

**ATILIM UNIVERSITY**  
**DEPARTMENT OF MANUFACTURING ENGINEERING**  
**2015 – 2016 SPRING SEMESTER**  
**MFGE 214 INTRODUCTION TO THERMOFLUIDS (3 Credits)**  
**COURSE OUTLINE**

**Instructor** : Asst. Prof. Dr. Levent ÇOLAK ([lcolak@baskent.edu.tr](mailto:lcolak@baskent.edu.tr))  
**Office/Tel/Web** : D - 321 / 246 66 66 - 1355 / <http://www.baskent.edu.tr/~lcolak>  
**Course Hours** : Monday 14:30 - 17:20 (B - 1015)  
**Text Book** : **Introduction to Thermal and Fluid Engineering (International Edition)**  
**D. A. KAMINSKI & M. K. JENSEN - WILEY, 2005.**  
**Supplements** : 1- Fundamentals of Thermal Fluid Sciences 3rd ed.  
ÇENGEL & BOLES – MCGRAW HILL, 2008.  
2- Principles of Engineering Thermodynamics 7th ed. SI Units  
MORAN, SHAPIRO, BOETTNER & BAILEY - WILEY, 2012.  
3- Introduction to Fluid Mechanics, 7<sup>th</sup> ed.,  
FOX, MCDONALD & PRITCHARD - WILEY, 2011.

Week	Date	Subjects and Related Sections
#1	15 Feb. – 19 Feb.	<b>Introduction to Thermal and Fluids Engineering;</b> Basic Concepts, Thermodynamics, Heat Transfer, Fluid Mechanics, Definitions of Property, System, Boundary, State, Process, Cycle (1.1 - 1.5)
#2	22 Feb. – 26 Feb.	<b>The First Law of Thermodynamics;</b> Definitions of Energy, Power, Work and Heat, The Pizza Procedure for Problem Solving (2.1 – 2.14)
#3	29 Feb. – 04 Mar.	<b>Thermodynamic Properties;</b> Properties of Pure Substances, Equation of State for Gases, Real Gases, Compressibility Factor, Ideal Gases, Specific Heat of Ideal Gases (5.1 – 5.7 & 2.6 & 2.11)
#4	07 Mar. – 11 Mar.	<b>Thermodynamic Properties;</b> Energy Analysis of Closed Systems by Using Tables for Evaluating Properties (Problems of Chapters 2 & 5)
#5	14 Mar. – 18 Mar.	<b>Conservation of Mass and Energy for an Opens System;</b> Definition of Mass Flowrate (4.4 – 4.5)
#6	21 Mar. – 25 Mar.	<b>Applications of the Energy Equation to Open Systems;</b> Problems for SSSF (Steady) and USUF (Transient) Processes (6.1 – 6.8)
#7	28 Mar. – 01 Apr.	<b>Thermodynamic Cycles and The Second Law;</b> Definition of Thermodynamic Cycles, Efficiency and COP Concepts for Cycles, Carnot Cycle, (7.1 – 7.5)
#8	04 Apr. – 08 Apr.	<b>Thermodynamic Cycles and The Second Law;</b> Basic Concepts, Definition of Entropy, Reversible and Irreversible Process (7.6 - 7.9)
#9	11 Apr. - 15 Apr.	<b>Thermodynamic Cycles and The Second Law;</b> Entropy Balances for Open and Closed Systems (7.10 - 7.11)
#10	18 Apr. – 22 Apr.	<b>Thermodynamic Cycles and The Second Law;</b> Second law Analysis of Turbines and Pumps, Definition of Isentropic Efficiency (7.12)
#11	25 Apr. - 29 Apr.	<b>Fundamentals of Fluid Mechanics;</b> Fluid Statics, Pressure, Force, Buoyancy (4.2)
#12	02 May - 06 May	<b>Fundamentals of Fluid Mechanics;</b> The Bernoulli Equation and Applications (4.6)
#13	09 May – 13 May	<b>Fundamentals of Fluid Mechanics;</b> Conservation of Linear Momentum for an Open System (4.8)
#14	16 May – 20 May	<b>Internal Flows;</b> Basic Concepts, Laminar and Turbulent Flow (9.4)
#15	23 May – 27 May	<b>Internal Flows;</b> Head Loss, Pressure Drop in Pipes (9.5 & 9.6)

**GRADING**

Homeworks	Quizzes	Mid-Term Exams	Final Exam	Total Grade
10 %	15 %	40 %	35 %	100 %

**Note:** Midterm exam dates (MT # 1 and MT # 2) will be announced later.