COLLYER'S
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Engineering Section
BTEC L3 Extended Certificate in Engineering
Scheme of Learning
(Also, BTEC SOW) – 2nd Year

Key: T=Teacher Activity S=Student Activity WS=Worksheet CTB=Course Textbook PS=Pro-Study

1st Year (2022/2024) –

Week	Lesson 1(unit1)	Lesson 2(unit1)	Lesson 3(unit3)	Lesson 4(unit10)
1 9/9/24	U1-Ohms laws and current Flow Revision on ohms law Static electricity Current flow and atomic structure Conventional current flow T- PowerPoint CTB- Workbook Page 32 S- see workbook task S-Quick Test	U1-Coulomb's law and electrostatic force. Coulomb's law Charged particles Permittivity of free space – uniform field T- PowerPoint CTB- Workbook Page 33 S- see workbook task	U3-Recap main point from 1st year Gantt Charts Products requirements Engineering drawings and sketches Engineering materials T-PowerPoint S-Tasks from Past papers – questions 1, 2,3,4	U10-Introdtcion to unit Mode of assessment Use of Autodesk Products outside lessons Over Fusion360 and AutoCAD Revision- use of measuring instruments – vernier / micrometre Example of products to draw T-PowerPoint / Demo S- Drawings tasks
2 16/9/24	U1-Types of resistors, Resistance, conductance and temperature Resistance Conductance Temperature coefficient of resistance T- PowerPoint CTB- Workbook Page 34, 35 S- see workbook task S-Quick Test	U1-Field Strength and uniform electrical strength Field strength Uniform electrical field Non-uniform electrical field T- PowerPoint CTB- Workbook Page 36 S- see workbook task	U3-Controlled assessment – unit 3 past paper – drill jig (June 2017) T-Unit 3 past paper – drill jig S-Complete task 1 – Gantt chart and document changes H/W&PS – Complete past papers tasks	U10-Fusion 360 modelling – drawing commands Drawing, line, circle, radius, chamfer Product Design Students have covered Fusion 360 & AutoCAD Peer to Peer learning PD students given extend drawings tasks. T-PowerPoint / Demo S-Drawings tasks Online videos

3 23/9 /24	Unit 1- Types of capacitors, Capacitance, Permittivity. Charge between parallel plates Capacitance Permittivity T- PowerPoint CTB- Workbook Page 37, 38 S- see workbook task S-Quick test	U1-Capacitors – Polarised and non-polarised. Dielectric strength Capacitor construction-polarised Supercapacitor Electrolytic Dielectric strength T- PowerPoint CTB- Workbook Page 138,39 S- see workbook task	U3-Controlled assessment – unit 3 past paper – drill jig T-Unit 3 past paper – drill jig S-Complete task 2 – Clients needs and develop a new product specification. H/W&PS – Complete past papers tasks – detailed analysis	Unit 10-Fusion 360 Modelling tasks / insertion / moving components / dimensions Producing T-PowerPoint / Demo S-Drawings tasks Online videos	U2-Workshop Assignment 3 S- Complete course assignment in workshop
4 30/9 /24	U1-Ohm's law Power efficiency 1 & 2 Graphical and non-graphical form Graphical form Variation on power equations Efficiency T- PowerPoint CTB- Workbook Page 40.41 S- see workbook task S-Quick test	U1-Kirchoff's Voltage and Current laws. Kirchoff's voltage law Kirchoff's current law Combining Kirchoff's and Ohms law T- PowerPoint CTB- Workbook Page 42 S- see workbook task	U3-Controlled assessment – unit 3 past paper – drill jig T-Unit 3 past paper – drill jig S-Complete task 2 – data analysis and evaluate findings. H/W&PS – Complete past papers tasks – detailed analysis		
5 7/10 /24	U1- Capacitors Networks, Capacitors charging and discharging. Capacitors Networks Charging capacitors Energy stored in a capacitor Capacitor parallel and series network T- PowerPoint CTB- Workbook Page 43,44 S- see workbook task S-Quick test	U1 -Capacitors in circuits – RC transients and capacitor time constant. RC transient Capacitor charging Capacitor discharging T- PowerPoint CTB- Workbook Page 45, 46 S- see workbook task	U3-Controlled assessment – unit 3 past paper – drill jig T-Unit 3 past paper – drill jig S-Complete task 3 – Produce initial sketches H/W&PS – Complete past papers tasks – detailed analysis		
6 14/1 0/24	U1-Diodes – bias and applications. DC power sources Forward bias Reverse bias Batteries Cells T- PowerPoint CTB- Workbook Page 47,48 S- see workbook task	U1-Resistors in series or parallel. Resistors in series and parallel combinations T- PowerPoint CTB- Workbook Page 49,50 S- see workbook task	U3-Controlled assessment – unit 3 past paper – drill jig T-Unit 3 past paper – drill jig S-Complete task 3 Complete sketches and add notes H/W&PS – Complete past papers tasks – detailed analysis		

