COURSE SPECIFICATION DOCUMENT

Academic School / Department: School of Liberal Arts

Programme: Computer Science

***FHEQ* Level:** 5

Course Title: Sustainable and Ethical Computing

Course Code: DGT 5102

Student Engagement Hours: 120 (standard 3- credit BA course)

Lectures: 45
Independent / Guided Learning: 75

Semester: Fall, Spring

Credits: 12 UK CATS credits
6 ECTS credits
3 US credits

Course Description:
This course introduces sustainability and ethics in the context of computing technologies and explores in detail, case studies across various contexts including computer architectures, networks, high-performance computing, programming languages and sensor systems and how they could be improved to be made ethical and more sustainable.

Prerequisites:
None

Aims and Objectives:
By the end of this course, students will have a good understanding of what ethical, green and sustainable computing means, how this relates to various contexts including computer architectures, networks, high-performance computing, programming languages and sensor systems and make informed choices about their work in any area of computer science.

Programme Outcomes:

COMPSC: A1, A7, A8, C1, C2, C4, C5, C6 and C7

A detailed list of the programme outcomes are found in the Programme Specification.

This is located at the archive maintained by Registry and found at:
https://www.richmond.ac.uk/programme-and-course-specifications/

Learning Outcomes:
By the end of this course, successful students should be able to:

- Understand what makes a computer system green and sustainable
- Demonstrate knowledge of how hardware systems could be made sustainable
- Demonstrate knowledge of how data and data systems could be built and managed in an ethical, green and sustainable way
- Understand and propose ethical, green and sustainable programming solutions to specific industry contexts

Indicative Content:

- What is sustainability
- Ethical and Digital Literacy
- Power management
- Green computer Architectures
- Nature & Implications of Digital Ethics
- Data and data centres
- Inter connection technology
- Sustainable and Ethical Programming
- Sensor network protocols
- Recycling hardware

Assessment:
This course conforms to the University Assessment Norms approved at Academic Board and located at: https://www.richmond.ac.uk/university-policies/

Teaching Methodology:

- Lectures, practical demonstrations and step-by-step software tutorials, class workshops, one-to-one tutorials.

Indicative Text(s):

Edited by Mohd Abdul Ahad, Sara Paiva and Sherin Safar, Springer, 2020. *Sustainable and Energy Efficient Computing Paradigms for Society* (EAI / Springer Innovations in Communication and Computing)

Beever, J., McDaniel, R. and Stanlick, N., 2019. *Understanding Digital Ethics*. Abingdon: Routledge.

Edited by Partha Pratim Pande, Amlan Ganguly and Krishnendy Chakrabarty, Springer, 2013. *Design Technologies for Green and Sustainable Computing Systems.*

Saban, A., 2021. *Green Computing Technologies And Computing Industry In 2021*. London:

Journals/Additional Texts
Sustainable Computing: Informatics and Systems:
https://www.journals.elsevier.com/sustainable-computing-informatics-and-systems

Change Log for this CSD:

Nature of Change	Date Approved & Approval Body (School or AB)	Change Actioned by Registry Services