

Oakland University
School of Health Sciences
Environmental Health & Safety Program
Winter 2018
Course Syllabus:
EHS 3330, Fire Protection and Prevention

Instructor and Class Meeting Information:

Instructor: Richard Olawoyin, Ph.D., CSP CEP
Office: HHB 3071
Office Hours: Online T and TH (1:00pm – 2:00 pm or By Appointment)
Phone: 248.364-8653
Fax: 248.364-8657
E-mail: olawoyin@oakland.edu
Class room: Prerecorded WebEx (Participation is encouraged)

Course Description:

This course provides a basic overview of the history of fire, characteristics and behavior of fire, as well as human behavior during fire events. It includes a review of important safety science aspects as they relate to fire. Aspects such as major fire incidents and cases, heat transfer, prevention and control of fire and explosion hazards, fire emergency planning and management, etc. will be discussed. Theoretical topics of discussion include flammability limits, mechanisms of heat transfer, flame temperatures, vapor pressures, ignition, the combustion phenomenon, etc. Applied topics include fire hazards relative to several types of occupancies and industries, materials of construction, building systems, fire codes, fire detection and suppression systems (water and non-water), alarms and detection systems, life safety code, and forensic analysis of fires and explosions, etc. The course includes lectures that provide students with the tools needed to analyze the behavior of fire, fire hazards, suppression systems, alarms and detection systems, portable fire extinguishers and extinguishing agents, fixed fire protection and suppression systems evacuation systems, explosions and building materials.

Course Objectives:

At the conclusion of the course, students should be able to:

1. **Discuss** the basics of the chemistry and physics of fire. Demonstration is in the form of acceptable performance on exams, homework problems, class participation and course paper with a target of 85%.
2. **Explain and review** aspects of the fire/combustion phenomenon and its dynamics, both chemically and physically. Demonstration is through acceptable performance in class activities, and on exams with a target of 85%.
3. **Assess and categorize** fire safe design as applied to the following: Human Systems; Building Design and Construction; Life Safety. Demonstration will be through acceptable performance on exams, assignments and course paper with a target of 85%.
4. **Classify and explain** the operations and design of alarm/detection systems, portable and fixed fire extinguishing systems, and water/non-water based suppression systems. Demonstration will be through acceptable performance on exams, assignments and course paper with a target of 80%.
5. **Research** problems and **develop** potential solutions to fire hazard problems associated with specific industries or occupancies. Demonstration will be through thorough and acceptable treatment on course paper or design project with a target of 90%. The specific industry or occupancy or design problem will be student's choice.

Course Textbook (Recommended):

1. Ferguson, Lon H. & Christopher A. Janicak. Fundamentals of Fire Protection for the Safety Professional, 2005. ISBN: 0-86587-988-5.

PLEASE NOTE: The course textbook will be used in this course with other materials that the course professor will provide.

Course Format:

The format of the course will be lecture-based (online delivery), with intensive writing, including demonstrations and application exercises as arranged by the professor. It will include an expectation for various types of class participation in the form of completing random and pre-planned class activities, response to class questions, participation in general forums and discussions including student's personal safety related experience, etc. Periodically, relevant course videos will be reviewed and class discussions will be encouraged for additional credits (at professor's discretion). The course will involve online-class activities, assignments, a term paper/project, midterm, and a final exam. **Please note:** There are relevant calculations and analyses throughout the content of this course.

