

WM191-30 Engineering Product Design

24/25

Department

WMG

Level

Undergraduate Level 1

Module leader

Piotr (Peter) Klin

Credit value

30

Module duration

42 weeks

Assessment

100% coursework

Study locations

University of Warwick main campus, Coventry Primary

Distance or Online Delivery

Description

Introductory description

This 30CATS module, running throughout the academic year, gives learners an opportunity to apply academic knowledge to real-life scenarios/work-based challenges.

The first part of the module focuses on developing study skills and the ability to select and evaluate technical literature in a Health & Safety (H&S) and Standard Operating Procedure (SOP) context.

Performing a Product Development Process (PDP) as part of a group forms the second part of the module.

During the module, learners will also be introduced self-learning and development as the foundation for lifelong learning and Continuous Professional Development (CPD).

This module is linked with C1, C4, C5, C6, C9, C10, C11, C13, C15, C16, C17, C18 of the AHEP 4.

LO1- C4, C10;

LO2- C1, C5, C6, C11, C13;

LO3- C9, C15;

LO4- C17;

LO5- C16;

Module aims

Initial aim of the module is to teach learners how to review and evaluation of workplace H&S documentation and SOPs related to data security.

The main module aim is to design solutions for broadly defined industrial problems that meet a combination of user, business and customer needs as appropriate with the use of technical literature (both internal and external), knowledge of engineering principles and relevant design/project management tool, techniques and processes.

This module will allow participants to understand the project landscape and employ principles and techniques used in industry to execute, manage and effectively deliver projects.

Learners will be taught to manage their own professional development as engineers (as individuals, team members or leaders), by introducing them to reflective practice and the UK Standard for Professional Engineering Competence (UK SPEC).

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

- Engineering report writing
- Use of published sources and referencing
- H&S , SOPs, Data security - structure and assessment.
- Overview of the Product Development Process
- Project and risk management tools and techniques
- Voice of the customer analysis
- Product Design Specification generation
- Concept generation and evaluation
- Process outcome Assessment
- Becoming a reflective engineering practitioner

Learning outcomes

By the end of the module, students should be able to:

- Review internal documentation based around health and safety and data security using internal and external technical literature.[AHEP:4-C4,C10].
- Apply product design tools and techniques to solve engineering problems in line with the clients design requirements while adopting an inclusive approach to engineering practice [AHEP:4-C1, C5, C6, C11, C13].
- Use project management and project related risk management tools in order to increase process efficiency and mitigate the effects of uncertainty associated with the undertaken

PDP [AHEP:4-C9, C15].

- Communicate the findings of your work to technical and non-technical audience [AHEP:4-C17].
- Demonstrate the ability to work as an individual or a team member to achieve shared objectives in an engineering design project [AHEP:4-C16].
- Reflect on their own learning and experience in terms of developing Knowledge, Skills, Behaviours and Professional Engineering Competences, to set and monitor their own professional development goals [AHEP:4-C18].

Indicative reading list

Design Process:

“Product Design and Development” Eppinger Steven, Ulrich Karl, 5th International Edition, (2020). ISBN: 1260569543, 9781260569544

“Engineering Design, Planning and Management”, Hugh Jack (2013). ISBN: 0123971586, 9780123971586

"Product design: a practical guide to systematic methods of new product development" Mike Baxter, 1st Edition, (2017). ISBN: 9781315275246

“Engineering Design Methods: A strategies for Product Design “ Nigel Cross 4th Edition (2021). ISBN: 1119724376

Project Management:

Kerzner, Harold R: (2017) Project Management: A Systems Approach to Planning, Scheduling and Controlling: 12th Ed; Wiley

Pinto, J. K (2016) Project Management: Achieving Competitive Advantage, 4th Edition. Boston: Pearson

Thompson, C, & Hopkin, P (2021) Fundamentals of Risk Management : Understanding, Evaluating and Implementing Effective Enterprise Risk Management, Kogan Page, Limited, London

Reflective Practice:

Engineering Council, (2021), The UK Standard for Professional Engineering Competence and Commitment (UK-SPEC), 4th edition.

[View reading list on Talis Aspire](#)

Subject specific skills

- Select, use and apply approved problem-solving methods to solve complex problems and determine appropriate solutions or actions (S2 in all DA standards).
- Manage assigned projects or programmes of work, taking into account factors such as safety, quality, cost and performance criteria (S6 in all DA standards).
- Create a project or work programme plan and develop activities in a logical process embedding mechanisms for adapting to changing circumstances or requirements (S9 in all

DA standards).

