



MODULE SPECIFICATION

Faculty of Engineering

Last Updated 29th July 2017

1. **Module Title**
Design, Drafting and Manufacture
2. **Module Code**
EM1101
3. **Number of credits**
20
4. **Level**
1
5. **Semester**
1
6. **Pre-requisites for admission to the module**
Normal entry requirements
7. **Module Coordinator**
Hj Md Asri Hj Muhammad
8. **Aims**
To introduce students to basic design processes, basic engineering drawings and extend the acquired skills to drafting simple components and consider their manufacturing using a variety of general hand/measuring tools used in industry.
9. **Summary of Contents**
The module covers the following topics:
 - **Introduction to Mechanical Engineering drawing:** Drawing Standards, Orthogonal, Isometric and Perspective drawing.
 - **Introduction to Computer Aided Drafting:** System environment and Setting, Templates and File formats, Dimensions, Units, Scaling and scale factors, limits; Geometrical constructions and Drawing modifications; CAD Model Space and Multi-views, View Ports, projections; and Drawing Sectional views.
 - **Introduction to Design philosophy:** steps in Design process, general Design rules for manufacturing.
 - **Health & safety in workshop:** Concepts of risk and hazard. Basic rules for safe working in the workshops.
 - **Metrology:** Standards, Tolerance, allowance, Fits & Limits, gauges; Surface Texture, Surface Roundness, Introduction to Coordinate Measuring Machine (CMM).
 - **Introduction to Manufacturing Processes:** Grinding: Grinding wheel construction, specifications, selection and principles of grinding operation; Casting processes: pattern making, expandable mould and pattern; Metal cutting theory: orthogonal metal cutting model, negative & positive rake angles, cutting temperature, cutting fluids, cutting tool wear, cutting tool materials. Machining of various shapes: holes, flat surfaces, contoured surfaces.

10. Module Intended Learning Outcomes (MILOs)

Upon successful completion of this module, students will be able to:

No.	MILOs	Weightage (%)
1	Interpret engineering drawings according to standards.	10
2	Produce 2D engineering drawings according to standards.	15
3	Apply design process in product development.	15
4	Demonstrate knowledge and capabilities of basic manufacturing processes.	15
5	Select a sample component and analyse the most suitable manufacturing process for producing it.	15
6	Produce a prototype with documentation.	30

11. Teaching and Learning Activities (TLAs)

MILO No.	TLAs	Functions	Hours/Week
1-6	Lecture	Deliver the relevant knowledge, concepts and theories	2
1-6	Tutorial	Apply knowledge to design a product based on set criteria	1
1-6	Laboratory for CAD	Practical CAD session using software	2
1-6	Laboratory for Manufacturing	Apply practical aspect of manufacturing process	2

12. Assessment Tasks/Activities

MILO No.	Type of Assessment Tasks/Activities	Weightage (%)
1, 4	1 Class Test	10
2	1 Mini Design project	15
4-6	3 Laboratory reports for manufacturing	25
1-6	1 Group Design and Manufacture project	50

Assessment Criteria:

Assessment components of the module shall be 100% Coursework. To achieve a pass in the module students must obtain a minimum overall mark of 40%.

Reassessment: Students eligible for reassessment shall be assessed according to the programme area examination board recommendation.

13. Attendance Requirements

Students are required to attend all lectures, tutorials and laboratory sessions.

14. Contribution to Programme Intended Learning Outcomes

PILO		MILO No.					
		1	2	3	4	5	6
1	Science & Mathematics	✓	✓	✓	✓	✓	✓
2	Engineering Analysis	✓	✓	✓	✓	✓	✓
3	Design			✓			✓
4	Advanced Design						
5	Economic, Legal, Social and Ethical Contexts						✓
6	Engineering Practice	✓	✓	✓	✓	✓	✓
7	General Skills	✓	✓	✓			✓

15. Grading of Student Achievement

Marks (%)	Grades	Grade Definition
85-100	A+	Excellent
75-84	A	
70-74	B+	Very Good
65-69	B	
60-64	C+	Good
55-59	C	
50-54	D+	Satisfactory
45-49	D	
40-44	E	Marginal
0-39	F	Fail

16. Resources

Primary texts

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	Karl T. Ulrich, Steven D. Eppinger	2016	Product design and development	6 th	NY McGraw-Hill Education	978-0073404776
2	E. Paul De Garmo	2017	Materials and Processes in Manufacturing	12th	John Wiley & Sons	978-1-119-38289-8

Secondary texts

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	Kalpakjian s, Steven R.Schmid	2007	Manufacturing Processes for Engineering Materials	5th	Pearson Education	0132272717
2	Kalpakjian s, Steven R.Schmid	2013	Manufacturing Engineering & Technology	7th	Pearson Education	0133128741

Note: Module specification valid for BEng Mechanical Engineering Intake 09 onwards.