Grade Distribution:

Final Course/Term Paper –	20%
Assignments –	15%
Random Class Activities/ Discussions	5%
Presentation –	5 %
Quizzes –	15%
Midterm Exam –	15%
Final Exam –	25%

Total –100%

Important Events and Dates

Events	Dates
Classes begin	Jan 3, 2018
Martin Luther King Jr. Day:	Jan 15, 2018
First day 0% tuition refund – full semester courses	Jan 18, 2018
Mid-term Exam	Feb. 15,-17 2018
Winter recess begins	Feb. 17, 2018 - 10 P.M.
Classes resume	Feb. 26, 2018 - 7:30 A.M.
Final Paper Due	April 16, 2018
Study day	April 18, 2018
Final Exam	April 19 – 21, 2018

EHS Grading Scale
Assigned Grade:

Highest	Lowest	Points	Grade	Letter
100%	98%	400-392	4	A
97.99%	96%	391-384	3.9	A
95.99%	94%	383-376	3.8	A
93.99%	92%	375-368	3.7	A-
91.99%	90%	367-360	3.6	A-
89.99%	89%	359-356	3.5	A-
88.99%	88%	355-352	3.4	A-
87.99%	86%	351-344	3.3	B+
85.99%	84%	343-336	3.2	B+
83.99%	82%	335-328	3.1	B+
81.99%	80%	327-320	3	B
79.99%	79%	319-315	2.9	B
78.99%	78%	314-311	2.8	B
77.99%	77%	310-306	2.7	B-
76.99%	76%	305-299	2.6	B-
75.99%	75%	298-294	2.5	B-
74.99%	74%	293-290	2.4	B-
73.99%	73%	289-287	2.3	C+
72.99%	72%	286-284	2.2	C+
71.99%	71%	283-281	2.1	C+
70.99%	70%	280-278	2	C
69.99%	69%	277-275	1.9	C
68.99%	68%	274-271	1.8	C
67.99%	67%	270-266	1.7	C-
66.99%	66%	265-261	1.6	C-
65.99%	65%	260-255	1.5	C-
64.99%	64%	254-251	1.4	C-
63.99%	63%	250-248	1.3	D+
62.99%	62%	247-245	1.2	D+
61.99%	61%	244-242	1.1	D+
60.99%	60%	241-238	1	D
59.99%	0%	237-000	0	F

Course Outline

1. Introduction to Fire Protection (Chapter 1)

- 1.1. Overview of Fire
 - 1.1.1. Definition of Fire
 - 1.1.2. Basic Elements of Fire
 - 1.1.3. Classes of Fire
- 1.2. Objectives of Fire Protection
- 1.3. History of Fire Protection
- 1.4. Major Fire Incidents
- 1.5. Fire Statistics in America

2. Characteristics and Behavior of Fire (Chapter 2)

- 2.1. The Fire Tetrahedron
- 2.2. Fuel and Fuel Types
- 2.3. Oxidation and Oxidizing Agents
- 2.4. Combustion/Chemistry of Combustion
- 2.5. Flammability Classification and Limits
- 2.6. The Phases of Fire
- 2.7. Numerical Examples, Class Activities, and/or Homework Assignment

3. Heat and Heat Transfer Methods(Chapter 2)

- 3.1. Heat Energy and Categories of Heat Energy
- 3.2. Heat Transfer Methods
- 3.3. Heat Exchangers
- 3.4. Heat Flow
- 3.5. Numerical Examples, Class Activities, and/or Homework Assignment

4. Fire Detection and Alarm Systems (Chapter 8)

- 4.1. Types of Fire Detection and Alarm Systems
- 4.2. Automatic Initiating Devices
- 4.3. Fixed Temperature and Rate-of-Rise Devices
- 4.4. Smoke and Flame Detectors
- 4.5. Protective Signaling Devices
- 4.6. Auxiliary Fire Alarm Systems
- 4.7. Supervision of Fire Alarm Systems
- 4.8. Numerical Examples, Class Activities, and/or Homework Assignment

5. Portable Fire Extinguishers and Extinguishing Agents (Chapter 9)

- 5.1. Review of classes of fire
- 5.2. Types of agents used in portable fire extinguishers
- 5.3. Types of operating systems in fire extinguishers
- 5.4. Basic steps of fire extinguisher operation
- 5.5. Basic steps of inspecting, maintaining, recharging, and hydrostatic testing of fire extinguishers

