Course Syllabus

(This is a preliminary document, the final version will be provided during the first week of classes)

1. Course Information

AE/ME 6766 **Combustion** (~ 3hrs/week) **Spring Term 2026**

Mondays : **(to be confirmed)**

Wednesdays : **(to be confirmed)**

2. Instructor & Grader Information

Instructor & Grader: Dr. Louis SATYANARAYAN Ph.D.

Email : Louis.Satyanarayan@georgiatech-metz.fr

Office Room Number: 226

Office Hours (by appointment): Tuesdays: 11:00AM – 12:00PM **To be confirmed**

Thursdays: 11:00 AM – 12:00 PM

I am always available for short questions or concerns just after class.

If required you may also send an email to make an appointment or come directly to my office in the slots given above.

3. Pre &/or CoRequisites

Pre-requisites:

- Consult GTA academic office

(highly desirable to have):

- ME 3340 Fluid Mechanics
- MATH 2401 Calculus III (C or better), and
- MATH 2403 Differential Equations (C or better)
- ME 3322 Thermodynamics

4. Textbook:

1. Stephen Turns, An Introduction to Combustion: Concepts and Applications, 3rd edition

Additional Texts:

2. Irvin Glassman et al., Combustion, 3rd -5th editions

5. Syllabus/Topics covered/Scheme

Course Overview

No.	Chapter / Title	Description
1	Chapter 1	Introduction to Combustion + Overview
2	Chapter 2	Chemical Kinetics
3	Chapter 3	Coupled Chemical and Thermal Analysis
4	Chapter 4	Conservation (Transport) Equations, Multi-Component, Reacting Fluids
5	Chapter 5	Premixed Combustion: 1-d Combustion Waves
6	Chapter 6	Planar Detonations
7	Chapter 7	Laminar Premixed Flames (Deflagrations)
8	Chapter 8	Ignition
9	Chapter 9	Laminar Nonpremixed Combustion
10	Chapter 10	Introduction to Turbulent Combustion
11	Chapter 11(optional)	Experimental Combustion & analysis

6. Course Outcomes:

Outcome 1: To develop a student's understanding of the fundamentals of combustion.

Outcome 2: To develop a student's skills in analyzing premixed and non pre-mixed combustion processes

Outcome 3: To develop a student's skills in analyzing laminar and turbulent combustion processes

7. Correlation between Course Outcomes and Student Outcomes:

AE/ME 6766											
	Mechanical Engineering Student Outcomes										
Course Outcomes	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
Outcome 1.1	**x**				**x**						**x**
Outcome 1.2	**x**				**x**						**x**
Outcome 2.1	**x**				**x**						**x**
Outcome 2.2	**x**				**x**						**x**
Outcome 3.1	**x**				**x**						**x**
Outcome 3.2	**x**				**x**						**x**

8. GWW School of Mechanical Engineering Student Outcomes:

a. an ability to apply knowledge of mathematics, science and engineering
b. an ability to design and conduct experiments, as well as to analyze and interpret data
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
d. an ability to function on multidisciplinary teams
e. an ability to identify, formulate, and solve engineering problems
f. an understanding of professional and ethical responsibility
g. an ability to communicate effectively
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. a recognition of the need for, and an ability to engage in life-long learning

j. a knowledge of contemporary issues
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

9. GT Academic Honor Code

As usual the GT Academic Honor Code is followed for this class. Please check this link for clear information : http://www.honor.gatech.edu/plugins/content/index.php?id=9