Course Syllabus

(NOTE: This is a preliminary draft of the course syllabus. The final version will be provided at the end of the first week of classes)

1. Course Information

ME 3322		Thermodynamics [We will have 2 classes (~3 hrs total)/week]
Mondays/Tuesdays	**:**	**~1 hour 15 minutes**
Wednesdays/Thursdays	**:**	**~1 hour 15 minutes**
NOTE :Days and time table	:	will be confirmed before the start of the classes

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):	Mondays/Wednesdays: 11:00AM – 12:30PM
	Tuesdays/Thursdays: 03:30 PM – 05:30 PM

3. General Information

- *Course Outline: ME 3322 THERMODYNAMICS*
  Introduction to thermodynamics. Thermodynamic properties, energy and mass conservation, entropy and the second law, and second law analysis. Thermodynamic analysis of power, refrigeration, and heat pump systems; vapor cycles and gas cycles.

4. Pre &/or Co-Requisites

Please confirm with the Academics Office

Suggested Pre-requisites:

- PHYS 2211 Intro Physics I and
- MATH 2403 Differential Equations

5. Textbook:

Michael J. Moran, Howard N. Shapiro, Daisie D. Boettner, and Margaret B. Bailey, Fundamentals of Engineering Thermodynamics, 6 th/7th Edition, John Wiley & Sons, 2011.
(SI Units)

6. Syllabus/Topics covered

Objective	To teach the basic principles and provide a working knowledge thermodynamics and associated physical processes, with emphasis on practical applications.

Course Overview

No.	Chapter Name	Description
1	Definitions	Property, state, closed and open systems, temperature, pressure, work interactions, and heat transfer. State postulate.
2	Forms of energy	Kinetic, potential, and internal.
3	Properties of pure substances	Equilibrium diagrams, and quality. Ideal gas and incompressible substances.
	Quiz 1	
4	Conservation of mass	Closed and open systems, and steady and transient processes.
5	Conservation of energy	Closed and open systems, and steady and transient processes.
6	Introduction to the second law	Entropy, Tds equations, irreversibility, and isentropic efficiency
	Quiz 2	
7	Second law analysis	Closed and open systems, and steady and transient processes.
8	Power, refrigeration, and heat pump systems	Vapor cycles (e.g., ideal, Rankine, and vapor-compression); and air standard analysis of gas cycles (e.g., ideal, Brayton, Otto, and diesel).
9	Additional second law topics (with practical applications)	Kelvin-Planck and Clausius statements, the Clausius inequality, and exergy (availability)
	Quiz 3	
10	Optional topics (with practical applications)	Methods to improve cycle performance, including reheat, regeneration, and intercooling.
	Final Exam	