industrial risk management consulting firms, insurance companies, and fire and explosion investigation experts. All have voiced to me great interest in this new proposed program.

On a personal note I would like to be one of the first students in the program. I attained my Bachelors of Science from Eastern Kentucky University in Fire and Safety Engineering Technology. Since graduating I have been searching for this type graduate level program and feel that it would greatly assist me in furthering my knowledge in the field of fire protection.

Please let me know if I can do anything else to assist you with this matter.

Best regards,

Jonathan G. Byers, Jr. CFI, CFEI, CFII, CVFI
Fire Investigator
Travelers Fire Investigation Unit

RelMark
PROGRAM MANAGERS

April 17, 2008

Mr. Jeff Kimble
Associate Professor
The University of NC at Charlotte
9201 University City Boulevard
Charlotte, NC 28223

RE: Fire Protection and Administration – Master's Program

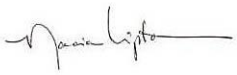
Dear Mr. Kimble:

I have heard through the fire protection community about UNCC's desire to offer a master's program in Fire Protection and Administration. As an insurance program manager, RelMark fully supports this very important endeavor.

As a loss control professional with over twenty years experience in fire safety, I understand the importance of having qualified individuals with formal degrees in the fire protection arena. I believe graduates from your program will be sought after candidates for jobs in both the public and private sectors. There is also a need among individuals currently involved in the fire protection industry to obtain ongoing formal training and advanced degrees.

I wish you luck in establishing the master's degree program.

Sincerely,



Nacia May Lipton
Loss Control Manager

Ludwig's Corner Professional Center
961 Pottstown Pike Chester Springs PA 19425-3510

610-321-101 610-321-1011 fax www.relmark.net

Rimkus Consulting Group, Inc.
5900 Northwoods Business
Parkway, Suite J
Charlotte, North Carolina 28269
(704) 896-6227 Telephone
(704) 896-6228 Facsimile

April 17, 2008

Prof. Jeff Kimble
Associate Professor / Program Coordinator
The University of North Carolina at Charlotte
Fire and Safety Engineering Technology
9201 University City Boulevard
Charlotte, North Carolina

Re: Masters Program and in Fire Protection and Administration

Dear Prof. Kimble:

It was recently brought to my attention that The University of North Carolina at Charlotte was considering the creation of a Masters Degree program in Fire Protection and Administration. I believe the creation of this program would be an excellent addition to your school and of great benefit to the members of the Fire Protection/Investigation field.

Being an active fire investigator with a BS degree in Mechanical Engineering, I feel that being able to obtain a Master Degree in Fire Protection would greatly increase my knowledge and credibility. I was also excited to note that you would be including online course for busy professionals.

Best Regards,

Mark Nelson, P.E., ACTAR, CFEI, CVFI
Senior Consultant

Professor Jeff Kimble
UNC Charlotte
9201 University City Blvd
Charlotte NC 28223-0001

April 18, 2008

Professor Kimble,
It is with much enthusiasm that I provide this letter of support for the proposed Masters of Fire Protection and Administration. Having been involved with the fire safety program at UNC Charlotte since the earliest stages of its planning, it is exciting to see the baccalaureate program prosper and moreover, expand with the addition of a Master's degree.

Having served as president of the International Association of Fire Chiefs and now as a member of the National Fire Protection Association board, I can attest to the fact the need for higher education programs for the fire field are remains strong and largely unmet. There are very few graduate level programs for those in the fire protection field in the U.S. and no programs in the southeast. Having a master's degree program at UNC Charlotte will once again uniquely position UNC Charlotte ahead of the curve in helping meet the demand for qualified individuals to work in North Carolina and the southeast in the fire protection industry.

Even though I have now retired from the fire department, my belief in the benefit of higher education and my commitment to promote higher education remains strong. Please do not hesitate to call upon me if I can be of assistance. I look forward to seeing the proposed Masters of Fire Protection and Administration approved and going strong in the very near future.

