

Extended Diploma Course Structure - Equivalent in size to three A Levels. 15 units, 7 are mandatory and 3 are external. Mandatory content (56%). External assessment (33%).

Diploma Course Structure - Equivalent in size to two A Levels - 10 units of which 5 are mandatory and 2 are external. Mandatory content (58%). External assessment (33%).

Summary Purpose - This qualification is designed as a two-year, full-time course supporting progression to engineering employment, higher apprenticeship programmes or higher education courses in engineering.

Curriculum - The curriculum design focuses on a wide range of units delivered by specialist teachers, including Engineering Maths, Electronics, Mechanical Engineering and CAD/CAM. The delivery and assessment schedule is a two-year programme including assessment windows and examination dates.

Starting Points - Students who arrive at Brook Sixth Form & Academy for KS5 have varied educational experiences at KS4. Initial baseline work enables the programme to consolidate existing skills and address gaps so students can fully access their Level 3 course.

Problem Based Learning - The course uses an integrated engineering programme with contextualised, problem-based assignments and practical opportunities that enable students to apply knowledge to real-life engineering situations.

Links with Industry Partners - Industry links are continuously developed to incorporate real-world challenges and increase students' contact with organisations and opportunities, supporting informed progression decisions.

Unit	Current Programme Units and GLH.	Learning Aims, Objectives and Assessment Outcomes.
1	Engineering Principles. 120 GLH.	AO1 Recall basic engineering principles and mathematical methods and formulae. AO2 Perform mathematical procedures to solve engineering problems. AO3 Demonstrate an understanding of electrical, electronic and mechanical principles to solve engineering problems. AO4 Analyse information and systems to solve engineering problems. AO5 Integrate and apply electrical, electronic and mechanical principles to develop an engineering solution.
2	Delivery of Engineering Processes Safely as a Team. 60 GLH.	A Examine common engineering processes to create products or deliver services safely and effectively as a team. B Develop two-dimensional computer-aided drawings that can be used in engineering processes. C Carry out engineering processes safely to manufacture a product or to deliver a service effectively as a team.
3	Engineering Product Design and Manufacture. 120 GLH.	AO1 Demonstrate knowledge and understanding of engineering products and design. AO2 Apply knowledge and understanding of engineering methodologies, processes, features and procedures to iterative design. AO3 Analyse data and information and make connections between engineering concepts, processes, materials, standards and regulatory requirements. AO4 Evaluate engineering product design ideas and manufacturing processes. AO5 Develop and communicate reasoned design solutions with appropriate justification.
17	Power and Energy Electronics. 60 GLH.	A Explore the construction and operation of common power electronic devices used to modify a form of electrical energy. B Investigate applications of power electronic circuits. C Develop a power electronic circuit to meet a given requirement.
41	Manufacturing Secondary Machining Processes. 60 GLH.	A Examine the technology and characteristics of secondary machining processes. B Set up traditional secondary processing machines safely. C Conduct traditional secondary machining processes to manufacture a component safely. D Review the processes used and reflect on personal performance.

Pearson BTEC Level 3 National Extended Diploma in Engineering - 1080 Guided Learning Hours

Unit	Current Programme Units and GLH.	Learning Aims, Objectives and Assessment Outcomes.
1	Engineering Principles. 120 GLH.	AO1 Recall basic engineering principles and mathematical methods and formulae. AO2 Perform mathematical procedures to solve engineering problems. AO3 Demonstrate an understanding of electrical, electronic and mechanical principles to solve engineering problems. AO4 Analyse information and systems to solve engineering problems. AO5 Integrate and apply electrical, electronic and mechanical principles to develop an engineering solution.
3	Engineering Product Design and Manufacture. 120 GLH.	AO1 Demonstrate knowledge and understanding of engineering products and design. AO2 Apply knowledge and understanding of engineering methodologies, processes, features and procedures to iterative design. AO3 Analyse data and information and make connections between engineering concepts, processes, materials, standards and regulatory requirements. AO4 Evaluate engineering product design ideas and manufacturing processes. AO5 Develop and communicate reasoned design solutions with appropriate justification.
4	Applied Commercial and Quality Principles in Engineering. 60 GLH.	A Examine business functions and trade considerations that help engineering organisations thrive. B Explore activity-based costing as a method to control costs and determine profitability. C Explore how engineering organisations use quality systems and value management to create value.
17	Power and Energy Electronics. 60 GLH.	A Explore the construction and operation of common power electronic devices used to modify a form of electrical energy. B Investigate applications of power electronic circuits. C Develop a power electronic circuit to meet a given requirement.
58	Energy Management. 60 GLH.	A Know about energy management. B Be able to plan for an energy management audit. C Be able to conduct an energy management audit. D Understand how to monitor and target energy savings.

