

Electric Circuits

EE215

5 ECTS Credits

Module Name	Electric Circuits 2
Module Code	EE215
Module Co-ordinator	Refer to Excel document <i>Module_Co-ordinators</i>
Department	Electronic Engineering
Module Level	2
Credit rating	5 ECTS credits
Pre-requisites	None

Aims	To provide an in-depth knowledge of RLC circuits and filter design.
Learning Outcomes	<p>At the end of the course, the student should be able to:</p> <ol style="list-style-type: none"> 1. Explain conceptually what resonance and bandwidth mean in the context of RLC networks. 2. List and draw the frequency specifications of the four basic types of filters. 3. Draw a bode plot of a network function. 4. Design and build a passive filter based on a Butterworth response. 5. Use RLC circuits to modulate bandwidth and resonance as needed. 6. Use Matlab to analysis signals with the appropriate filter hardware. 7. Design, build and analysis a filter circuit in a lab environment.

Time Allowance for Constituent Elements	
Lectures	24 hours
Tutorials	10 hours

Laboratory and exam	21 hours
Class Test	2 hours
Independent study	66 hours
Semester Examination	2 hours

Indicative Syllabus

- RLC resonance, bandwidth and Q-factor
- Passive filter design – Low Pass, High Pass, Band stop and band pass filters
- RLC filter effects stage, Butterworth filters
- Bode plots
- Realisation of various filter specifications
- Stability of filter circuits
- Oscillators
- ADC and DAC circuitry

Assessment Criteria

Semester Examination	60%
Laboratory (6)	15%
Laboratory Exam (1)	15%
Class Test (2)	10%

Penalties: Missed labs and class test cannot be repeated, in general.

Pass Standard and any Special Requirements for Passing Modules: The Pass Mark is 40% - students are not required to pass the written and continuous components separately.

Supplemental Examination: 1 x 2 hour written examination (Autumn). The continuous assessment mark is carried forward as there is no facility for repeating the continuous assessment elements of the course.

Assessment Philosophy

The class tests and examination paper are designed to cover learning outcomes 1- 5. All questions in the class test are compulsory, while the final examination paper has a compulsory question that covers all aspects of the syllabus. The lab sessions cover learning outcomes 5 -7 and encourage teamwork.

It should be noted that the laboratory exam will be individually assessed in the form a different problem given to each student.

Course Text	"Electromagnetics with Applications", Kraus and Fleisch, McGraw-Hill
References	<ul style="list-style-type: none">• "Engineering Electromagnetics", Hayt and Buck, McGraw-Hill• "Electromagnetic Fields and Waves", Lorrain and Carson, Freeman

Programmes currently utilising module	Compulsory
BE in Electronic Engineering	Yes
BSc in Science (Engineering Science)	Yes