

Liverpool John Moores University

Title: ADVANCED MEASUREMENT AND INSPECTION
Status: Definitive
Code: **7029ENG** (105379)
Version Start Date: 01-08-2016

Owning School/Faculty: General Engineering Research Institute
Teaching School/Faculty: General Engineering Research Institute

Team	Leader
Francis Lilley	Y

Academic Level: FHEQ7
Credit Value: 10
Total Delivered Hours: 39
Total Learning Hours: 100
Private Study: 61

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	12
Practical	24

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1		70	3
Report	AS2	Measurement Application Programming Assignment Report	30	

Aims

To provide an overview of systems capable of performing quality control and inspection in an industrial environment with special reference to the automotive and aerospace industries.

Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate understanding of the physical principles of various optical systems such as: interferometry, holography, holographic interferometry, electronic speckle pattern interferometry, 3D shape measurement, etc.
- 2 Discuss and critically evaluate the role of processing systems in the quantified analysis of images resulting from the above techniques.
- 3 Specify and critically evaluate complete system solutions to common measurement problems in areas such as; length, surface, form, vibration, stress etc.

Learning Outcomes of Assessments

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

Examination	1	2	3
Report	2	3	

Outline Syllabus

Laser properties, concept of coherence, introduction to interferometry, fibre optic interferometry, holography, holographic interferometry, digital holography, illustrations of practical systems and applications.
Image acquisition systems, concept of digital images. Methods for the quantitative analysis of fringe images; fringe tracking, phase stepping, Fourier transfer methods. Sources of error and inaccuracy in fringe analysis systems. Practical systems and applications.

Learning Activities

The module will be taught by a combination of lectures, laboratory demonstrations, practical activities and case studies.

Notes

This module provides an overview of non-contact measurement and inspection in an industrial environment