F28LL Programming Languages

COURSE DETAILS

Course Code: F28LL
Full Course Title: Programming Languages
SCQF Level: 8
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL

Undergraduate: Yes  Postgraduate Taught: No  Postgraduate Research: No

Additional Information:

COURSE AIMS

• To gain understanding of different language paradigms
• To gain understanding of defining concepts of programming languages
• To develop skills in programming in languages from key paradigms

LEARNING OUTCOMES – SUBJECT MASTERY

• understanding of distinguishing characteristics of language paradigms
• understanding of relationships between languages
• understanding of generic language concepts
• ability to program in languages from key paradigms
• ability to use tool sets for these languages
• ability to relate learned knowledge to work based computing projects

LEARNING OUTCOMES – PERSONAL ABILITIES

• Understanding of how to choose an appropriate language for different problem domains
• Can relate and/or apply learned knowledge at work place
• Take significant responsibility for their work and for a range of resources

• To be aware of distinctive features of programming languages and of the impact of their choice on industrial projects

• Can communicate effectively with work colleagues on learned issues

SYLLABUS

• Overviews of language history, definition (lexicon, syntax, semantics), implementation (compiler, interpreter, virtual machine)
• Overviews of language paradigms: e.g. imperative (high-level, system, low-level), declarative (functional, logic), concurrency/parallelism
• Overviews of programming language concepts: variable, lvalue & rvalue, assignment (sharing/copying), data abstraction (sequential, structured, recursive, shared/distributed), type mechanisms (weak/strong, static/dynamic, ad-hoc/parametric polymorphism), declaration (scope, extent), control abstraction (sequence, choice, repetition, block, procedure, labels/jumps, exceptions, processes), expression abstraction (functions), parameter mechanisms (value, reference), evaluation mechanisms (strict/lazy, ordered/unordered, concurrent)

• An introduction to programming in languages from key paradigms e.g.

  - scripting: e.g. Python
  
  - declarative/functional: e.g. SML
  
  - declarative/logic: e.g. Prolog

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