

Alarms 102 Syllabus

Basic Info

Course Name: Alarms 102 | Code: MNT 3200 | Section: 80594 | Semester: 2015CE3

Instructor: Paul J. Inferrera, SET

Office: Online

Office Hours: 8:00am - 5:00pm (EDT), Monday-Friday Excluding Holidays

Email: pinferrera@cfcc.edu

Response Time: Less than 24 hours

Contact Instructions: Please place "Alarms 102" and "Module #" in the Subject Line. All emails will be returned in less than 24 hours.

Course Overview

This course is designed for individuals who are fire alarm technicians or have intermediate experience in the fire alarm industry and will focus on application and design.

LEARNING OBJECTIVES

The subject matter will build upon concepts addressing the behavior and generation of smoke, the combustion process and the requirements of codes and standards that govern fire alarm systems and installations. (14.4 CEU's awarded)

RECOMMENDED MATERIALS

NFPA 70, the National Electric Code (NEC), 2011 ed.

NFPA 72, the National Fire Alarm and Signaling Code, 2013 ed.

NFPA 101, the Life Safety Code, 2012 ed.

International Building Code (IBC), 2012 ed.

This course will also reference the 2007 edition of NFPA 72. We do this because a significant number of municipalities enforce editions prior to the reorganization of chapters in the 2010 edition and to help technicians make the transition. Having these codes books is not required, but strongly recommended. The course is designed to enable the student to become quite familiar with the codes and they are referenced throughout.

[Click Here](#) for free access to NFPA codes.

Student Expectations

ATTENDANCE

Students are expected to complete all modules by the end of the course. Students who miss more than 20% of the course modules will automatically receive a failing grade (F) for the course.

Special circumstances may be considered with prior notification of the instructor.

Since the course is 100% online you can participate as your schedule allows. Due dates are to keep students on track and you have the entire four months of the course to complete all assignments. Assignments submitted after the due date will be accepted with no penalty. This is an online course which is not affected by school closures due to incimate weather and holidays.

EXPECTED WORKLOAD

Students can expect to spend 2-3 hours per module, with three modules per week. The course is designed to present the modules on Monday, Wednesday and Friday, but you can complete them as your time permits.

EXPECTATIONS FOR INTERACTIONS

Students will be held to the highest standards of language and content in all interaction, whether online or in person. Abusive and derogatory language, actions, or content will not be tolerated. This non-discrimination policy includes face-to-face interactions, email, online discussions and all course related content and materials. To learn more about online interaction, please see “The Core Rules of Netiquette”, from the book Netiquette by Virginia Shea at: <http://www.albion.com/netiquette/corerules.html>

GRADING

Modules

Each week will include three Modules for the student to complete. There may be links to recommended reading, or references to required and suggested text books. When you have an understanding of the lesson material you can submit a thread on the Discussion Board and take the Progress Survey.

- 48 Modules
- 3 per week (approximately 2-3 hours each)

Discussion Boards

The Discussion Board will be used to evaluate the students understanding of the lesson topic and you are graded on this exercise. You are asked to be courteous in your reply to one another's post and refrain from derogatory or inflammatory responses. Include code reference and/or source(s) in your post or replies. Discussion Boards will make up 10% of your final grade.

Pre-Test

Prior to each Lesson students are encouraged to participate in the Pre-Test to evaluate your knowledge of the material and identify areas of weakness. You are allowed to take the Pre-Test twice and should do so to review before taking the Exam. Scores on Pre-Test will not be included to determine final grade.

- 5 questions, 5 minutes
- Identifies areas of focus
- Allowed to take twice

- Non-Graded

Progress Survey

A Progress Survey will follow each lesson to evaluate the students understanding of the topic. These are exams and will count towards your final grade. Students are only allowed to take the survey once for each session. The survey will consist of ten questions with a time limit of ten minutes. Progress Surveys will make up 30% of your final grade.

- 10 questions, 10 minutes
- Measures progress
- Graded

Exams

An Exam will be administered at the conclusion of each month, for a total of four. They will be limited to one-hour and consist of 60 questions. References allowed during exam will be NFPA 72 The National Fire Alarm and Signaling Code, and NFPA 70 The National Electric Code. Exams will make up 40% of your final grade, and 20% for final exam.

- 60 questions, 60 minutes
- Graded

Grading Overview

Discussion Board: 10%

Pre-Test (48): This exercise does not count towards final grade

Progress Survey (48): 30%

Exams (3): 40%

Final Exam: 20%

Grading Scale

A = 92 - 100

B = 84 - 91

C = 76 - 83

D = 68 - 75

F = 0 - 67

Participants who complete the course with a C, or 76% or better have passed the course and will receive a *Certificate of Attendance* and be awarded 14.4 CEU's.