6. Fixed Fire Protection and Suppression Systems (Chapter 9)

- 6.1. Categories of Fixed Fire Protection Systems
 - 6.1.1. Active and Passive Systems
- 6.2. Sprinklers and Types of Sprinkler Systems
- 6.3. Sprinkler Systems Standards
- 6.4. Design Considerations for Sprinkler Systems
- 6.5. Sprinkler Heads and Types
- 6.6. Advantages and Disadvantages of Sprinkler Systems
- 6.7. Numerical Examples, Class Activities, and/or Homework Assignment

7. Midterm Exam

8. Winter Recess
9. **Electrical Ignition and Fire Explosions (Chapter 3 & 4)**
 - 9.1. Electrical Ignition Process
 - 9.2. Static Electricity
 - 9.3. Types of Explosions and Explosives
 - 9.4. Shock Wave Effects
 - 9.5. Explosion By Source
 - 9.6. Blast Effects and Damage Potential
 - 9.7. TNT Equivalence and Baker-Strehlow Methods
 - 9.8. Countermeasures for Explosions
 - 9.9. Numerical Examples, Class Activities, and/or Homework Assignment
10. **Fire Protection Requirements in Building Design and Construction (Chapter 5)**
 - 10.1. Types of Construction
 - 10.2. Types of Fire Walls
 - 10.3. Fire Protection of Building Elements
 - 10.4. Interior Finishes
 - 10.5. Structural Integrity During a Fire
 - 10.6. Fire Doors
 - 10.7. Lightning Protection
 - 10.8. Numerical Examples, Class Activities, and/or Homework Assignment
11. **Life Safety in Fire Situations (Chapter 6)**
 - 11.1. Assessment of Life Safety
 - 11.2. Life Safety Codes
 - 11.3. Confinement of Fire in Buildings
 - 11.4. Smoke Management in Buildings
 - 11.5. Vent Practices (Non-Sprinklered Buildings)
 - 11.6. Evacuation and Exit Requirements
 - 11.7. Challenges of Life Safety
 - 11.8. Numerical Examples, Class Activities, and/or Homework Assignment
12. **Prevention and Control of Fire and Explosion Hazards**
 - 12.1. Types of Fire and Explosion Hazards
 - 12.2. Burns (1st, 2nd, and 3rd Degree)
 - 12.2.1. Electrical, Chemical and Thermal Burns
 - 12.3. Inhalation injury
 - 12.4. Radiation Injury
13. **Fire Program Management (Chapter 10)**
 - 13.1. Hazard identification fire protection strategy
 - 13.2. Active or passive Emergency response plan (OSHA CFR 1910.38)
 - 13.3. Fire Brigades (OSHA 1910.156)
 - 13.4. Chemical Process Safety Management (OSHA CFR 1910.119)
 - 13.5. Maintenance of fire protection systems
 - 13.6. Fire Inspections
14. **Finals Week**

Course/Term Paper Requirements:

Each individual will choose and submit a term paper on a fire protection/safety science problem or fire safety equipment or analysis discussed in the course or a real life fire protection science problem (from the course or any other relevant source). SEE GUIDELINES FOR THE FINAL PAPER ON MOODLE. Guidelines for writing research papers and expectations for completion of technical papers are available on [MOODLE](#). The course term paper will be due on **Monday April 16, 2018 by 11:59pm (EST) on MOODLE (No Extension)**. The grading rubric shown below would be applicable to the chosen topic of interest. References should be listed at the end of your paper and documented in the following APA format: Author (should be listed in alphabetical order by last name), Title of the book or article (month and year published), publication it came from (or publisher if it is a book), page numbers of the article. Throughout your paper, please note author and year in the location where the borrowed information or text shows up. **All students MUST submit an electronic copy (Word Document ONLY) via MOODLE (Course/term paper submission folder) on Monday April 16, 2018 by 11:59pm (EST). Submissions made after 11:59pm (EST) will not be accepted.**

ALL ESSAYS SUBMITTED IN THIS CLASS MUST BE ACCOMPANIED BY PAGE 10 OF THE DOCUMENT (RELEASE AND AUTHORIZATION).

