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 in 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:
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

TYPE OF COURSE: Rerun | Elective | UG
COURSE DURATION: 12 weeks (26 July 2021 - 15 Oct 2021)
EXAM DATE: 24 Oct 2021