Academic Misconduct Policy

Students are expected to conduct themselves in a professional, academic manner appropriate to the college's mission as an institution of higher education. Examples of academic misconduct are plagiarism and cheating, discrimination, and lying.

Collaboration is a natural part of college and students will benefit greatly from working with other students on assigned activities. Collaboration becomes Academic Misconduct when two or more students jointly draft answers to assigned work. For example, students discussing how best to approach a problem or assignment is acceptable and even encouraged; however, students writing the same answer or choosing to copy someone else's answer is not acceptable.

Plagiarism

Plagiarism is defined as taking the words, ideas, or thoughts of another and representing them as one's own. If you use the ideas of someone else, provide a complete citation of the source work; if you use the words of another, present the words in the correct quotation notation (indentation or enclosed in quotation marks, as appropriate) and include a complete citation to the source.

STUDENT SERVICES

Disability Support Services

Any student who requests classroom accommodations because of a disability must present documentation to verify his/her disability to the CFCC's Disability Service Coordinator. On a confidential basis, the student, disability services and the instructor will determine the appropriate accommodations following documentation. These accommodations will be provided in a manner that is consistent with the objectives, outcomes, and academic standards of the course. Absences must not exceed class attendance policy.

IT Student HelpDesk

The IT Services Student Helpdesk provides first-level technical support to all students of Cape Fear Community College. They are available to assist students with basic computer and technical needs, including logging into Blackboard, myCFCC and WebAdvisor. More information, including Hours, Location, and Contact Information is available at <http://www2.cfcc.edu/studenthelpdesk/>

Blackboard Help

Answers to common Blackboard questions can be found at <http://www2.cfcc.edu/online/bb-faq> or Ask Ray.

Learning Lab

The Learning Lab at CFCC can provide Writing Assistance, Computer Competency Skills, and Tutoring. The Learning Lab is located in the Learning Resource Center (LRC) and can be found online at <http://cfcc.edu/learninglab/>.

Learning Resource Center (Library)

The CFCC Learning Resource Center (Library) provides students with the following resources: Books/Materials, Course Reserves, Computer/Internet Access, Online Databases/Journals, Group Study Space, Quiet Study Space. The Learning Resource Center (Library) is located on the 2nd Floor of the L-Building (Downtown Campus) or on the 1st Floor of the McKeithan Center (North Campus) and can be found online at <http://cfcc.edu/lrc>.

MyCFCC – Student Accounts

Your myCFCC account is a single username and password for all of your CFCC network accounts: email, WebAdvisor, Blackboard, campus computer access, and more. The email account provided to you (yourusername@mail.cfcc.edu) is used for all official communication with CFCC instructors and staff. Some information will ONLY be sent by email and not by postal mail, so it is very important that you check this account. This account may also be used

for personal mail, but it is subject to the CFCC Acceptable Use Policy. Be sure to log out of your account in each service you may have opened (email, Blackboard, etc.) when you leave a shared computer, otherwise it is possible for the next user of the computer to access your information.

Additional Student Support and Academic Services

For a list of CFCC Student Support and Academic Services, please visit <http://www2.cfcc.edu/online/student-support/>.

Lessons

Module 1: Prescriptive and Performance-Based Design

Understand the methodology in assessing the threat of fire within a structure. Know the difference and application between prescriptive and performance based design.

Module 2: Building Codes and Standards

Understand building codes and how they determine building classification which governs type of system installed. Review building codes to determine special requirements for fire alarm systems. Know the difference between codes and standards and when and how they are applied.

Module 3: Smoke Detection Spacing

Review the various smoke detection principles and the advantages of their application. Know the code requirements for location and spacing of smoke detection. Be able to lay out smoke-sensing detectors within a given space.

Module 4: Thermal Detection Spacing

Know the code requirements for location and spacing of thermal detection. Understand how elevation affect response and detection principles. Be able to lay out thermal detectors within a given space.

Module 5: Sprinkler System Interface

Understand the operation and interconnection to a fire alarm system of various sprinkler wet and dry pipe alarm devices such as water flow, pressure, temperature, and level, retarding devices, gate valve supervisory switches, and fire pumps.

Module 6: Audible Appliances

Understand audible alarm notification appliances and their application and the requirements for appliances intend for the handicapped. Know attenuation of audible signals by distance and building partitions, background noise considerations, and recommended signal levels above ambient.

Module 7: Visual Appliances

Understand visible alarm notification appliances and their application, including such concepts as alarm by zone, alarm signal coordination with other systems in the building, visual and tactile alarm appliances for the handicapped.

Module 8: Construction Plans and Drawings

Acquire a working knowledge of various types of plans used in the construction industry. Use standard plans to determine dimensions, types of materials, elevations, locations, and other information needed for a building fire alarm system. Be able to generate a bill of material listing symbol, description, manufacturer and part number of all equipment used.

