

Course Description

4049 - Analog Microelectronic Systems

Course Code:	ELEC ENG 4049
Course Title	Analog Microelectronic Systems
Academic Year:	2009
Semester:	3
Units:	2
Lecturer:	Dr. S. Al-Sarawi
Office:	Engineering and Maths Building, EM411
E-mail Address:	alsarawi@eleceng.adelaide.edu.au

Content

Review of fabrication processes, design rules and transistor models. Layout issues; ASIC design flow; simulators and performance estimation; current sources and references; operational and transconductance amplifiers; current mode circuits; data conversion systems; switched capacitor systems; phase locked loops. A major project involving the design of a mixed signal microelectronic circuit.

Mode of delivery

This course will be presented as a series of approximately 18 lectures plus 18 hours of tutorials and design project work.

Assumed knowledge

This course assumes familiarity with principles of circuit theory, the characteristics of basic electronic devices such as diodes FETs and BJTs and CMOS fabrication processes.

Assessment

End of semester exam: 60%

Two Assignments: 10%

Major Project 30%

In accordance with School policy on assessment, students must achieve at least 40% of the maximum mark in both the exam component and the project component. If this is not achieved, the total course mark will be limited to a maximum of 44 F. In addition, if students fail to sit the examination their assessment will be deemed to be incomplete and they will be assigned a final mark of 0 (Fail).

Course Reference:

- Design of Analog CMOS Integrated Circuits by Behzad Razavi, **ISBN:** 0072380322.
- CMOS: Circuit Design, Layout and Simulation by Baker, Li and Boyce, **ISBN:** 0-7803-3416-7.
- Design with Operational Amplifiers and Analog Integrated Circuits (3rd Ed.) by Sergio Franco, **ISBN:** 0-07-232084-2.
- Analysis and Design of Analog Integrated Circuits (4th Ed.) by Paul R. Gray, Paul J. Hurst, Stephen H. Lewis, Robert G. Meyer, **ISBN:** 0-471-32168-0.
- Analog-to-Digital and Digital-to-Analog Conversion Techniques by David F. Hoeschele, **ISBN:** 0471571474.
- Course slides prepared by Said Al-Sarawi.

Graduate attributes

Attrib.	Description	Assignment (formative tasks)	Exam (summative assessment)	Hands on Practical
GA1	An advanced level of knowledge and understanding of the theory and practice of Electrical and Electronic, Computer Systems or Telecommunications Engineering and the fundamentals of science and mathematics that underpin these disciplines.	Yes	Yes	Yes
GA2	A commitment to maintain an advanced level of knowledge throughout a lifetime of engineering practice and the skills to do so.	Yes		Yes
GA3	The ability to apply knowledge in a systematic and creative fashion to the solution of practical problems.		Yes	Yes
GA4	A commitment to the ethical practice of engineering and the ability to practice in a responsible manner that is sensitive to social, cultural, global, legal, professional and environmental issues.	Yes		Yes
GA5	Interpersonal and communication skills for effective interaction with colleagues and the wider community.	Yes		Yes
GA6	An ability to work effectively both independently and cooperatively as a leader, manager or team member with multi-disciplinary or multi-cultural teams.	Yes		Yes
GA7	An ability to identify, formalise, model and analyse problems.			Yes
GA8	The capacity to design, optimise, implement, test and evaluate solutions.	Yes		Yes

GA9	An ability to plan, manage and implement solutions that balance considerations of economy, quality, timeliness and reliability as well as social, legal and environmental issues.	Yes		Yes
GA10	Personal attributes including: perseverance in the face of difficulties; initiative in identifying problems or opportunities; resourcefulness in seeking solutions; and a capacity for critical thought.	Yes		Yes
GA11	Skills in the use of advanced technology, including an ability to build software to study and solve a range of problems.	Yes		Yes
GA12	A commitment to the highest standards of professional endeavour and the ability to take a leadership role in the community.	Yes	Yes	Yes
GA13	An ability to utilise a systems approach to design and operational performance.	Yes		Yes
GA14	Understanding of the principles of sustainable design and development.	Yes		Yes

These programs also foster the graduate attributes of the University of Adelaide and the Institution of Engineers Australia. These should be read in conjunction with the list above.

sas:clg:25 February 2009