Course: **Design and Analysis of Sprinkler Systems – FPST 2243**
Semester: **Summer 2022**
Lecture: **Online**
Lab: **Online**
Instructor: **Professor Bryan Hoskins, PE, PhD**
Contact: **bryan.hoskins@okstate.edu**

Final Exam:
The final exam schedule for this course is at the end of Week 8 per OSU policy. This is a <u>mandatory comprehensive examination</u>. <u>All</u> students will take the exam.

Catalog Description:
A study of detailed current standards for selection, design, installation, operation and maintenance of automatic fire suppression systems. Laboratory problems on applicable technological principles.

Prerequisites:
All prerequisites require a grade of C or better
        FPST 1373
        FPST 2483
        ENGR 1322, 1332, or GENT 1153

Course Objectives:
This course will familiarize students with the procedure to design and calculate an automatic sprinkler system. Upon successful completion of this course the student will be able to prepare working plans and specifications for the installation of sprinkler and standpipe and hose systems. Students will be able to perform the required calculations for the design and review of automatic sprinkler and standpipe and hose systems as well as use computer assistance in the design process. Additionally, students will be able to recognize discrepancies in the design and installation of fire sprinkler systems.

Learning Objectives
1. Explain the requirements for working plans and specifications for the installation of sprinkler and standpipe and hose systems.
2. A Discuss and demonstrate the calculations required in design and review of automatic sprinkler and standpipe and hose systems.
3. Recognize discrepancies in the design and installation of fire sprinkler systems.
4. Understand the use of computer assistance in the design of sprinkler systems.

Course Learning Outcomes:
1. Prepare working plans and specification for the installation of sprinkler and

standpipe and hose systems.
2. Perform calculations required in design and review of automatic sprinkler and standpipe and hose systems.
3. Recognize discrepancies in the design and installation of fire sprinkler systems.
4. Use computer assistance in the design of sprinkler systems.

Required Texts:
NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2019 Edition, National Fire Protection Association, Quincy, MA.

Note: this text can be accessed via nfpa.org with the following log-in:
Codesonline.nfpa.org
Log-in name: nfcss@okstate.edu
pw: NFCSSokstate2020

Brock, P.D. *Fire Protection Hydraulics and Water Supply Analysis*, Fire Protection Publications, Stillwater, OK, Third edition.

Note: this is the same text from FPST 2483

Recommended Texts:
National Fire Protection Association. (2008). *Fire Protection Handbook* (20th ed.). (A. E. Cote, Ed.) Quincy, Massachusetts, USA: NFPA.

SFPE. (2016). SFPE Handbook of Fire Protection Engineering (5th ed.). (M. J. Hurley, Ed.) Springer.

Reading Assignments:
Reading assignments are preparation for the lecture or laboratory period and completion prior to class or lab is expected. This class involves significant out-of-class assignments. The student is responsible for all material assigned regardless of inclusion in class lecture. Preparation for class discussions is expected.

- The Course Outline spreadsheet at the end of the syllabus lists the reading assignments.

Assignments and Conduct of the class:
Incomplete or not turned in assignments will receive a score of zero. Only you can submit your homework, a proxy is not permitted unless previous permission is authorized. Email submissions will NOT be accepted. Assignments are due at the date and time indicated in the Canvas DropBox.

This class will have an on-line component using Online Classroom. This

course management tool is available at https://my.okstate.edu. Lecture notes will not typically be posted in Canvas.

Turned in materials failing to follow the formatting instructions of the assignment will receive a grade of zero. Failure to place your name on the submitted file will result in a grade of zero. Files submitted on Canvas must be in word or PDF format and in one file. Multiple files are not permitted to be submitted unless the assignment dictates it.

Submit calculation assignments on engineering paper, unless a separate worksheet is provided (i.e. hydraulic calculation paper or graphs). Additionally, complete all calculations utilizing pencil and have the answer clearly boxed.

