

# Course Syllabus

**(This is a preliminary document, the final version will be provided on the first week of the spring 2027 semester)**

## 1. Course Information

|                             |                                 |                         |
|-----------------------------|---------------------------------|-------------------------|
| <b>AE/ME 6766</b>           | <b>Combustion</b> (~ 3hrs/week) | <b>Spring Term 2027</b> |
| <b>Mondays/Tuesdays</b>     | : <b>(to be confirmed)</b>      |                         |
| <b>Wednesdays/Thursdays</b> | : <b>(to be confirmed)</b>      |                         |

## 2. Instructor & Grader Information

|                                |                                                                                                    |
|--------------------------------|----------------------------------------------------------------------------------------------------|
| Instructor & Grader:           | Dr. Louis SATYANARAYAN Ph.D.                                                                       |
| Email :                        | <a href="mailto:Louis.Satyanarayan@georgiatech-metz.fr">Louis.Satyanarayan@georgiatech-metz.fr</a> |
| Office Room Number:            | 226                                                                                                |
| Office Hours (by appointment): | Tuesdays: 11:00AM – 12:00PM <b>To be confirmed</b><br>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

## 4. Textbook:

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

### **Additional Texts:**

2. Irvin Glassman et al., Combustion, 3<sup>rd</sup> -5<sup>th</sup> 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 <sub>(optional)</sub> | Experimental Combustion & analysis                                   |
|     |                                  |                                                                      |