Tutorial on Thin Film Solar Cells

- **Period:** August 7(Tue) – August 9(Thu), 2012
- **Place:** Yeungnam University, CRC Building Rm 502
- **Instructors:**

1. Timothy J. Anderson, Distinguished Professor, Department of Chemical Engineering, University of Florida, 311 Weil Hall, P.O. Box 116550, Gainesville, Florida 32611-6550, USA, ph: (352) 392-0947, fax: (352) 392-9513, email: tim@ufl.edu

2. Angus Rockett, Professor, University of Illinois at Urbana Champaign, Department of Materials Science and Engineering, 201 Materials Science and Engineering Building, 1304 W. Green St., Urbana, IL 61801, USA, email: arockett@ad.uiuc.edu

- **Course Content:**

- Prerequisite: Basics of Materials Chemistry, Basics of Solid State Electronics

- Reference Text: Thin Film Solar Cells: Fabrication, Characterization and Applications, Jef Poortmans (Editor), Vladimir Arkhipov (Co-Editor), ISBN: 978-0-470-09126-5

Day 1 (August 7, Tuesday)

Lecture	Time period	Contents	Lecturer
1	10:00 – 10:50	Overview of Energy Generation, Solar Energy and Role of PV	T. Anderson
2	11:00 – 11:50	Introduction to PV Fundamentals : (1) Solar Radiation and Optical Absorption	T. Anderson
Lunch break			
3	13:00 – 13:50	Introduction to PV Fundamentals : (2) PV device and system - Inverters, review of diodes, recombination, generation,the main junction, detailed device physics	A. Rockett
4	14:00 – 14:50	Characterization	A. Rockett
5	15:00 – 15:50	Data analysis and modeling	A. Rockett
6	16:00 – 16:50	Modules, encapsulations, system design, accelerated lifetime testing & reliability	A. Rockett

Day 2 (August 8, Wednesday)

Lecture	Time period	Contents	Lecturer
1	09:00 – 09:50	Crystalline Si	A. Rockett
2	10:00 – 10:50	Crystalline Si	A. Rockett
3	11:00 – 11:50	Amorphous and microcrystalline Si	A. Rockett
Lunch break			
4	13:00 – 13:50	CdTe	T. Anderson
5	14:00 – 14:50	CdTe	T. Anderson
6	15:00 – 15:50	CIGS	T. Anderson
7	16:00 – 16:50	CIGS & CZTS	T. Anderson

Day 3 (August 9, Thursday)

Lecture	Time period	Contents	Lecturer
1	09:00 – 09:50	TCO's	T. Anderson
2	10:00 – 10:50	Third generation concepts	T. Anderson
3	11:00 – 11:50	OPV	A. Rockett
Lunch break			
4	13:00 – 13:50	Thin film nucleation & growth	A. Rockett
5	14:00 – 14:50	Thin film deposition: physical methods (evaporation/sputtering)	A. Rockett
6	15:00 – 15:50	Thin film deposition: chemical methods (CBD, CVD, nanoparticle)	T. Anderson
7	16:00 – 16:50	Concluding Remarks & Questions	A. Rockett/T. Anderson