Module 9: Project Correspondence

Utilize common rules of grammar and punctuation to form clear sentences and paragraphs in composing project documents. Adhere to industry accepted guidelines for routing and distribution. Be familiar with common forms and methods of communication in the construction industry.

Module 10: Shop and Riser Drawings

Prepare plan view diagram of a multi-zone, multi-story fire alarm system consisting of manual fire alarm boxes, heat detectors, four wire smoke detectors and a variety of audible and visible appliances. Create riser diagram and operation matrix to indicate sequence of operation. The diagrams are to show the number and size of conductors and conduit and the location of each system component.

Module 11: Ancillary Systems

Understand the function of ancillary systems permitted by the code, such as fan shutdown, elevator capture, and smoke management systems. Know their purpose, location, operation, restrictions, circuit and supervision requirements.

Module 12: Electricity and Electronics

Know the types and characteristics of electrical and electronic components used in fire alarm control systems. Understand circuit types and concepts that dictate their operation.

Exam #1

Exam will be limited to one-hour and consist of 60 questions covering Modules 1-12. References allowed during exam will be NFPA 72, the National Fire Alarm and Signaling Code; NFPA 70, the National Electric Code (NEC); NFPA 101, the Life Safety Code and the International Building Code (IBC).

Module 13: Agency Listing Requirements

Understand test methods and requirements for equipment listing. Understand how fire alarm signaling equipment is reviewed and tested by testing laboratories before being listed. Know the methods of testing and quality assurance follow-up programs for compliance.

Module 14: NFPA 70

Understand how the National Electric Code (NEC) governs the installation methods and materials required for fire alarm systems. Know how to use box and conduit fill, conductor characteristics and other tables.

Module 15: State and Federal Agencies

Know special fire alarm installation requirements of governmental agencies, and others and their relationship to national installation standards. Be familiar with the codes enforce by each and how to determine priority.

Module 16: Circuit Calculations

Know the effects of conductor size and circuit length on fire alarm signaling circuits. Be able to determine the maximum length of circuit allowing for device operation and conductor sizing. Be able to calculate for proper power to ensure adequate operating performance.

Module 17: Remote Communication Pathways

Discuss methods for remote signal and power transmission for basic fire alarm systems. Understand advantages of various transmission media such as copper, fiber optic, and radio.

Module 18: Project Specifications

Project specifications consist of the body of information that should guide designers, installers, and Authority Having Jurisdiction (AHJ) through all phases of the project.

Module 19: Tactile Notification

Understand the operation, selection, location, spacing, mounting, and use of tactile and alternate visible alarm notification appliances.

Module 20: Surge and Transient Protection

Understand the principles of induction and sources of disruptive energy on fire alarm systems. Know the types and methods of protection to minimize those effects. Be able to apply type of suppression methods for the anticipated hazard.

Module 21: Intelligent Systems

Understand the operation of addressable devices and their control systems. Know the benefits, wiring methods, and how circuits are monitored for integrity. Understand typical communication protocols and signaling methods with addressable devices.

Module 22: Reliable and Survivable Systems

Types of design and installation methods to allow for continuous operation of systems. Location and protection of equipment and wiring depending on the environment.

Module 23: Communication Methods

Understand the concept of combining multiple analog signals over a shared medium (multiplexing). Know the active and passive systems and communication formats, and components.

Module 24: Interconnection of Systems

Discuss the interconnection of systems associated with fire alarm functions. Know the purpose, operation and connection requirements.

Exam #2

Exam will be limited to one-hour and consist of 60 questions covering Modules 13-24. References allowed during exam will be NFPA 72, the National Fire Alarm and Signaling Code; NFPA 70, the National Electric Code (NEC); NFPA 101, the Life Safety Code and the International Building Code (IBC).

Module 25: Insurance Agencies and Organizations

Become familiar with the role of insurance agencies and organizations and how they influence fire alarm design and installations. Know the requirements for acceptance and system approval and the protocols of each agency.

Module 26: Training and Presentations

Develop and create presentations for training or information. Be able to present topics in an logically and concise manner. Know the proper documentation of presentation for project file or general contractor.

Module 27: Local Wireless Systems

Know the operation characteristics of low power radio systems. Understand the power requirements, devices operation, and system capacity. Know the code requirements for types of systems utilizing wireless technologies.

Module 28: Hostile Environment Design Considerations

Discuss various environmental hazards and conditions associated with fire alarm system installation. Know the proper device selection or installation method to reduce or prevent damage. Be able to apply codes determined by environment.

Module 29: Design Review

Demonstrate the ability to evaluate shop drawings for proper device placement and coverage. Review drawings for completeness and adherence to local, state and national codes and project specifications. Determine the required interface with control equipment and building functions.

