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| Module Title: | Advanced Programming |
| Language of Instruction: | English |
| Credits: | 10 |
| NFQ Level: | 7 |
| Module Delivered In | 2 programme(s) |
| Teaching & Learning Strategies: | Lectures, Laboratories, Programming Assignments, Final Examination |
| Module Aim: | To give students a thorough understanding and practical experience of programming with C, and to introduce Object Oriented Programming with C++. |
| Learning Outcomes | |
| <i>On successful completion of this module the learner should be able to:</i> | |
| LO1 | Be familiar with correct program structure and good programming practice |
| LO2 | Have an understanding of C/C++ necessary to design and implement a given application |
| LO3 | Utilise problem solving techniques to analyse a given problem and develop a solution for it; |
| Pre-requisite learning | |
| Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i> | |
| No recommendations listed | |
| Incompatible Modules <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i> | |
| No incompatible modules listed | |
| Co-requisite Modules | |
| No Co-requisite modules listed | |
| Requirements <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i> | |
| No requirements listed | |

Module Content & Assessment

| Indicative Content |
|---|
| Introduction Building , Debugging; Testing; Programming paradigms; |
| C programming Introduction; Data types; Enumerations; Symbolic constants; Operators; Expression evaluation - precedence & associativity;. |
| Flow control Program structure; Programming standards |
| Functions Parameter passing; Recursion; Stack issues; Scope; Static functions. Functions with variable sized parameter lists. |
| Arrays Contiguosness; Arrays as function parameters; Strings; Initialisation. |
| Pointers Pointer arithmetic; Pointers on PC |
| Pointers and arrays Arrays of pointers; Character arrays vs. string constants; Pointers to functions; Dynamic memory; Stack & Heap; |
| Structures Unions,bit fields, Typedef |
| I/O & file handling; I/O & file handling; |
| C++ Building on C; OOP; Classes, objects, constructors and destructors; Data hiding; Encapsulation; Inheritance; Polymorphism; Operator and function overloading; Other C++ enhancements; GUI & systems programming |

| Assessment Breakdown | % |
|----------------------------------|--------|
| Project | 45.00% |
| Practical | 25.00% |
| End of Module Formal Examination | 30.00% |

No Continuous Assessment

| Project | | | | |
|-----------------|---|-------------------|------------|-----------------|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
| Project | Project assignments to apply learned knowledge and develop problem solving skills | 1,2,3 | 15.00 | Week 5 |
| Project | Practical assignments to apply learned knowledge and develop problem solving skills | 1,2,3 | 15.00 | Week 8 |
| Project | Practical assignments to apply learned knowledge and develop problem solving skills | 1,2,3 | 15.00 | Week 12 |

| Practical | | | | |
|-----------------------------|---|-------------------|------------|-----------------|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
| Practical/Skills Evaluation | Practical assignments to apply learned knowledge and develop problem solving skills | 1,2 | 25.00 | n/a |

| End of Module Formal Examination | | | | |
|----------------------------------|------------------------|-------------------|------------|-----------------|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
| Formal Exam | No Description | 1,2,3 | 30.00 | End-of-Semester |

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

Module Workload

| Workload: Full Time | | |
|----------------------------|-----------------------|--|
| <i>Workload Type</i> | <i>Frequency</i> | <i>Average Weekly Learner Workload</i> |
| Lecture | 12 Weeks per Stage | 3.00 |
| Laboratory | 12 Weeks per Stage | 4.00 |
| Estimated Learner Hours | 15 Weeks per Stage | 11.07 |
| Total Hours | | 250.00 |

Module Delivered In

| Programme Code | Programme | Semester | Delivery |
|----------------|---|----------|-----------|
| CW_KCSOF_B | Bachelor of Science (Honours) in Software Development | 5 | Mandatory |
| CW_KCSOF_D | Bachelor of Science in Software Development | 5 | Mandatory |