1/23/15	DATE	Technology	DIVISION
	REQUIRED COURSE	X	NEW COURSE
X	ELECTIVE COURSE		REVISION

LAKE LAND COLLEGE
Course Information Form

COURSE NUMBER EET 068 TITLE Photovoltaic Systems
SEM CR HRS 3 LT HRS 2 LAB HRS 2 SOE HRS ____ ECH 3.6
COURSE PCS # _____(Assigned by Administration)

PREREQUISITE: EET 040, EET 050

CATALOG DESCRIPTION: This course is designed to provide a technical foundation for design, installation, and evaluation of residential and commercial photovoltaic systems. Concepts of system advantages and disadvantages, site evaluation, system design and sizing are assessed.

CONTENT OUTLINE	LECTURE HOURS	LAB HOURS
Introduction to Photovoltaic Systems	2	2
Solar Radiation	2	2
Site Survey & Preplanning	2	2
System Components & Configuration	2	2
Cells, Modules, and Arrays	2	2
Batteries	2	2
Charge Controllers	2	2
Inverters	2	2
System Sizing	2	2
Mechanical Integration	2	2
Electrical Integration	2	2
Utility Interconnection	2	2
Permitting and Inspection	2	2
Maintenance & Troubleshooting	2	2
Economic Analysis	2	2
TOTAL	**30**	**30**

EVALUATION: Quizzes X Exams X Oral Pres. ____ Papers X
Lab Work X Projects X Comp. Final X Other ____

TEXTBOOK: Title Photovoltaic Systems
Publisher American Technical Publishers
Volume/Edition 2nd
Copyright Date 2011

Major Course Segment	Lecture/Lab Hours	Learning Outcome The student will be able to:
Introduction to Photovoltaic Systems	2/2	Evaluate the design priorities for PV systems in different types of applications.
Solar Radiation	2/2	Describe solar power and solar energy. Understand the factors affecting the suns apparent path through the sky.
Site Survey & Preplanning	2/2	Explain the process of determining potential array locations.
System Components & Configuration	2/2	Identify the common types of energy storage systems. Compare the functions of various power conditioning devices.
Cells, Modules, and Arrays	2/2	Identify the relationships between PV cells, modules, and arrays.
Batteries	2/2	Evaluate the major components of batteries and the function of each component.
Charge Controllers	2/2	Identify the principle functions and features of charge controllers. Define charge regulation and load control set points.
Inverters	2/2	Identify basic waveform types and properties. Explain the basic types of inverters in PV systems.

System Sizing	2/2	Describe the system energy and power requirements from a load analysis. Calculate critical design parameters, size and configuration.
Mechanical Integration	2/2	Summarize the key factors involved in choosing a mounting system. Describe the various types of attachment methods.
Electrical Integration	2/2	Calculate the voltage and current limits for various circuits of a PV system. Describe the required types of disconnects and their installation.
Utility Interconnection	2/2	Identify the applicable codes and standards for utility interconnection. Identify the common issues addressed in interconnection agreements for small PV systems.
Permitting and Inspection	2/2	Explain building codes and code enforcement in electrical installations. Describe the common requirements for permit applications.
Maintenance, & Troubleshooting	2/2	Identify the maintenance task involved with maximizing array output, battery health, and other equipment operation. Develop a maintenance plan based on system configuration.
Economic Analysis	2/2	Describe how present and future cost are calculated. Compare energy production systems based on total life cycle cost.

Course Outcomes: At the successful completion of this course, students will be able to:

- Evaluate the design priorities for PV systems in different types of applications.
- Evaluate how array orientation affects solar energy received by modules.
- Evaluate the design priorities for PV systems in different types of applications.
- Identify the relationship between PV cells, modules, and arrays.
