Module Guide

Design Futures and Emerging Technologies

ENG_5_548

School of Engineering
Division Mechanical Engineering and Design

2019 – 2020

Level 5

Table of Contents

1. MODULE DETAILS

Module Title:	Design Futures and Emerging Technologies
Module Level:	Level 5
Module Reference Number:	ENG_5_548
Credit Value:	20 CATS
Student Study Hours:	200
Contact Hours:	65
Private Study Hours:	135
Pre-requisite Learning (If applicable):	Design Methods Visual Communications Inclusive Design and Usability Digital Design and Modelling Design for a Sustainable Society
Co-requisite Modules (If applicable):	Design Thinking and Applications Design Contexts and Communications Digital Visualisation and CAD
Course(s):	Product Design Engineering Product Design
Year and Semester	2018-19 Semester 1
Module Coordinator:	Susana Soares
MC Contact Details (Tel, Email, Room)	T703 020 7815 7621 soaress@lsbu.ac.uk
Teaching Team & Contact Details (If applicable):	Barney Townsend 020 7815 7633 barney.townsend@lsbu.ac.uk
Subject Area:	Engineering and Design
Summary of Assessment Method:	100% Coursework
External Examiner appointed for module:	

2. SHORT DESCRIPTION

The Design Futures and Emerging Technologies module raises students' awareness of emerging technological and scientific research as well as ethical, economic and socio/cultural changes in the society. It enhances students' ability to address and think critically about future challenges.

3. AIMS OF THE MODULE

The module aims to:
- To use the design process as a tool to generate multiple future narratives/scenarios;
- To be familiar with foresight activities and get feedback about which possible direction to pursue in the future;
- To encourage a holistic design approach;
- To increase awareness of emerging technologies;
- To provide experience electronics and coding;
- To plan and organise design project time.

4. LEARNING OUTCOMES

4.1 Science and Mathematics (US):
1. Understand the implications and potential for the design discipline presented by developments in current and emerging technologies (US1i) (US1p)

4.2 Design (D):
2. Source and research relevant material, assimilating and articulating relevant findings and utilise design research methods to anticipate change (D1i) (D2p)
3. Communicate and articulate ideas and information comprehensibly in visual, oral and written forms (D6) (D7p,D10p)

4. Anticipate and accommodate change within contexts of ambiguity, uncertainty and unfamiliarity (D3i, GS1)

4.3 Economic, legal, social, ethical, and environmental context (S):

5. Develop and consolidate understanding of sustainable design and apply the principles of sustainability to real world applications (S4i) (S6p)

4.4 Engineering / Design Practice (P):

6. Build simple electronic circuits and write microcontroller code for prototyping interactions (P2i, P4i) (D7p)

Note: The number and letter codes in brackets with 'i' suffix eg (D1i) refer to the Institution of Engineering Designers Engineering Design Specific Learning Outcomes for EC(UK) Accredited Degree Programmes; those with 'p' suffix eg (D1p) refer to the Institution of Engineering Designers Product Design Specific Learning Outcomes for Accredited Degree Programmes

5. ASSESSMENT OF THE MODULE

All assessment is based on coursework and will take place during group critiques. In order to pass the module, student must submit all assignments, and attain an overall aggregated mark of at least 40%.

Coursework	Weighting	Hand-in dates
Digital Playground – Arduino and physical computing You should achieve these learning outcomes: 1, 4, 5, 6	50%	16 Jan 2020
Design for Dementia You should achieve these learning outcomes: 2, 3, 5, 6	50%	7 Nov 2019

Submissions:
The work will be submitted digitally or/and printed (as required in the brief) in class or at the Faculty Office and via Moodle. Students are responsible to verify if the data is actually stored in any media you have used to submit the assignments. If you hand in your work in a memory stick, lectures are not responsible for loss or damage of any device.
Please note that assignments submitted electronically (through Moodle) it is solely students' responsibility.

Late submissions:
A student who is unable to submit a written coursework assignment by the specified deadline may submit up to two weeks late. Coursework not submitted by the published deadline but, following notification, is submitted within two weeks (ten working days) of the published submission date will be marked by an appropriate member of staff and will have their marks capped at the pass mark 40%. Work submitted more than two weeks after the published deadline date will receive a mark of 0%.
A successful claim for extenuating circumstances may mean the capping is not applied – please check Academic Regulations at https://www.lsbu.ac.uk/about-us/policies-regulations-procedures.