Sample Grading Rubric for Course Paper (200 Points – 20% Maximum)

Category	Maximum Point
Title: Does the title indicate (clearly & sufficiently) what the paper is about? Any relevance to the course work?	10
Introduction: Does the introduction section clearly and briefly describe the purpose, importance, and plan of the term paper? Does the rest of the paper follow through from this introduction?	20
Content: Does the paper provide a complete and accurate discussion of the topic using examples from the literature? Is the experimental design adequate enough? Are there empirical analysis indicating new areas of concentration? Does it demonstrate critical thinking when evaluating ideas? Are the conclusions explained and backed by reasons?	100
Conclusion: Are the main points summed up? Are the conclusions related to the importance of the study? Are some wider implications drawn from this study?	20
Organization: Does the paper follow the proposed outline? Does it provide an historical perspective on the problem, and a chronological description of events leading up to the current day? Does it discuss the current status of the issue and the outlook for the future, indicating what additional work of research needs to be done?	10
Quality of writing: Is the paper written in a technical format? Are the sentences clear? Do they flow in logical order to make a persuasive case?	10
Spelling: Are there spelling errors in the text? Any grammatical errors, typos or incomplete sentences?	10
Citations: Are in-text citations appropriately used to credit all material from other sources?	10
Bibliography: Are all citations listed? Are they appropriately distributed among web sites (no more than 3), peer reviewed journals (at least 3), and other sources? Is the appropriate format followed? Any false citations?	10
Total Points	200

Methods of Class Communication:

All questions, concerns or feedbacks should be expressed through the communication tab on Moodle or feel free to send an email to the Course Professor - Dr. Olawoyin (olawoyin@oakland.edu) or call 248-364-8653

Recommended email format:

Dr. Olawoyin,

My name is XYZ from your EHS 3330 class; I am having problems with the homework assignment. I will appreciate if you can explain this better.

Thank you.

XYZ

Note: Improperly written emails that do not meet professional standards WILL NOT be responded to by the Course Professor.

Make-up Policy:

All students will turn in assignments and exams on the dates listed in the syllabus. Zero points will be awarded for any late assignments or missed quizzes, and missed exams unless prior arrangements have been made with the Course Professor. Make-up quizzes will not be allowed except with a prior approval from the Course Professor.

Proctoring of Exams:

All examinations in this class will be proctored by ProctorU. Please make adequate accommodations for the examination proctoring fees. ProctorU is a live online proctoring service that allows you to take your exam from the comfort of your home. ProctorU is available 24/7, however you will need to schedule your proctoring session at least 72 hours in advance to avoid any on demand scheduling fees. Creating a ProctorU account is very simple. All you will need to do is visit <http://proctoru.com/portal/oakland>.

ProctorU also provides free technical support to ensure you have the best testing situation possible. That is available at www.proctoru.com/testitout. On this page you will also be able to test your equipment, learn about what to expect during your proctoring session, and ask any questions you may have about the proctoring process with a ProctorU representative.

In order to use ProctorU you will need to have a high-speed internet connection, a webcam (internal or external), a windows or apple Operating System, and a government issued photo id. ProctorU recommends that you visit proctoru.com/testitout prior to your proctoring session to test your equipment. For additional technical services needed before your exam, you can click on the button that says "connect to a live person."

