

## Liverpool John Moores University

Title: HIGH PRECISION MANUFACTURE  
Status: Definitive  
Code: **6506ENGSBC** (113916)  
Version Start Date: 01-08-2018

Owning School/Faculty: Maritime and Mechanical Engineering  
Teaching School/Faculty: The Sino-British College

Team	Leader
Russell English	Y

**Academic Level:** FHEQ6  
**Credit Value:** 12  
**Total Delivered Hours:** 37  
**Total Learning Hours:** 120  
**Private Study:** 83

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	20
Practical	5
Tutorial	10

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	70	2
Essay	AS2	Laboratory Assignment	30	

### Aims

*To develop understanding of the requirements of precision manufacturing systems with particular relevance to the aerospace / automotive sectors.*

### Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate and apply a practical knowledge of industrial and laboratory contact and non-contact measurement instruments and understand the potential effect of the operator and environment on measured results.
- 2 Critically appraise the role of sensors and instrumentation and adaptive / intelligent systems for process monitoring and control in precision manufacture.
- 3 Delineate and explain in clear and concise statements the key features that distinguish high precision manufacturing from conventional manufacturing.

### **Learning Outcomes of Assessments**

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

Exam	1	2	3
Lab assignment	2		

### **Outline Syllabus**

- *High-Precision manufacturing. Emerging and non-traditional machining technologies. Competing technologies and Limits of conventional technologies.*
- *Machine tool design fundamentals.*
- *Process modelling and control. Modelling methods: empirical and other. Intelligent and adaptive control systems. State-of-the-art in abrasives machining.*
- *High Precision Measurement, Industrial / Laboratory Metrology. Resolution – Repeatability – Accuracy. Statistical control. Surface measurement parameters.*
- *Sensors and instrumentation. In-process measurements.*
- *Principles of manufacturing processes systems design – aerospace / automotive sectors. Systems integration. Performance monitoring and evaluation.*

### **Learning Activities**

A series of lectures supported by tutorials, practical laboratory work and presentations from engineering industry and leading researchers.

### **Notes**

Industry is continually challenged by the demand for higher quality parts delivered at higher production rates. This requires knowledge of the process capability and performance. This module explores many of the issues involved in achieving such high precision manufacturing systems.