

MODULE PROFORMA		
Full module title: Software Development Group Project		
Module code: 5COSC021W	Credit level: 5	Length: 1 Semester
UK credit value: 20	ECTS value: 10	
College and School: College of Design, Creative and Digital Industries; School of Computer Science and Engineering		
Module Leader(s):		
Extension:	Email:	
Host course and course leader: BSc Computer Science		
Status: Core – BSc Computer Science, BEng Software Engineering		
Subject Board: COMENG		
Pre-requisites: None	Co-requisites: None	
Study abroad: Yes		
Special features: Industry based project		
Access restrictions: Database and Programming experience		
Are the module learning outcomes delivered, assessed or supported through an arrangement with an organisation(s) other than the University of Westminster: Yes		
Summary of module content: In this module students gain practical work experience through their participation in a team that develops a prototype for a real-life software application suggested by industry contacts. The module takes the students through the different managerial and technical steps of software development. Students gain experience in managing a team and deliver software iteratively by using an agile approach and receiving feedback from industry contacts. The module also provides students with experience in team communication and ways to overcome any problems, as well as the opportunity to reflect on professional issues such as quality of project documentation, cybersecurity, ethics and code of conduct.		

Learning outcomes

By the end of the module the successful student will be able to:

- LO1 Work effectively with an external client through the management and development of a real-life project using modern agile software lifecycle approaches;
- LO2 Work as a member of a software development project team demonstrating collegiality and professional standards of conduct in communication, time management, project documentation and version control;

- LO3 Identify, use and evaluate relevant frameworks and technologies when developing software including the application of appropriate testing methods and tools to evaluate software performance;
- LO4 Consider the ethical and legal relevant issues of a software project, including issues of intellectual property and data protection;
- LO5 evaluate security risks and demonstrate how computer security decisions affect software development;

Course outcomes the module contributes to

BSc Computer Science	L5.1, L5.2, L5.5, L5.6, L5.7, L5.8, L5.9
BEng Software Engineering	L5.1, L5.3, L5.5, L5.8, L5.7, L5.9

Indicative syllabus content

Software project development

- Models of software projects, estimating the effort;
- Software development lifecycle;
- Requirements analysis, user stories;
- Modelling a system: the different needs of the data, the human computer interface and what lies in between;
- Introduction to agile approach.

Professional behaviour

- The needs of others; boundaries of rights and responsibilities;
- Legal issues as they apply to software development, data protection (GDPR), intellectual property;
- Ethics: the project team, the wider world, and life-long development; privacy; ethical clearance and ethics unclear: dilemmas;
- Professional behaviour in a global, distributed, environment.

Quality Assurance

- Safety, reliability, availability, resilience and security;
- Testing and version control; tools; evaluation beyond software testing: critical evaluation of sources, research, documentation, communication;
- Security requirements: adding a security component versus adding security in all components;
- Threats and counter-measures: external security threats, internal security threats and security threats from user ignorance.

Teaching and learning methods

This module is delivered in a mixture of presentations, lectures (2 hours) and tutorials (2 hours). The module is supported by industry contacts who introduce the client project to the students, deliver talks on industry practices such as integration and deployment, and provide feedback on the students' work during a scheduled event in the teaching calendar and the

final presentation of the best students' work. The development of the project is student driven with weekly formative feedback from the tutors during the tutorials on the projects' progress and the team-centred stand-ups. The taught material delivered during lectures focuses on managing development projects using agile methods, system modelling, HCI considerations and discussions on professional, legal and ethical issues. Part of the taught material is formative assessed during the tutorials through short on-line tests followed by feedback from tutors. Outside the formal class time, there is online support via Blackboard.

Activity type	Category	Student learning and teaching hours*
Lecture	Scheduled	22
Practical Classes and workshops	Scheduled	26
Total Scheduled		48
Module and coursework -based general study	Independent	82
Preparation for Assessment	Independent	70
Total Independent Study		152
Total student learning and teaching hours		200

*the hours per activity type are indicative and subject to change.