Marking scheme:
A	70% and over	Excellent work all round
B	60% - 70%	Good work all round or a combination of excellent and acceptable work
C	50% - 60%	Acceptable work or a combination of good and below average work
D	40% - 50%	Below average work but still a pass

E	30% - 40%	Significantly poor work. Needs improvement to pass
F	below 30%	Very poor work. Shows lack of effort. Fail
X	0%	No submission of work

Attendance:
The school is expecting a minimum of 75% attendance in classes to achieve a grade in a module, if your attendance is below 75% without official evidence of absence your grade will be capped at 0% **– do not forget to tap in your student card.**

6. FEEDBACK

Feedback will normally be given to students 15 working days after the final submission of an assignment or as advised by their module leader.
Feedback will be given in a variety of ways, this may be verbal, written, sketched or demonstrated, the vital aspect of design learning is that the student absorbs the feedback through note taking, reacts to feedback, and reiterates their design proposal in a timely fashion.

7. INTRODUCTION TO STUDYING THE MODULE

7.1 Overview of the Main Content

Emerging design methods will encourage students to have a holistic design approach through generation of ideas, concepts, proposals, strategies and arguments independently and/or collaborative in response to set brief(s).
The project brief(s) will be used to emphasise students' awareness for new design approaches as well as provide opportunities to strength the interdisciplinary nature of design.
Students will also build electronics circuits and use code for particular functions that can be applied to other design projects and assignments.

7.2 Overview of Types of Classes

The module is comprised of lectures, tutorials, demonstrations, workshops and laboratory sessions, seminars and design project assignments. Students will participate in individual and group tutorials and work in studio and workshops. In addition to organized activates students are expected to visit museums, galleries and retail outlets and to look at product design and design in general as part of research activities.

7.3 Importance of Student Self-Managed Learning Time

You are expected to apply design skills and methodologies learned during level 4 modules, to apply the design process with rigour and professionalism, to attend all sessions and participate fully in seminars and presentations. You are also expected to liaise with and consult teaching staff throughout the project. In addition to the timetabled sessions, you will have to work independently in order to produce work of an appropriate standard. This module guide states the minimum amount of time you will need to devote to your project work. The design profession is very competitive and therefore it is not enough simply to produce work of a minimum standard. You should strive for excellence in all aspects of the project in order to learn as much as possible and develop a strong project for your portfolio.

7.4 Employability

- You will improve your project and time management skills;
- Three-dimensional design skills: further develop your model-making skills;
- Refine your visual communication skills and your aesthetic awareness: in two – dimensional design work through exploration of composition, balance, layout, attention to detail etc.;
- Verbal communication studies: improve your verbal communication skills by presenting your design work to an audience;
- Ability to work in groups and understand group dynamics;
- Understand basic electronics and coding.

8.   THE PROGRAMME OF TEACHING, LEARNING AND ASSESSMENT

A detailed programme will be made available on the module VLE site, please be aware that on occasion the schedule can change, but the tutors will communicate any change in advance.

