431-204 Digital Systems 2: System Design

Credit Points:	12.50
Level:	2 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: Thirty-six hours of lectures, 12 hours of tutorials and 12 hours of laboratory work Total Time Commitment: Not available
Prerequisites:	431-102 Digital Systems 1: Fundamentals
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Coordinator:	Assoc Prof Michael Cantoni
Subject Overview:	The objective of this course is to introduce the student to various tools and paradigms for digital system design and to further their knowledge of the technical language used in this field. The focus of the course is at a level of abstraction that sits between high-level system specification issues and low-level system realisation issues. Topics covered include hardwired and stored logic paradigms for digital system implementation; the hardware description language VHDL, as a tool for modelling digital systems; a lab based introduction to configurable logic devices such as PLDs and FPGAs; system interconnection structures, including an introduction to bus arbitration schemes and data-link level bus communication protocols; architectural and operational aspects of general purpose central processing units (CPUs); an introduction to the use of programming languages (assembly and high-level) in the design of stored logic systems and related low-level issues such as the binding of program and data to memory; and memory and input/output organisations and interrupt mechanisms.
Objectives:	On completing this subject the student should be able to: 1. Apply fundamental tools in the analysis of combinational and sequential logic systems; 2. Apply fundamental concepts in the design of digital systems to achieve specified functionality; 3. Assess tradeoffs within the context of digital system design; 4. Use EDA tools and a hardware description language (HDL) for the documentation, simulation and synthesis of reasonably complex digital systems; 5. Configure and test digital hardware development platforms in the laboratory.
Assessment:	One 3-hour end of semester examination, practice classes, tests, laboratory reports and notebooks, assignments and project reports. Students will be notified of the weighting of assessment components at the beginning of the semester.
Prescribed Texts:	None
Recommended Texts:	Information Not Available

Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	# ability to apply knowledge of basic science and engineering fundamentals # ability to communicate effectively, not only with engineers but also with the community at large # in-depth technical competence in at least one engineering discipline # ability to undertake problem identification, formulation and solution # ability to utilise a systems approach to design and operational performance # ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member # expectation of the need to undertake lifelong learning, capacity to do so # capacity for independent critical thought, rational inquiry and self-directed learning # intellectual curiosity and creativity, including understanding of the philosophical and methodological bases of research activity
Related Course(s):	Bachelor of Engineering (Computer) and Bachelor of Arts Bachelor of Engineering (Computer) and Bachelor of Commerce Bachelor of Engineering (Computer) and Bachelor of Laws Bachelor of Engineering (Electrical) and Bachelor of Arts Bachelor of Engineering (Electrical) and Bachelor of Commerce Bachelor of Engineering (Electrical) and Bachelor of Laws