

# SUSTAINABILITY AND ETHICS

## INTRODUCTION

Sustainability is a critical challenge for fashion-tech. With both the fashion and tech industries working to increasingly fast product cycles in which novelty and obsolescence are key drivers, sustainability is now slowly emerging as an area of concern. Moreover, the combination of fashion and tech products presents unique sustainability challenges which require new approaches and competencies. These include digital fashion rental and maintenance models, the recycling and re-use of textiles incorporating electronic components, localised production of complex products which merge traditional supply chains, on-demand production, balancing the impacts of physical materials and digital data (server farm carbon footprints) and the design of interactive technologies for social and environmental benefit.

This has been acknowledged by European projects such as WearSustain (<https://wearsustain.eu/>). In our current time of climate emergency, such competencies are vital to embed in education for fashion-tech. With a critical and sustainable focus fashion-tech can be more sustainably produced, consumed and re-made. While furthermore, through intelligently applied interaction design, fashion-tech can also promote the kinds of behavioural change needed to address global sustainability challenges.

## UNIT OUTLINE

The objective of this unit is for students to develop critical theoretical thinking around the notion of responsible practice within the field of fashion-tech. Through individual, self-directed research and reflective practice, students should be encouraged to consider ecological, sociocultural, economic and political drivers that are influencing emerging schools of thought around ethical, sustainable and responsible design.

The students will use the knowledge gained through their theoretical research in this unit to design a proposal for a holistic ecosystem surrounding a fashion-tech product. This should be presented in both visual and written format, see Assessment Methods below. The proposed ecosystem should detail how the product and related processes can be made as ethical and sustainable as possible. Importantly, the students should work from first principles, and consider the full product lifecycle from materials choice and sourcing, production, through use practices to maintenance and end of life/re-use. Their final outcomes should include the consideration of the social life of the product, reasons for its acceptance and use in the long term, rather than as fashion novelty. Additionally, what benefits the product may bring and ways it may reward sustainable behaviour should also be addressed.

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## INDICATIVE CONTENT AND TEACHING AND LEARNING METHODS

Project briefings, lectures, seminars, case studies, supervised studio or workshops, presentations and peer feedback.

This unit should aim to introduce students to key texts on current sustainability thinking relating to both materials, and behavioural and social change. Furthermore, in your teaching you should promote a critical appraisal of the sustainability of current fashion industry processes whilst introducing the students to emerging fashion industry technologies (for manufacturing, design and retail). This will support students to debate the potential impacts of emerging technology solutions and speculate on design futures.

Lectures: Suggested Titles:

- Environmental Impacts of the Fashion Industry: examining the long-term sustainability of current industry models, sourcing challenges for more sustainable materials.
- The Trajectory of Sustainability Thinking – moving from better materials and processes to societal/behavioural change: different sustainability approaches such as lower consumption VS circularity and zero impact through biomaterials.
- Fashion Industry Tech Futures: e.g. 3D avatars and retail, manufacturing on demand, re-shoring, local and distributed manufacturing, VR and AR design tools, virtual fashion products, robotic manufacturing, 3D print and 3D knit, new retail interfaces, new digitally enabled ownership and rental models.
- Speculative Design and Futures Thinking: using speculation and extreme scenario building to explore preferable futures, understanding and extrapolating from current social trends.
- Is the digital sustainable? Impacts of technology in terms of resource usage and end of life management, the carbon footprint of data hosting.

Seminars/Discussion Groups: Suggested Themes:

- Assess the sustainability of both a current fashion and a current tech product, (e.g. a high street t-shirt and a smartphone) using Product Lifecycle Management (PLM) tools and metrics such as the Higg Index, TED Ten Design Tool and Fashion Revolution's Transparency Index to identify potential improvements. Identify areas in which the metrics may need to adapt for fashion tech products. Identify how alterations in the lifecycle impact both the product design and its sustainability. How can the two be balanced? What are the short and long-term impacts?
- Identify a current unsustainable behaviour. Find current technologies, apps and digital services which could be leveraged to help change this behavior or make it more sustainable. Discuss how these technologies could be incorporated into, or connected with a fashion product? What

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benefits would this bring?

- Discuss the students' experiences of online shopping. Are there any tools (e.g. video of a product on the body, measurement comparison such as Virtusize, interactive models such as Nike ID) that help them to understand a product and reduce the likelihood of them returning it? Have they used a measuring App? Was it accurate? Would they like a virtual avatar of themselves to try on clothing, or would it be too uncanny? Do they trust virtual models of a fashion product? Can they tell the difference between a real product and a render (e.g. most Ikea products are sold from 3D rendered images rather than photos of the product)? What helps them to trust a purchase decision in a physical store. What would their ideal retail interface be?

Case Studies: Self-directed learning & group discussion

- Fairphone <https://www.fairphone.com/en/> – explore the ways Fairphone, a Dutch mobile phone company, approached sourcing rare earth metals and electronic components, ensuring ethical labour practices in their suppliers, and creating a repairable and upgradable product. Research the reception of the Fairphone and compare its functionality to other smartphones. How has it been marketed? Have obvious sacrifices been made to create a sustainable product? How might you design it differently?
- Change of Paradigm <http://changeofparadigm.com> – explore the fully virtual design and retail model proposed by Change of Paradigm. What environmental impact might the transition to a virtual business model have? Would it help reduce consumption, or encourage more? What issues have prevented such a model from being adopted by the fashion industry already? What skills do you think designers would need to engage with it? What technologies would factories need to produce these virtual garments? Do you think that this virtual business model is cheap enough or fast enough to be adopted by industry? Which fashion markets might adopt it first? Do you as a consumer trust that you would receive the expected product?

