

Liverpool John Moores University

Title: AUDIO EQUIPMENT MAINTENANCE
Status: Definitive
Code: **4515STE** (118560)
Version Start Date: 01-08-2016

Owning School/Faculty: Electronics and Electrical Engineering
Teaching School/Faculty: Liverpool Institute for Performing Arts

Team	Leader
Karl Jones	Y

Academic Level: FHEQ4
Credit Value: 12
Total Delivered Hours: 34.5
Total Learning Hours: 120
Private Study: 85.5

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	15
Tutorial	10
Workshop	8

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Practice	DEMO	DEMONSTRATION OF MEASUREMENT EQUIPMENT	25	
Report	RPT	TEST SPECIFICATION DOCUMENT	25	
Exam	EXAM	WRITTEN EXAM	50	1.5

Aims

This module aims to provide an introduction to the electronic principles, components and systems relevant to typical audio systems. The syllabus will cover the theoretical and practical skills necessary to understand basic audio circuits, diagnose simple faults and be able to use standard audio measurement tools.

The module includes both a theoretical component and a practical component in using electronic test and construction equipment.

Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate an understanding of simple analogue circuit analysis of resistor and capacitors networks.
- 2 Demonstrate an understanding of simple operational amplifiers, analogue filters, electro-magnetic and tape based recording devices.
- 3 Measure common technical parameters and fault-find within audio systems using standard test, construction and maintenance tools.
- 4 Conduct research into technical specification parameters and methods of presenting these.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

DEMO OF MEASUREMENT EQUIPMENT	3	
TEST SPECIFICATION DOCUMENT	3	4
WRITTEN EXAM	1	2

Outline Syllabus

Basic Electrical Circuits

What is electricity and why is it important for audio engineers? Definitions – energy, current, resistance, EMF, potential difference, voltage, power Ohm's Law; Electrical Circuits; Circuit Diagrams; Direct Current / Alternating Current; Simple DC Circuit Analysis

Electro-Magnetism, AC and Impedance

Relationship between magnetism and current flow; Generation of AC. Mains / Audio Signals; Transformers; Resistance, Reactance and Impedance; D.I. Box; Simple AC Circuit Analysis

Passive Audio Circuits

Resistors; Capacitors; Inductors; Simple RC Filter Circuits; LP / HP Filter Circuit Analysis

Analogue Audio Connections and Recording

Unbalanced and Balanced; Types of Connectors and Cables; Earth Loops; Phantom Power; Analogue Tape Machine; Tape Machine Maintenance

Active Circuits

Active components and Amplification; Valve; Transistor; Operational Amplifier; Op-amp circuit Analysis; Power Supply Unit; Fault Finding in an Audio Signal Chain

Measurement Tools

Signal Generator; Multimeter; Oscilloscope; Neutrik Analyser; EQ Measurement; EQ experiment

Building Cables

Soldering tools; Good soldering practice; Sleeving; Jack, XLR, Bantam

Learning Activities

This module is divided into two parts. The first half of the module will deal with the theoretical issues and this will be delivered by five weekly lectures followed by tutorial sessions addressing the specific topic for that week.

The second half of the module is workshop based and introduces the practical parts of the module in two 5 hour workshops. It is essential that the students do additional private study as part of this module such as completing tutorial sheets, consulting recommended text books and conducting some research for the assessment tasks.

Notes

It should be noted that this is not a degree level course in electronic engineering so it will not equip the student with skills to deal with complex design or fault-finding. Instead it should be considered as a foundation module designed to enable the understanding of basic operation of simple analogue devices and to enhance communication with qualified service engineers.