Unit	Current Programme Units and GLH.	Learning Aims, Objectives and Assessment Outcomes.
4	Applied Commercial and Quality Principles in Engineering. 60 GLH.	A Examine business functions and trade considerations that help engineering organisations thrive. B Explore activity-based costing as a method to control costs and determine profitability. C Explore how engineering organisations use quality systems and value management to create value.
7	Calculus to Solve Engineering Problems. 60 GLH.	A Examine how differential calculus is used to solve engineering problems. B Examine how integral calculus is used to solve engineering problems. C Investigate the use of differential equations to solve engineering problems.
10	Computer Aided Design in Engineering. 60 GLH.	A Develop a three-dimensional computer-aided model of an engineered product. B Develop two-dimensional detailed computer-aided drawings of an engineered product. C Develop three-dimensional computer-aided models for thin-walled and fabricated products.
24	Maintenance of Mechanical Systems. 60 GLH.	A Examine the characteristics of lubricants and their application in mechanical systems. B Investigate common consumable components used in mechanical systems. C Investigate operation and application of power transmission components. D Carry out routine maintenance safely and sustainably.
58	Energy Management. 60 GLH.	A Know about energy management. B Be able to plan for an energy management audit. C Be able to conduct an energy management audit. D Understand how to monitor and target energy savings.

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Unit	Current Programme Units and GLH.	Learning Aims, Objectives and Assessment Outcomes.
5	A Specialist Engineering Project. 60 GLH.	A Investigate an engineering project in a relevant specialist area. B Develop project management processes and a design solution for the specialist engineering project. C Undertake the solution for a specialist engineering project and present the solution as undertaken in industry.
6	Microcontroller Systems for Engineers. 120 GLH.	AO1 Demonstrate knowledge and understanding of computer coding principles, electronic hardware components and the development process. AO2 Apply knowledge and understanding to design and create a physical computer system to meet a client brief. AO3 Analyse test results and evaluate evidence to optimise performance. AO4 Develop a physical computer system to meet a client brief with appropriate justification.
7	Calculus to Solve Engineering Problems. 60 GLH.	A Examine how differential calculus is used to solve engineering problems. B Examine how integral calculus is used to solve engineering problems. C Investigate the use of differential equations to solve engineering problems.
58	Energy Management. 60 GLH.	A Know about energy management. B Be able to plan for an energy management audit. C Be able to conduct an energy management audit. D Understand how to monitor and target energy savings.
41	Manufacturing Secondary Machining Processes. 60 GLH.	A Examine the technology and characteristics of secondary machining processes. B Set up traditional secondary processing machines safely. C Carry out traditional secondary machining processes to manufacture a component safely. D Review the processes used and reflect on personal performance.

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Unit	Current Programme Units and GLH.	Learning Aims, Objectives and Assessment Outcomes.
6	Microcontroller Systems for Engineers. 120 GLH.	AO1 Demonstrate knowledge and understanding of computer coding principles, electronic hardware components and the development process. AO2 Apply knowledge and understanding to design and create a physical computer system to meet a client brief. AO3 Analyse test results and evaluate evidence to optimise performance. AO4 Develop a physical computer system to meet a client brief with appropriate justification.
8	Further Engineering Mathematics. 60 GLH.	A Examine how sequences and series can be used to solve engineering problems. B Examine how matrices and determinants can be used to solve engineering problems. C Examine how complex numbers can be used to solve engineering problems. D Investigate how statistical and probability techniques can be used to solve engineering problems.
24	Maintenance of Mechanical Systems. 60 GLH.	A Examine the characteristics of lubricants and their application in mechanical systems. B Investigate common consumable components used in mechanical systems. C Investigate operation and application of power transmission components. D Conduct routine maintenance safely and sustainably.
41	Manufacturing Secondary Machining Processes. 60 GLH.	A Examine the technology and characteristics of secondary machining processes. B Set up traditional secondary processing machines safely. C Conduct traditional secondary machining processes to manufacture a component safely. D Review the processes used and reflect on personal performance.

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Unit	Current Programme Units and GLH.	Learning Aims, Objectives and Assessment Outcomes.
17	Power and Energy Electronics. 60 GLH.	A Explore the construction and operation of common power electronic devices used to modify a form of electrical energy. B Investigate applications of power electronic circuits. C Develop a power electronic circuit to meet a given requirement.
45	Additive Manufacturing Processes. 60 GLH.	A Examine the technology and characteristics of additive manufacturing processes. B Investigate component design considerations and finishing processes. C Develop a component using additive manufacturing processes safely.
57	Sustainable Transport. 60 GLH.	A Investigate the sustainability of alternative power sources for transport vehicles. B Investigate the wider benefits of reducing the distance travelled by transport vehicles. C Investigate how barriers to use, incentives and penalties could affect demand for sustainable vehicle transport. D Investigate ways to improve the sustainability of leisure travel.