Fundamentals of Heat Transfer

Course Code			
Class Times	Mon/Wed/Thu Type B (13:00~16:00)	**Classroom**	Bldg
Equivalent Year Level	3	**Course Credit**	3

Instructor	Prof. Yun Seog Lee	**Sessions**	15 (45 class hours)
Office	Rm. 301-1505	**Email**	leeyunseog@snu.ac.kr

❑Instructor's Profile

Name: Yun Seog Lee

Prof. Yun Seog Lee is an Assistant Professor in Mechanical Engineering Department at Seoul National University. He received his B.S. degree from Seoul National University in 2006, M.S. degree from Stanford University in 2007, and Ph.D degree from Massachusetts Institute of Technology (MIT) in 2013. From 2013 to 2014, he worked as a postdoctoral researcher at the Photovoltaics Research Laboratory at MIT. From 2014 to 2017, he worked as a research staff member at the IBM Thomas J. Watson Research Center, where he received the IBM Invention Plateau Awards and the IBM Research Outstanding Accomplishment Award. His research interests include novel materials and innovative nano-scale manufacturing technologies for high-performance thin-film solar cells.

Education

Ph.D. in Mechanical Engineering, Massachusetts Institute of Technology, USA (2013)
M.S. in Mechanical Engineering, Stanford University, USA (2007)
B.S. in Mechanical and Aerospace Engineering, Seoul National University, Korea (2006)

Professional Experience

- **Seoul National University**, Korea
  Assistant Professor, Department of Mechanical and Aerospace Engineering
  (2017 –Present)
- **IBM T. J. Watson Research Center**, USA
  Research Staff Member, Semiconductor Technology Research (2015 –2017)
  Postdoctoral Researcher, Physical Science Division (2014 – 2015)
- **Massachusetts Institute of Technology**, USA
  Postdoctoral Research Associate, Laboratory for Manufacturing and Productivity
  (2013 – 2014)
- **Bosch Research and Technology Center**, USA, Research Intern (2011)

Research Interest

Energy Conversion and Storage; Solar Cells; Semiconductor Materials and Devices; Advanced Manufacturing; Thin-Film Mechanics; Defect Engineering

❑Course Information

Course Description	This course is an introduction to the principal concepts and fundamental methods of heat transfer processes. The objectives of this course include (1) understanding the fundamental principles and laws of heat transfer, (2) formulating the simple models necessary to study, analyze and design heat transfer systems, and (3) developing the problem-solving skills that can be applied to real-world applications. Specific topics to be covered in the course are Fourier's law, thermal resistance model, fins, lumped capacitance model, heat exchangers, etc. Students will have the opportunity to improve abilities to engineer heat transfer systems. These outcomes will be demonstrated through an assessment of homework assignments and exams.
Course Evaluation	Homework, quiz, class participation 40% Midterm exam 30% Final exam 30% **Attendance** will be important for keeping up with class. Good attendance and **active participation** will be reflected in grade.
Course Materials	**Introduction to Heat Transfer** by Frank P. Incropera *et al*. (5^{th} Edition, ISBN-10: 0471457272)
Class Policy	*(Insert as necessary)*
Etc. *(e.g. Guidelines)*	Students are expected to read the chapters of the lecture.

❑ Course Schedule

Session	Description	
1	**Overview & Chapter 1. Introduction**	
2	**Chapter 2. Introduction to Conduction**	
3	**Chapter 3. One-dimensional, Steady-State Conduction**	
4	**Chapter 4. Two-dimensional, Steady-State Conduction**	
5	**Chapter 5. Transient Conduction**	
6	**Chapter 6. Introduction to Convection**	
7	***Mid-term Exam***	
8	**Chapter 7. External Flow**	
9	**Chapter 8. Internal Flow**	
10	**Chapter 9. Free Convection**	
11	**Chapter 10. Boiling and Condensation**	
12	**Chapter 11. Heat Exchangers**	
13	**Chapter 12. Radiation**	
14	**Chapter 13. Radiation Exchange Between Surfaces**	
15	**Final Exam**	