W	S	Date	Time	Room	Lec	Topic
SEMESTER 1						
Digital Playground - Part 1						
11	1	30-Sep	10:00-13:00	BR-B48	BT	Introduction to module. Intro to physical computing and interaction Intro to Arduino and kit
	2	30-Sep	14:00-17:00	BR-B48 + T-622	BT	Arduino lab exercises
	3	01-Oct	14:00-17:00	BR-B48	BT	Microcontrollers: Microcontroller basics, programming theory and terms, digital and analogue input and output
	4	03-Oct	10:00-13:00	BR-B49 + T-622	BT	Arduino Lab exercises
	5	03-Oct	14:00-17:00	BR-B49 + BR-B34	BT	Assignment 1: Digital Playground project. Practical considerations Powering projects, using transistors, relays, motors, and programmable LEDs.
Design for Dementia						
14	1	28-Oct	11:00-13:30	BR-B48	SS	Assignment 2: Design for Dementia project intro Lecture & Workshop by Gavin Walker, Lecturer at School of Health & Social Care at LSBU Teams set up
	2	28-Oct	14:30-17:30	BR-B48	SS	Preliminary research User profiling / journey Group tutorials
	3	29-Oct	14:00-17:00	BR-B48	SS	Research Review Ideation and concept generation
	4	31-Oct	10:00-13:00	BR-B49	SS +SL	Design a brief lecture
	5	31-Oct	14:00-17:00	BR-B49	SS	Interim Presentation: preliminary concepts Project brief hand in Project feedback
15	1	04-Nov	11:00-13:30	BR-B48 + BR-B34	SS	Workshop by Sandie Woods Project Tutorials
	2	04-Nov	14:30-17:30	BR-B48 + BR-B34	SS	Anthropometrics and ergonomics refresher Design development: model making and testing as appropriate
	3	05-Nov	14:00-17:00	BR-B49 + BR-B34	SS	Workshop by Sandie Woods, Senior Lecturer at School of Health & Social Care Design resolution and iteration
	4	07-Nov	10:00-13:00	BR-B49	SS+SL	Complete models Presentation and report preparation
	5	07-Nov	14:00-17:00	BR-B49	SS	Design for Dementia Final Presentation

Digital Playground - Part 2						
20	1	09-Dec	10:00-13:00	T-622	BT	Electronic lab: Soldering, building circuits, setting up breadboards
	2	09-Dec	14:00-17:00	T-622	BT	Electronic lab: Project tutorials
	3	11-Dec	14:00-17:00	BR-B48	BT	Electricity basics: Definitions, components, relationships, and electricity flow in circuits. Circuit calculations exercise.
	4	13-Dec	10:00-13:00	BR-B49	BT	Project tutorials
	5	13-Dec	14:00-17:00	BR-B49 +BR-B34	BT	Project Development and Tutorials
	6	**16-Jan**	**14:00-16:00**	**BR-B49**	**BT**	**Project Presentation and Critique**

9. STUDENT EVALUATION

In 2018-19 student feedback was very positive and they commented that they really enjoyed both projects; they found the coding and electronics challenging and therefore the project deadline was reviewed. They found the expertise sessions about Dementia particularly useful and so this is included in the current version of the module.

10. LEARNING RESOURCES

10.1 Core Materials

– Getting Started with Arduino: The Open Source Electronics Prototyping Platform (Make), Banzi, M,; Sebastopol, Calif., Maker Media, Inc; 3 edition, 2014
– Arduino and Kinect projects: Design, build, blow their minds, Melgar, ER Díez CC with Jaworski P, Apress, 2012
– Design for Dementia volume 1 a guide - Bill Halsall and Rob McDonald, Paperback, 2015
– Design for Dementia Volume 2 Research Projects - Bill Halsall and Rob McDonald, Paperback, 2015
– Design as Future-Making, Susan Yelavich and Barbara Adams, Bloomsbury, 2014

10.2 Optional Materials

– Arduino Cookbook, Michael Margolis, O'Reilly Media, 2011
– Discursive Design: Critical, Speculative, and Alternative Things, Bruce and Stephanie Tharp, The MIT Press, 2019
– Bio Design: Nature + Science + Creativity – Antonelli, P.; Myers, W. 2014
– Speculative Everything: Design, Fiction, and Social Dreaming, Anthony Dunne and Fiona Raby, MIT Press, 2013
– Ten Technologies to Save the Planet: Energy Options for a Low-Carbon Future, Chris Goodall (2010), Greystone Books
– Six Memos for the Next Millennium, Italo Calvino, Peguin Classics Harvard University Press, 2009
– Massive Change, Bruce Mau & Jennifer Leonard, Phaidon, 2004
– Tomorrow Now: Envisioning the Next Fifty Years, Bruce Sterling, Random House, 2002
– Arduino and Kinect projects: Design, build, blow their minds, Melgar, ER Díez CC with Jaworski P, Apress, 2012
– Getting Started with Arduino: The Open Source Electronics Prototyping Platform (Make), Banzi, M,; Sebastopol, Calif., Maker Media, Inc; 3 edition, 2014
– Arduino Cookbook, Michael Margolis, O'Reilly Media, 2011