**

The Department of Computer Science

# **CIS4517**

# **Research and Development Project**

Level 7

Module Handbook

2023 /2024

**Module Leader:** Professor Yonghuai Liu

🕿 01695 65 7230

**Email: liuyo@edgehill.ac.uk**

***Administrators:***

🕿 01695 65 7603

|  |
| --- |
| Module Overview |

**Introduction**

This module provides experience and opportunity of designing and executing a substantial project in a limited time, based on a project plan, employing practical skills, problem solving and underpinned by relevant research. Students will apply and extend skills and knowledge learned in taught modules and demonstrate their competency to construct and complete a coherent project as a computing professional.

In conjunction with BCS expectations, this module has major benefits by providing students with the opportunity to demonstrate:

* their ability to apply practical and analytical skills present in the programme as a whole.
* innovation and/or creativity
* synthesis of information, ideas and practices to provide a quality solution together with an evaluation of that solution.
* that their project meets a real need in a wider context
* the ability to self-manage a significant piece of work.
* critical self-evaluation of the process (BCS, 2018)

Furthermore, students are encouraged to conduct the project for an identified client, which enables them to develop skills of client management, and elicitation of requirements from non-technical users. Whilst students are provided with advice in their project, the element of choice enables them to pursue areas of individual interest, promoting motivation aligned to their degree pathway.

The R&D project is an effective tool for promoting student learning, particularly 'deep' learning. This is because it provides the opportunity for students to develop their ideas in more depth than assessment patterns in other modules allow. The R&D project will focus on a topic appropriate to the master's degree they are studying. It also enables students to carry out research that interests them and which may be of benefit to their future careers.

|  |
| --- |
| Outline Content |

Since the R&D project is individually negotiated, most learning will be self-directed under the guidance of the student's supervisor. While underpinning skills and knowledge are developed in research skills/methods modules that student’s study, supervisions are likely to include discussion of the project design and management, requirements specification, justification of choice of methods, software testing & prototyping, documentation and report requirements, evaluation methods and discussion of relevant professional, ethical and legal issues.

|  |
| --- |
| Tutor Details |

|  |  |
| --- | --- |
| **Module Leader**: Prof Yonghuai Liu | |
| **Location:** TH-F15  **Direct line:** 01695 65 7230 | **e-mail:** liuyo@edgehill.ac.uk |
| Student Learning | | |

The use of a Virtual Learning Environment (VLE) will be adopted for learning support, including notifications, email, and presentation storage. The teaching and learning strategy will be via lectures, seminars, demonstrations and tutor assistance in one of the department’s computer suites. Student learning will be supported with the availability of a range of Web authoring tools and access to the Internet. The burden of responsibility for learning, however, lies, ultimately, with the student, and to facilitate this, theoretical content will be presented via appropriate course handouts and electronic presentations. These will be made available on the VLE to which all students will have access to. Practical exercises and additional theory will be introduced via the web teaching environment. Students will be expected to exercise their responsibility as autonomous learners during the later stages of the module. The substantive content of the module will be explored during formal lectures and discussed in seminars and supplementary material and directed reading. Reading around the subject in addition to any materials provided in the module is expected. This reading material can be sourced from the given reading list and suggested readings are identified in the schedule.

|  |
| --- |
| Learning Outcomes |

On successful completion of this module, students will be able to:

1. Identify, specify and critically analyse a system, issue, or problem of current interest within a relevant context.
2. Critically and systematically review relevant literature and alternative approaches and solutions.
3. Demonstrate and critically self-reflect on the significance of the outcomes of the project in a professional manner including aspects related to legal, social, and ethical implications.
4. Demonstrate systematic application of knowledge, together with a practical understanding of how current techniques of research and enquiry are used to identify, develop and evaluate practical solutions to a well-defined problem.
5. Deal with complex issues both systematically and creatively, make sound judgments in the absence of complete data, and communicate their conclusions clearly, relating theory to practice.

|  |
| --- |
| Intended Skills Outcome |

On successful completion of this module, it is intended that students will have acquired developing skills in the following areas:

* Analytical thinking
* Systematic literature review and application of knowledge
* Report writing

|  |
| --- |
| Graduate Skills Framework |

In addition to the above specific skills, there is a collection of generic and transferable skills that we may expect students to demonstrate collectively throughout their programme, this is known as the ‘Graduate Skills Framework’.

