| Module code: MOD010259 | **Version:** 2 **Date Amended:** 04/Dec/2024 |
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### 1. Module Title

Design, Project Management and Quality Engineering Project

### 2a. Module Leader

Mohamed Yehia

### 2b. School

School of Engineering and the Built Environment

### 2c. Faculty

Faculty of Science and Engineering

### 3a. Level

5

### 3b. Module Type

Standard (fine graded)

### 4a. Credits

30

### 4b. Study Hours

300

### 5. Restrictions

| Type | Module Code | Module Name | Condition |
|---|---|---|---|
| Pre-requisites: | None | | |
| Co-requisites: | None | | |
| Exclusions: | None | | |
| **Courses to which this module is restricted:** | None | | |

**LEARNING, TEACHING AND ASSESSMENT INFORMATION**

## 6a. Module Description

This project-based module carries you throughout the entire design process: from identifying a need to ensuring quality in a mass-produced product.

Working in groups, you will identify a user-need, conduct market research, and develop and evaluate multiple design ideas which meet this user-need.  You will then create (if feasible) a prototype of your chosen design and use Project Evaluation and Review Techniques to evaluate your product.  You will also learn about patents and other legal issues.  Having created your design prototype, you will then learn how to optimise your design based on DfMA (Design for Manufacture and Assembly). This streamlining is essential to mass-producing your product.  You will also learn about how Statistics and Process Quality Assurance is used to ensure the quality of the mass-produced parts remains high.

To help you efficiently and effectively achieve these aims, you will learn valuable Project Management skills throughout the module.  These skills include how to create and use Gantt charts, SWOT, Risk Management, Critical Pathways, and Change Management.

## 6b. Outline Content

- New product market research and assessment, cost analysis, and payback period.
- Practical application of design for ease of manufacture and assembly (DfMA).
- Critical evaluation of appropriate manufacturing processes for a given design.
- Detailed design and technical considerations for material and design choice.
- Quality management theories and standards e.g. ISO 9000.
- Probability and statistics including: sampling, graphical representation of data, binomial and Poison and normal distributions.
- Statistical process control charts including: average and range, average and standard deviation, moving average and range, multi-stream charts.
- Project management

## 6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

## 6d. Specialist Learning Resources

None

## 7. Learning Outcomes (threshold standards)

| No. | Type | On successful completion of this module the student will be expected to be able to: |
|-----|------|--------------------------------------------------------------------------------------|
| 1 | Knowledge and Understanding | Evaluate and apply advanced engineering management principles within a commercial context, incorporating strategic project management, change management methodologies, and an in-depth understanding of relevant legal frameworks, including intellectual property rights and their implications for engineering practice. |
| 2 | Intellectual, practical, affective and transferrable skills | Critically analyse and implement risk management and quality management frameworks to systematically identify, assess and mitigate risks, while driving continuous improvement in engineering processes and practices. |
| 3 | Intellectual, practical, affective and transferrable skills | Design and optimise complex 3D assembly models, creating inclusive design solutions which meet societal, environmental, user, business, and/or customer needs. |
| 4 | Intellectual, practical, affective and transferrable skills | Communicate effectively on complex engineering matters with technical and non-technical audiences. |

## 8a. Module Occurrence to which this MDF Refers

| Year | Occurrence | Period | Location | Mode of Delivery |
|------|-----------|--------|----------|------------------|
| 2025/6 | ZZF | Template For Face To Face Learning Delivery | | Face to Face |

## 8b. Learning Activities for the above Module Occurrence

| Learning Activities | Hours | Learning Outcomes | Details of Duration, frequency and other comments |
|---------------------|-------|-------------------|---------------------------------------------------|
| Lectures | 24 | 1-4 | Lectures, 2 hours per week |
| Other teacher managed learning | 48 | 1-4 | Tutorials/seminars/practical sessions, 4 hours per week |
| Student managed learning | 228 | 1-4 | Self-directed learning |
| TOTAL: | 300 | | |

| 9. Assessment for the above Module Occurrence | | | | | |
|---|---|---|---|---|---|
| Assessment No. | Assessment Method | Learning Outcomes | Weighting (%) | Fine Grade or Pass/Fail | Qualifying Mark (%) |
| 010 | Coursework | 3-4 | 30 (%) | Fine Grade | 30 (%) |

**Presentation followed by Q&A. It maps to Engineering Council Learning Outcome C3 Equivalent to 2000 words**

| Assessment No. | Assessment Method | Learning Outcomes | Weighting (%) | Fine Grade or Pass/Fail | Qualifying Mark (%) |
|---|---|---|---|---|---|
| 011 | Coursework | 1-4 | 70 (%) | Fine Grade | 30 (%) |

**Individual report, maps to Engineering Council. Learning Outcomes C6, C9, C13, C16, C17 Equivalent to 4000 words**

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**In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).**

**In addition, students are required to:**
**(a) achieve the qualifying mark for each element of fine graded assessment as specified above**
**(b) pass any pass/fail elements**

**[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]**