

EECE325 Fundamentals of Energy Systems
Spring 2023

Course Information

CRN: 13717
 Title: Fundamentals of Energy Systems (4 crs)
 Class hours: MW 11:40 - 1:00 pm
 & M 1:10 - 2:00pm
 Classroom: LKD3105
 Course website: www.mwfr.com/325S23.html

Instructor Information

Instructor: Dr. Charles Kim
 Office/phone: LKD 3014 202-806-4821
 Email address: ckim@howard.edu
 Office hours: WR 1 - 3

Prerequisites or Co-requisites

Pre-requisite: Fundamentals of Circuits
Co-requisite: EECE326 Fundamentals of Energy
 Systems Lab

TEXTBOOKS AND OTHER RESOURCES

Required: Gilbert Masters, *Renewable and Efficient Electric Power Systems*, John Wiley & Sons, Hoboken, NJ, 2004

Supplementary: Sarma, *Electric Machines*, West publishing Co., 1996.

COURSE OUTLINE

- I. Power system review with phasors
- II. Electric power industry transition and distributed generation
- III. Wind power systems
- IV. Solar resources
- V. Photovoltaic materials and characteristics
- VI. Photovoltaic systems

COURSE REQUIREMENTS (*What must students do to fulfill the objectives?*)

- 1. Class Attendance
- 2. Active Participation
- 3. On-time submission of assigned work

COURSE POLICIES

Grading

Assignments.....30 %
 Essay (Socially Responsible Engineering)10%
 Exam 120%
 Exam 2.....20%
 Final Exam20%
 On-time arrival5%

Late Submission: Max points 10% reduced each day of late submission after the due date

Course Grades:

A: $\geq 90\%$, B: 80 – 89%, C: 70 – 79%
 D: 60 – 69%, F: $< 60\%$

Academic honesty and integrity AND student code of conduct

You are expected to adhere to the student code of conduct in academic honesty and integrity. Giving or receiving help in assignments, exams, and any other required course submissions is cheating and violation of the code. If you are caught in the cheating, your score of the submission is automatically zero. Further disciplinary action may follow.

COURSE SCHEDULE (subject to change)

<i>Date</i>	<i>Topic</i>	<i>Assignment</i>
Week 1	Class kick-off	
Week 2	Phasor System	
Week 3	Single-Phase Systems	
Week 4	Three-Phase Systems	
Week 5	Power Industry in transition	
Week 6	Material Balance and Cost Parameters	
Week 7	Generation Mix and Energy Cost	Exam 1
Week 8	Spring Break	
Week 9	Power in the wind	
Week 10	Average Power and Wind Turbine Efficiency	
Week 11	Wind Energy Calculation	
Week 12	Solar Radiation and Average Daily Insolation	Exam 2
Week 13	Peak sun and PV energy	
Week 14	PV cell and PV module	
Week 15	PV system design I	
Week 16	PV system design II	
		Exam 3