**Table 1. Graduate Skills Framework applied to CIS4517, where F=Formative, S = Summative, and left blank = does not apply to this module.**

| **(QAA Subject Benchmark Statements – Computing (2016)**  **BCS Course Accreditation Statements (2018)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Computer related cognitive skills:(C)**  **Knowledge & Understanding**  (Recalling important information: Explaining important information) | | | | | | | | | | **Intellectual Skills**  (Solving problems: Creating "unique" answers Making critical judgements knowledge base) | | | | **Computing-related practical skills: ( P )** | | | | | | | | | **Generic skills for employability ( E )** | | | | | | **Transferable Skills** | |
| **Develop theory** | | | | **Apply theory** | | | | | | **Develop theory** | | | | | | **Apply theory** | | |
| Computational thinking | Scientific approach | Conceptual understanding | System modelling and design | Business relevance | Information modelling | Data architecture | Mathematical underpinning | IS Management | Information security | Data Synthesis | Critical evaluation | Use appropriate tools | Ethical, Social, Cultural awareness | Construct usable systems | Evaluate quality of systems | Project management | Recognition of risks | Deploy tools | Critical Thinking | Use appropriate processes | Holistic system design | Implementation of design | Intellectual skills | Self-management | Reflective Communication | Team working & Management | Contextual awareness. | Sustainability | Working in a development team | Lifelong learning skills |
| **C1** | **C2** | **C3** | **C4** | **BCS** | **BCS** | **BCS** | **BCS** | **BCS** | **BCS** | **C5** | **C6** | **C7** | **C8** | **P1** | **P2** | **P3** | **P4** | **P5** | **P6** | **BCS** | **BCS** | **BCS** | **E1** | **E2** | **E3** | **E4** | **E5** | **E6** | **BCS** | ***BCS*** |
| S | S | S |  | S | S | S | F |  | F | S | S | S | S |  | S | F | F |  | S | F | F | S | S | S | F |  | S | F |  | F |

**(for full details of the above descriptors please refer to QAA Subject Benchmark Statements – Computing (2016) and BCS Course Accreditation Statements (2018))**

|  |
| --- |
| Attendance and Monitoring Processes |

Attendance at all lectures, seminars, and lab sessions is required. Attendance to scheduled sessions will be monitored through Blackboard tracking. If you fail to attend sessions, you will be contacted requesting an explanation for your absence. Persistent non-attendance will trigger a formal student review meeting with the Programme Leaders / Director of Postgraduate Studies, and in exceptional cases may lead to you being withdrawn from the course.

Consequently, if you are unable to attend any of your timetabled sessions you must let your tutor and the Department Administrators know as soon as possible. You may be asked to provide additional documentation such as medical certificates. Tutors will take this evidence into account when monitoring attendance and tracking in accordance with the requirements of the Student Loan Company.

### **Module Mode of attendance**

***Average Weekly Schedule***

*2 x 1-3 hour workshops (Yonghuai Liu)*

*Self-organised weekly meetings with supervisor*

*Bookable surgery time Wednesday 11:00-12:00am (Yonghuai Liu)*

The substantive content of the module will be explored and discussed through an integrated combination of lecturing, seminar-based discussion, and practical exercises. Concepts will first be covered theoretically through formal lectures and issues arising from these will be discussed in a seminar setting. The practical impact of the concepts will then be investigated, and the conceptual understanding deepened through series of exercises.

You are advised to consult your Personal Tutor if there is a problem leading to long-term absence (or a pattern of shorter absences) from the University. It is your responsibility to catch-up with academic work missed during a period of absence. **DO NOT** assume that your absence from the programme is approved. The University reserves the right to reject requests for absence, including self-certification of sickness, if there are concerns about a student’s overall pattern of attendance.

