

UTC Engineering Department Learning Cycles 2019 – Year 13 Course Outline

Cycle 2.6	Cycle 2.7	Cycle 2.8	Cycle 2.9	Cycle 2.10
<p align="center"><u>Unit 2 - Delivery of Engineering Processes Safely as a Team</u> Topics</p> <p>A1 Common engineering processes A2 Health and Safety requirements</p>	<p align="center"><u>Unit 2- Delivery of Engineering Processes Safely as a Team</u> Topics</p> <p>A3 Human factors affecting the performance of engineering processes B1 Principles of Engineering Drawings</p>	<p align="center"><u>Unit 2- Delivery of Engineering Processes Safely as a Team</u> Topics</p> <p>B2 2D Computer Aided Drawing C1 Principles of Effective Teams</p>	<p align="center"><u>Unit 2-Delivery of Engineering Processes Safely as a Team</u> Topics</p> <p>C2 Team set-up and organisation C3 Health and Risk Assessment</p>	<p align="center"><u>Unit 2-Delivery of Engineering Processes Safely as a Team</u> Topics</p> <p>C4 Preparation activities for batch manufacture or batch delivery C5 Delivery of manufacturing or service engineering processes</p>
<p align="center"><u>Unit 4- Applied Commercial and Quality Principles in Engineering</u> Topics</p> <p>A1 Business functions and key activities A2 Trade considerations</p>	<p align="center"><u>Unit 4- Applied Commercial and Quality Principles in Engineering</u> Topics</p> <p>A3 Competitive advantage B1 Reasons for Cost Control and Types of Cost</p>	<p align="center"><u>Unit 4- Applied Commercial and Quality Principles in Engineering</u> Topics</p> <p>B2 Activity Based Costing Methods</p>	<p align="center"><u>Unit 4- Applied Commercial and Quality Principles in Engineering</u> Topics</p> <p>C1 Quality Systems</p>	<p align="center"><u>Unit 4- Applied Commercial and Quality Principles in Engineering</u> Topics</p> <p>C2 The Principles and Values of Value Management</p>
<p align="center"><u>Unit 5 - A Specialist Engineering Project</u> Topics</p> <p>A1 Project life cycle A2 Project idea generation and solution development</p>	<p align="center"><u>Unit 5 - A Specialist Engineering Project</u> Topics</p> <p>A3 Feasibility study of solutions B1 Planning and monitor project-management processes</p>	<p align="center"><u>Unit 5 - A Specialist Engineering Project</u> Topics</p> <p>B2 Risk and issue project-management processes B3 Technical Specification</p>	<p align="center"><u>Unit 5 - A Specialist Engineering Project</u> Topics</p> <p>B4 Design Information C1 Undertake and test solution to the problem</p>	<p align="center"><u>Unit 5 - A Specialist Engineering Project</u> Topics</p> <p>C2 Demonstration of Relevant Behaviours C3 Present a solution to the problem</p>
<p align="center"><u>Unit 7 - Calculus to Solve Engineering Problems</u> Topics</p> <p>A1 Functions, rate of change, gradient A2 Methods of differentiation</p>	<p align="center"><u>Unit 7 - Calculus to Solve Engineering Problems</u> Topics</p> <p>A3 Numerical value of a derivative A4 second derivative and turning points</p>	<p align="center"><u>Unit 7 - Calculus to Solve Engineering Problems</u> Topics</p> <p>B1 Integration as the reverse/inverse of differentiation B2 Integration as a summing tool</p>	<p align="center"><u>Unit 7 - Calculus to Solve Engineering Problems</u> Topics</p> <p>B3 Numerical integration C1 Thinking methods</p>	<p align="center"><u>Unit 7 - Calculus to Solve Engineering Problems</u> Topics</p> <p>C2 Mathematical modelling of engineering problems C3 Problem specification and proposed solution C4 Solution implementation</p>
<p align="center"><u>Unit 19 - Electrical Devices and Circuits</u> Topics</p> <p>A1 Safe electronic working practices</p>	<p align="center"><u>Unit 19 - Electrical Devices and Circuits</u> Topics</p> <p>A3 Transistor devices and transistor-based circuits</p>	<p align="center"><u>Unit 19 - Electrical Devices and Circuits</u> Topics</p> <p>A6 Testing physical analogue circuits</p>	<p align="center"><u>Unit 19 - Electrical Devices and Circuits</u> Topics</p> <p>B3 Sequential logic circuits</p>	<p align="center"><u>Unit 19 - Electrical Devices and Circuits</u> Topics</p>