Sincerely,

Luther L. Fincher

Luther L Fincher
Chief (ret)

MYERS RISK SERVICES
Providing Solutions For Your Risk Management Needs

April 17, 2008

Mr. Jeff Kimble
Associate Professor
The University of NC at Charlotte
9201 University City Boulevard
Charlotte, NC 28223

RE: Fire Protection and Administration – Master's Program

Dear Mr. Kimble:

I have heard through the fire protection community about UNCC's desire to offer a master's program in Fire Protection and Administration. As a risk management consulting company, Myers Risk Services fully supports this very important program. We regularly work with fire officials, the fire protection community, insurance companies, and business owners. There is not only a need for individuals with advanced degrees in the specialty areas of Fire Protection and/or Administration, but even more importantly, there is a need for a set standard of qualifications that your degree program will offer to employers.

Sincerely,

Top Myers
Miles G (Top) Myers

Ludwig's Corner Professional Center
961 Pottstown Pike Chester Springs PA 19425-3510

610-321-2415 610-321-2418 fax www.myersrisk.com

SCHIRMER ENGINEERING
125 Floyd Smith Drive, Ste. 170
Charlotte, NC 28262
Phone (704) 295-1300 Fax (704) 295-1302
Fire Protection ■ Code Consulting ■ Risk Control ■ Security Consulting

April 18, 2008

Mr. Jeff Kimble
Associate Professor, Program Coordinator
Fire Safety Engineering Technology
The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001

Dear Mr. Kimble

Schirmer Engineering is pleased to know that the University is considering a master's program in Fire Protection and Administration. Fire Protection is the core business of our firm and has been for over 70 years. We interact with fire marshals and fire department representatives on a daily basis, and we recognize the need and their desire for continued education. Schirmer Engineering encourages your efforts to enhance knowledge and opportunities in Fire Protection and Fire Administration. As you know, one of our employees (Charles Carriker) is currently enrolled in your program for the Bachelor's degree in Fire Safety Engineering Technology. Please keep us advised regarding the status of the program and contact me if we can offer any assistance.

Sincerely,

Lisa Bossert

Lisa Bossert, P.E.
Manager, Charlotte Office
Schirmer Engineering

SFPE
EDUCATIONAL and SCIENTIFIC FOUNDATION

April 18, 2008

Anthony L. Brizendine, PhD, PE
Chair & Professor, Department of Engineering Technology
University of North Carolina at Charlotte
9201 University City Blvd
Charlotte NC 28223-0001

Re: The UNCC Department of Engineering Technology
Proposed Master of Fire Protection and Administration (MFPA)
Degree Program.

Dear Dr. Brizendine

This correspondence is to express support for the proposed Master of Fire Protection and Administration (MFPA) degree program. I am currently the Chairman of the Board of Governors for the Society of Fire Protection Engineers (SFPE), Educational & Scientific Foundation. A primary purpose of the Foundation is to support higher education of fire protection professionals. By this correspondence I am expressing the Foundation's Board of Governors support for the proposed program.

By all demographic studies and surveys of fire protection engineering employers, the SFPE has determined that there is a significant shortage of fire protection engineering and technology professionals. Our information is that all graduates of fire protection engineering and technology programs typically receive multiple employment offers upon graduation.

The proposed common courses and fire protection core courses will prepare the program graduates for employment in fire protection design, analysis, research, consulting and program management. I frequently hear about job opportunities in North Carolina, throughout the south and the nation concerning these job opportunities. The demand for these graduates continues to grow as the fire protection profession becomes more scientifically based.

SFPE feels so strongly about the need for additional fire protection higher education programs, that the Society has established a Higher Education Initiative to increase the number of fire protection programs. The Higher Education Initiative task group is working to identify potential universities and to determine how the Society can assist with the development and support of the program. I believe that UNCC would be a candidate for support.

If I may be of assistance in the development of the program, please let me know.

Very Truly Yours

Doug Brandes

Doug Brandes P.E., FSFPE
Chair, Board of Governors
SFPE Educational & Scientific Foundation