Space Studio West London
an Aspirations Academy

Btec Single Engineering (AAQ) - Curriculum Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 12 curriculum overview(AAQ)	Unit 1 Engineering Principles – Mathematical Methods and Mechanical Engineering Principles	Unit 1 Engineering Principles – Fluid, Electrical and Electronic Principles	Unit 2 Engineering Applications – Engineering Sectors, Emerging Technologies and Sustainable Engineering	Unit 2 Engineering Applications – Engineering Materials, Manufacturing Processes and Engineering Solutions	Unit 4 Engineering Project – Project Research, Problem Identification and Planning	Unit 4 Engineering Project – Design Development, Project Realisation, Testing, Evaluation and Presentation
Key knowledge outcomes (students should know)	> Algebraic methods > Trigonometry > Calculus fundamentals > Static engineering systems > Forces and moments > Stress and strain > Dynamic systems > Mechanical energy and power	> Fluid systems and fluid flow > Density and pressure > Hydraulic and pneumatic systems > DC electrical principles > Circuit theory > Electronic principles > Magnetism and electromagnetic systems	> Structure of the engineering industry > Engineering sectors and careers > Emerging technologies > Industry 4.0 > Robotics and automation > Sustainability in engineering > Environmental impacts of engineering	> Engineering materials and properties > Material selection > Manufacturing processes > Quality considerations > Engineering problem-solving techniques > Sustainable engineering solutions	> Project management principles > Research techniques > Engineering briefs > Project specifications > Resource planning > Risk assessment > Gantt charts	> Design development techniques > Prototype development > Testing methods > Data analysis > Evaluation techniques > Continuous improvement > Professional project presentation
Key skills (students should be able to)	Solve engineering calculations → Apply algebraic and trigonometric methods → Analyse mechanical	Analyse fluid systems →Calculate pressure and flow rates → Analyse electrical circuits	Investigate engineering industries → Evaluate technological	Select suitable engineering materials → Justify manufacturing methods	Conduct engineering research → Develop project specifications	Develop engineering solutions → Test and evaluate outcomes

	systems → Calculate forces, moments and stresses → Interpret engineering data	→ Apply electrical formulae → Interpret engineering diagrams and schematics	developments → Analyse sustainability challenges → Research engineering innovations → Present engineering findings	→ Evaluate engineering solutions → Analyse engineering problems → Recommend improvements	→ Create project plans → Manage resources → Produce risk assessments → Organise project documentation	→ Analyse project data → Produce technical reports → Present engineering projects professionally → Reflect on project performance
Year 13 curriculum overview(AAQ)	Unit 3 Engineering Design – Design Requirements and Design Development	Unit 3 Engineering Design – CAD Modelling, Technical Drawings and Design Communication	Unit 3 Engineering Design – Final Design Portfolio and Assignment Submission	Revision of Unit 1 Engineering Principles and Unit 2 Engineering Applications	External Exam Preparation, Mock Assessments and Resit Support	Progression Preparation, UCAS, Apprenticeships, Interview Skills and Engineering Portfolio Development
Key knowledge outcomes (students should know)	>Design requirements and constraints > Client needs and engineering briefs > Product specifications > Sustainability in engineering design > Design methodologies and design processes >Engineering standards and regulations	>CAD principles and applications > 2D and 3D modelling techniques > Technical drawing conventions > BS8888 engineering drawing standards >Design communication methods > Material and manufacturing considerations	**Unit 3 Engineering Design Completion** > Design verification and validation > Engineering design optimisation > Prototype evaluation > Technical presentation techniques > Portfolio development	**Unit 1 Engineering Principles Revision** > Mechanical principles > Electrical and electronic principles >Fluid engineering principles > Mathematical methods > Engineering calculations	**Exam Preparation and Progression** >Examination techniques >Command words and assessment requirements > Application of engineering knowledge to unfamiliar scenarios > Engineering	**Progression Preparation** >Degree and apprenticeship pathways > Professional engineering practice > Engineering ethics and sustainability > Portfolio requirements

	> Research techniques for engineering design	> Design evaluation methods	requirements > Synoptic links between design, engineering principles and engineering applications	**Unit 2 Engineering Applications Revision** > Engineering sectors >Emerging technologies > Materials and processes >Sustainability principles	problem-solving techniques > Higher education expectations	> Interview preparation techniques > Employability skills
Key skills (students should be able to)	Interpret engineering design briefs → Analyse customer requirements → Produce design specifications → Research engineering solutions → Generate engineering concepts → Apply sustainable design principles	Create professional CAD models → Produce accurate engineering drawings → Apply technical drawing standards → Communicate engineering ideas effectively → Select appropriate materials and processes → Evaluate alternative design solutions	Produce a complete engineering design portfolio →Justify engineering decisions → Evaluate and improve engineering designs → Present technical information professionally → Apply knowledge from Units 1 and 2 to design tasks	Solve engineering calculations accurately →Analyse engineering systems → Apply engineering principles to examination questions →Interpret engineering data and technical information → Use mathematical methods in engineering contexts	Apply knowledge synoptically across units → Complete timed examination questions → Evaluate engineering scenarios critically → Demonstrate independent problem-solving skills → Use technical terminology accurately	Produce professional engineering portfolios → Prepare UCAS applications and personal statements → Demonstrate interview skills → Present engineering projects confidently → Reflect on personal performance and career goals → Demonstrate readiness for higher education or apprenticeships

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Assignment and Assessment Timeline – Year 12

Term	Assessment Activity
October	Unit 1 Topic Test
December	Unit 1 Full Mock Examination
January	Unit 1 External Exam Preparation
March	Unit 2 Mock Assessment
May/June	Unit 2 External Examination
Summer 1	Unit 4 PSAB Released
Summer 2	Unit 4 Assignment Submission

Assignment and Assessment Timeline – Year 13

Term	Assessment Activity
October	Unit 3

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December	Unit 3
January	Unit 1 External Exam Preparation Unit 2Exam
March	Unit 4 Final
May/June	Unit 3 Final
Summer 1	Unit 3 Final
Summer 2	Unit Assignment Submission