In this unit, your students will be expected to explore speculative and present-day scenarios and through a process of problem-based learning (see: Teacher's Toolkit, tool 5 > 'Problem-based Learning [available at <https://www.e4ft.eu>]), begin to identify solutions they can implement into design practice, production and (or) business models. Students should also consider how the introduction of innovations such as Artificial Intelligence, carbon neutrality, digital interaction, service as product, digital products, design for disassembly, collectivism, crowd sourcing, and circularity will affect the field of fashion-tech and what challenges and opportunities they will face. See: The units 'Identifying Fashion-tech Opportunities' and 'Entrepreneurship and Small Business Start-up: An Introduction' for tools to explore future trends.

For additional support see also Teacher's Toolkit, Tools 1 & 2 for guidance on 'Lectures' and 'Workshops' and Tool 7 > 'Learning through Research' and Tool 9 > 'Self-directed learning' (available at <https://www.e4ft.eu>).

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## LEARNING OUTCOMES

Upon successful completion of the unit the students will be able to:

1. Understand fashion-tech within a wider context and explore these scenarios as a means to ideate fashion-tech sustainably for application in current practice
2. Reflect on personal and collective values
3. Outline design thinking that can contribute to sustainability in fashion-tech
4. Identify mindset, actions and behaviours necessary to develop this area
5. Develop personal commitments that articulate actions that respond today to problems of tomorrow, and that contribute to visions for a sustainable future

## ASSESSMENT METHODS

The assessment for this unit is holistic and involves both visual and written interpretation of research findings:

- Interactive Design Portfolio documenting the proposed fashion-tech ecosystem and supporting visual research
- Written theoretical analysis of sustainability issues in relation to fashion-tech, documenting existing fashion-tech ecosystems and their impacts (1500 words)
- Reflective statement (1500 words)

## READING AND RESOURCE LIST

### Essential Reading and Resources

Anon (2016) Textiles and Clothing Sustainability: Sustainable Technologies. [Online]. Singapore: Springer Singapore.

Baker, C. et al. (2018) Wear: Wearable technologists engage with artists for responsible innovation: Processes and progress. Virtual Creativity. [Online] 8 (1), 91–105.

Dunne, A. and Raby, F. (2013) Speculative Everything: Design, fiction and social dreaming. Cambridge, Massachusetts: MIT Press.

Kuusk, K. et al. (2012) Crafting Smart Textiles : a meaningful way towards societal sustainability in the fashion field? The Textile Research Centre: Swedish School of Textiles.

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Lee, Jaewoon et al. (2016) Sustainable Wearables: Wearable Technology for Enhancing the Quality of Human Life. Sustainability. [Online] 8 (5), 466. [online]. Available at: <http://search.proquest.com/docview/1788753751/>.

Nayak, R. (2019) Sustainable Technologies for Fashion and Textiles. 1st ed. 2019. Woodhead Publishing.

Ossevoort, S.H.W. (2013) 'Improving the sustainability of smart textiles-14', in Multidisciplinary know-how for smart-textiles developers. [Online]. pp. 399–419.

Pan, Yue et al. (2015) Fashion Thinking: Fashion Practices and Sustainable Interaction Design. International Journal of Design. 9 (1), n/a. [online]. Available at: <http://search.proquest.com/docview/1682231529/>.

Pasricha, Anupama & Greeninger, Rachel (2018) Exploration of 3D printing to create zero-waste sustainable fashion notions and jewelry. Fashion and Textiles. [Online] 5 (1), 1–18.

Scaturro, Sarah (2008) Eco-tech fashion: rationalizing technology in sustainable fashion. Fashion theory. [Online] 12 (4), 469–488. [online]. Available at: <http://search.proquest.com/docview/37153814/>.

van Der Velden, Natascha M et al. (2015) Life cycle assessment and eco-design of smart textiles: The importance of material selection demonstrated through e-textile product redesign. Materials & Design. [Online] 84 313–324.

Vignali, G. et al. (2020) Technology-Driven Sustainability Innovation in the Fashion Supply Chain . 1st ed. 2020. [Online]. Cham: Springer International Publishing.

## Further Reading and Resources

Braddock-Clarke, S. & O'Mahony, M. (2005) Techno Textiles 2: Revolutionary Fabrics for Fashion and Design. London: Thames & Hudson.

Brown, S. (2013) Refashioned: Cutting Edge Clothing from Upcycled Materials. Oxford: Blackwell's

Brown, S. (2010) ECO Fashion. London: Laurence King Publishing.

Lee, S. (2005) Fashioning the Future: Tomorrow's Wardrobe. London: Thames & Hudson.

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Quinn, B. (2012) Fashion Futures. London: Merrell Publishers.

Quinn, B. (2013) Textile Visionaries: Innovation and Sustainability in Textile Design. London: Lawrence King.

Rissanen, T. & McQuillan, H. (2015) Zero Waste Fashion Design. London: Fairchild Books.

Shedroff, N. (2009) Design is the Problem: the Future of Design must be Sustainable. New York: Rosenfeld Media.