

Syllabus

Specialization in Photovoltaics

University of Northumbria

Module	CP	Title
Photovoltaic Cell and Module Technology	10	Semiconductor materials and characteristics Band theory and the absorption of light Carrier transport, mobility and diffusion Theory of the ideal diode Photocurrent and spectral response Behaviour of real diodes Effect of operating conditions on I-V characteristic Crystal growth and processing Thin film growth techniques Overview of cell and module design
Advanced Photovoltaic Cell Design	5	Overview of technology status Concentrator and multijunction concepts High efficiency cell designs Organic and polymer cells Advanced material and cell characterization
Economics, Policy and Environment	5	Economic theory and life cycle assessment Financing mechanisms Environmental impact assessment Historical market development and projections Government policies and market development schemes
Photovoltaic System Technology	10	Introduction to PV system design Grid connected systems – electrical design Grid connected systems – building integration Large ground based PV systems Inverters for PV systems Stand-alone PV systems – design and application PV systems for space applications Concentrator PV systems Assessment of system performance Quality assurance aspects