END OF KEY STAGE 4

BTEC Level 1/2 Tech Award in Engineering
Design Engineering and Electronics
Practical Design Engineering and Electronic skills, terms and keywords. Mathematical skills for Engineering
Materials – Plastics and Metals. Processes and finishing
Drawing – Oblique, Single and Two Point Perspective. 3D drawing skills

CAD/CAM – 2D Design and 3D Tinkercad/ Fusion360 CAD and CAM applications. Milling, Laser cutting, & Vacuum Forming
Design Process. Brief to Evaluation process stages of the design process as theory and practical
Make. Basic Hand tools, Electronic Soldering. Health & Safety in the workshop

YEAR 12 AUTUMN

- Unit 1 (External May Exam) – Engineering Principles – Math. (Mandatory Unit)
- Unit 2 (Internal) Manufacturing and Teams. Assignment 2. 2D CAD Product & Circuit drawing. (Mandatory Unit)
- Unit 3 (External May Controlled Assessment) Design and Manufacturing. (Mandatory unit)
- Unit 4 (Internal) – Commercial & Quality Principles. Assignment 1. Business Functions (Mandatory unit)
- Unit 6 (External May Controlled Assessment) Microprocessors and Controllers. (Mandatory unit)
- Unit 7 (Internal) Calculus. Assignment 1. Differentiation. (Mandatory)
- Unit 10 (Internal) Computer Aided Design. Assignment 2. 2D drawings of an Engineered Product (Optional)
- Unit 43 (Internal) Computer Aided Manufacturing. Assignment 1. Control Systems/Programming (Optional)

YEAR 12 SPRING

- Unit 1 (External May Exam) – Engineering Principles – Math. (Mandatory Unit)
- Unit 2 (Internal) Manufacturing & Teams. Ass 1. Engineering Processes. Assignment 2 Team Manufacturing. (Mandatory Unit)
- Unit 3 (External May Controlled Assessment) Design and Manufacturing. (Mandatory unit)
- Unit 4 (Internal) – Commercial & Quality Principles. Ass 2. Activity Based Costing. Ass 3 Use of Quality Systems (Mandatory unit)
- Unit 6 (External May Controlled Assessment) Microprocessors and Controllers. (Mandatory unit)
- Unit 7 (Internal) Calculus. Assignment 2 Integral Calculus. Assignment 3 .Application of Calculus (Mandatory)
- Unit 10 (Internal) Computer Aided Design. Assignment 1. 3D Computer Modelling. (Optional)
- Unit 43 (Internal) Computer Aided Manufacturing. Assignment 2. CAM Design & Manufacturing. Assignment 3. Reviewing CAM Processes.(Optional)

YEAR 12 SUMMER

May Exam Unit 1. Controlled Assessment Unit 3, Unit 6

- Unit 4 (Internal) – Commercial & Quality Principles. Assignment 3 Use of Quality Systems (Mandatory unit)
- Unit 7 (Internal) Calculus. Assignment 3. Application of Calculus (Mandatory)
- Unit 10 (Internal) Computer Aided Design. Assignment 3. 3D Thin Walled and Sheet Metal Modelling (Optional)
- Practical work with CAD/CAM – CNC Milling, Lathe, Laser Cutting, 3D Printing, PCB Board Design and Engraving
- Unit 5. (Internal) A Specialist Engineering Project. – Introduction (Mandatory) – Preparation and Research.
- 2 Week Work Experience in a Design Engineering Environment

YEAR 13 SUMMER

May Resit Exam Unit 1, Controlled Assessments Unit 3 & 6

- Unit 5. (Internal) A Specialist Engineering Project. Assignment 3. Make, Test, and Present (Mandatory)
- Unit 19. Electronic Devices &Circuits. Ass Based. (Optional)
- Unit 22. Electronic Printed Circuit Board Design and Manufacture. Assignment Based. (Optional)
- Unit 24. Maintenance of Mechanical Systems. Assignment Based. (Optional)
- Unit 25. Mechanical Behaviour of Metallic Materials. Assignment Based. (Optional)
- Unit 36. Programmable Logic Controllers. Assignment Based. (Optional)
- Unit 45. Additive Manufacturing Processes. Ass Based. Optional)
- Portfolio Presentation and Interviews

YEAR 13 SPRING

January Resit Exam U1, Controlled Assessments U3 &6

- Unit 5. (Internal) A Specialist Engineering Project. Assignment 2. Project Management & Design Solution. Assignment 3. Make, Test, and Present (Mandatory)
- Unit 19. Electronic Devices &Circuits. Ass Based. (Optional)
- Unit 22. Electronic Printed Circuit Board Design and Manufacture. Assignment Based. (Optional)
- Unit 24. Maintenance of Mechanical Systems. Assignment Based. (Optional)
- Unit 25. Mechanical Behaviour of Metallic Materials. Assignment Based. (Optional)
- Unit 36. Programmable Logic Controllers. Assignment Based. (Optional)
- Unit 45. Additive Manufacturing Processes. Ass Based. Optional)

