Institute of Technology Tallaght
Institiúid Teicneolaíochta Tamhlacht

ANEL H2066: Audio Circuits
Extra Header Data

Module Delivered in

Programme Code	Programme	Semester	Delivery
TA_EAELE_B	Bachelor Degree in Engineering (Honours) in Electronic Engineering	4	Mandatory

Short Title:	Audio Circuits APPROVED
Full Title:	Audio Circuits

Module Code:	ANEL H2066	**NFQ Level:**	6	**ECTS Credits:**	4

Reviewed By:	JAMES WRIGHT

Description:	This subject aims to introduce the key concepts of analogue system design to the student. The student will apply Analogue design techniques to a range of realistic amplifier designs using both discreet and integrated components. The student will construct and test a range of realistic Analogue circuits.

Learning Outcomes:

On successful completion of this module the learner will be able to

1. Analyse feedback and its application to oscillators.
2. Design and analyse multistage amplifiers and filters.
3. Analyse op-amp applications and limitations.
4. Explain different types of A/D and D/A converters.
5. Evaluate the consequences of heat losses and heatsinking.
6. Construct active circuits, perform electrical measurements and submit written report.

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Module Content & Assessment

Content

Differential amplifiers 8%
CMRR.

cillators : 12%
Feedback review, feedback and oscillators - some practical oscillators such as Colpitts, Wien Bridge or Hartley.

Multistage amplifiers: 12%
frequency effects (phase and gain margins), the Miller effect and cascode stage.

Real-world Op amps : 12%
Op-amp applications and effects of limitations such as input bias current, input offset current, input offset voltage, gain-bandwidth product and slew rate.

Active Filters : 15%
Filter Characteristics, LP, HP, BS and BR; derivation of transfer function using KCL. Passive Designs for low order applications. Active Designs from Sallen and Key Circuits.

Analogue Characteristics of A/D and D/A converters. 10%
Sample and Hold circuit. Some different converter types.

Power Amplifiers: 15%
Realistic design of Class A and AB types, calculation of DC requirements, heat losses and efficiency.

Heatsinking; 8%
Calculation of suitable heatsinks for power applications.

Linear and Switching Regulators: 8%
Design of typical circuits. Specifications such as; Load Reg. Line Reg. etc.

Assessment Breakdown	**%**
Course Work	40%
End of Semester Formal Examination	60%

	Outcome addressed	*% of total*	*Assessment Date*
Formal End-of-Semester Examination	1,2,3,4,5	60%	Semester End

Coursework Breakdown

Type	*Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Continuous Assessment	Midterm Examination	1,2,3,4,5,6	8	Week 7
Continuous Assessment	Design and Construction of Power Amplifier Circuits	1,2,3,4,5,6	9	Week 8
Practical/Skills Evaluation	n/a	1,2,3,4,5,6	10	n/a

IT Tallaght reserves the right to alter the nature and timings of assessment

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Module Workload & Resources

This course has no full time workload.

Resources

Recommended Book Resources

Theodore F. Bogart, Jeffrey S. Beasley, Guillermo Rico 2001, *Electronic devices and circuits*, Prentice Hall Upper Saddle River, N.J. [ISBN: 978-0130851789]

Thomas L. Floyd 2006, *Electronics fundamentals*, Pearson Prentice Hall Upper Saddle River, N.J. [ISBN: 978-0131995857]