

MODULE SPECIFICATION FORM

Module Title:	Computer-based Manufacturing	Level:	5	Credit Value:	10
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Module code: (if known)	ENG573	Cost Centre:	GAME	JACS2 code:	H710
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Semester(s) in which to be offered:	1	With effect from:	July 2015
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Office use only: To be completed by AQSU:	Date approved:	July 2015
	Date revised:	
	Version No:	1

Existing/New:	Existing	Title of module being replaced (if any):	N/A
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Originating Academic area:	Engineering and Applied Physics	Module Leader:	Martyn Jones
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Module duration (total hours)	100	Status: core/option/elective (identify programme where appropriate):	Free-standing 10-credit component comprising first half of ENG553 (Computer-based Manufacturing and Quality Assurance).
Scheduled learning and teaching hours	36		
Independent study hours	64		
Placement hours	0		

Percentage taught by Subjects other than originating Subject (please name other Subjects):	0%
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Programme(s) in which to be offered:	Pre-requisites per programme (between levels):	None
Engineering European Programme (Non Award Bearing)		

Module Aims:
To develop an understanding of processes involved in the manufacture of engineering components from a variety of modern materials, including plastics and composites, and with due consideration of the use of computer-control in the processes.

Expected Learning Outcomes
<u>Knowledge and Understanding:</u>
At the completion of this module, the student should be able to:
<ol style="list-style-type: none"> 1. Compare and select modern manufacturing processes and apply them to given components; 2. Explain the use of computer-controlled equipment within the manufacturing process; (KS 3, 4) 3. Select appropriate materials and associated processes for the manufacture of specified components.
<u>Key skills for employability</u>
<ol style="list-style-type: none"> 1. Written, oral and media communication skills, 2. Leadership, team working and networking skills 3. Opportunity, creativity and problem solving skills 4. Information technology skills and digital literacy 5. Information management skills 6. Research skills 7. Intercultural and sustainability skills 8. Career management skills 9. Learning to learn (managing personal and professional development, self management) 10. Numeracy

Assessment:

Please indicate the type(s) of assessment (eg examination, oral, coursework, project) and the weighting of each (%). **Details of indicative assessment should also be included.**

Assessment is by means of an examination covering outcomes 1, 2 and 3. It is an unseen, time-constrained, formal written examination.

(This corresponds to 'Assessment 1' of ENG553.)

Assessment number (use as appropriate)	Learning Outcomes met	Type of assessment	Weighting	Duration (if exam)	Word count (if coursework)
Assessment One:	1, 2, 3	Examination	100%	2 hrs	

Learning and Teaching Strategies:

The module will be presented to students through a specified series of lectures assisted by notes made available to the student before the start of each lecture (in hard copy format or, increasingly, via electronic media). Relevant video clips will be used to aid the learning process. Demonstrations will also be arranged to show the operation and set up of certain processes. Visits to local industries will demonstrate other processes including super-plastic forming and carbon fibre component manufacture. Investigative case studies will enhance the lectures.

Syllabus outline:

Review of Traditional Processes: machining - broaching, gears, screw thread, transfer machine; finishing; metal forming, blanking, piercing, modern methods;

Modern processes: laser machining; rapid prototyping; thermosetting and thermoplastic polymers; superplastic forming; composite materials, glass fibre, carbon fibre; machining and assembling honeycomb structures. Consideration of developing techniques/technologies and sources of information.

Computer Aided Manufacturing Processes: relevance of computers for modelling processes; CNC machines and special machines, linking between CAD and CNC machines; role of flexible manufacturing systems. Comparison with manual processes, associated decisions.

Bibliography:Essential reading:

Chang, T. Et al. (2005) *Computer-Aided Manufacturing*, 3rd Edn., Prentice-Hall.

Recommended reading:

McMahon, C. & Browne, J. (1988) *CADCAM Principles, Practice and Manufacturing Management*, Addison-Wesley.

Hannam, R. (1997) *Computer Integrated Manufacturing*, Addison-Wesley.

Leek, K. (1999) *Principles of CAD, CAM, CAE Systems*, Addison-Wesley.

Mair, G. (1993) *Mastering Manufacturing*, Macmillan.

Timings, R.L. (1992) *Manufacturing Technology Vol 1*, Longman.

Timings, R.L. (1993) *Manufacturing Technology Vol 2*, Longman.