OUTLINE OF FIRST YEAR SYLLABUS 2015/2016

EEE 112 ENGINEERING APPLICATIONS

EEE 117 ELECTRICAL CIRCUITS AND NETWORKS

EEE 118 ELECTRONIC DEVICES AND CIRCUITS
Electrons in a Vacuum: force on electrons in an electric field, energy, velocity, current and current density. Electrons in Solids: transport mechanisms, drift, diffusion. Resistivity of metals and physical origin, temperature coefficient. Insulators: break-down strength, dielectrics and relative permittivity, different types of capacitors and their uses. Semiconductors: intrinsic and extrinsic, doping, charge carriers, holes basic relations of J and for bulk semiconductors. PN Junctions: structure, junction potential, forward behaviour, charge injection, diode equation. Idea of space charge, Poisson's equation, internal fields, reverse breakdown mechanisms. Diode characteristics and temperature effects, large and small signal models. Diode Applications: Identifying conduction state, clipping, clamping, voltage doublers, voltage multipliers, rectifiers, capacitor smoothing, ripple. Transistors: JFETs and MOSFETs basic mechanisms and characteristics, \( g_m \), BJT, transport mechanisms, charge control model. BJT, JFET and MOSFET characteristics with emphasis on similarity of behaviour. Transistor Applications: Switching: idea of electronic switch, on state current, on state power loss, driving BJF and FET switches, switching inductive loads, bridge switching topologies. Amplification: idea of amplification, biasing, designing dc conditions, thermal stability, small signal models (\( g_m \), based), small-signal equivalent circuits, coupling and decoupling, mid-frequency examples. Operational Amplifiers: advantages of ideal performance. Basic circuit shapes, idea of feedback, follower circuits, virtual earth circuits, effect of finite gains. Use of superposition to handle multiple source amplifiers.

EEE 119 DIGITAL SYSTEM ENGINEERING

EEE 124 INTRODUCTION TO ENERGY
This module introduces the concepts of electricity and energy in the home. It is aimed at a wide audience and
answers those questions that many people have about energy, electricity and ‘renewables’ but don’t know who or how to ask. The module will use only basic arithmetic maths - multiplication, division, addition and subtraction. Renewable energy sources such as solar PV panels, small wind turbines and heat pumps will be described. What savings can you really make? Petrol vs diesel cars, how does electric fit into the picture?

EEE 160 COURSEWORK
(a) Laboratory Work: Workstation Familiarisation Exercises I and II; Fabrication of a Light Emitting Diode; Analysis Identification of an Unknown Circuit Component; AC Circuits; Computer Aided Design Exercise; Logic Circuit Design; DC Machines; Transformers; Spectrum Analyser; Bipolar Transistor; Individual Construction Project; Group Project.
(c) Professional Skills: Report Writing Skills; Oral Presentation Skills, Presentation of Data; Use of the Library; Good Experimental Practice.

EEE 163 SYSTEM DESIGN ANALYSIS
This unit aims to investigate the design and assembly of common electrical and electronic devices. Examples of commercially available devices will be examined in detail and deconstructed to allow critical assessment of the assembly and the design decisions that have been made in their construction. The unit will be a combination of formal lectures and laboratory analysis of the devices, being assessed by a short report and interaction during laboratory sessions. A formal talk will also form part of the assessment.

MAS156 MATHEMATICS I


MLT *** MODERN LANGUAGES
At present it is possible to study in French, German, Spanish as part of a degree with a Modern Language (or casually as part of the University’s Languages for All provision). There are five progressive stages in most languages, and each stage consists of two half modules. The stages, with the appropriate entry standard are:
- Stage 1: Beginners, no previous knowledge
- Stage 2: GCSE equivalent
- Stage 3: A-level equivalent
- Stage 4: A-level plus 1 year
- Stage 5: A-level plus 2 years
A more detailed description of the content of these courses is contained in the separate Modern Language teaching document.