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MODULE DESCRIPTOR

Module Title

Advanced Manufacturing

Reference	EN3108	Version	3
Created	May 2022	SCQF Level	SCQF 9
Approved	March 2021	SCQF Points	30
Amended	August 2022	ECTS Points	15

Aims of Module

To provide the student with the fundamental understanding of joining processes and equipment, surface technology and engineering metallurgy, manufacturing systems and different support systems for manufacturing including quality control and inspection.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Examine the principles of welding processes, brazing, soldering and adhesive bonding as well as mechanical assembly processes.
- 2 Evaluate surface processing operations including treatment, coating and cleaning.
- 3 Apply the principles of rapid prototyping and additive manufacturing processes.
- 4 Integrate the fundamentals of automation technologies for manufacturing systems including CAM and CIMS.
- 5 Design a manufacturing system including material selection for a given product.

Indicative Module Content

Joining processes and equipment: fusion welding process, solid-state welding process, Brazing, Soldering, Adhesive-bonding, and Mechanical Fastening Processes. Surface processing operations: Surface Roughness and Measurement; Friction, Wear, and Lubrication. Surface Treatments, Coatings, and Cleaning. Fundamentals of rapid prototyping and additive manufacturing processes. Automation of Manufacturing Processes and Operations Computer-aided Manufacturing Computer-integrated Manufacturing Systems Manufacturing in a Competitive Environment Manufacturing support systems: process planning and production control, quality control and inspection

Module Delivery

The module will be essentially student centred but will be supported by lecture, demonstration, industrial visits and video where these are felt to be appropriate. It will involve the student working to tackle problems relating to real mechanical engineering products. The student will be given set objectives and will in general be expected to follow prescribed procedures.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	80	N/A
Non-Contact Hours	220	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	300	N/A
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	60%	Outcomes Assessed:	1, 2, 3
Description:	Case study covering manufacturing processes.				

Component 2

Type:	Coursework	Weighting:	40%	Outcomes Assessed:	4, 5
Description:	Case study covering automation technologies and manufacturing systems.				

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 is worth 60% and C2 is worth 40%.

		Coursework:						
		A	B	C	D	E	F	NS
Coursework:	A	A	A	B	B	E	E	
	B	B	B	B	C	E	E	
	C	B	C	C	C	E	E	
	D	C	C	D	D	E	E	
	E	E	E	E	E	E	F	
	F	E	E	E	F	F	F	
NS		Non-submission of work by published deadline or non-attendance for examination						

Module Requirements

Prerequisites for Module	Completion of EN1703 and EN2704 or equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

- 1 CALLISTER W.D., RETHWISCH, D. G., 2014. Materials Science and Engineering. 9th Edition SI Version, New York: Wiley
- 2 KALPAKJIAN, S. and SCMID, S., 2014. Manufacturing engineering & technology. 7th edition. Harlow: Pearson.
- 3 GROOVER, M.P., 2016. Principles of modern manufacturing. Global Edition SI Version. New York: Wiley.