### **Support:**

Support will be offered within the formal contact sessions, in particular in monitoring the practical aspect. Students are highly encouraged to arrange regular (weekly) meetings with their supervisor to demonstrate progress, discuss any issues met and possible ways forward, and make plans for the coming week(s). In some cases, some online meetings may be arranged with agreement through MS Teams, for example. Emails should be mainly used to communicate with their supervisor and where necessary to send work to the tutor for comment, or to seek additional guidance.

|  |
| --- |
| Assessment |

Assessment is used in supporting the learning of students and in quality management and enhancement. Assessment serves the following purposes among the others:

* + - * diagnosing potential.
      * evaluating progress and identifying possible challenges to the learning experience.
      * providing a means of feedback.
      * motivating students by requiring them to demonstrate the knowledge, understanding, skills and competencies they have developed.
      * measuring achievement at appropriate academic levels;
      * providing staff with information about the effectiveness of their teaching and students’ learning.

The form of assessment will be fit for the purpose of allowing students to demonstrate their achievement of the intended learning outcomes.

### **Assessment Overview**

Assessment criteria will be provided in separate documentation. Below is an outline of the assessment strategy used within this module:

### **Formative:**

### Formative assessment is an integral part of any R&D project.  There are two principal methods of formative assessment: Discussion during supervision meetings and comments on draft sections of work (supplemented by discussion).

Students initially prepare a proposal which is discussed with the project supervisor.  It is refined to create an extended proposal as an interim progress report which is not summatively assessed and forms the basis for the project.  Since projects may encompass primary research with thesis-style artefacts, software, or client reports then the initial discussion process is critical to establish the outputs.  Thus, the outputs/ deliverables of the project are negotiated between the supervisor and student, and the assessment weightings and project plan are clarified at that point. This forms the initial project 'contract'.

Draft work is discussed on a regular basis, driven by student work and the project plan.

**Summative:**

**Report (CW1) (20%) Individual**

*Learning Outcomes: LO1, LO2, LO3.*

CW1 - Students will report on the progress made in their projects. The report should cover areas such as the project’s aim and objectives, background and small literature review, ethical considerations, project management and progress review.

**Report and Artefact (CW2) (80%) Individual**

*Learning Outcomes: LO1, LO2, LO3, LO4, LO5.*

CW2 - The form of the deliverables (report & artefact) will have been negotiated at the start of the project. All students will produce a final report, reflective of the project research and development lifecycle.

|  |
| --- |
| Late Submissions |

Your assignment is regarded as late if it is not submitted by midday (12:00) on the due date indicated on the Blackboard submission drop-box. Early submission is recommended to avoid uploading issues.

If you have missed a submission deadline for a written (individual) assessment, at the scheduled first sitting, the University will accept Late Submissions where the submission is received within five working days of the original deadline (aside from where PSRB requirements preclude this). [These] late Submissions will be subject to the normal capped mark for reassessment. Work handed in late [after this five-day period] without approval through a Deferral, Extension or authorised late submission (H4.4) will be marked at zero.

|  |
| --- |
| Extensions |

If you are unable to submit by the stated deadline, you should follow the extension application guidelines below. Only in extreme cases will extensions be granted for coursework.

**Student guidelines for applying for an extension:**

* All applications for extensions should be submitted to the Department Administrator. (Forms are available on Blackboard / Organisation area)
* Any application for an extension of a deadline should normally be made at least twenty-four hours before the due deadline for the assessment. In exceptional circumstances outside of this time scale students are permitted to submit an extension form without supporting evidence. The supporting evidence must be submitted within 7 working days, or the extension request will not be approved.
* All applications for an extension should be accompanied by verified independent documentary evidence.
* Extensions may be granted for a period that extends up to **two weeks before** a Module Assessment Board. If a period longer than this is required, the student should be advised to apply for consideration under exceptional mitigating circumstances.
* The timing of student feedback against published deadlines will be affected if an extension is granted.

|  |
| --- |
| Malpractice |

When researching and writing-up your coursework you must ensure that you fully reference any elements within it that are not written or conceived by yourself. In doing so you will respect the intellectual property of other writers and acknowledge the importance of their work in your area of research. If you fail to attribute a source for the work of other people and present it as your own, you are stealing their work. **Academic malpractice** of this kind (**‘plagiarism’**) is seen as the most serious offence in academia, and if you are found guilty of such activities it **may lead to the termination of your course of study or the non-conferral of your degree**.