Lab assignments are due at the end of the laboratory session time on the date and time indicated in the Canvas DropBox. No time extensions will be given. You are expected to come to lab prepared to complete the assignments.

Unless excused for valid (and unavoidable) university reasons, late work will receive a zero score. Turn in all work per the incomplete work criteria above. Travel for university functions is not an excuse for late work. Turn in assignments early or make alternative arrangements. Illness, death in the immediate family and other such emergencies are excusable under university policy. However, the student should contact the professor as soon as possible (email is best).

Office Hours: (subject to change)
Office Hours will be Thursday from 8:00-8:50 pm (Beijing time) for class assistance only. The instructor will also be generally available during regular working hours. Make appointments by email. The instructor will also respond to student questions by e-mail.

Join Zoom Meeting
https://zoom.us/j/95611510457

Attendance:
Students are here studying for a profession therefore promptness is expected. Attendance, as at a job, is required.

Design Project Work Session:
Attendance at the design project work session and lab meeting is mandatory. Failure to attend this session will result in loss of one letter grade off your final grade. See course schedule for date of this session.

Labs:
Labs are intended to re-emphasize the lectures and provide valuable experience analyzing data and performing calculations. Two labs missing (i.e. not submitted) will lead to a downgrade in the final grade of one letter. Each subsequent lab missed will lead to an additional downgrade in the final grade of one letter.

Lab assignments are due in the designated dropbox by the submittal deadline. No time extensions will be given. You are expected to come to lab prepared to complete the assignments.

Classroom Behavior:
With respect to cell/smart phones, this is practice for a profession and are adult conduct is expected. The student's conduct is expected to reflect being an adult and using technology in an appropriate manner e.g. participating in interactive surveys during class that use texting technology are appropriate; playing games, chatting with friends, etc. are not appropriate. Phones, if on, should be placed on vibrate to allow for Code Red alerts.

The use of recording equipment, IPODS, MP3 players, cell phones, the taking of video or photography are NOT PERMITTED without the expressed written consent of the instructor. Any recordings will result in a F! for the course.

During exams, exam review sessions, exam rework sessions, or any other time when a student views an exam, any cell phone, or other electronic equipment use will automatically constitute cheating resulting in the requisite penalty, up to an F!.

Students who are disrupting class in any way (as defined by the instructor) will be asked to leave and will receive a zero for the assignment and/or have 2% deducted from their final grade (this includes use of profane language in written work). Unprofessional communication e.g. by email, will receive no response from the instructor.

Communication:
The student will utilize professional correspondence. Using "hey" to begin an e-mail, using colloquial expressions such as "is it cool if," or failure to use a greeting, body (with complete sentences), and salutation is considered unprofessional and therefore will not be answered. The use of the niceties of polite society is strongly encouraged e.g. please and thank you. Finally, if the student asks a question that can be answered in the syllabus, or found in Canvas, the student may not receive a response.

Design Projects:
This is a design course and submittal of design projects are mandatory. See implications from grading below.

Grading:
Course grades will be determined with the following weighting:

(Your total score on hourly exams/top total score) x 40 = X
(Total score on labs, etc. /top total store) x 15 = Y
(Your score on Final Exam/top score) x 25 = Z
(Your score on the projects) x 20 = P
X + Y + Z + P = Your TOTAL EQUIVALENT SCORE

The material in this course is essential professional material and a high level of competency is expected. Weighted equally in the grading of material are both quality of presentation and technical content.

Because this is a design course, the projects are mandatory. Failure to submit <u>any</u> of the project assignments <u>will result in an "F" regardless of the percentage of points earned</u>. Your grade may also be adjusted based upon your individual effort on the project from team member feedback.