Oakland University Portal Page

url: <http://proctoru.com/portal/oakland>

Test Taker Walk Through Video

url: <https://vimeo.com/107066503>

Code of Conduct for Oakland University Students:

The Code of Conduct describes behaviors that are inconsistent with the essential values of the University community. Intentionally attempting or assisting in these behaviors may be considered as serious as

engaging in the behavior. A person commits an attempt when, with intent to commit a specific violation of the Code of Conduct, he/she performs any act that constitutes a substantial step toward the commission of that violation. For more detailed information on Code of Conduct for OU students consult: <http://www.oakland.edu/?id=24228&sid=482>

Academic Integrity:

Students must be aware that the consequences of violating standards of academic integrity are extremely serious, and costly and may result in the loss of academic and career opportunities. Students found to have committed violations of academic integrity may face removal from university classes and degree programs, and/or suspension from the university, while remaining fully responsible for payment of current and any past due tuition and fees. Take care to follow approved methods of citing references in all written work. Ensure you adequately use <http://turnitin.com/> or any other source appropriately. **IT IS NOT ACCEPTABLE FOR STUDENTS IN THIS OR ANY CLASS TO TURN IN WORK PREPARED BY SOMEONE ELSE, OR ANY OTHER WORK THAT THE STUDENT COMPLETED FOR A DIFFERENT CLASS. ALL ESSAYS SUBMITTED IN THIS CLASS MUST BE ACCOMPANIED BY PAGE 10 OF THE DOCUMENT (RELEASE AND AUTHORIZATION).** EHS 3330 adopts OU's academic integrity policy. For further information, please visit the Oakland University's website on academic integrity issues:

For General Information:

<https://www.oakland.edu/?id=28413&sid=522> Go to plagiarism, attendance and grading policies

Student code of conduct

For the University's ordinances and Regulations, please check the website below:

<http://www.oakland.edu/?id=24410&sid=482>

Student's Freedom of Expression:

All students are strongly encouraged to participate in class activities. In any classroom situation that includes discussion and critical thinking, there are bound to be many differing viewpoints. These differences enhance the learning experience and create an atmosphere where students and Professor alike will be encouraged to think and learn. On sensitive and volatile topics, students may sometimes disagree not only with each other, but also with the Professor. All major questions or concerns should be directed to the Course Professor (during office hours). It is expected of all students to respect the views of others when expressed during online discussions and throughout the duration of the course. There WILL be zero tolerance for disrespect and academic dishonesty in this course.

Please visit the website below for more information on Student Rights & Principles of Freedom

<http://www.oakland.edu/?id=24226&sid=482>

Retention of work:

All work submitted becomes property of the Environmental Health and Safety Program and may be retained for display, web posting, teaching, accreditation and research purposes.

Syllabus change:

The course professor reserves the right to modify, alter, delete, add to and otherwise change the content of this syllabus or calendar at any time during the semester. Students will be notified by Moodle "NEWS" Notification, email, and/or in class announcement.

RELEASE AND AUTHORIZATION

In consideration of action taken by Oakland University to detect plagiarism, I grant to Oakland University a non-exclusive, royalty free license to make a copy of my work submitted for this class and have it checked for plagiarism. Checking for plagiarism may include submitting the work to a plagiarism detection service. I authorize the plagiarism detection service to include my work in its database to facilitate the subsequent detection of plagiarism by other individuals. I understand that my work will be used only to facilitate the detection of plagiarism and will not be used for any other commercial purposes without my further written consent. I, as the author, retain all other rights to my work. I acknowledge that I am not required to provide this Release and Authorization and that if I do not agree to have my work submitted to a plagiarism detection service, I may be given an alternate, equivalent assignment.

I read the above, understood what I read, and agree with the terms of the Release and Authorization.

Student's Signature:

Student's Name (please print):

Date:

Or you can submit a recent Oakland University [Plagiarism certificate](#).

STATEMENT OF AGREEMENT

I, understand the contents of the syllabus and I am responsible for all assignments, tests, and any other activities stated and understand all due dates for assignments, exams, and any other activities in the syllabus for the course EHS 3330 – Fire Protection and Prevention, Winter 2018.

Sign:

Date: