

ARCE 664 -- FIRE PROTECTION ENGINEERING

Fall Semester 2014

Course Meets: TR 8:00 to 9:15 a.m. in 120 Marvin Studios (MARS)

Instructor: Brian A. Rock, Ph.D., P.E.; 2134-D Learned Hall; docrock@ku.edu
Office hours: almost any time I'm in 2134-D, or by appt.

Catalog: An introduction to human response, fire science, combustion calculations, compartment fires, piping and sprinkler design, and smoke management. Analytical methods, experimental data, codes, case studies, and videos are presented in this engineering design course.

Prerequisites: Thermodynamics and fluid mechanics, or consent of instructor.

References: *Handouts and equipment manufacturers' catalogs (print/Internet).*
The ASHRAE Handbook (Fundamentals & HVAC Applications).
SFPE Handbook of Fire Protection Engineering.
NFPA Standards 1, 13, 20, . . .

Grading:	Homework	60%	Final Grades:		
	Midterm Exam	20%	90% to 100%	=	"A"
	Final Exam	<u>20%</u>	80% to 89.9%	=	"B"
	Total =	100%	70% to 79.9%	=	"C"
			60% to 69.9%	=	"D"
			Less than 60%	=	"F"

All work submitted for grading must be completed independently by each student; no assistance by any others is allowed. Homework assignments will each be graded on a 0 to 10 point scale. They are due at the beginning of class one week after each is assigned unless otherwise stated. Late homework assignments lose one point per full or partial 24 hours.

Advance written notice, acceptable physical proof and reason, and verification are required for a class obligation to be rescheduled; voluntary events are not acceptable reasons. Due to the nature of the course some relevant but potentially disturbing video footage will be shown in class.

Final Exam: Wednesday, December 17th, 7:30 to 10:00 a.m., 120 MARS.

Other: 1) Cell phones, etc. off during class. 2) Students are expected to abide by KU's academic integrity policies. Discovered violations are reported to the CEAE and Dean's Offices. Penalties for academic misconduct range from receiving a zero on a particular assignment or exam to dismissal from the School or KU. *All work submitted for grading must be completed independently unless specifically assigned as a team project.* 3) All course content copyright © Prof. Rock, unless prior copyright by others, e.g., by NFPA, SFPE, or ASHRAE. No redistribution without advance written permission. Recording or transmitting of any live content, by any party, is specifically prohibited.

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OBJECTIVES

Methods of teaching: lectures, case studies, show & tell, homework/projects, exams, viewing videos, etc.

- ☞ To introduce the arts and sciences of fire protection engineering from a mechanical/thermal-sciences perspective
- ☞ To understand fire, fires in buildings, and human response to fire events
- ☞ To perform combustion calculations for a variety of fuels
- ☞ To review the fundamentals of fluid mechanics related to piping and fire protection engineering
- ☞ To analyze and design water-based fire suppression systems (sprinklers, piping, pumps, . . .)
- ☞ To present smoke management concepts
- ☞ To learn about many influential historical and recent fire events

HOMEWORK

- √ Be neat. Rewrite if needed.
- √ Use engineering paper (front side only) for calculations, graph or computer paper for graphs, and appropriate paper for drawings and computer output.
- √ Show all calculations, units, conversions, and references. Box the *final* answer (only) for each problem.
- √ Show one complete sample calculation and then a summary of results for repetitive calculations. Provide a cover page with a summary or table of results for lengthy assignments.
- √ Orient text and pages so they read from the bottom or the right side. Staple pages together in the upper left-hand corner.
- √ Fold the pages lengthwise unless more than about 12 pages. When folded be sure to write your name on the outside.