

SUSTAINABLE PRODUCT DESIGN (22WSP437)

Semester 2 2023

In Person Examination

This examination is to take place in-person at a central University venue under exam conditions. The standard length of time for this paper is **2 hours**

You will not be able to leave the exam hall for the first 30 or final 15 minutes of your exam. Your invigilator will collect your exam paper when you have finished.

Help during the exam

Invigilators are not able to answer queries about the content of your exam paper. Instead, please make a note of your query in your answer script to be considered during the marking process.

If you feel unwell, please raise your hand so that an invigilator can assist you.

Answer **All** three questions

All questions carry equal marks.

- 1) The footwear industry is facing significant environmental, economic and social challenges which will have far reaching implications for its long-term sustainability, mainly due to unsustainable consumption of their products inspired by the concept of 'fast fashion'.
 - a) Briefly describe the sustainable product design concepts proposed by the 'Walker Principles'. [8 marks]
 - b) With aid of examples, explain how these principles could be used to improve the design of future footwear products. [12 marks]

- 2) A kettle manufacturing company is planning to conduct a Life Cycle Assessment (LCA) of its products.
 - a) Propose a suitable 'Functional Unit' for this LCA exercise. [2 marks]
 - b) Provide a simple illustration of how ISO14040 LCA methodologies could be used to support the design of future kettles. [14 marks]
 - c) Identify two disadvantages of LCA as a tool to support eco-design. [4 marks]

- 3) The pressure on the global toy industry to improve the safety and recyclability of its products has significantly increased over the last decade.
 - a) Briefly describe four key considerations in the 'Design for Recycling' (DfR) approach. [4 marks]
 - b) With the aid of examples, explain how these four DfR considerations could be used to improve the design of future toy products. [16 marks]

S Rahimifard