640-381 Principles and Applications of Sensors

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus. Lectures, tutorials and practical laboratory classes.
Time Commitment:	Contact Hours: 24 hours of lectures, 12 hours of tutorials and 12 hours of practical laboratory class Total Time Commitment: 120 hours total time commitment.
Prerequisites:	Physics 640-141 plus 640-142 or 640-121 plus 640-122 or equivalent.
Corequisites:	Electrical engineering 431-330 or equivalent.
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. This subject requires all students to actively and safely participate in laboratory activities. Students who feel their disability may impact upon their participation are encouraged to discuss this with the subject coordinator and the Disability Liaison Unit.
Coordinator:	Prof Steven Prawer
Subject Overview:	This subject integrates the principles of physics and electrical engineering to introduce students to sensor technology. Topics to be covered include the basic principles of the quantum theory of atoms, molecules and solids and the application of these principles to a wide range of materials which are of key importance in modern electronics and technology. In addition to the fundamental concepts, topics to be covered include an introduction to various types of sensors and the basic physical phenomena underpinning their operation.
Objectives:	Students completing this subject should be able to: # explain the fundamentals of the operation of sensors and transducers for the measurement of temperature, pressure, light, stress, composition, fatigue and the chemical environment; and # design a solution to a particular sensing problem based on their knowledge of the physical principles underpinning the operation of each type of sensor.
Assessment:	Ongoing assessment of laboratory work during the semester (20%); project work totalling up to 3000 words comprising a written report (15%) and a poster presentation (15%) due during the semester; a 3-hour written examination in the examination period (50%).
Prescribed Texts:	None
Recommended Texts:	J Fraden, *Handbook of Modern Sensors*, 3rd Edition. Springer
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2009/D09)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2009/F04)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2009/A04)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2009/M05)**

	You should visit **learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)** and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	Students should enhance their ability to: # participate effectively in a laboratory environment and be able to work on a project as part of a team; and # plan effective work schedules and manage their time to meet the deadlines for submission of assessable work and preparation for tests and the examination.
Notes:	This subject is available for science credit to students enrolled in the BSc (pre-2008 degree only), BASc or a combined BSc course.
Related Course(s):	Bachelor of Engineering (Biomedical) Biomechanics Bachelor of Engineering (Biomedical)Biosignals Bachelor of Engineering (Electrical Engineering)