Module Title: OBJECT ORIENTED ANALYSIS, DESIGN AND IMPLEMENTATION

No. of Credits: 20
Credit Level: 7
Mandatory: None
Pre-requisite: None
Co-requisite: None

MODULE DESCRIPTION

This module presents the Object Orientation paradigm in the context of industrial web application architectures. This involves requirements gathering, analysis, specification, design, implementation and finally critical review. You will use industry standard notations, approaches and integrated development environment tools as applicable.

LEARNING OUTCOMES

1. Critically appraise and model user requirements.
2. Produce a design for some software using object oriented principles.
3. Apply suitable industrial approaches to the implementation of a software system using Object Oriented principles.
4. Critically evaluate the use of design patterns in the global context of software development.

INDICATIVE CONTENT / AREAS OF STUDY

Web application architectures are ubiquitous in the commercial IT industry, and one of the most pervasive paradigms with respect to application development is that of Object Orientation.

You will experience a full development project lifecycle from requirements gathering through to documentation and evaluation, and understand the myriad skills and techniques that are required to bring an application development project to a successful conclusion. In particular you will be required to explore and engage with multi-cultural issues such as communication, negotiation and presentation, in relation to international contexts and the global software development economy.

You will use an appropriate programming language that supports object orientation constructs, as well as industry-relevant tool sets. The workshop sessions (on campus study) or guided activities (online study) enable a variety of activities to be experienced and instigated by your peers. You will work together with your peers to practice the application of different skills at different stages, and you will be required to discuss and debate approaches, frameworks and techniques that may be relevant to the web application domain.

You will be required to evidence your learning throughout the module, in the form of two portfolios. The exact nature and presentation style of the portfolio will be undertaken by the learner, under guidance from the module tutor. There will be a strong emphasis upon practice-based research, as a means of demonstrating what has been achieved, but also to provide a formative assessment approach throughout the study.

TEACHING AND LEARNING STRATEGY
All activities related to learning, teaching and assessment (LTA) will be tailored to suit the chosen mode of study, with a view to providing parity of opportunity in the learning experience for all students. As befits Level 7 study, the learning experience is grounded upon an enquiry-based approach. This will require the processes of research to be applied to both the subject discipline as well as a systematic enquiry into the learning and teaching process itself. You will develop your own autonomy by working alongside research active academic staff, to embed rigour, academic integrity and ultimately, professionalism into the learning experience.

On Campus Full Time

You will engage in an initial module induction that consists of group based seminars/workshops, where interactive exercises, activities and group discussions are used to begin your own exploration of the relevance of enquiry based study in the context of Object Oriented application design and implementation. This will not only facilitate your engagement with the module, but also provide the opportunity to engage with software design issues in a global, multi-cultural context. Related support materials will be provided through electronic resources such as the University’s Virtual Learning Environment (VLE).

Working in groups, you will then be challenged to identify a set of employment skills/competencies which are relevant to the management of people who will build OO applications. You will audit your current level of competency in these areas using, amongst other things, group based reflective practices, to prioritise and plan areas for further development. You will then be organised into small action learning sets to identify, plan, deliver and evaluate a software development project to enable you to practice and develop new skills in the development areas identified. You will be responsible for recording your own learning and development progress on the task through individual portfolios of achievement, that form the basis of your formative, and ultimately, summative, achievement.

The module tutor (or a deputy) will be provided to act as a mentor and critical friend to the group. However, the emphasis will be on the use of peer support and feedback to aid self-directed learning. There is no intention to create a dependency upon the teaching staff, rather there is a clear mandate to develop the characteristics of an autonomous Masters-level learner. Both the personal tutor and peer learning sets therefore provide specific formative feedback for you. You will be responsible for driving the tutor relationship e.g. making necessary arrangements with the tutor to observe the learning set in action, to provide formative feedback on their progress and to complete any progress checks as required at specified stages.

On Campus Part Time

As for full time, although employer and professional preferences for your development may take precedent over the project development scenario and adjustment to the process will need to be made. One such adjustment will be the augmentation of your on-campus activities with the use of online resources, to facilitate learning interactions over the course of your study. However, your overall learning and development requirement, and the requirement for the personal tutor role, will remain.

On-line Distance Learning

You will start the module with an induction activity that will be delivered via the University’s virtual learning environment. This will allow you to interact with staff and other students. This virtual induction event will be recorded so that you can access it afterwards if you are unable to access a computer at the scheduled time.
Each week you will be given access to some online materials that will facilitate your study. Additional to this, you will be set some guided activities to work on individually, and sometimes as a group, depending upon what you are studying. For example you may be working on a design specification for some software that requires you to work in pairs or as part of a small group. In this case you would work together collaboratively, using online tools, and then submit your work to a discussion board where you can solicit feedback from other groups.

On Campus

Lectures 12 hours
Seminars and tutorials 24 hours
Workshops 12 hours
Self and directed study 152 hours
Total 200 hours

On-line Distance Learning

Engagement with online presentation materials 24 hours
Guided online activities 36 hours
Self and directed study 140 hours
Total 200 hours

Whilst this is the planned notional use of time, some flexibility in delivery should be expected to ensure that the value of the learning experience is maximised.

Each of the workshop sessions is designed to facilitate the learning needs of individuals in a way that is most applicable. Learners will be encouraged to experiment with relevant challenges posed by the tutor in order that the requisite knowledge and skills are developed. There is a constant theme of peer-review to support formative assessment for learning.
ASSSESSMENT:

Assessment Strategy

The nature of the module is such that you will develop personalised ways of demonstrating your achievement of the learning outcomes. Therefore, after completing a critical design portfolio (CW1), you will construct an application portfolio (CW2) that demonstrates your achievement.

Assessment Weighting: 100%CW

CW1: 60% weighting: Learning outcomes to be assessed: LO1 and LO2

You will develop a software design portfolio that demonstrates your understanding of OO design principles. A typical design portfolio will consist of:

- Requirements specification;
- Use cases and use case models;
- Sequence/interaction models;
- Class diagrams and stub code;
- Rationale for the application of design patterns.

CW2: 40% weighting: Learning outcomes to be assessed: 3 and 4

You will produce a portfolio of evidence that illustrates how you have implemented and demonstrated a web application. A typical portfolio will consist of:

- An initial, critical, self-appraisal with regard to your skills development;
- Implemented code (fully commented and documented);
- Testing strategy and results;
- Screencast presentation that demonstrates application functionality and error trapping.

REGULATIONS

This module conforms fully to the relevant PG regulatory framework.

RESOURCES

You will need access to an internet enabled computer that has multimedia facilities such as:

- Audio speakers
- Microphone

Throughout the module you will be using an Integrated Development Environment such as Eclipse (http://www.eclipse.org/), and an OO programming language such as Java or C#.

Key texts


Essential texts


Head First Design Patterns, O'Reilly Media, ISBN-10: 0596008678.

Other reading


Gamma, Erich; Richard Helm, Ralph Johnson, and John Vlissides (1995). Design Patterns: Elements of Reusable Object-Oriented Software. Addison-Wesley. ISBN 0-201-63361-2.