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## MODULE DESCRIPTOR

### Module Title

Object Oriented Software Development

Reference	EN3543	Version	6
Created	August 2021	SCQF Level	SCQF 9
Approved	December 2009	SCQF Points	15
Amended	August 2021	ECTS Points	7.5

### Aims of Module

To provide the student with the skills and knowledge necessary to manage software projects and to develop software systems using an object-oriented approach.

### Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Design, implement and test software using an object-oriented approach.
- 2 Utilise appropriate rapid application development tools in the development of a software solution.
- 3 Design, implement and test software using appropriate data structures.
- 4 Design and implement a graphical user interface.

### Indicative Module Content

Project Administration: size, time and cost considerations of a software project. Project planning, life cycle. Project control: progress monitoring, revision control. Project maintenance. Object-oriented Design: objects, object classes, inheritance. Design representation, UML. Object-oriented Programming: classes, private, protected and public data and member functions. Constructors and destructors. Overloading, derived classes, virtual functions. Software Development for graphical user interfaces: Class frameworks, rapid application development tools, user interface design, widgets, event handling. Review of Programming Languages: review of the features of current programming languages which are applicable to electronic engineering applications. Case studies. Data Structures: linked lists, doubly-linked lists, queues, trees, stacks, standard template library.

### Module Delivery

The module is taught using a structured programme of lectures, tutorials, laboratories and student-centred learning.

<b>Indicative Student Workload</b>	Full Time	Part Time
Contact Hours	36	N/A
Non-Contact Hours	114	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
<b>TOTAL</b>	<b>150</b>	<b>N/A</b>
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

**ASSESSMENT PLAN**

*If a major/minor model is used and box is ticked, % weightings below are indicative only.*

**Component 1**

Type: Coursework Weighting: 30% Outcomes Assessed: 1

Description: Coursework.

**Component 2**

Type: Coursework Weighting: 70% Outcomes Assessed: 2, 3, 4

Description: Coursework.

**MODULE PERFORMANCE DESCRIPTOR**

**Explanatory Text**

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 is worth 30% and C2 is worth 70%.

		Coursework:						
		A	B	C	D	E	F	NS
Coursework:	<b>A</b>	A	A	B	B	E	E	
	<b>B</b>	B	B	B	C	E	E	
	<b>C</b>	B	C	C	C	E	E	
	<b>D</b>	C	C	D	D	E	E	
	<b>E</b>	E	E	E	E	E	F	
	<b>F</b>	F	F	F	F	F	F	
	<b>NS</b>	Non-submission of work by published deadline or non-attendance for examination						

**Module Requirements**

Prerequisites for Module EN2541 Computer Engineering or equivalent.

Corequisites for module None.

Precluded Modules None.

**INDICATIVE BIBLIOGRAPHY**

- 1 SUMMERFIELD, M., 2010. Programming in Python 3. 2nd ed. Addison Wesley.
- 2 KALB, I., 2018, Learn to Program with Python 3, Apress
- 3 SUNDRES, J., 2020, Introduction to Scientific Programming with Python, Springer Open
- 4 NAGAR, S., 2017, Introduction to Python for Engineers and Scientists, Apress
- 5 DONALDSON, T., 2013, Python: Visual QuickStart Guide, 3rd Ed, Peachpit Press
- 6 SHOVIC, J.C., 2021, Python All-In-One For Dummies, 2nd ed. For Dummies