Module 30: Combustion - Theory and Principles

Develop and understanding of the chemical reaction in the combustion process and the signature produced. Understand the stages of material heating and thermal particulates. Know advantages of various methods of detection.

Module 31: Smoke Propagation Principles in Buildings

Develop an understanding of the properties and characteristics of smoke movement. Know the effects of pressure, temperature and partitions affecting the expansion of heated gases produced by combustion.

Module 32: Hazard Protection Analysis

Understand the methods used to determine the risk for a particular facility. Know the factors that influence a design and inputs from insurance agencies, stakeholders and authority having jurisdiction. Determine suitable detection methods and technologies to satisfy performance requirements.

Module 33: Prevention of Nuisance and False Alarms

Proper selection and placement of automatic detectors. Maintenance programs for reliable and proper operation of fire alarm systems. System program features to reduce unwanted alarms from utilizing alarm verification, positive alarm sequencing, cross zoning and pre-signal. Also electronic and pneumatic retard mechanisms for sprinkler water devices.

Module 34: Special Hazard Protection Systems

Be able to lay out a fire detection system for protection of special hazards. Facilities discussed shall include data centers, telecom and server rooms, document storage and critical processes. Know the proper location and spacing of smoke detectors, manual release and abort stations. Understand the interconnection to the building fire alarm system and HVAC equipment interface of.

Module 35: Public Reporting Systems

Understand the systems purpose and basic requirements of power sources and supervision. Know the characteristics and capacity of circuits. Be familiar with codes and standards that apply. Be familiar with the types of dispatching systems, such as wired, radio, telephone, and computer aided dispatch.

Module 36: Project Management

Be familiar with project timelines and the installation of fire alarm and protection systems. Demonstrate ability to communicate with agencies and coordination of general trades to meet project deadlines. Know the methods of tracking progress and characteristics of each.

Exam #3

Exam will be limited to one-hour and consist of 60 questions covering Modules 25-36. References allowed during exam will be NFPA 72, the National Fire Alarm and Signaling Code; NFPA 70, the National Electric Code (NEC); NFPA 101, the Life Safety Code and the International Building Code (IBC).

Module 37: UV/IR Detection Methods

Know the various ultraviolet and infrared detection principles and the advantages of their application. Discuss the advantages and drawbacks of each method and response characteristics.

Module 38: Contract Documents

Understand the various agencies that govern the content of contract documents and when they are used. Be familiar with terms and purpose of site programs. Know procedures for contract administration and coordination of communication during a project.

Module 39: Systems for Smoke Control

Know the requirements, purpose and methods of smoke control in buildings. Discussing placement of detectors and building functions controlled by the fire alarm system. Understand smoke movements and how it is purge or contain for occupant relocation and egress.

Module 40: Intelligibility Standards

Know the approved methods to demonstrate adequate intelligibility of voice systems. Understand the factors that affect intelligibility and acoustically designated spaces.

Module 41: Voice Systems

Understand how factors that affect intelligibility determine the selection and placement of speakers. Know the operation of big audio and arrays for outdoor applications and proper tapping of speakers for indoor operation. Basic understanding of Mass Notification Systems (MNS) and Emergency Communication Systems (ECS).

Module 42: Acts and Legislation

Interpret governmental requirements and the specific effects of various acts on the projects performance. Establish procedures to report on and conform to the requirements of federal and state regulations, including affirmative action, Copeland and Davis-Bacon, payroll affidavits, subcontracting, programs and legislation.

Module 43: Logic Equations

Know the meaning of common symbols used in logic equations. Be able to interpret system function and represent using logic functions.

Module 44: Microprocessor Based Control Systems

Understand how microprocessors, integrated circuits and types of memories are utilized in fire alarm control systems. Know the methods used to assure the integrity of processed data and the suitability of various types of integrated circuits for fire alarm applications.

Module 45: Proposal Generation

Determine the proper selection of systems and components to satisfy customer specifications. Understand how local, state and agency requirements affect the selection and design of fire alarm systems.

Module 46: Design Surveys and Preparation

Know the inputs required to competently design a system that will perform its life safety and asset protect mission. Determine when a survey of property for layout of and preparation of plans is needed. Decide the most cost effective system which is best suited for the application in keeping with applicable building and fire codes.

Module 47: IP Communications

Understand the basic internet protocols and how they transmit fire alarm and mass notification system signals. Know industry terminology and concepts such as VoIP.

Module 48: Project Close-Out

Know the various documentation that is required to for project close out. Understand the proper distribution of materials and archive procedures of documents.

Final Exam

Exam will be limited to one-hour and consist of 60 questions covering all Modules in the course. References allowed during exam will be NFPA 72, the National Fire Alarm and Signaling Code;

NFPA 70, the National Electric Code (NEC); NFPA 101, the Life Safety Code and the International Building Code (IBC).