

ENGINEERING TRIPOS PART IB – 2011/12

LABORATORIES, PROJECTS AND OTHER COURSEWORK

Part IB Laboratories

Overall Leader: Dr. RA McMahon

Timing: 2-hour sessions running on Mondays, Tuesdays, Wednesdays and Thursdays in Michaelmas and Lent Terms.

Structure: Laboratories are divided into “Short” (S) or “Long” (L). Short laboratories are self-contained and completed within a 2-hour session (including marking);

Long laboratories have a separate write-up followed by a signing-up session.

AIMS

The aims of the laboratories are to enable students to:

- Develop workshop and laboratory skills, including working safely and collaboratively.
- Learn the importance of careful recording of results, and concise, clear reporting.
- Enhance understanding of concepts introduced in lectures.
- Appreciate the limitations of theoretical modelling of engineering problems, and the inherent uncertainties in experimental measurements.

LABORATORIES

Mechanics

- Rotor dynamic and balancing (S)

Structures

- Plastic collapse (S)

Materials

- Materials characterisation (L)
- Heat treatment of steels (S)
- Torsion testing (L)

Thermofluids

- Peltier heat-pump (S)
- Pipe flow (S)
- Boundary layers (L)
- Heat transfer (S)

Electrical Engineering

- Integrated circuit power amplifier (S)
- Synchronous machine (S)
- 3-phase induction motor (S)
- Wave transmission and reflection (L)

Information Engineering

- Spectrum analysis (L)
- Process control (S)
- Position control (S)

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