

# TECH010: COMMUNICATION ENGINEERING

## Module Booklet (2003)

### Lecturer: Dr. Paul Filmore

Latest information and 'reference' see: Student Portal TECH010 module &

<http://www.tech.plym.ac.uk/dcee/staff/PaulFilmore/undrgrad.htm>

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### MODULE AIMS:

1. To develop further the TECH008 electronic and electrical skills and understanding, in the analogue/ digital communications field, using a systems approach.
2. To gain further experience and competence in the use of:- laboratory work, computer simulation and practical construction

### OBJECTIVES / LEARNING OUTCOMES (LO):

At the end of the module students should be able to:

1. name, describe and explain basic analogue/digital quantities, measurements and subsystems;
2. undertake measurements on practical circuits and construct/test an electronic project;
3. design a solution (simple circuits) for a simple problem (brief specification), using computer simulation software;
4. present a systematically organised portfolio of the student's module work;
5. reflect on their learning;
6. recognise how simple 'electronic building blocks' can be used to design more complex systems.

### SKILLS ELEMENTS:

**Core:** Knowledge & Understanding (LO1 and 6), Synthesis and Creativity (LO3 and 6), Practical and Psycho-motor (LO2 and 3), Problem Solving (LO3), Communication and Presentation (LO4).

**Enhancement:** Analysis (LO3), Evaluation (LO2), Planning and Management of Learning (LO4), Self-appraisal and Reflection on Practice (LO5).

### THIS MODULE CONTAINS (2003)

Theory and progress questions,

Computer Simulations (using the package "Electronic Workbench")

Use of computer aided learning modules

A simple design exercise

A Project - to build an electronic organ

Note: As there are three hours of "contact" per week, the University expects that on average, you will spend another three hours per week of self-study on this module. Some of this can be computer-based, in 201 Smeaton, e.g. finishing off EWB simulations, or working on CAL lessons. Recommended reading, and questions to complete, are given in a later section of this booklet.

## INDICATIVE DELIVERY SCHEDULE

Week 29		
10/2	304	Outline of TECH010 module & Capacitor Reactance
	SB3	No lecture: EWB Reactance of a Capacitor
Week 30	SB3	The Operational Amplifier: use as a Voltage Amplifier & as a Voltage Comparator.
17/2		
	304	No Labs. Work on EWB Capacitor Reactance
<b>Own time</b>	201	<i>Engineering CAL - Analogue Electronics:- Intro to Amplifiers, chaps 1, 2, and 3 sections 1 - 8, and Operational Amplifiers, All chaps except ch. 5.</i>
Week 31	SB3	The Operational Amplifier continued and problem session: - review of op amp questions
24/2		
	304	The Operational Amplifier Lab1a.
Week 32	SB3	RC Revision & Filters
3/3	304	Operational Amplifier Lab1b
Week 33	SB3	Communications 1
10/3	304	EWB - The Op Amp and Op Amp Laboratory completion
Week 34	SB3	Communications 2
17/3	304/201	EWB - Tone Controls (Filters)
<b>During week</b>		<b><i>Perception: Op Amp lab. computer based test (assessed)</i></b>
Week 35	SB3	Design Project
24/3	304	Simulate your design on EWB
<b>Own time</b>	201	<i>Continue simulation and start write up</i>
Week 36	SB3	Sound Waves, radio waves, TV and the wave equation
31/3	304	Design project: interfacing (lab & simulation)

## EASTER BREAK

Week 40	SB3	The Internet
28/4	304	The Internet
		<b>Hand in your Design Project to DCEE Office (Sm101): (Thursday 1/5/03)</b>
Week 41	SB3	Radio, Hi-Fi systems
5/5	304/201	CAL:- Data Communications
Week 42	SB3?	Guest lecture - Satellites and Personal Communications
12/5	304/201	Lab Experiment - Modulation and Detection
Week 43	SB3	Theory of electronic organ project
19/5	304	Project session 1 - drill main board and solder components

Week 44 SB3 Revision & Problem session - review of radio questions  
26/5 304 Project session 2 - drill oscillator board and mount components

Week 45 SB3?\* **Test 1.5 hours (6/6/03, 10am?).**  
2/6 304 Project session 3 - test oscillator board and complete (marking)

*\* Time & place of written test to be confirmed*

## RECOMMENDED READING, PROBLEMS, AND OTHER STUDY ACTIVITIES

Textbook (except for Internet): "Electronics for Today and Tomorrow" Tom Duncan

**Op Amps** Read ch. 48,53,54, (56 optional),  
wks 28-31 Do p. 117, qu. 1, 2, 3. p.119 qu. 1, 2 p. 122 qu. 1, 2  
p. 128 qu. 1, 4, 5, 9, 10.

**Audio** Read ch. 79, 80, 81, 87, 90, 91  
wks 32-33 Do p. 192 qu 1-4, 6,7

**Internet/ Digital Information** Read ch. 89, 90, 91  
wks 33-34 Do p. 215 qu. 4, 5

E.g. Buchanan, William (1997), Global Information Systems, Macmillan Master Series,  
ISBN 0-333-68951-8

E.g. Buchanan, William (1997), The Internet, Macmillan Master Series, ISBN 0-333-69261-6

**Radio** Read ch. 76, 77, 83, 84, 87  
wks 34-39 Do p. 206, qu 1-5

## ASSESSMENT SCHEDULE

<b>Test</b>	<b>75%</b>	
	Op Amp Perception test	20%
	Reactance & Tone Controls Perception test (schedule to be announced)	10%
	Test (6/6/03, 10am?)	45%
<b>Coursework</b>	<b>25%</b>	
	Design Project 1/5/03	15%
	Quality of Organ Project (marked in laboratory)	10%