

Year 11 Engineering Design Curriculum End Points and Key Vocabulary

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term
Units of Work	R040: Product Analysis & Disassembly Activity & NEA R040	R040: Virtual/Physical Modelling & NEA R040	R040 Virtual/Physical Modelling, R040 Submission	Exam Revision; R040: Physical Modelling & Prototype Testing	Comprehensive Exam Revision & Final Examination. R040: Final NEA Submission
Ethos Links	<p>Sustainability: Examining manufacturing considerations, material waste reduction, and disassembly for recycling.</p> <p>STEM: Quantitative and qualitative criteria, ACCESS FM application, and mechanical disassembly analysis.</p> <p>Milton Keynes: Investigating local manufacturing plants and product teardown methodologies.</p>	<p>Sustainability: Selecting sustainable modelling materials (card, foam, polymers) and rapid prototyping efficiency.</p> <p>STEM: Third-angle orthographic projection, BS 8888 standards, dimensions, tolerances, and CAD stress simulation.</p> <p>Milton Keynes: Applying engineering drawing conventions to regional design specifications.</p>	<p>Sustainability: Reviewing environmental life-cycle performance of prototype outcomes.</p> <p>STEM: Engineering matrices, Quality Function Deployment (QFD), ranking matrices, and exam command word application.</p> <p>Milton Keynes: Participating in early exam entries and mock moderation reviews.</p>	<p>Sustainability: Assessing prototype performance against environmental and functional design criteria.</p> <p>STEM: Measuring dimensions and functionality, user testing protocols, and data interpretation.</p> <p>Milton Keynes: Refining practical workshop skills and prototype finishing techniques.</p>	<p>Sustainability: Synthesizing sustainable engineering principles for terminal examination.</p> <p>STEM: Comprehensive mastery of all Performance Objectives (PO1-PO3) and technical engineering vocabulary.</p> <p>Milton Keynes: Final qualification certification entries and exam series participation.</p>
Learning End Points	<p>By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> Quantitative and qualitative criteria in engineering specifications (ACCESS FM). Scale of manufacture (one-off, batch, mass, continuous) and production cost factors (labour, capital). Product disassembly procedures, tools, and 	<p>By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> Types of engineering drawings (freehand, isometric, oblique, orthographic, assembly, schematic). BS 8888 drawing conventions: title blocks, metric units, scale, tolerance, line types, and abbreviations. Virtual CAD simulation 	<p>By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> Methods of evaluating design ideas (ranking matrices, QFD, engineering matrices). R038 examination structure (Section A multiple choice, Section B short/extended response questions). Rules governing R039 resubmissions and R040 	<p>By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> Methods of measuring dimensions and functionality of manufactured prototypes. Quantitative comparison with design specifications and structured user testing protocols. Identifying potential design modifications, improvements, and justifications. 	<p>By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> Terminal assessment rule: mandatory requirement to sit the R038 exam in the final assessment series. Comprehensive engineering design theory across all four R038 topic areas. Final administrative checks for R040 NEA portfolio authentication and moderation submission.

	analysis of components, assembly methods, and materials.	(assembly fit, component motion, stress analysis) and physical modelling methods.	final submission deadlines.		
	<p>By the end of this unit students will develop their ability to:</p> <ul style="list-style-type: none"> • Formulate comprehensive engineering specifications incorporating qualitative and quantitative criteria. • Conduct structured product analysis and physical disassembly observations. • Initiate R040 NEA coursework covering product evaluation and disassembly tasks. 	<p>By the end of this unit students will develop their ability to:</p> <ul style="list-style-type: none"> • Produce formal 3rd angle orthographic projection drawings and assembly views following BS 8888. • Execute virtual CAD simulation and build physical prototypes using sheet and block modelling materials. • Progress R040 modelling and production planning evidence independently. 	<p>By the end of this unit students will develop their ability to:</p> <ul style="list-style-type: none"> • Apply ranking matrices and engineering matrices to evaluate design options objectively. • Sit the R038 practice/early exam opportunity under formal examination conditions. • Finalize and submit R040 NEA evidence and process R039 resubmissions where applicable. 	<p>By the end of this unit students will develop their ability to:</p> <ul style="list-style-type: none"> • Conduct rigorous dimensional and functional testing on manufactured physical prototypes. • Formulate justified design improvements and evaluate prototype outcomes against specifications. • Execute targeted exam revision across all R038 topic areas. 	<p>By the end of this unit students will develop their ability to:</p> <ul style="list-style-type: none"> • Answer demanding exam questions with precision, using technical engineering terminology and structured reasoning. • Complete and submit all terminal qualification evidence and examination papers. • Secure final qualification certification eligibility.
Key Vocabulary	Quantitative criteria, Qualitative criteria, Scale of manufacture, Batch production, Mass production, Product disassembly, Component, Material, Labour cost, R040.	Orthographic projection, BS 8888, Tolerance, Assembly drawing, Exploded view, Stress simulation, Rapid prototyping, Sheet modelling, Block modelling, Production plan.	Ranking matrix, QFD, Engineering matrix, Command word, Multiple choice, Extended response, Resubmission, Early entry, Terminal rule, Moderation.	Dimensional accuracy, Functionality testing, User testing, Modification, Justification, Prototype evaluation, Revision, Command word, Analysis, Evaluation.	Terminal assessment rule, Certification entry, Performance objective, Technical terminology, Examination, Final submission, Authentication, URS, Qualification grade, UMS.