



## METALLURGICAL AND MATERIALS ENGG.

# SOLAR PHOTOVOLTAICS: PRINCIPLES, TECHNOLOGIES & MATERIALS

### PROF. ASHISH GARG

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IIT Kanpur



**TYPE OF COURSE** : New | Elective | UG/PG  
**INTENDED AUDIENCE** : BE/ME/MSc/PhD  
**PRE-REQUISITES** : Basic physics knowledge

**COURSE DURATION** : 8 weeks (28 Jan 19 - 22 Mar 19)

**EXAM DATE** : 31 March 2019

**INDUSTRIES APPLICABLE TO** : Most companies related to solar photovoltaic

### COURSE OUTLINE :

This course is an introductory course on solar photovoltaics materials and devices covering basic physics of materials as well as devices, various solar photovoltaic technologies and their status with a brief discussion of the fabrication aspects of the devices followed by discussion of the pending materials and technologies issues and measurement techniques.

### ABOUT INSTRUCTOR :

Ashish Garg is Professor of Materials Science and Engineering at IIT Kanpur. Details of his research and teaching can be accessed on <http://home.iitk.ac.in/~ashishg>

### COURSE PLAN :

- Week 01** : Introduction and Solar radiation fundamentals
- Week 02** : Basic physics of semiconductors
- Week 03** : Carrier transport, generation and recombination in semiconductors
- Week 04** : Semiconductor junctions
- Week 05** : Essential characteristics of solar photovoltaic devices
- Week 06** : First Generation Solar Cells
- Week 07** : Second Generation Solar Cells
- Week 08** : Third Generation Solar Cells