	S-Quick test			
7 21/10/24	U1- Resistors and diodes in series T- PowerPoint CTB- Workbook Page 51 S- see workbook task S-Quick test	U1-Capacitors in series or parallel. Capacitors in series and parallel combination T- PowerPoint CTB- Workbook Page 52,53 S- see workbook task	U3-Controlled assessment – unit 3 past paper – drill jig T-Unit 3 past paper – drill jig S-Complete task 4 – Produce engineering drawing 1st angle . H/W&PS – Complete past papers tasks – detailed analysis	
8 4/11/24	U1-Magnetism and magnetic fields Magnetic fields, magnetic flux density, ferromagnetic materials, solenoids, magnetic field strength T- PowerPoint CTB- Workbook Page 54 S- see workbook task S-Quick test	U1-Permeability, B/H Curves, loop and hysteresis. Relative permeability B/H curves in ferromagnetic materials T- PowerPoint CTB- Workbook Page 55, 56 S- see workbook task	U3-Controlled assessment – unit 3 past paper – drill jig T-Unit 3 past paper – drill jig S-Complete task 4 – Produce engineering drawing 1st angle fully dimensioned, select materials H/W&PS – Complete past papers tasks – detailed analysis	
9 11/11/24	U1-Relutance and magnetic screening. Analogy of reluctance and resistance Reluctance Magnetic screening T- PowerPoint CTB- Workbook Page 57 S- see workbook task S-Quick test	U1--Electromagnetic induction Basic DC motor operations Induction DC motor T- PowerPoint CTB- Workbook Page 58 S- see workbook task	U3-Controlled assessment – unit 3 past paper – drill jig T-Unit 3 past paper – drill jig S-Complete task 4 –Select and justify engineering processes. H/W&PS – Complete past papers tasks – detailed analysis	
10 18/11/24	U1-Electrical Generators Operation of an electrical generator Factors effecting induced EMF Sinusoidal Output of generator T- PowerPoint CTB- Workbook Page 60 S- see workbook task S-Quick test	U1-Inductors and self-induction Induction, electromotive force emf (e) self-inductance in a coil (L), Energy stored in an inductor (W) T- PowerPoint CTB- Workbook Page 61 S- see workbook task	U3-Controlled assessment – unit 3 past paper – drill jig T-Unit 3 past paper – drill jig S-Complete task 4 – External finishes with justifications H/W&PS – Complete past papers tasks – detailed analysis	
11	U1-Transfomers and mutual inductance Mutual induction (M), transformers	U1- AC Waveforms Sinusoidal waveform Square waveform	U3-Controlled assessment – unit 3 past paper – drill jig	

