

Precision Engineering Laboratory – Reactive Atom Plasma

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PRE-REQUISITES: Optical fabrication principles, Interferometer principles

RATIONALE:

To provide the student with an overview of a novel fast fabrication technique for ultra-high quality surfaces. This is a laboratory based session with a strong emphasis on practical aspects of optical fabrication and associated metrology, students will participate in the generation and assessment of surfaces using plasma based non contact material removal tool. The session will cover the physical principles, operating characteristics and practical applications of the processes.

OBJECTIVES/LEARNING OUTCOMES/COMPETENCES: (Numbered list)

1. Introduction to "state-of-the-art" plasma tool
2. Introduction to "state-of-the-art" motion system.
3. Introduction to interferometric measurement
4. Provide insight into processing parameters and influences that effect the surface generation
5. Provide insight into programming of machine tools and generation of complex tool path algorithms

SYLLABUS/RANGE:

- Surfaces
 - Surface measurement (Form and Roughness)
- Machine
 - Configuration of machine tools and the workpiece
 - Outline of processing parameters
 - FANUC Programming and specific RAP processing parameter
- Metrology
 - Introduction to interferometric measurement
 - Calibration and correct use of the interferometric instrument
 - Introduction to form and roughness measurement
- Data processing
 - Assessment the quality of interferometric measurements
 - Extract results of the pre and post interferometric measurements
 - Modelisation of surface creation through analyse of processing parameters

Reference Material:

- (1) Precision Engineering Module, UPT MSc Cranfield University 2012

STUDENT WORKLOAD: Hours

Staff/Student Contact Time:	Laboratory	6
Independent Learning Time:	Private Study (Data processing with Matlab)	6
Total		12