University of Southern California
Department of Astronautics and Space Technology Division

Course Number & Title: Spacecraft Sensors, ASTE 554
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Time: Thursdays from 18:40 to 21:20

COURSE CATALOG DESCRIPTION:

This course presents a comprehensive review of many aspects and intricacies of sensors used in the spacecraft industry. It covers sensor development from concept, design, and cost, to building, testing, interfacing, integrating, and on-orbit operation. This course explains how mathematics, physics, business, and engineering-based concepts are used to develop and design a sensor which complies with a set of specific requirements. Essential topics such as cost estimation signal processing, noise reduction, filters, phased arrays, radars, optics, and radiometers used in space operation will be discussed. Typical sensors that will be studied are IR, Radiometers, Radars, SAR, LIDAR, GPSP and health monitoring sensors for manned and unmanned spacecraft. Prerequisite: BS or equivalent in engineering or applied sciences.

COURSE GOALS AND OBJECTIVES:

At the completion of the subject, students will master basic concepts of physics that drive sensors, their development, design, testing, integration, and on-orbit operation. Students will be given the opportunity to develop an appreciation of the interplay of classical analysis method, modern approaches and state-of-the art sensors.

The notes and the textbook provide most of the details and homework is designed to provide first-level understanding. The term paper is meant to permit the student to experience the sequence of designing, building, testing, and integration of a given sensor for a specific mission.

REQUIRED READINGS:

M. Abid "Spacecraft Sensors", ISBN: 0-470-86527-X, John Wiley & Sons, Ltd 2005

RECOMMENDED GRADING:

Homework (HW)	**20%**
Term paper	**25%**
Lower grade(MidTerm, Final)	**25%**
Higher grade (MidTerm, Final)	**30%**