Final Grade Scale
A = Above 90%
B = Above 80% and below 90%
C = Above 70% and below 80%
D = Above 60% and below 70%
F = Below 60%
F! = Cheating

Academic Misconduct:
Copying the work of another for personal credit is **plagiarism** whether the work is a published work or the unpublished work of another student. Thoroughly reference all use of materials developed by others using APA 6th edition formatting. Use of electronic files that are the work of others is plagiarism. Complete all assignments individually unless specifically assigned as group work. While students may discuss assignments with each other, individual completion of the work is required. Plagiarism and work-sharing violations, as well as dishonesty on examinations, may result in reduction in grade, no credit, failure in the course, or an F! per university policy.

The minimum penalty for acts of academic dishonesty in this course is a grade of zero on the writing assignment or examination in question. Penalties may be much more severe, however, and could include an "F!" for the entire course and a recommendation of additional disciplinary actions. University regulations regarding academic misconduct are applicable per http://academicintegrity.okstate.edu/ .

Academic dishonesty includes both giving and taking of improper assistance on writing assignments or examinations as well as any other form of attempting to gain credit for work that is not that of the student.

Laptop Computers
Per the University Catalog page 111:

"For students in Engineering, Architecture, and Technology, the **college requires** that all students have several basic tools. Students in the College must have a scientific calculator and **a laptop computer**. The scientific calculator should be capable of computing trigonomic functions, logarithmic and natural logarithmic functions, basic statistical analysis, and all algebraic functions. The laptop requirements are published on the college IT website http://ceat-its.okstate.edu ."

Permissible Calculators:
Permitted calculators for FPST exams are as follows:

Hewlett Packard -- HP 30s; Hewlett Packard - HP 33s; Hewlett Packard - HP 9s
Casio - FX 115 ES, FX115MS, andFX.115MSPlus (Note: FX115ESand FX115MS models ending with an "-SR" designation are also allowed.)
Texas Instruments - TI3OXA (or TI 3OXa);
Texas Instruments - TI 30X HS and TI 30X 11B; Texas Instruments - TI36X Solar

Note: almost all TI calculators with a TI 3x number are compliant with the department policy

These calculators are those typically permitted for certification and professional licensing examinations (CSP, FE, and CIH). Prohibited calculators include PDAs, cell phone calculators, or programmable calculators such as the TI 82, 83, 84 and 89.

Also allowed, after inspection by the instructor, are basic 4 or 5 function or nonprogrammable inexpensive scientific calculators. However, these basic calculators may put the student at a disadvantage on math problems that are complex or involve some special trig functions.

Special Accommodations for Students:
If any member of this class feels that he/she has a disability and needs special accommodations of any nature whatsoever, the instructor will work with the student and the office of Student Accessibility Services at 155 UHS, to provide reasonable accommodations to ensure the student has a fair opportunity to perform this class. Please advise the instructor of such disability and the desired accommodations at some point immediately after the first scheduled class period.

Religious Holidays
Should the student have any religious holidays that he or she wishes the instructor to consider, inform the instructor during the first week of class. Failure to notify the instructor during the first week of class results in no accommodation for religious holidays.

Reminders
See the University Syllabus Attachment:

FPST Student ListServ
All current FPST students should be signed up on the FPST Student ListServ. Directions are attached below, please read them carefully, and send your request as directed. Being on the ListServ is important, as it is the main means of contact that the program has with the entire FPST student population for notifications from the faculty and student organizations. You must send your request from your OSU email account, request from other accounts are declined to avoid spam.

Please announce
LISTSERV SIGN-UP DIRECTIONS

To subscribe to the School of Fire Protection and Safety Technology listserv, send an email message to listserv@listserv.okstate.edu with "subscribe OSU-SFPS *Your Name*" in the body of the message, without the quotation marks.

Example: This is an example of the email, if your name is George Smith.

Send	Delete

To: listserv@listserv.okstate.edu

Cc:

Bcc:

Subject:

Subscribe OSU-SFPS George Smith

Job Information

Job positions that are open to FPST students and alumni are now posted on the HireOSUGrads website only and are no longer sent out on the ListServ first. All students seeking internships, part-time, or full-time employment for the FPST degree should go to www.hireosugrads.com and create an account. All students take the time now to create their accounts so you are well prepared. (Note: Be sure to review your account and update as needed before applying for a listing.) Andrea Haken, Career Specialist, can assist you if you should need help with this available employment tool.

