

# ARCE 665 -- Solar Energy Systems Design

Fall Semester 2008

*Meeting Time & Place:* TR 9:00 to 10:50 a.m., 120 Marvin Studios

*Instructor:* Brian A. Rock, Ph.D., P.E., Associate Professor, Fellow ASHRAE  
2134-D Learned Hall, Voice: 864-3603, E-mail: docrock@ku.edu

*Office Hours:* By appt., or whenever I'm in my office and the door is open! ☺

*Catalog Description:*

A quantitative and qualitative study of active, passive, wind, and photovoltaic energy conversion systems for buildings. Solar radiation and system performance prediction.

*Prerequisites:* ME 312, C&PE 221, or ARCE 561, or consent of instructor.

*References:* Class handouts.  
*A Golden Thread*, Butti and Perlin.  
*2005 Fundamentals volume of the ASHRAE Handbook*, I-P ed.  
+ many solar books (some in Spahr Engineering Library).

<i>Grading:</i>	Homework/Projects	90%	Final Grades:		
	Participation	<u>10%</u>	90% to 100%	=	"A"
	Total =	100%	80% to 89.9%	=	"B"
			70% to 79.9%	=	"C"
			60% to 69.9%	=	"D"
			Less than 60%	=	"F"

The homework assignments will each be graded on a 0 to 10 scale. Individual homework sets are due one week after assignment and are to be completed independently unless otherwise stated. Late homework loses 10% per calendar day or fraction thereof. Computer programming (in VisualBasic, Fortran, C++, ?) required. Advance written notice, acceptable physical proof, and verification are required for a class obligation to be rescheduled. Voluntary events are not accepted. Final scores may be curved up. Students assume the liability for personal injury during laboratory work. Do not perform any lab work without proper training, safety precautions, and/or supervision.

*Final Exam:* No "exam". However, the last assignment may be due at the end of the scheduled final exam period which is Monday, Dec. 15<sup>th</sup>, 7:30 - 10:00 a.m.

*Other:* Students are expected to abide by KU's academic integrity policies. Discovered violations are reported to CEAE and the Dean's Office. Penalties for academic misconduct range from receiving a zero on a particular assignment or exam to dismissal from the School or KU.

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**COURSE OBJECTIVES**

- ☞ To begin learning the language, philosophies, arts, and sciences which form the field of solar energy engineering
- ☞ To understand solar geometry, economics, and their effects on solar energy collection systems
- ☞ To introduce photovoltaic, wind, and other electrical energy collection and storage systems
- ☞ To investigate active and passive solar-thermal energy design
- ☞ To examine different materials for solar utilization attributes and liabilities
- ☞ To repair a full-scale working active solar energy collection system

**HOMEWORK / PROJECT REPORTS**

- √ Be neat. Rewrite if needed. See the example handout.
- √ Use engineering paper (front side only) for hand calculations, graph or computer paper for graphs, and appropriate paper for drawings and computer output.
- √ Show all calculations, units, conversions, and references. Show one complete sample calculation for repetitive calculations, but show all the results.
- √ Box the *final* answer (only!) for each problem. Provide a cover page with a summary or table of results for lengthy assignments.
- √ Staple pages together in the upper left-hand corner. Write your name on the outside and the inside.
- √ If less than 12 pages or so, fold lengthwise. If thicker, leave unfolded (flat).
- √ For assignments that require computer programming, turn in a hardcopy (printout) of your source code and your input and output files. Don't turn in a disc, or e-mail files, unless specifically requested.