COURSE NUMBER: ME 4131W, 4 credits	**COURSE TITLE:** Thermal Environmental Engineering Laboratory
TERMS OFFERED: Fall and Spring Semester	**PREREQUISITES:** ME 4031W, Meas. Lab, ME 3333, Thermal Sciences III and ME upper div. or grad student.
TEXTBOOKS/REQUIRED MATERIAL: Text: Course Packet written by Kuehn and Ramsey References: "Thermal Environmental Engineering"3rd Edition, By T. H. Kuehn, J. W. Ramsey and J. L. Threlkeld, Prentice Hall 1998 ASHRAE Handbook Series	**PREPARED BY:** James W. Ramsey and Thomas Kuehn **DATE OF PREPARATION:** 3/14/2007
COURSE LEADER(S): T. H. Kuehn and J. W. Ramsey	**CLASS/LABORATORY SCHEDULE:** One 50 minute lecture session and one three hour laboratory session per week. **CONTRIBUTION OF COURSE TO MEETING PROFESSIONAL OBJECTIVES:** 100 % Engineering Topics
CATALOG DESCRIPTION: Experiments in psychrometrics, refrigeration, air-conditioning, solar energy, indoor air quality, and other topics related to refrigeration, building heating and cooling, and indoor air quality.	**COURSE TOPICS:** 1. Automated data acquisition. 2. Fan performance and duct air flow measurements. 3. Mixing of outdoor and return air, mixed air dampers, stratification. 4. Particulate filtration, particle sampling and measurement. 5. Refrigeration – walk-in cooler performance both steady and transient behavior. 6. Solar radiation instrumentation. 7. Flat-plate solar collector performance tests. 8. Heat exchanger performance. 9. Heating and humidifying or Cooling and dehumidifying system performance. 10. Room air flow, local ventilation, flow visualization techniques. 11. Small refrigeration system instrumentation and test.

COURSE OBJECTIVES	1. Function effectively in laboratory teams. 2. Teach the students to use automatic data acquisition systems. 3. Teach the students to write data acquisition and analysis software. 4. Teach students the behavior of actual heating, ventilating, air-conditioning, refrigeration and solar heating systems. 5. Allow students to operate real mechanical systems. 6. The comparison of theoretical and actual system performance. 7. Proper report writing and documentation skills, including proper referencing of source material, and the presentation of data and results. 8. Learn how to instrument a piece of equipment or system to obtain the desired performance characteristics.
COURSE OUTCOMES	**(Letters shown in brackets are linked to program outcomes a-k)** 1. Test & document the performance of real building mechanical systems. [a, b, d, j, k] 2. To operate potentially dangerous laboratory equipment in a safe manner. [b] 3. Select and install instrumentation appropriate to characterize a refrigeration system. [a, b, c, d, e, k] 4. Write effective laboratory reports. [b, f, g] 5. Write data acquisition software, e.g. in C or C+ code. [a, b, c, k] 6. To develop expertise in the operation of automatic data acquisition systems. [b, k] 7. To analyze the experimental data including an uncertainty analysis. [b, g] 8. Interpret experimental results and make comparisons with theoretical system performance predictions. [a, b] 9. Make recommendations regarding changes to improve the existing experimental procedure. [b, e, k]
ASSESSMENT TOOLS:	1. Laboratory data sheets. 2. Informal laboratory reports. 3. Formal laboratory reports. 4. Quizzes. 5. Lab participation.

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Nature of Changes:
This syllabus was reviewed in 2007 and no changes were made.