YEAR 13 AUTUMN

- Unit 5. (Internal) A Specialist Engineering Project. Assignment 1. Investigate and Engineering Problem (Mandatory)
- Unit 19. Electronic Devices and Circuits. Assignment Based. (Optional)
- Unit 22. Electronic Printed Circuit Board Design and Manufacture. Assignment Based. (Optional)
- Unit 24. Maintenance of Mechanical Systems. Assignment Based. (Optional)
- Unit 25. Mechanical Behaviour of Metallic Materials. Assignment Based. (Optional)
- Unit 36. Programmable Logic Controllers. Assignment Based. (Optional)
- Unit 45. Additive Manufacturing Processes. Assignment Based. Optional)

KNOWLEDGE TRANSFER

Assignments (2D and 3D CAD/CAM) skills (unit 10 and 43. Manufacturing and Industrial Considerations & understanding. Assignments (Unit 2 and 4). Computer programming and testing skills (Unit 6). Design development and problem solving skills (Unit 3). Utilisation of math principles in Engineering (Unit 1 and 7)

BEYOND YEAR 13

- Employment in Design and Engineering Companies
- University Degrees in all areas of Design, Engineering in Mechanical, Electronic, Electrical, CAM and Production Manufacturing, Environmental, Civil,
- Apprenticeships & Level 4/5 HNDs in Engineering based disciplines – Industrial / Military.

UNIVERSITY COLLEGIATE SCHOOL

CURRICULUM ROAD MAP

ENGINEERING

UNIVERSITY COLLEGIATE SCHOOL

QUEST

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YEAR 12 AUTUMN

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YEAR 12 SPRING

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YEAR 12 SUMMER

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YEAR 13 SUMMER

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YEAR 13 SPRING

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YEAR 13 AUTUMN

EMPLOYER ENGAGEMENT LINKS

ENGINEERING

Q. What are the industry application(s) for this knowledge/concept(s)?

UNIVERSITY COLLEGIATE SCHOOL

QUEST

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YEAR 12 AUTUMN

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YEAR 12 SPRING

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YEAR 12 SUMMER

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YEAR 13 SUMMER

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YEAR 13 SPRING

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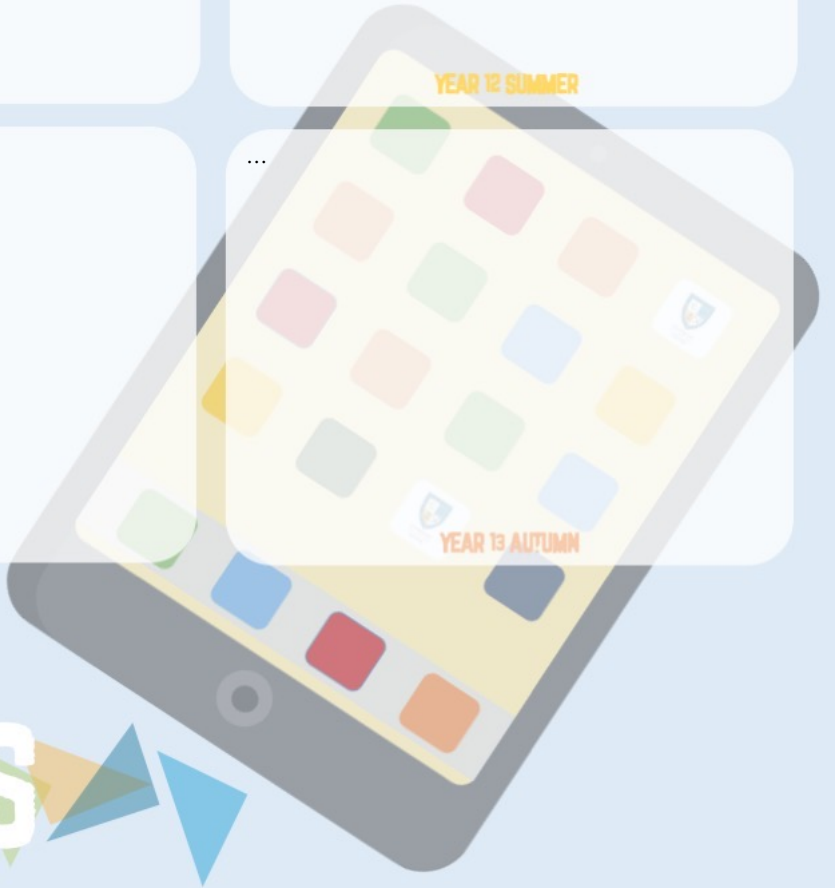
YEAR 13 AUTUMN



DIGITAL ACTIVITY LINKS

ENGINEERING

UNIVERSITY COLLEGIATE SCHOOL

QUEST

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YEAR 12 AUTUMN

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YEAR 12 SPRING

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YEAR 12 SUMMER

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YEAR 13 SUMMER

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YEAR 13 SPRING

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YEAR 13 AUTUMN

SPECIFICATION REFENCES

ENGINEERING