

KS5 Curriculum Overview (Engineering - Single)

Year 12 - BTEC Level 3 National Extended Certificate in Engineering

TERM 1 – 6 TOPIC	TERM 1 - 6 TOPIC	*Key Skills/Subject Links	*Career links & BV
<p><u>Unit 1</u></p> <p>4 lessons per week</p> <p>Engineering Principles – External Exam – Jun 2024</p> <p>Learners apply mathematical and physical science principles to solve electrical-, electronic- and mechanical-based engineering problems.</p> <p>AO1 - Recall basic engineering principles and mathematical methods and formulae</p> <p>AO2 - Perform mathematical procedures to solve engineering problems</p> <p>AO3 - Demonstrate an understanding of electrical, electronic and mechanical principles to solve engineering problems</p> <p>AO4 - Analyse information and systems to solve engineering problems</p> <p>AO5 - Integrate and apply electrical, electronic and mechanical principles to develop an engineering solution</p>	<p><u>Unit 2</u></p> <p>2 lessons per week</p> <p>Delivery of Engineering Processes Safely as a Team</p> <p>A - Examine common engineering processes to create products or deliver services safely and effectively as a team.</p> <ul style="list-style-type: none"> - Engineering processes and human factors <p>B - Develop two dimensional (2D) computer-aided drawings that can be used in engineering processes.</p> <ul style="list-style-type: none"> - 2D CAD drawings <p>C - Carry out engineering processes safely to manufacture a product or to deliver a service effectively as a team.</p> <ul style="list-style-type: none"> - Using engineering processes and working in teams 	<p>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:</p> <ul style="list-style-type: none"> • 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. <p>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</p> <ul style="list-style-type: none"> • 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. 	<p>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:</p> <ul style="list-style-type: none"> • engineering operative • manufacturing operative • semi-skilled operative • engineering technician • electronics technician • IT support technician • mechatronics technician. <p>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</p>

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Year 13 - BTEC Level 3 National Extended Certificate in Engineering

TERM 1 – 6 TOPIC	TERM 1 - 6 TOPIC	*Key Skills/Subject Links	*Career links & BV
<p><u>Unit 3</u></p> <p>4 lessons per week</p> <p>Engineering Product Design and Manufacture External Exam – Jun 2025</p> <p>AO1 Demonstrate knowledge and understanding of engineering products and design</p> <p>AO2 Apply knowledge and understanding of engineering methodologies, processes, features and procedures to iterative design</p> <p>AO3 Analyse data and information and make connections between engineering concepts, processes, features, procedures, materials, standards and regulatory requirements</p> <p>AO4 Evaluate engineering product design ideas, manufacturing processes and other design choices</p> <p>AO5 Be able to develop and communicate reasoned design solutions with appropriate justification</p>	<p><u>Unit 41</u></p> <p>2 lessons per week</p> <p>Unit 41: Manufacturing Secondary Machining Processes</p> <p>A: Examine the technology and characteristics of secondary machining processes that are widely used in industry</p> <ul style="list-style-type: none"> - 1. Secondary Machining Processes <p>B: Set up traditional secondary processing machines to manufacture a component safely</p> <p>C: Carry out traditional secondary machining processes to manufacture a component safely</p> <ul style="list-style-type: none"> - Setting up and carrying out secondary machining processes <p>D: Review the processes used to machine a component and reflect on personal performance</p> <ul style="list-style-type: none"> - Review and reflection on secondary machining processes and personal performance 	<p>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:</p> <ul style="list-style-type: none"> • 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. <p>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</p> <ul style="list-style-type: none"> • 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. 	<p>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:</p> <ul style="list-style-type: none"> • engineering operative • manufacturing operative • semi-skilled operative • engineering technician • electronics technician • IT support technician • mechatronics technician. <p>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</p>