**COLLIN COLLEGE**

**COURSE SYLLABUS**

Course Information

**Course Number**: SMFT 1371

**Course Title:** Fundamentals of Solar Cell Engineering

**Course Description:** The chemistry, device physics, and materials science of Photovoltaic Solar Cell technology which results in the production of electricity from sunlight is covered. An overview of the process flows used to manufacture solar cells, the resulting device characteristics, the variety of solar cell structures and the solid state electronics characterization of the, structures is presented. The course is taught from an engineering perspective using an appropriate level of mathematics for the engineering models presented. Lab required.

**Course Credit Hours:** 3

Lecture Hours: 2

Lab Hours: 3

**Prerequisite:** MATH 1314 or consent of Associate Dean.

**Student Learning Outcomes:** The student will develop an understanding of and apply the appropriate theoretical models to:

* + - 1. The basic chemistry, device physics, and materials science of solar cell Technology. (SCANS: F1-F5, F9, C1-C3, C11 – C19)
      2. The process flow of manufacture. (SCANS: F1-F5, F9, C1-C3, C11 – C19)
      3. Physical, electrical and optical solid state device characteristics. (SCANS: F1-F5, F9, C1-C3, C11 – C19)
      4. The variety of solar cell device structures (e.g. crystalline silicon, polycrystalline silicon, III-V compounds, multi-junction and multi-material cells). (SCANS: F1-F5, F9, C1-C3, C11 – C19)
      5. Battery technology. (SCANS: F1-F5, F9, C1-C3, C11 – C19)
      6. Solid state device characterization (SCANS: F1-F5, F9, C1-C3, C11 – C19)
      7. Solar cell device interconnection (SCANS: F1-F5, F9, C1-C3, C11 – C20)

**Secretary’s Commission on the Acquisition of Necessary Skills (SCANS)** - SCANS skills are a group of foundational skills and workplace competencies that the Secretary’s Commission on the Acquisition of Necessary Skills established as vitally important for workplace success in the 21st century. In Collin’s workforce programs, the SCANS skills are developed and reinforced throughout the curriculum to provide students with an opportunity to hone these skills/competencies in the context of their education. Over the course of an entire degree program, the successful student is expected to demonstrate all of the SCANS skills and competencies as part of their education. The SCANS Foundation Skills and Workplace Competencies are described at: <http://www.collin.edu/academics/programs/Workforce_SCANS_Skills_Syllabi_Code_Key.pdf>

**Withdrawal Policy:** See the current *Collin Registration Guide* for last day to withdraw.

**Collin College Academic Policies:** See the current *Collin Student Handbook.*

**Americans with Disabilities Act Statement:** Collin College will adhere to all applicable federal, state and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student’s responsibility to contact the ACCESS office, SCC-D140 or 972.881.5898 (V/TTD: 972.881.5950) to arrange for appropriate accommodations. See the current *Collin Student Handbook* for additional information.

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