- Select the best method for collating and conveying complex information using a range of data sources and supporting documentation (S3 in all DA standards).
- Interpret and produce technical documentation such as schematic and circuit diagrams, engineering drawings or 3D CAD models, simulation models, project plans, engineering reports, test reports, fault reports or data analytics using company documentation systems and guidelines (S4 in ST0027).
- Comply with statutory and organisational safety standards and requirements, supporting safety risk assessments and mitigate any risks (S7 in ST0023, S7 in ST0027 and S8 in ST0025)
- Evaluate engineering designs, development or modification options (S13 in ST0027)

Transferable skills

- Understanding of business, government and third sector issues and priorities.
 - Understanding organisational norms of behaviour.
 - The systematic collection, analysis and evaluation of information in the investigation of a topic.
 - Manages priorities and time.
 - Aware of personal strengths and emotional intelligence.
 - Reflect on learning, seeking feedback on and evaluating personal practices, strengths and opportunities for personal growth.
 - Verbal communication: Communicate orally in a clear and sensitive manner which is appropriately varied according to different audiences.
 - Written communication: Present arguments, knowledge and ideas, in a range of formats
 - Use rational and logical reasoning to deduce appropriate and well-reasoned conclusions.
 - Operate within, and contribute to, a respectful, supportive and cooperative group climate.
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Study

Study time

Type

Lectures

Seminars

Work-based learning

Online learning (scheduled sessions)

Online learning (independent)

Other activity

Private study

Assessment

Total

Required

21 sessions of 1 hour (7%)

9 sessions of 1 hour (3%)

30 sessions of 1 hour (10%)

30 sessions of 1 hour (10%)

10 sessions of 1 hour (3%)

10 hours (3%)

70 hours (23%)

120 hours (40%)

300 hours

Private study description

- Self-guided study: revision on module contents, solution of additional seminar-type questions, video tutorials and supplementary materials.
- Study and use of simulation software.
- Online forum and discussion (asynchronous).

Other activity description

10 hours of on-line support / consultancy before assessments.

Work-based Learning details of 30 hours is as follows:

12 hours in Term 1 for getting familiar with company documents on Health and Safety procedures, data security procedures, password safety, cloud safety and safe remote access to company's IT systems, for Assessment 1.

12 hours in Term 2 on company's approach to design process and project/process management, for Assessment 2.

6 hours in Term 3 on company's internal professional development schemes and alignment with relevant professional engineering institution recognition schemes.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A

	Weighting	Study time	Eligible for self-certification
Assignment 1	25%	30 hours	Yes (extension)
Individual report on analysis and review of:			
<ul style="list-style-type: none">• health & safety policy of the apprentice's company vs. legislation;• health and safety procedure at apprentice's workplace or activity;• data security procedures at apprentice's company;• password safety, cloud safety and safe remote access to company's IT systems.			
Assignment 2 - Group design project	50%	60 hours	No
Group Report on the Design process and the management of the design process.			

	Weighting	Study time	Eligible for self-certification
Typical Group size will be 6 students, possibly 5. Will be subjected to Peer-Marking in line with the WMG policy.			
Assignment 3 - Initial Professional Development	25%	30 hours	Yes (extension)
Creation of an individual Initial Professional Development portfolio, which will include reflection on learning and experiences during the year, and setting of personal development action plans.			

Feedback on assessment

FORMATIVE FEEDBACK:

Term 1: automated individual Moodle feedback at on-line tests on Health and Safety.

Term 1: automated individual Moodle feedback at on-line tests on Data Security,

Term 2: cohort-level feedback on the preliminary design of the product/artefact.

Term 2-3: small group / individual feedback on professional development activities.

- verbal feedback given during seminars and revision classes throughout the Y1 (1-to1, group or cohort-level, as appropriate).

SUMMATIVE FEEDBACK:

Written individual feedback on Assignment 1.

Written group feedback on Assignment 2.

Written individual feedback on Assignment 3.

Availability

Courses

This module is Core for:

- Year 1 of UWMS-H7C3 Undergraduate Applied Professional Engineering (Control/Technical Support Engineer)
- Year 1 of DWMS-H7C7 Undergraduate Applied Professional Engineering (Control/Technical Support Engineer) (Degree Apprenticeship)
- Year 1 of UWMS-H7C2 Undergraduate Applied Professional Engineering (Electrical/Electronic Support Engineer)
- Year 1 of DWMS-H7C6 Undergraduate Applied Professional Engineering (Electrical/Electronic Support Engineer) (Degree Apprenticeship)
- Year 1 of UWMS-H7C1 Undergraduate Applied Professional Engineering (Manufacturing Engineer)
- Year 1 of DWMS-H7C5 Undergraduate Applied Professional Engineering (Manufacturing Engineer) (Degree Apprenticeship)
- Year 1 of UWMS-H7C4 Undergraduate Applied Professional Engineering (Product Design Engineer)

and Development Engineer)

- Year 1 of DWMS-H7C8 Undergraduate Applied Professional Engineering (Product Design and Development Engineer) (Degree Apprenticeship)