

Liverpool John Moores University

Title: Sustainability and Ethics in Design
Status: Definitive
Code: **6004PDE** (120092)
Version Start Date: 01-08-2018

Owning School/Faculty: Electronics and Electrical Engineering
Teaching School/Faculty: Electronics and Electrical Engineering

Team	Leader
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Academic Level: FHEQ6
Credit Value: 20
Total Delivered Hours: 72
Total Learning Hours: 200
Private Study: 128

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24
Practical	24
Tutorial	24

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Rpt	Research report	30	
Portfolio	Port	Design portfolio	70	

Aims

Gives students a critical understanding of and allows them to make sound judgments with regard to complex ethical issues in design.

Learning Outcomes

After completing the module the student should be able to:

- 1 Identify the social and environmental impact of poor design.
- 2 Recognise relevant social, environmental and ethical issues that constrain design.
- 3 Critically evaluate and use methodologies that ensure well-designed products and services.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Research report	1	2
Design portfolio	3	

Outline Syllabus

Module introduction

Module guide; aims; learning outcomes; assessment and marking schemes. Outline syllabus; module timetable and student feedback.

Sustainability

Social issues: e.g. use of local labour, low wages, importing expertise, use of immigrant labour; transport infrastructure; changes to road/rail links and the emerging use of waterways.

Environmental issues: e.g. cost concern for the environment; CO2 emissions; pollution, packaging, use of new materials/resources; recycled materials, energy and renewables; targeting key disciplines – waste reduction, emission control, energy use, water consumption; obtaining and distributing products using national and local guidelines. Disposability of end of life product

Sustainable Design: e.g. exploiting natural resources without destroying the ecological balance of an area; economic development maintained within acceptable levels of global resource depletion and environmental pollution. Understanding and appreciating the values and beliefs of others, local and regional considerations.

Balancing issues: e.g. ensuring profitability and competitive costing of products whilst embracing social, environmental and sustainability issues. Triple bottom line (TBL). Product life cycle and life cycle assessment. Taguchi's 'Total Loss to Society Function'. Simplification, multi-functional designs; source reduction; longevity; design for disassembly and recycling; reduce use of consumables; design with less; light-weighting; volume reduction; recycled and bio-degradable materials; energy conservation of equipment; renewable energy systems; eco-design software tools; design checklists; matrices.

Legislative Drivers: Waste Electrical and Electronic Equipment Directive (WEEE); Restriction of

Hazardous Substances Directive (ROHS); End of Life Vehicles; Eco-design of End Use Equipment Directive (EUE); environmental management system BS14001 and waste management.

Design Ethics

A design engineer's professional responsibilities: Design ethics, design codes and processes. Characteristics of design processes in relation to ethical issues. Moral responsibility and the trust relationship between engineers and society. Decision making on ethical issues. Professional integrity and the importance of engineering ethics in the career of an engineer. What an engineer should when the employers interest conflicts with the public. Societal and global awareness. Regulative framework Legislation and codes.

Contemporary design issues and methodologies

Social and ethical impact of poor design. Product misuse and overloading. Inclusive design; sustainable design; design for safety and security; design against violence; integrated design teams (IDT).

Case Studies

To include: Ford Pinto, Napster, Kazaa, et al.

Learning Activities

This module will be delivered through an integrated series of lectures, tutorials, practical sessions, guided design activities and case studies. The learning activities are to be student focused and develop the students design knowledge through experiential learning.

Notes

This module is delivered using a variety methods including lectures, seminars, tutorials and practical sessions. The module will be delivered from a engineering and product design perspective.