Y11 - 10 Week Plan

Subject	**CNAT Engineering Design – 11EgC-1**
Paper	**Paper - Unit R038: Principles of engineering design** Topic Area 1: Designing processes Topic Area 2: Design requirements Topic Area 3: Communicating design outcomes Topic Area 4: Evaluating design ideas
Work/skills/activities being covered in lesson leading to exams	• **Week 1** 1.1 - Revision of Design Strategies – specifically: - Linear design - Iterative design - Inclusive design - User-centred design - Sustainable design - Ergonomic design 1.2 - Particular focus on the stages of the iterative design process, and the activities carried out within each stage of this cyclic approach. • **Week 2** 1.2.1 - Revision of methods and strategies supporting effective design including: - Analysis of the design brief - Methods of researching the product requirements including the types of information obtained from primary and secondary research. - Using market research to determine existing products - Using interviews with potential users and focus groups - Using tables of anthropometric data - Analysis of existing products using ACCESS FM - The production of an engineering design specification • **Week 3** 1.2.2 - Revision of the value/purpose for using modelling as part of the design process including: - to test proportions - to test scale - to test function Revision of Virtual modelling and Physical modelling of design ideas. 4.2 – Revision of Modelling methods including: - Virtual (3D CAD - Card - Block

- Breadboarding
- 3D printing

4.1 - Revision of Methods of evaluating design ideas including:

- Production of models
- Qualitative comparison with the design brief and specification
- Ranking matrices
- Quality Function Deployment (QFD)

4.3 - Revision of methods of evaluating a design outcome including:

- Methods of measuring the dimensions and functionality of the product
- Quantitative comparison with the design brief and specification
- User testing
- Reasons for identifying potential modifications and improvements to the design

- **Week 4**

2.1 - Revision of the types of criteria included in an engineering design specification including:

- Needs and wants
- Quantitative and qualitative criteria
- The product criteria included in ACCESS FM.

- **Week 5**

2.2 - Revision of manufacturing considerations that affect design including:

- Scale of manufacture: (one-off, batch, mass)
- Material availability and form
- Types of manufacturing processes including wasting, shaping, forming, joining, finishing, assembly.
- Production cost sources including labour and capital costs

- **Week 6**

2.3 - Revision of influences on engineering product design including:

- Market pull and technology push
- British and International Standards
- Legislation
- Planned obsolescence
- Sustainable design (6Rs)
- Design for the circular economy

- **Week 7**

3.1 - Revision of the types of drawing used in engineering including:

	- Freehand sketching, Isometric, Oblique, Orthographic drawings, exploded views, Assembly drawings, Block diagrams, Flowcharts, Circuit diagrams, Wiring diagrams 3.3 – Revision of the advantages and limitations of using CAD drawing software compared to manual drawing techniques. 3.2 – Revision of working drawings including: - Standard conventions including title block, metric units of measurement, scale and tolerance. - Standard conventions for dimensions. - Meaning of line types including outlines, hidden detail, centre line, projection, dimension, leader line - - Abbreviations including across flats, centre line, diameter, drawing, material and square. - Representations of mechanical features including threads, holes, chamfers, countersinks and knurls. • **Week 8** Past paper/exam technique. • **Week 9** Past paper/exam technique. • **Week 10** Exam week – Final review of key topics and exam technique
Areas to revise as a priority leading to exams	• Design Strategies – specifically, Linear design, Iterative design, Inclusive design, User-centred design, Sustainable design, Ergonomic design • ACCESSFM – its meaning and use. • Types of manufacturing processes included under each of the terms - wasting, shaping, forming, joining, finishing, assembly. • The influences on engineering product design including, Market pull and technology push, British and International Standards, Legislation, Planned obsolescence and Sustainable design (6Rs) • Revision of the ten types of drawing used in engineering. • Revision of the standard conventions used in engineering working drawings

Suggested methods of revision	• Create and use flashcards for key terminology and content facts. • Scans of the revision guide provided on email. • Revision worksheet activities on Worksheets 1-11 • Past papers available on CNAT website. Practice the prescribed unseen questions and past papers and check against mark scheme.