A2 Diode devices and diode-based circuits	A4 Operational amplifier circuits A5 Schematic capture and simulation of analogue circuits	B1 Logic gates and Boolean algebra B2 Combinational logic circuits	B4 Schematic capture and simulation of digital circuits B5 Testing physical digital circuits	C1 Lessons learned from exploring electronic devices and circuits C2 Personal performance while exploring electronic devices and circuits
<u>Unit 22 - Electronic Printed Circuit Board Design and Manufacture</u> Topics A1 PCB types, technologies and applications A2 Characteristics of PCBs A3 Heat gain and thermal management	<u>Unit 22 - Electronic Printed Circuit Board Design and Manufacture</u> Topics A4 Manufacturing processes A5 Quality control methods A6 Sustainability and environmental considerations	<u>Unit 22 - Electronic Printed Circuit Board Design and Manufacture</u> Topics B1 Schematic capture B2 Circuit simulation	<u>Unit 22 - Electronic Printed Circuit Board Design and Manufacture</u> Topics C1 PCB design C2 Health and safety requirements when manufacturing a PCB C3 Risk assessment	<u>Unit 22 - Electronic Printed Circuit Board Design and Manufacture</u> Topics C4 Manufacture of a single-sided PCB D1 Lessons learned from developing a PCB D2 Personal performance while developing a PCB
<u>Unit 26 - Mechanical Behaviour of Non Metallic Materials</u> Topics A1 Types of non-metallic materials A2 Structures of non-metallic materials A3 Mechanical properties of non-metallic materials	<u>Unit 26 - Mechanical Behaviour of Non Metallic Materials</u> Topics A4 Typical engineering applications of non-metallic materials B1 In-service behaviour of non-metallic materials	<u>Unit 26 - Mechanical Behaviour of Non Metallic Materials</u> Topics B2 Destructive test procedures to determine mechanical properties B3 Material defects in non-metallic materials	<u>Unit 26 - Mechanical Behaviour of Non Metallic Materials</u> Topics B4 Non-destructive tests used to identify material defects C1 Ductile and brittle fracture C2 Creep failure C3 Fatigue failure	<u>Unit 26 - Mechanical Behaviour of Non Metallic Materials</u> Topics C4 Degradation processes C5 The contribution of design to prevent component failure
Keywords	Keywords	Keywords	Keywords	Keywords
Topic Assessments Used	Topic Assessments Used	Topic Assessments Used	Topic Assessments Used	Topic Assessments Used

Cycle 2.6		Cycle 2.7		
Topics		Topics		
Keywords		Keywords		
<u>Student Review</u>		<u>Student Review</u>		
What Went Well		What Went Well		
Even Better if		Even Better if		

Teacher Feedback

Teacher Feedback

Cycle 2.8	
Topics	
Keywords	
<u>Student Review</u>	
What Went Well	
Even Better if	

Teacher Feedback

Cycle 2.9	
Topics	
Keywords	
<u>Student Review</u>	
What Went Well	
Even Better if	

Teacher Feedback

Cycle 2.10	
Topics	
Keywords	
<u>Student Review</u>	
What Went Well	
Even Better if	

Teacher Feedback

Cycle 2.10	
Topics	
Keywords	
<u>Student Review</u>	
What Went Well	
Even Better if	

Teacher Feedback