# \*\* Photovoltaics Engineering Course \*\*

# Science and Technology of Solar Cell Fabrication

# Spring Session B 2015

### About the Course

This course will focus on the science and technology involved in the fabrication and manufacture of silicon solar cells and will provide students with an introduction to important manufacturing concepts such as device design, yields, throughput, process optimisation, reliability, in-line quality control and fault diagnosis. In this class, students will learn about: (i) the fabrication processes of the commercially-dominant screen-printed solar cells; (ii) the impact of various processing and device parameters on performance, yields and product reliability; and (iii) in-line, end-of-line and failure-analysis quality control techniques, and (iv) trends in commercial cell technology and the corresponding manufacturing processes. As a big component of the course, students will be given the opportunity to take control of their own "virtual solar cell production line" to adjust the equipment controls and processing parameters to try and optimise performance and maximise virtual production yields. In-line quality control procedures are available to the student to aid in this optimisation and will prove to be particularly useful in identifying and rectifying weaknesses or problems associated with the production.

Students in this course should have a good foundation in basic mathematics, statistics, physics and chemistry. The course will be open to senior/junior-level undergraduate and graduate-level students.

### About the Instructor

Dr. Jeff Cotter has been working in solar photovoltaics for 20+ years, including research and development, tertiary education and high-volume manufacturing. For the past 5 years, he was Director of the technology deployment team at Sunpower Manufacturing Limited, in the Philippines, where he and his team deployed Sunpower’s Gen II, 22.4% efficient silicon solar cell from R&D into high-volume production. The Gen II reached almost 1.0+ GW of annual production in 2011. Before joining Sunpower, he was an Associate Professor at the University of New South Wales, where he was a co-founder of the School of Photovoltaics and Renewable Energy Engineering – the world’s first undergraduate degree programs in Photovotaics and Renewable Energy.

Jeff also teaches “Manufacturing Science of Solar Cells” at ASU, and around the world.

### Questions about the course?

Email Jeff at [jecotter@asu.edu](mailto:jecotter@asu.edu)

 