Prototyping and Modelmaking for Design

Module Information

2022.01, Approved

Summary Information

Module Code	4266PDE
Formal Module Title	Prototyping and Modelmaking for Design
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 4
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Engineering

Learning Methods

Learning Method Type	Hours
Lecture	11
Practical	33
Workshop	36

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	This module introduces the subject of prototyping and modelmaking as a strategic part of the Design Thinking process. It emphasises how these practical activities lead to more informed design decisions in the successful development of innovative products.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Test prototypes to better understand design problems
MLO2	2	Explore innovative solutions by testing for human interaction and functionality
MLO3	3	Select appropriate materials, tools and techniques to produce prototypes and models as an integral part of the Design Thinking process
MLO4	4	Understand the broader history of design and classify the principles of aesthetics

Module Content

Outline Syllabus	Principles of prototyping and modelling:Prototyping and testing cycle. How prototypes are employed: explorative idea generation, usability testing with basic human factor/ergonomics knowledge to a prototype model-making process, design verification and communication. The iterative test cycle. Purpose, effectiveness and appropriateness. Different types of prototypes including works-like, Looks-like, functional, appearance, alpha and beta. Experience prototyping. Prototyping and modelling workflow. Workshop practice:Health and safety. Risk assessment and risk management techniques. Hazards, labelling and safety data sheets. Personal protective equipment and risk assessment. Workshop environment, equipment, hand, power and machine tools. Laser scanners, laser cutters, CNC routers and rapid prototyping. Reading engineering drawings. Developing practical workshop skills. Measurement and inspection.Materials:Adhesives and fillers. Card and paper. Foamboard and modelling foam/board. Finishing and painting. Aesthetics:Understanding of aesthetics in design and the principles of composition such as structure, repetition and rhythm, symmetry, asymmetry, balance and proportion. The rule of thirds, positive and negative space, emphasis and dominance, contrast, unity, variety, harmony and other factors that enhance aesthetics, such as materials, colour and texture. Understanding of the geometry of design by building upon the omnipresence of the mathematical constant Phi (Φ) the golden ratio, describe examples of Φ found in nature, explain the general term of the Fibonacci sequence, use Φ as a starting point for proportion and the configuration of product and graphical design. The emotional components of design at a visceral, behavioural and reflective level and to use this knowledge to design products that are desirable and continue to delight the users over time.3D form:Use a variety of techniques to produce studies in organic (convexity and concavity), curvilinear, linear, planar, solid flow and solid roto flow, rectilinear, serial plane, solid tectoform and 3D geometric forms, their properties and use through the process of abstraction.Design history:Explore the broader history of design from the industrial revolution to the present day and introduce key design movements, notable designers, and their work that have helped shape our society.
Module Overview	**Aims** **This module introduces the subject of prototyping and modelmaking as a strategic part of the Design Thinking process. It emphasises how these practical activities lead to more informed design decisions in the successful development of innovative products.** **Learning Outcomes** **After completing the module the student should be able to:** **1 Test prototypes to better understand design problems** **2 Explore innovative solutions by testing for human interaction and functionality** **3 Select appropriate materials, tools and techniques to produce prototypes and models as an integral part of the Design Thinking process** **4 Understand the broader history of design and classify the principles of aesthetics**
Additional Information	UN Sustainable Development GoalsThis module includes content that relates to the following UN Sustainable Development Goals:SDG04 – this module develops relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Portfolio	A portfolio of models	100	0	MLO1, MLO2, MLO3, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings

Adam Papworth	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings