

# AME 513a

## Fundamentals and Applications of Combustion

Fall 2021, OHE 100C, MW 1:30-3:20 pm

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Office Hours: Anytime by appointment

**Teaching Assistant:** TBD

### References:

1. Combustion Physics, by C.K. Law, 1<sup>st</sup> Edition, Cambridge University Press, 2006, (required).
2. Unpublished notes updated yearly, by C.K. Law & F.N. Egolfopoulos (will be provided).
3. Combustion Theory, by Forman A Williams, 2<sup>nd</sup> Edition, Addison-Wesley, 1985.
4. Combustion, Flames, and Explosions of Gases, by Bernard Lewis and Guenther von Elbe, 3<sup>rd</sup> Edition, Academic Press, 1987.
5. Combustion, by Irvin Glassman, 3<sup>rd</sup> Edition, Academic Press, 1996.
6. An Introduction to Combustion, Concepts and Applications, by Stephen R. Turns, 2<sup>nd</sup> Edition, McGraw-Hill, 2000.
7. Molecular Theory of Gases and Liquids, by Joseph O. Hirschfelder, Charles F. Curtiss, and R. Byron Bird, 2<sup>nd</sup> Edition, John Wiley & Sons, 1963.
8. Physical Chemistry, by P.W. Atkins, 4<sup>th</sup> Edition, W.H. Freeman and Company, New York, 1990.
9. Chemical Kinetics, by Keith Laidler, 3<sup>rd</sup> Edition, Harper and Row, 1987.
10. Chemical Kinetics of Gas Reactions, by V.N. Kondrat'ev, Pergamon Press, 1964.
11. Physical Chemistry of Fast Reactions, Volume 1, Gas Phase Reactions of Small Molecules, edited by B.P. Levitt, Plenum Press, 1973.
12. Thermochemical Kinetics, by Sidney W. Benson, John Wiley & Sons, 1968.

### Topics:

Introduction; Chemical Thermodynamics; Chemical Kinetics; Transport Phenomena; Conservation Equations; Non-Premixed Flames; Premixed Flames; Aerodynamics of Laminar Flames; Environmental Impacts of Combustion

### Dates:

Monday August 23: First class meeting  
Wednesday December 1: Last class meeting

### Grading:

Midterm Exam	October 20, 2021 (W)	(1:45 pm - 3:15 pm)	35% of grade
Final Exam	December 15, 2021 (W)	(11:00 am - 1:00 pm)	35% of grade
Homework			30% of grade

**Note:** The use of laptops or cell phones to access the internet/e-mail during class and/or exams is not allowed. Such devices are allowed only to access material pertaining to the course.