

## Liverpool John Moores University

Title: Testing Product Performance  
Status: Definitive  
Code: **5100ENG** (117189)  
Version Start Date: 01-08-2011

Owning School/Faculty: Engineering  
Teaching School/Faculty: Engineering

| Team            | Leader |
|-----------------|--------|
| Stephen Ebbrell | Y      |
| Gareth Bradley  |        |

**Academic Level:** FHEQ5      **Credit Value:** 24.00      **Total Delivered Hours:** 62.00  
**Total Learning Hours:** 240      **Private Study:** 178

### Delivery Options

Course typically offered: Standard Year Long

| Component | Contact Hours |
|-----------|---------------|
| Lecture   | 10.000        |
| Practical | 45.000        |
| Tutorial  | 5.000         |

**Grading Basis:** 40 %

### Assessment Details

| Category | Short Description | Description | Weighting (%) | Exam Duration |
|----------|-------------------|-------------|---------------|---------------|
| Exam     | Exam              |             | 50.0          | 2.00          |
| Report   | Rpt               |             | 15.0          |               |
| Report   | Rpt               |             | 35.0          |               |

### Aims

*To introduce students to product testing and how it may be used to enhance product development, design and performance.*

### Learning Outcomes

After completing the module the student should be able to:

- LO1 Use standards to enhance product design and performance.
- LO2 To compare a range of static, dynamic and durability tests useful in optimising product design and performance and select as appropriate.
- LO3 Recognise why tests are undertaken and how they relate to the products and their design characteristics.
- LO4 Be able to analyse and utilise test data with respect to enhancing product design and verifying its performance.

### Learning Outcomes of Assessments

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

|                      |         |         |         |         |
|----------------------|---------|---------|---------|---------|
| Exam                 | LO<br>1 | LO<br>2 | LO<br>3 | LO<br>4 |
| Report               | LO<br>1 |         |         |         |
| Group project report | LO<br>2 | LO<br>3 | LO<br>4 |         |

### Outline Syllabus

*Reliability – how it is measured and why it is important.*

*Standards - what types of standard are available and what areas they cover; why standards are used with respect to product testing and performance.*

*Mechanical testing – static, dynamic and durability testing; why the tests are employed and typical applications.*

*Environmental testing – temperature, humidity, rain/water, dust etc.*

*Electrical testing – power surges, static.*

*Flow testing – aerodynamics, hydrodynamics, burst & proof pressure, hydraulic & pneumatic flow.*

*Equipment used in product testing – test frames, wind tunnels, microscopes, etc.*

### Learning Activities

The module will consist of practical individual and group exercises supplemented with a series of lectures and case studies.

### References

|                 |         |
|-----------------|---------|
| Course Material | Reports |
| Author          |         |

|                        |   |
|------------------------|---|
| <b>Publishing Year</b> |   |
| <b>Title</b>           | Various British, European, US and International Standards |
| <b>Subtitle</b>        |   |
| <b>Edition</b>         |   |
| <b>Publisher</b>       |   |
| <b>ISBN</b>            |   |

|                        |  |
|------------------------|--|
| <b>Course Material</b> | Book   |
| <b>Author</b>          | Gilmore, HL, Schwartz, HC  |
| <b>Publishing Year</b> | 1986   |
| <b>Title</b>           | Integrated Product Testing and Evaluation: A Systems Approach to Improve Reliability and Quality |
| <b>Subtitle</b>        |  |
| <b>Edition</b>         | 2nd  |
| <b>Publisher</b>       | CRC Press  |
| <b>ISBN</b>            | 0824774701   |

|                        |   |
|------------------------|---|
| <b>Course Material</b> | Book  |
| <b>Author</b>          | Pecht, M (editor)   |
| <b>Publishing Year</b> | 2009  |
| <b>Title</b>           | Product Reliability, Maintainability, and Supportability Handbook |
| <b>Subtitle</b>        |   |
| <b>Edition</b>         | 2nd   |
| <b>Publisher</b>       | CRC Press   |
| <b>ISBN</b>            | 978-0-8493-9879-7   |

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## Notes

The module will introduce students to a range of tests that may be employed to determine the performance of a product and why these are important. The use of standards in both product design and testing is also introduced.