25/11/24	Transformer calculations. T- PowerPoint CTB- Workbook Page 62 S- see workbook task PS-Past Papers S-Quick test	Triangular waveform Sawtooth waveform Single phase AC parameters AC Parameters. Peak-to-Peak, Root-Mean Square, Average Voltage and Form Factor T- PowerPoint CTB- Workbook Page 64 S- S- see workbook task T- PowerPoint CTB- Workbook Page 63 S- see workbook task PS-Past Papers	T-Unit 3 past paper – drill jig S-Complete task 5 – Evaluate final solution and why. Justify your reasons for your selection.	
12 2/12/24	U1-Reactance and impedance Capacitive Reactance (Xc) Inductive Reactance (X_L) Resistor/capacitor series circuit Resistor/inductor series circuit Total impedance of a resistor/capacitor series circuit Total impedance of resistor inductor series circuit T- PowerPoint CTB- Workbook Page 66 S- see workbook task S-Quick test	U1-Rectifiction Simple half wave rectifier Full wave bridge rectifier Smoothed full bridge rectifier T- PowerPoint CTB- Workbook Page 67 S-see work book End of learning for Unit 1	Unit 3 – Part A – 1hr controlled assessment T-Controlled assessment S-make notes on part A, under exam conditions	Unit 3 – Part A – 1hr controlled assessment T-Controlled assessment S-make notes on part A, under exam conditions
	Christmas Break			
13 9/12/24	Revision – past papers	Revision – past papers	Revision – past papers	Revision – past papers
14 16/12/24	**Unit 1 Exam**	**Unit 1 Exam**	**Unit 3 Exam**	**Units 3 Exam**
15 6/1/25	**Unit 3 Exam**	**Unit 3 Exam**	**Unit 3 Exam**	**Unit 3 – Exam**

16 13/1 /25	Unit 10 – Fusion 360 T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 1	Unit 10 – Fusion 360 T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 1	Unit 10 – Fusion 360 T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 1	Unit 10 – Fusion 360 T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 1
17 20/7 /25	Unit 10 – Fusion 360 T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 1	Unit 10 – Fusion 360 T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 1	Unit 10 – Fusion 360 T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 1	Unit 10 – Fusion 360 T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 1
18 27/1 /25	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings
19 3/2/ 25	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 2	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 2	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 2	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 2
20 10/2 /25	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 2	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 2	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 2	Unit 10 – AutoCAD T-Demo AutoCAD commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 2
21 24/2 /25	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings
22	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features

3/3/25	S-Produce an engineered product PS/HW-Complete drawings	S-Produce an engineered product PS/HW-Complete drawings	S-Produce an engineered product PS/HW-Complete drawings	S-Produce an engineered product PS/HW-Complete drawings
23 10/3/25	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3
24 17/3/24	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3
25 21/3/25	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3
26 31/3/25	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3
27 21/4/25	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3	Unit 10 – Fusion 360 -Thin Walled T-Demo Fusion 360 commands and features S-Produce an engineered product PS/HW-Complete drawings Assignment 3
28 28/4/25	**Re submission of assignment**	**Re submission of assignment**	**Re submission of assignment**	**Re submission of assignment**

29 5/5/25	**Revisions for unit 1 or 3 retakes** **Re submission of assignment**	**Revisions for unit 1 or 3 retakes** **Re submission of assignment**	**Revisions for unit 1 or 3 retakes** **Re submission of assignment**	**Revisions for unit 1 or 3 retakes** **Re submission of assignment**
30 12/5/25	**Revisions for unit 1 or 3 retakes** **Re submission of assignment**	**Revisions for unit 1 or 3 retakes** **Re submission of assignment**	**Revisions for unit 1 or 3 retakes** **Re submission of assignment**	**Revisions for unit 1 or 3 retakes** **Re submission of assignment**
31 19/5/25	**2nd year student's exam level**	**2nd year student's exam level**	**2nd year student's exam level**	**2nd year student's exam level**
32 2/6/25				
33 9/6/25	**2nd year student's exam level**	**2nd year student's exam level**	**2nd year student's exam level**	**2nd year student's exam level**
34 23/6/25				
35 30/6/25				
36 7/7/25				
37 14/7/25				