

NAME:



**DEPARTMENT OF COMMUNICATION
& ELECTRONIC ENGINEERING**

**TECH008 ELECTRONIC ENGINEERING
FTP**

Module Booklet (2002-2003)

Full and latest information at:

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

& TECH008 Module: Student Portal

<http://exchange.plymouth.ac.uk/portal/>

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TECH008 ELECTRONIC ENGINEERING

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Introduction

Theory
Laboratory
Computer Simulations (using the package Electronic Workbench: EWB)
A Project - to build an Electronic Dice
CAL (computer aided learning - backup for the theory)
Study skills

MODULE AIMS:

1. To introduce from first principles basic electrical and electronic understanding
2. To gain experience in the use of:- laboratory work, computer simulation and practical construction, to underpin the background knowledge

OBJECTIVES / LEARNING OUTCOMES (LO):

At the end of this module the student will be able to:

1. name, describe and explain basic electrical and electronic quantities and components
2. construct, and undertake calculations on simple circuits
3. undertake measurements on practical circuits and construct an electronic project
4. operate a computer circuit simulation package to make measurements on circuits
5. design simple circuits from a brief specification
6. present a systematically organised portfolio of the student's module work

SKILLS ELEMENTS:

Core: Knowledge & Understanding(LO1,LO2), Analysis (LO2), Practical & Psycho-motor(LO3, LO4), Communication and presentation(LO6),

Enhancement: Synthesis/Creativity(LO5), Planning and Management of Learning(LO6), Problem solving(LO4, LO5)

Module Content:

Theory

The theory covers DC circuits, logic, diodes and transistor switches, backed up where ever possible by laboratory work, simulation, CAL and a practical build project.

Laboratory

- Lab 1 Instrument Familiarisation
- Lab 2 Practical Problem-solving in Digital Electronics 1
- Lab 3 Practical Problem-solving in Digital Electronics 2
- Lab 4 RC (Capacitors)
- Project 1 Drill display board, solder components, and test the board
- Project 2 Design PCB for the logic board
- Project 3 Build the logic board; assemble and test the complete project

Simulations (EWB) & CAL:

- Comp 1 - CAL - Basic EWB: Simple Resistor Networks
- Comp 2 - EWB: AC Signals and the CRO & EWB: Logic Gates
- Comp 3 - CAL - Capacitors & Electronic Work Bench: Capacitor Timing Circuits & EWB: The Reactance of a Capacitor
- Comp 4 - EWB: Diodes and Rectifier Circuits & EWB: Transistor Switch
- Comp 5 - CAL - Diodes and Transistors (part)

Assessment

Tests

75%

- Test 1 Computer based test: own time: 5/11/02 to 7/11/02 & hand in workings to 101 Smeaton Office(8/11/02) 25%
- Test 2 Computer based tests on the EWB sheets 20%.
(A schedule of computer based tests will be published)
- Test 3 (Exam 22/1/03?, 2 pm: to be advised) 30%

Coursework

25%

- Portfolio 1 Hand in, in lab. session (by 7/11/02) 4%
- Portfolio 2 Hand in to 101 Smeaton 15/1/03 7%
- Attendance 5%
- Quality of Project (marked in laboratory: week 9/12/02) 9%

Module Expectations

As there are about three hours of "contact" per week, it is expect that, on average, you will spend another three hours per week of self-study on this module. This may be: Duncan reading & questions, or computer-based, in 201/209 Smeaton, e.g. completing simulations (EWB), or working on CAL tutorials.

Textbook

Electronics for Today and Tomorrow, Tom Duncan, 2nd Ed., John Murray 1997. This book will also be used in TECH 010: Communication Engineering, in Semester 2.

Lecture/Laboratory/Seminar Schedule

Date: Week starting		[Pre-reading sections & questions in Duncan]
Week 10 30/9	LAB/SEM 304 LECT. 101	Welcome & introduction to measurement Welcome & introduction to DC theory
		[40,41,42] [1,2]
Week 11 7/10	LAB/SEM 304 LECT. 101	Comp 1: CAL, potential dividers DC, resistors, Ohms Law
		[2,5] [3,9]
Week 12 14/10	LAB/SEM 304 LECT. 101	Lab 1: Instruments Potential dividers, power, loading, ac
		[40,41,42] [6,7]
Week 13 21/10	LAB/SEM 304 LECT. 101	Comp 2: DC circuits & CAL introduction Meters
		[8] [4]
Week 14 28/10	LAB/SEM 304 LECT. 101	Lab 2: Digital Review, study skills & digital
		[61,62,64]
Week 15 4/11	LAB/SEM 304 LECT. 101	Lab 3: Digital & EWB simulations Capacitors Hand in portfolios in lab (by 7/11/02) Test 1: computer based test (5th-7th Nov.) Hand in workings to DCEE office (101 Smeaton) on 8/11/02
		[65,66,72] [10,12]
Week 16 11/11	LAB/SEM 304 LECT. 101	Lab 4: RC (Capacitors) Logic
		[64,65,66]
Week 17 18/11	LAB/SEM 304 LECT. 101	Project 1 Logic & semiconductors
		[25,26,69,72,74]
Week 18 25/11	LAB/SEM 304 LECT. 101	Project 2: Move down to 209 Sm., pcb layout Review, portfolio review & study skills
Week 19 2/12	LAB/SEM 304 LECT. 101	Comp 3: Capacitors & Reactance Diodes
		[10,12] [26,27,33]
Week 20 9/12	LAB/SEM 304 LECT. 101	Project 3 and project assessment (in lab.) Diodes/ Transistors
		[35,36,37,29]
Week 21 16/12	LAB/SEM 304 LECT. 101	Comp 4: Diodes EWB Transistors
		[30]
HAPPY CHRISTMAS		
Week 25 13/1	LAB/SEM 304 LECT. 101	Comp 5: Diodes & transistors CAL Revision & Module review
Week 26 20/1	TEST	room to be announced Test 3 (1.5 hour test) Hand in Portfolio to DCEE Office, 101 Smeaton (22/1/03 by 4pm)

Test & Portfolio Sheets

Test 1

Portfolio Check Lists

Portfolio Mark Sheet

Laboratory Sheets

Instrumentation Familiarisation: familiarisation with basic laboratory test equipment

Practical Problem-solving in Digital Electronics: designing and testing simple digital circuits

RC (Capacitors): Investigating timing circuits

Simulation Sheets (EWB)

(Electronic Work Bench: Quick Reference Card)
Electronic Work Bench: [Simple Resistor Networks](#)
Electronic Work Bench: [AC Signals and the CRO](#)
Electronic Work Bench: [Meter Loading](#)
Electronic Work Bench: [Logic Gates](#)
Electronic Work Bench: [Capacitor Timing Circuits](#)
Electronic Work Bench: [The Reactance of a
Capacitor](#)
Electronic Work Bench: [Diodes and Rectifier Circuits](#)
Electronic Work Bench: [The Transistor Switch](#)

The Project