COURSE #: Vm421	**COURSE TITLE: Thermal-Fluids Systems Design**
TERMS OFFERED: Summer	**PREREQUISITES: Thermo I, Fluid Mech I, Heat Transfer**
TEXTBOOKS/REQUIRED MATERIAL: 1. Introduction to Thermo-Fluids Systems Design; A McDonald and H. L. Magande; Wiley 2. Thermal Design; HoSung Lee, Wiley 3. Design of Fluid Thermal Systems, W. S. Janna, Cengage Learning	**PREPARED BY:** Morteza Eslamian
INSTRUCTOR(S): Morteza Eslamian	**SCIENCE/DESIGN: Both**
CATALOG DESCRIPTION: The course is intended to broaden students' knowledge of some applied topics in thermal and fluid sciences, such as ducting, piping, heat exchangers, and solar energy.	**COURSE TOPICS:** In summary, the course will cover the following topics 1. Introduction (Thermal-fluids principles and Design concept) 2. Air distribution systems, including fan selection, system analysis, sizing and design 3. Piping including pump selection, analysis, sizing, design 4. Heat exchangers: fundamentals, double pipe, shell and tube and plate type heat exchangers 5. Heat exchangers and boiler design in a system. 6. Solar Energy: Basic principles of operation of solar thermal and photovoltaic solar cells
COURSE STRUCTURE/SCHEDULE: Two lectures per week, each 100 minutes	

COURSE OBJECTIVES	1. To provide the knowledge and experience necessary to understand and design thermal fluid system components 2. To provide the knowledge and experience needed to communicate ideas, progress, and results to others in an easy-to-understand and professional manner, and in multiple ways (written and graphical). 3. To provide experiences working together as a team to accomplish a common goal.
COURSE OUTCOMES	After completing this course, students should be able to: 1. Understand and apply the concepts of energy, energy saving, energy conversion in major thermal fluid components and systems 2. Identify, analyze and choose various components of major thermal fluid systems such as heat exchanger, pumps, fans, etc. 3. Design some simple thermal fluid components such as simple heat exchangers 4. Analyze, select and size thermal fluid system components, such as pumps, heat exchangers, etc. 5. Create a proposal for a design project. 6. Work effectively and professionally together in diverse teams.
ASSESSMENT TOOLS	Homework 20% Midterm exam: 40% and Final Exam 40% Peer evaluations