COURSE SPECIFICATION DOCUMENT

Academic Department:	Science, Innovation & Technology
Programme:	Computer Science
***FHEQ* Level:**	5
Course Title:	Research Methods in Data Science
Course Code:	COMP 5301
Total Hours:	160
Timetabled Hours:	45
Guided Learning Hours:	15
Independent Learning Hours:	100
Credits:	16 UK CATS credits 8 ECTS credits 4 US credits

Course Description:

Introduces students to key Data Science research methodologies and research practices. Students will learn skills, including using data science for computing, science and applied mathematics, that translate directly into a board range of careers. This course also prepares students for their Senior Project by undertaking data science gathering, analysis and visualisation. Students are prepared to plan their Senior projects using suitable methodologies such as systems analysis and design and agile approaches.

Students will also carry out an introduction to range of humanities methods (including textual analysis, interviews, surveys, focus groups, and ethnography) and students are introduced to widely used and newer modes of and approaches to research, including creative methods and participatory/reflexive approaches.

Prerequisites:

40 credits, LIBA 4301 Academic Research and Writing

Aims and Objectives:

- To introduce the concept of methodology and computing research methods and practices including their ethical considerations as they are used in both academic contexts and beyond;
- To prepare students for fieldwork, internships, and future employment in an international research setting, as well as for a Senior Project, in part through engaging with consideration of research ethics;
- To provide a background for eventual careers in computer science, software engineering and math & data science fields, which require articulate, clear-thinking individuals with a grasp of computing related research methods;
- To provide a framework to assist students to think critically about technology and math issues that are of increasing importance in the 21st century;
- To promote critical engagement with a wide range of suitable methodologies such as systems analysis and design and agile approaches.

Programme Outcomes:

A5 (I), B5 (II), C5 (II), D5 (I)

A detailed list of the programme outcomes is found in the Programme Specification. This is maintained by Registry and located at: http://www.richmond.ac.uk/admitted-students/programme-and-course- specifications/

Learning Outcomes:

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

- Demonstrate a detailed understanding of and critical engagement with key research methods and practices in computing, science and math including issues of research design and methodology.
- Complete assigned work with a degree of clarity, technical competence and critical thinking, and a degree of independence and capacity for self-evaluation, appropriate for a 5000-level course.
- Demonstrate well-developed control of research methods and related ICT skills that will translate into the workplace, including the ability to present research in a manner suitable to a range of audiences and changing contexts.

Indicative Content:

- Overview of core research methods and practices in computing and questions of research ethics
- Research design, literature reviews and theoretical frameworks
- Case studies and comparison
- Qualitative research methods such as:
    - Interviews and focus groups
    - Surveys/Polls
    - Participatory research methods
    - Content/Discourse analysis
    - Systems Analysis and Design
    - Agile / Scrum approaches
    - Black/White box testing
    - Process tracing
    - Visual and textual analysis
    - Digital ethnography
    - Creative methods
    - Qualitative/Quantitative data analysis and presentation
- Research project design (for example questions of costing, implementation, evaluation, and ethics)
- Information Literacy and Literature Reviews

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:

This course will be delivered face to face through a combination of lectures and interactive sessions. In addition to classroom activities, there are guided learning elements that are tutor led and arranged through Blackboard. These activities can be asynchronous online sessions, flipped classrooms, set readings with discussion boards or set guest lectures for example. Set activities are monitored by the instructor to ascertain student engagement. Students are encouraged to prepare for class and to play an active part, to raise questions, following-up ideas and interact with a wide range of provided material.

Indicative Texts:

Dawson, C. (2019) *Introduction to Research Methods: A Practical Guide for Anyone Undertaking a Research Project*. 5th edn. London: Robinson Publishers.

Kendall, K. and Kendall, J. (2019) *Systems Analysis and Design*. Global 10th edn. London: Pearson Publishers.

See syllabus for complete reading list.

Change Log for this CSD:

Nature of Change	Date Approved & Approval Body (School or AB)	Change Actioned by Academic Registry
First Edition	Nov 2024	