Mandatory short-term work-based learning

As part of this module, students will undertake a mandatory Work Based Learning component (WBL) which follows the University's Employability Strategy as adopted by the School. This will include and provide a plan for short-term WBL project in addition to the current set of activities such as: CV workshop, impact of engineering designs, factors affecting products and engineering, engineering ethics, professional Code of Conduct & applied professionalism, finance and accounting, marketing and project management. Before the module starts, the module team where possible will liaise/communicate/invite industrial partners and organise an industrial event/talk/presentation/forum/webinar of WBL projects. The event will be scheduled in the first 2-3 weeks of the module.

The outcome of the event, is that students will chose a WBL project to work effectively in a group, undertake market research, carry out requirements analysis, specifications and work on the project design/business case. Students will compile a report and present their findings to the class including industrial partners for comments and feedback. The event will take place towards the end of semester 1. The learning outcome of the short WBL project is that students demonstrate entrepreneurial thinking, undertake effective project management and communicate effectively in order to develop their employability skills. The learning outcomes of this will be assessed in the Project Presentation and Project Report assessment components.

Assessment rationale

Being a practical module by its nature, the module encompasses a range of applied knowledge and practical skills that students should have gained from other core modules of their courses. Thus, the module has a balanced mixture of formative summative, and synoptic assessment.

Formative assessment: to reinforce learning, formative assessment is provided on a weekly basis. There are two types of formative assessments: a) A set of formative on-line tests on topics covered during the lectures. Solution are provided to get feedback from a group supervisor; b) Feedback on the work presented weekly by the group to the group supervisor. At the end of the module the best pieces of work are selected for presentation to the industry contacts setting the brief, with a non-credit bearing award to the best implementation as selected by our industry contacts.

Summative Assessment: The module consists of two summative assessments: CW1 “Design” and CW2 “Implementation, Evaluation and Testing”. In both pieces of coursework students receive group and individual marks, based on the individual contribution of a student to a group work which is also monitored by a tutor (preparation for assessment 30 hours).

CW1 comprises analytic and synthetic work on analysing and presenting data relevant to the project, report, software documentation. The students work as a team, and all contribute to the specified group elements of the coursework. Students need to indicate that each contributed equally to each of the elements. CW1 also has individually assessed elements and includes a collection of the students’ weekly stand-up, reflection on the feedback received and feedback given to their team members.

CW2 comprises practical work on the implementation of the design, its evaluation and testing, report, software documentation, presentation, demonstration. Students receive individual mark for the implementation of their project part, as well as their weekly stand-up and feedback given. Students receive group mark for the overall quality of the software product developed and their contribution in ensuring a smooth integration of the various parts (preparation for assessment 40 hours)

Note that the module is designed in such a way that consistent and continuous work during the scheduled tutorial and timely management of group project, including all required elements of the project documentation, will contribute a significant proportion of the final deliverables, allowing the balanced spread of students’ time and efforts and thus releasing stress from the final stages prior to the submission.

Demonstration of the work to the group supervisor is an essential and part-fulfilment of the assessment.

Assessment criteria

Two courseworks are group practical work, with the first aiming at the specification and design of the software (LO1, LO2, LO3, LO4) and the second allowing for the integration of design and development skills (LO1, LO2, LO3, LO4, LO5). Both courseworks will be done in groups with individual work per student. In CW1 higher marks will be achieved by demonstrating higher level of analytical skills in consistent design solution that meets the requirements with strong evidence-based and research informed demonstrations of professionalism. In CW2 higher marks will be achieved by the full and consistent implementation of the design reflecting the functionality of the system, advanced implementation of classes and their relationships, implementation and use of the database, use of advanced programming techniques, implementation of the graphical user interface to meet the principles of HCI and usability, and the completeness of evaluation and testing. Additionally, students will gain higher marks in both courseworks for effective team-work.

Assessment methods and weightings

Assessment name	Weighting %	Qualifying mark %	Qualifying set	Assessment type (e.g. essay, presentation, open exam or closed exam)
<i>Group Coursework 1: Project Design</i>	40	30		<i>Coursework</i>
<i>Group Coursework 2: Project Implementation evaluation and Testing</i>	60	30		<i>Coursework</i>

Synoptic assessment

This module draws on technical and analytical skills learned elsewhere in the course. This module therefore engenders synoptic learning and its assessment is inherently synoptic.

Sources

Link to the online reading list

<http://readinglists.westminster.ac.uk/lists/B736A9AF-01B5-B031-AB7E-040550CE1C44.html>