Andrea Haken
Career Specialist

College of Engineering,
  Architecture and Technology

102 Engineering North
Stillwater, OK 74078

Phone: (405) 744-7574
Fax: (405) 744-6066

andrea.haken@okstate.edu
http://studentservices.okstate.edu

OKLAHOMA STATE UNIVERSITY

Course Outline:
Note: Course schedule is subject to change at instructor's discretion.

Week	Class	Topic(s)	Reading Assignment	Design Project Due Dates
1 (Part 1)	Lab	Drawing Basics and Pipe Take-outs		
	Lecture 1	History of Sprinklers	Ch. 1-3, 27, FPH Section 16, Ch. 1, Station House (on Canvas)	
	Lecture 2	Basics of NFPA 13	Ch. 7-8, FPH Section 16 Ch. 2	
1 (Part 2)	Lab	FPP Warehouse Drawing and Riser ID		
	Lecture 1	System Components	Ch. 4	
	Lecture 2	System Components		
2 (Part 1)	Lab	FPP Warehouse Drawing		
	Lecture 1	Occupancy and Commodity Classifications	Ch. 9-10	
	Lecture 2	Sprinkler Spacing Requirements	Ch. 19, 27.5	Design Project 1 Introduced
2 (Part 2)	Lab	Code Lab		
	Lecture 1	Sprinkler Spacing Requirements		
	Lecture 2	Pipe Schedule Design	Ch. 17-18, FPH Section 16.4	
3 (Part 1)	Lab	Pipe Schedule and Code Lab		
	Lecture 1	General Design Requirements		
	Lecture 2	General Design Requirements		
3 (Part 2)	Lab	Computer Software		
	Lecture 1	Hydraulic Calculations	Hydraulics Book, Ch. 13	
	Lecture 2	Hydraulic Calculations		
4 (Part 1)	Lab	Preliminary Hydraulic Calculations		DESIGN PROJECT 1 - PART A DUE
	Lecture 1	Hydraulic Calculations		
	Lecture 2	Hydraulic Calculations		
4 (Part 2)	Lab	Computer Software		
	Lecture 1	Hydraulic Calculations- Review Videos		
	Lecture 2	Exam 1		

Week	Class	Topic(s)	Reading Assignment	Design Project Due Dates
5 (Part 1)	Lab	Full Hydraulic Calculations		
	Lecture 1	Hydraulic Calculations	Ch. 20, FPH Section 16.5	
	Lecture 2	Hydraulic Calculations		
5 (Part 2)	Lab	Design Project Work Session- Virtual Meeting		
	Lecture 1	Warehouse Introduction	Ch. 21	
	Lecture 2	Warehouse	Ch. 22-23	
6 (Part 1)	Lab	Sprinkler Spray Patterns and Warehouses		DESIGN PROJECT 1 - PART B (FINAL) DUE
	Lecture 1	Warehouse	Ch. 27	
	Lecture 2	Plan Reviews		
6 (Part 2)	Lab	Drawing Review and K-Factors		
	Lecture 1	Plan Reviews		Design Project 2 Introduced
	Lecture 2	Exam 2		
7 (Part 1)	Lab	End Head Analysis		
	Lecture 1	End Head Analysis		
	Lecture 2	Building Code Application	FPH Section 16 Ch. 6	
7 (Part 2)	Lab	Building Code Application and Residential Sprinkler Demo		DESIGN PROJECT 2 - DUE
	Lecture 1	Residential Systems	FPH Section 16 Ch. 10	
	Lecture 2	Standpipes		
8 (Part 1)	Lab	Final Exam Review		
	Lecture 1	Ethics		
	Lecture 2	Final Exam Review		
8 (Part 2)	Lecture	Final Exam		