**OCR National Engineering Design – 2021 Cohort**

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| **Year 10**  **Engineering Design** | | | | | |
| **Half term 1**  **Learning Overview** | **Half term 2**  **Learning Overview** | **Half term 3**  **Learning Overview** | **Half term 4**  **Learning Overview** | **Half term 5**  **Learning Overview** | **Half term 6**  **Learning Overview** |
| **Key topics covered**   * Regulations and Safeguards * Manufacturing Processes * End of Life Considerations, conforming to legislation and standards and Protecting Designs | **Key topics covered**   * The design cycle - identify and design * The design cycle – optimise and validate * Designer needs * Design brief and specification * Requirements of a design specification. * Product Requirements * Commercial Production and Automation * Manufacturing Considerations * Life Cycle Analysis * End of Life Considerations, conforming to legislation and standards and Protecting Designs * Sustainable design | **Set Assignment R106 Product Analysis and Research**  Students find out how to perform effective product analysis through both research and practical experience of product assembly and disassembly procedures. This helps them develop skills in critical analysis and an understanding and appreciation of manufacturing processes, design features, materials used and the principles behind good design. | **Set Assignment R106 Product Analysis and Research**  Students find out how to perform effective product analysis through both research and practical experience of product assembly and disassembly procedures. This helps them develop skills in critical analysis and an understanding and appreciation of manufacturing processes, design features, materials used and the principles behind good design. | Revision for R105 Exam | **Set Assignment R107 Developing and presenting engineering designs**  Students develop their knowledge and skills in communicating 2D and 3D design ideas, including effective annotation and labelling. They use detailed hand rendering as well as computer-based presentation techniques and computer-aided design (CAD) software. |
| **Learning Outcomes Covered** | | | | | |
| **R105 LO2:** Understand the requirements of design specifications for the development of a new product | **R105 LO1:** Understand the design cycle and the relationship between design briefs and design specifications  **R105 LO3:** Know about the wider influences on the design of new products | **R106 LO1:** Know how commercial production methods, quality and legislation impact on the design of products and components  **R106 LO2:** Be able to research existing products  **R105 LO2:** Understand the requirements of design specifications for the development of a new product  **R105 LO3:** Know about the wider influences on the design of new products | **R106 LO2:** Be able to research existing products  **R106 LO3**: Be able to analyse an existing product through disassembly  **R105 LO2** Understand the requirements of design specifications for the development of a new product  **R105 LO3** Know about the wider influences on the design of new products | **R105 LO1:** Understand the design cycle and the relationship between design briefs and design specifications  **R105 LO2:** Understand the requirements of design specifications for the development of a new product  **R105 LO3:** Know about the wider influences on the design of new products | **R107 LO1:** Be able to generate design proposals using a range of techniques |
| **Year 11**  **Engineering Design** | | | | | |
| **Half term 1**  **Learning Overview** | **Half term 2**  **Learning Overview** | **Half term 3**  **Learning Overview** | **Half term 4**  **Learning Overview** | **Half term 5**  **Learning Overview** | **Half term 6**  **Learning Overview** |
| **Set Assignment R107 Developing and presenting engineering designs**  Students develop their knowledge and skills in communicating 2D and 3D design ideas, including effective annotation and labelling. They use detailed hand rendering as well as computer-based presentation techniques and computer-aided design (CAD) software. | **Set Assignment R107 Developing and presenting engineering designs**  Students develop their knowledge and skills in communicating 2D and 3D design ideas, including effective annotation and labelling. They use detailed hand rendering as well as computer-based presentation techniques and computer-aided design (CAD) software. | **Set Assignment R108 3D design realisation**  Students apply practical skills to produce a prototype product or model using craft-based modelling materials alongside computer-controlled or rapid-prototyping processes.  Students will evaluate the prototype making a judgement of the outcome against the product specification and evaluate potential improvements in design such as features, function, materials, aesthetics and ergonomics and make suggestions on improvements to the final product. | **Set Assignment R108 3D design realisation**  Students apply practical skills to produce a prototype product or model using craft-based modelling materials alongside computer-controlled or rapid-prototyping processes.  Students will evaluate the prototype making a judgement of the outcome against the product specification and evaluate potential improvements in design such as features, function, materials, aesthetics and ergonomics and make suggestions on improvements to the final product. | **Retake of units submission and revision** | Course finished |
| **Learning Outcomes Covered** | | | | | |
| **R107 LO2:** Know how to develop designs using engineering drawing techniques and annotation | **R107 LO3**: Be able to use Computer Aided Design (CAD) software and techniques to produce and communicate design proposals | **LO1:** Know how to plan the making of a prototype  **LO2:** Understand safe working practices used when making a prototype | **LO3:** Be able to produce a prototype  **LO4:** Be able to evaluate the success of a prototype |  |  |

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| **Key topics covered**   * Design Briefs and Specifications * The design cycle * User Requirements * Manufacturing Processes * End of Life Considerations, conforming to legislation and standards and Protecting Designs | **Key topics covered**   * Sustainable design * Market Forces * New and emerging materials * Commercial Production and Automation * Manufacturing Considerations * Life Cycle Analysis * Sustainable design * End of Life Considerations, conforming to legislation and standards and Protecting Designs | **Set Assignment R107 Developing and presenting engineering designs**  Students develop their knowledge and skills in communicating 2D and 3D design ideas, including effective annotation and labelling. They use detailed hand rendering as well as computer-based presentation techniques and computer-aided design (CAD) software. | **Set Assignment R107 Developing and presenting engineering designs**  Students develop their knowledge and skills in communicating 2D and 3D design ideas, including effective annotation and labelling. They use detailed hand rendering as well as computer-based presentation techniques and computer-aided design (CAD) software. | **Set Assignment R107 Developing and presenting engineering designs**  Students develop their knowledge and skills in communicating 2D and 3D design ideas, including effective annotation and labelling. They use detailed hand rendering as well as computer-based presentation techniques and computer-aided design (CAD) software. | Course finished |
| **Learning Outcomes Covered** | | | | | |
| **R105 LO1:** Understand the design cycle and the relationship between design briefs and design specifications  **R105 LO2:** Understand the requirements of design specifications for the development of a new product | **R105 LO3:** Know about the wider influences on the design of new products | **R107 LO1:** Be able to generate design proposals using a range of techniques | **R107 LO2:** Know how to develop designs using engineering drawing techniques and annotation | **R107 LO3**: Be able to use Computer Aided Design (CAD) software and techniques to produce and communicate design proposals |  |