Module Title:	Concurrent Development
Language of Instruction:	English

Credits:	5

NFQ Level:	8

Module Delivered In	1 programme(s)

Teaching & Learning Strategies:	Learners will be expected to activity participate in class on the materials covered and work throughout each scheduled lab session to accomplish assigned tasks. While theoretical topics are covered in lectures the practical application of the theory will be covered in the computer laboratory classes where students get to apply the concepts to solve real world problems.

Module Aim:	To provide learners with a theoretical knowledge and practical skills of developing concurrent software

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Assess the different approaches to developing concurrent systems.
LO2	Design, develop and test concurrent systems.
LO3	Evaluate proposed concurrent architectural designs.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
No requirements listed

Module Content & Assessment

Indicative Content
Architecture Flynn's Taxonomy, Multicore, Manycore and Stream Processors
Concurrency Models Shared Memory Model, Message Passing Model, Software Transactional Memory and Actors
Concurrency Issues Replication, Fault Tolerance, Load Balancing and Scalability
Concurrent API's OpenMP, Cilk, Map-Reduce, CUDA

Assessment Breakdown	%
Project	20.00%
Practical	20.00%
End of Module Formal Examination	60.00%

No Continuous Assessment

Project				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Project	Concurrent System Development using appropriate tools. (Design, implement and test)	1,2,3	10.00	Week 9
Project	Performance measurement of previously developed concurrent system. System profiling and analytics.	1,2,3	10.00	Week 11

Practical				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Laboratory Exercises. Development of small concurrent projects each solving a different well known concurrency problem. Familiarisation with the toolset used for concurrent programming.	2	20.00	Every Week

End of Module Formal Examination				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	No Description	1,2,3	60.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	12 Weeks per Stage	2.00
Independent Learning Time	15 Weeks per Stage	5.13
Laboratory	12 Weeks per Stage	2.00
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_KCSOF_B	Bachelor of Science (Honours) in Software Development	7	Mandatory