As such, you should ensure that you are familiar with the appropriate ways in which to avoid academic malpractice, using the appropriate referencing system. The department of Computer Science, like many departments at Edge Hill University, use the **Harvard referencing system (2014)**.

**Avoiding malpractice when using electronic research mechanisms**

 You will be encouraged to use a range of electronic and online resources such as electronic journals, online database, and the Internet, which, collectively are a ubiquitous resource. However, students need to be cautious when using these research tools, as whilst they streamline the process of research/information gathering, they simultaneously generate a depth of materials that need to be filtered and ***read***.

In addition, caution is needed as use of these electronic research tools often generate materials for your scope of study which are not relevant. Consequently, you should ensure that you search within the relevant parameters of investigation as framed by the recommended reading and research materials indicated in the module handbook of each module.

Remember: you ***read*** for a degree – you cannot demonstrate you understand academic theory in an appropriate manner if you have not read and **understood** ***relevant*** resources.

If you have any concerns, please check with your tutor or Learning Services

[*https://www.edgehill.ac.uk/ls/uni-skills/?tab=referencing*](https://www.edgehill.ac.uk/ls/uni-skills/?tab=referencing)

**Remember, it is as easy for the department to uncover any information taken from the internet and passed off as your own work, as it is for you to find it!**

|  |
| --- |
| Learning Resources |

Students will be directed to a wide range of reading, which will be specific to their project, however the following project/research texts will be useful.

Bell, J. & Waters, S., 2018, *Doing your Research Project: A guide for first-time researcher*s, 7th Edition, OUP.

Biggam, J., 2021, Succeeding With Your Master's Dissertation, Open University Press.

Gary, T., 2017, How to Do Your Research Project: A Guide for Students, SAGE Publications Ltd.

Zobel,  J., 2015, Writing for Computer Science, Springer.

|  |
| --- |
| Suggested Learning Resources |

**Literature:**

Boland, A., Cherry, G., & Dickson, R., 2017, Doing a Systematic Review: A Student's Guide, SAGE Publications Ltd.

Bott,  F., 2014, Professional Issues in Information Technology, 2nd edition, BCS, The Chartered Institute for IT.

Creswell, J.W., & Creswell J.D., 2018, Research Design: Qualitative, Quantitative, and Mixed Methods, SAGE Publications, Inc.

Dawson, C., 2019, Introduction to Research Methods 5th Edition: A Practical Guide for Anyone Undertaking a Research Project, Robinson.

Field, A., 2018, Discovering Statistics Using IBM SPSS Statistics, SAGE Publications Ltd.

Gough,  D., Oliver,  S. & Thomas, J., 2017, An Introduction to Systematic Reviews, SAGE Publications Ltd.

Gray, D. E., 2017, Doing Research in the Real World, SAGE Publications Ltd.

Hughes, B., 2019, Project Management for IT-Related Projects, 3rd edition, BCS, The Chartered Institute for IT.

Kara, H., 2018, Research ethics in the real world: Euro-Western and Indigenous Perspectives, Policy Press.

Katz, L., 2018, Critical Thinking and Persuasive Writing for Postgraduates, Red Globe Press.

Quinn,  M., 2016, Ethics for the Information Age, 7th Edition, Pearson.

Sharp, H., Preece, J., & Rogers,  Y., 2019, Interaction Design: Beyond Human-Computer Interaction, 5th Edition, Wiley.

Townsend, K. (Editor), & Saunders,  M. N. K. (Editor), 2018, How to Keep Your Research Project on Track: Insights from When Things Go Wrong (How To Guides), Edward Elgar Publishing Ltd.

Villafiorita, A., 2014, Introduction to Software Project Management, Auerbach Publications.

Wallace, M. & Wray, A., 2021, Critical Reading and Writing for Postgraduates (Student Success), 4th Edition, SAGE Publications Ltd.

Yin, R. K., 2018, Case Study Research and Applications: Design and Methods, SAGE Publications, Inc.

**Key journals**

Students should utilise both electronic journals and those in hard copy to support their research for this module.

IEEE Explore Digital Library

Science Direct Elsevier

ACM Digital Library

Springer

Other learning resources

On-line electronic databases

Appropriate web sites