

KS5 Curriculum Overview (Engineering - Diploma)

Year 12 - BTEC Level 3 National Diploma in Electrical/Electronic Engineering

TERMS 1 – 4 TOPIC		*Key Skills/Subject Links	*Career links & BV
Unit 19 3 lessons per week Unit 19: Electronic Devices and Circuits A: Explore the safe operation and applications of analogue devices and circuits that form the building blocks of commercial circuits. - Analogue electronic devices and circuits B: Explore the safe operation and applications of digital logic devices and circuits that form the building blocks of commercial circuits. - Digital electronic devices and circuits C: Review the development of analogue and digital electronic circuits and reflect on own performance. - Improving personal performance and lessons learnt	Unit 22 3 lessons per week Unit 22: Electronic Printed Circuit Board Design and Manufacture A: Examine the design and manufacture of printed circuit boards that are widely used in industry - Printed circuit board technology and manufacture. B: Explore how computer software is used for schematic capture and simulation of an electronic circuit - Schematic capture and simulation of electronic circuits C: Develop safely a printed circuit board to solve an engineering problem D: Review the development of the printed circuit board and reflect on own performance. Development of a printed circuit board and reflection on own performance.	All BTEC Nationals provide transferable knowledge and skills that prepare learners for progression to university or other higher study either immediately or for career progression. The transferable skills that universities value include: • the ability to learn independently • the ability to research actively and methodically • being able to give presentations and being active group members. • reading technical texts • analytical skills • creative development • preparation for assessment methods used in degrees. Scientific principles and practical knowledge to transform ideas and materials into products and systems safely and support them during their lifetime. This qualification has a focus on a broad range of engineering specialist areas including electrical and electronics • cognitive and problem-solving skills: use critical thinking, approach non-routine problems applying expert and creative solutions, use systems and technology • intrapersonal skills: communicating, working collaboratively, negotiating and influencing, self-presentation • interpersonal skills: self-management, adaptability and resilience, self-monitoring and development.	This qualification is for learners who want to pursue a career in engineering, and who want to be able to collaborate across and apply knowledge, skills and understanding in other branches of engineering. They can either progress directly to an apprenticeship or employment as an engineering technician or can choose to progress to higher education to study for an engineering degree. This qualification supports progression to job opportunities in the engineering sector at a variety of levels. Jobs that are available in these areas: • engineering operative • manufacturing operative • semi-skilled operative • engineering technician • electronics technician • IT support technician • mechatronics technician. This qualification also supports those following an apprenticeship in engineering who are looking to work and progress in the engineering sector as an engineering technician or as an engineering operative. After this qualification, learners can progress directly to technician roles. This qualification is recognised by higher education providers as contributing to meeting admission requirements for many relevant courses in a variety of areas of the engineering sector, for example: • BEng (Hons) in Engineering • BEng (Hons) in Electronics Engineering • BEng (Hons) in Aerospace Engineering • BSc (Hons) in Computer Science • BSc (Hons) in Mathematics
TERMS 5 & 6 TOPIC			
Unit 5 6 lessons per week Unit 5: A Specialist Engineering Project A: Investigate an engineering project in a relevant specialist area - Investigating an Engineering Project B: Develop project-management processes and a design solution for the specialist engineering project as undertaken in industry - Implement project-management processes to develop a solution for an engineering project C: Undertake the solution for a specialist engineering project and present the solution as undertaken in industry - Development and testing of a project solution			

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Year 13 - BTEC Level 3 National Diploma in Electrical/Electronic Engineering

TERMS 1 – 4 TOPIC		*Key Skills/Subject Links	*Career links & BV
Unit 14 3 lessons per week Unit 14: Electrical Installation of Hardware and Cables A: Examine safety requirements based on statutory and non-statutory regulations when working with electrical installations - Electrical Safety B: Interpret lighting and power circuit diagrams for domestic and commercial applications - Interpret wiring diagrams C: Select materials and documentation for an electrical installation D: Develop an electrical installation that incorporates different types of circuits in compliance with current regulations - Construct and test an electrical installation	Unit 20 3 lessons per week Unit 20: Analogue Electronic Circuits A: Investigate through research and simulation the operation of single function analogue electronic circuits. B: Explore the operation of single function analogue electronic circuits safely that form the building blocks of commercial circuits. - 1 Single function analogue circuits C: Modify a single function analogue electronic circuit to meet given parameters as widely undertaken in industry - 2 Modification of a single function analogue electronic circuit to meet a given specification. D: Review the development of analogue electronic circuits and reflect on own performance - 3 Lessons learnt exploring single function analogue circuits	All BTEC Nationals provide transferable knowledge and skills that prepare learners for progression to university or other higher study either immediately or for career progression. The transferable skills that universities value include: • the ability to learn independently • the ability to research actively and methodically • being able to give presentations and being active group members. • reading technical texts • analytical skills • creative development • preparation for assessment methods used in degrees. Scientific principles and practical knowledge to transform ideas and materials into products and systems safely and support them during their lifetime. This qualification has a focus on a broad range of engineering specialist areas including electrical and electronics • cognitive and problem-solving skills: use critical thinking, approach non-routine problems applying expert and creative solutions, use systems and technology • intrapersonal skills: communicating, working collaboratively, negotiating and influencing, self-presentation • interpersonal skills: self-management, adaptability and resilience, self-monitoring and development.	This qualification is for learners who want to pursue a career in engineering, and who want to be able to collaborate across and apply knowledge, skills and understanding in other branches of engineering. They can either progress directly to an apprenticeship or employment as an engineering technician or can choose to progress to higher education to study for an engineering degree. This qualification supports progression to job opportunities in the engineering sector at a variety of levels. Jobs that are available in these areas: • engineering operative • manufacturing operative • semi-skilled operative • engineering technician • electronics technician • IT support technician • mechatronics technician. This qualification also supports those following an apprenticeship in engineering who are looking to work and progress in the engineering sector as an engineering technician or as an engineering operative. After this qualification, learners can progress directly to technician roles. This qualification is recognised by higher education providers as contributing to meeting admission requirements for many relevant courses in a variety of areas of the engineering sector, for example: • BEng (Hons) in Engineering • BEng (Hons) in Electronics Engineering • BEng (Hons) in Aerospace Engineering • BSc (Hons) in Computer Science • BSc (Hons) in Mathematics
TERMS 5 & 6 TOPIC			
Unit 4 6 lessons per week Unit 4: Applied Commercial and Quality Principles in Engineering A: Examine business functions and trade considerations that help engineering organisations thrive - Business Activities and Trade Considerations B: Explore activity-based costing as a method to control costs and to determine if an engineering product or service is profitable - Activity-Based Costing C: Explore how engineering organisations use quality systems and value management to create value - Quality Systems and Value Management			