DESIGN OF PHOTOVOLTAIC SYSTEMS

PROF. L UMANAND
Department of Electrical, Electronics and Computer Science Engineering
IISc Bangalore

PRE-REQUISITES : Electric Circuits

INTENDED AUDIENCE : BE ME

COURSE OUTLINE :

This course is a design oriented course aimed at photovoltaic system design. The course begins by discussing about the PV cell electrical characteristics and interconnections. Estimation of insolation and PV sizing is addressed is some detail. Maximum power point tracking and circuits related to it are discussed. Later, applications related to peltier refrigeration, water pumping, grid connection and micro grids are discussed in detail. Lastly a brief discussion on life cycle costing is also discussed in order to bring in a measure of completeness to the course.

ABOUT INSTRUCTOR :

Prof. L. Umanand is a faculty at the Department of Electronics System Engineering of Indian Institute of Science, Bangalore. He has been teaching, guiding and consulting in power electronic converters for more than two decades. His area of research are in power conversion, renewable energy systems and modelling.

COURSE PLAN :

WEEK-01 - THE PV CELL

WEEK-02 - SERIES AND PARALLEL INTERCONNECTION

WEEK-03 - ENERGY FROM SUN

WEEK-04 - INCIDENT ENERGY ESTIMATION

WEEK-05 - SIZING PV

WEEK-06 - MAXIMUM POWER POINT TRACKING

WEEK-07 - MPPT ALGORITHMS

WEEK-08 - PV-BATTERY INTERFACES

WEEK-09 - PELTIER COOLING

WEEK-10 - PV AND WATER PUMPING

WEEK-11 - PV-GRID INTERFACE-I

WEEK-12 - PV-GRID INTERFACE-II and LIFE CYCLE COSTING