

Full Title	Manufacturing Process Planning (Apprenticeship)		
Status	Uploaded to Banner	Start Term	2017
NFQ Level	07	ECTS Credits	05
Module Code	ENGI07056	Duration	Stage - (26 Weeks)
Grading Mode		Department	Mechanical & Industrial Eng
Module Author	Patrick Delassus		
Co Authors	Paul ODowd		

Module Description

The aims of this module are

- to help the students develop an understanding of the underlying knowledge and related methods of Process Planning and Computer Aided Process Planning, and
- to equip the students with the skills required in carrying out the process planning (PP) function.

Learning Outcomes

☰ *On completion of this module the learner will/should be able to:*

1. Describe the process planning functions, the role of process planning in manufacturing, the characteristics of traditional and Computer Aided Process Planning (CAPP) systems, and the structure of typical CAPP systems.
2. Identify the process capabilities, such as process parameters, process boundaries, process performance and process cost in the areas of machining, mechanical, electronic and biomedical product assembly.
3. Apply group technology, geometric coding systems, electronic product information representation methods, and process data representation methods to encode part and process information within machining or biomedical products manufacturing environment.
4. Implement Manual and Computer Aided Process Planning systems in consideration of process planning criteria, and industrial considerations.
5. Review (i) the relevant principles for designing products easily producible and for economic production with adequate selection of materials and manufacturing processes, and (ii) the capacity of different manufacturing processes so as to adequately manufacture and design mechanical products.
6. Identify factors and causing mechanisms of the defects likely to occur with different manufacturing processes in producing mechanical products and the relevant design approaches to rectify them, and issues relevant to green manufacturing.
7. Compare the production cost of a mechanical product by different manufacturing processes so as to enable the selection of most cost effective process

Indicative Syllabus

- Traditional Process Planning Systems and Computer Aided Process Planning Systems. Variant approaches and generative approaches of CAPP.
- Manual process planning: part print analysis; preliminary process planning; process evaluation and industrial considerations; tolerance analysis; process planning documentation.
- Group Technology: CAPP and group technology; classification and examples of coding systems.
- Process Knowledge Representation. Modelling of CAPP Systems. Feature Representation and Recognition.
- Case studies on the application of CAPP in Machining or Assembly.
- Materials and manufacturing processes selection. Comparison of various processes for producibility and productivity.

Teaching and Learning Strategy

This module requires to cover the selection of processes, equipment, tooling and the sequencing of operations required to transform a chosen raw material into a finished product. The content reviews materials and processes for manufacturing and details the core activities involved in process planning, from drawing interpretation to preparing the final process plan. Therefore, the theoretical content will be covered through lectures and its application will be delivered through cases studies in laboratories and also with a project.

Assessment Strategy

Advanced Manufacturing Processes is a "Type 1" apprenticeship module. It is 100% assessed during the Academic Block.

The assessment strategy of this module will be a combination of:

- In class/lab assessments,
- Exam-type assessments,
- Industry project.

Repeat Assessment Strategies

Students will be given the opportunity to take a repeat examination.

Indicative Coursework and Continuous Assessment:		100 %		
Form	Title	Percent	Week (Indicative)	Learning Outcomes
Assessment	In class/lab assessment	40 %	OnGoing	1,2
Assessment	Exam-type assessment	40 %	End of Semester	3,4
Project	Industry project	20 %	OnGoing	5,6,7

Full Time Delivery Mode Average Weekly Workload:			3.05 Hours		
Type	Description	Location	Hours	Frequency	Weekly Avg
Lecture	Theory	Not Specified	2	Weekly	2.00
Practical	Practical	Computer Laboratory	1	Weekly	1.00
Supervision	Industry project	Not Specified	0.05	Weekly	0.05

Part Time Delivery Mode Average Weekly Workload:			1.50 Hours		
Type	Description	Location	Hours	Frequency	Weekly Avg
Lecture	Lecture	Not Specified	1	Weekly	1.00
Practical	Practical	Computer Laboratory	0.5	Weekly	0.50

Recommended Reading Book List

Bsc, P., (2003). *Process Planning: The design/manufacture interface*. Butterworth-Heinemann.
ISBN 0750651296 ISBN-13 9780750651295

(2013). *Technology and Manufacturing Process Selection: The Product Life Cycle Perspective (Springer Series in Advanced Manufacturing)*. Springer.

Kesavan, R., (2008). *Process Planning and Cost Estimation*. New Age International Pvt Ltd Publishers.
ISBN 8122426050 ISBN-13 9788122426052

Programme Membership

GA_EMAJG_B07 201900 Bachelor of Engineering in Manufacturing Engineering (Apprenticeship)
GA_EMAPG_B07 201900 Bachelor of Engineering in Manufacturing Engineering (Apprenticeship)