Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	COMPARATIVE PROGRAMMING LANGUAGES
Unit ID:	ITECH5403
Credit Points:	15.00
Prerequisite(s):	(ITECH1400 or ITECH5104)
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	029999

Description of the Unit:

The course content consists of a comparative study of several high-level programming languages such as C, C++, Java, Python, Perl, Lisp, Prolog, Ruby, and Smalltalk. The languages are compared with regard to their intrinsic data types and operations, control structures, implementation, and ease of use for various programming problems, allowing developers to choose the best programming language to use for a variety of different tasks.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Does Recognition of Prior Learning apply to this Unit? No

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

CourseLevel:

Level of Unit in Course	AQF Level of Course					
	5	**6**	**7**	**8**	**9**	**10**
Introductory						
Intermediate					✔	

Level of Unit in Course	AQF Level of Course					
	5	**6**	**7**	**8**	**9**	**10**
Advanced	☐	☐	☐	☐	☐	☐

Learning Outcomes:

On completion of the course, students should be able to: *Easily learn a new programming language by systematically investigating its definition and implementation, *Identify and use the most appropriate language or language feature to solve a particular problem, *Appreciate the relationship between language definition and its execution time characteristics, *Ability to select a domain specific language to solve a particular problem.

Knowledge:

K1. Explain advanced programming concepts,

K2. Describe historical and current issues in the design, implementation and application of programming languages,

K3. Analyse the influence of comparative language design and implementation on programming practice and methodology.

K4. Compare and contrast features across various programming languages and their implementation strategies,

Skills:

S1. Demonstrate ability to make a comparative assessment of language design and implementation,

S2. Analyse suitability of various languages for differing tasks and environments,

S3. Appraise various programming paradigms, including those of representative languages

S4. Appraise and implement strategies appropriate for different programming languages

S5. Demonstrate ability to write programs using a number of different modern programming languages.

Application of knowledge and skills:

A1. Determine the most suitable programming language for a variety of different tasks, based on the requirements and characteristics of the particular task being undertaken.

Unit Content:

The course consists of a comparative study of several high-level programming languages such as C, C++, Java, Python, Perl, Lisp, Prolog, Ruby, and Smalltalk. The languages are compared with regard to their intrinsic data types and operations, control structures, implementation, and ease of use for various programming problems.

Topics may include:

- Evolution of major programming languages
- Comparative understanding of procedural, object-oriented, functional and logical programming languages,
- Lexical and Syntax Analysis
- Names, Bindings and Scopes,
- Data types
- Abstract data types, encapsulation and object-orientation
- Expressions and assignment statements
- Statement level control structures
- Dynamic programming, introspection, reflection and meta-programming
- Fundamentals and design considerations of subprograms and concurrency
- Exception and event handling

FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**ttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	Students at this level will demonstrate an advanced ability in a range of contexts to effectively communicate, interact and work with others both individually and in groups. Students will be required to display high level skills in-person and/or online in: • Using and demonstrating a high level of verbal and non-verbal communication • Demonstrating a mastery of listening for meaning and influencing via active listening • Demonstrating and showing empathy for others • High order skills in negotiating and conflict resolution skills • Demonstrating mastery of working respectfully in cross-cultural and diverse teams.	Not applicable	Not applicable
FEDTASK 2 Leadership	Students at this level will demonstrate a mastery in professional skills and behaviours in leading others. • Creating and sustaining a collegial environment • Demonstrating a high level of self -awareness and the ability to self-reflect and justify decisions • Inspiring and initiating opportunities to lead others • Making informed professional decisions • Demonstrating initiative in new professional situations	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students at this level will demonstrate high level skills in working in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: • Reflecting critically to generate and consider complex ideas and concepts at an abstract level • Analysing complex and abstract ideas, concepts and information • Communicate alternative perspectives to justify complex ideas • Demonstrate a mastery of challenging conventional thinking to clarify complex concepts • Forming creative solutions in problem solving to new situations for further learning	S2	AT1, AT2

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 4 Digital Literacy	Students at this level will demonstrate the ability to work competently across a wide range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: • Mastering, exploring, evaluating, managing, curating, organising and sharing digital information professionally • Collating, managing complex data, accessing and using digital data securely • Receiving and responding professionally to messages in a range of professional digital media • Contributing competently and professionally to digital teams and working groups • Participating at a high level in digital learning opportunities	Not applicable	Not applicable
FEDTASK 5 sustainable and Ethical Mindset	Students at this level will demonstrate a mastery of considering and assessing the consequences and impact of ideas and actions in enacting professional ethical and sustainable decisions. Students will be required to display skills in: • Demonstrate informed judgment making that considers the impact of devising complex solutions in ambiguous global economic environmental and societal contexts • Professionally committing to the promulgation of social responsibility • Demonstrate the ability to evaluate ethical, socially responsible and/or sustainable challenges and generating and articulating responses • Communicating lifelong, life-wide and life-deep learning to be open to the diverse professional others • Generating, leading and implementing required actions to foster sustainability in their professional and personal life.	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, K4, S1, S2, S3, S4, S5, A1	Students will demonstrate the ability to implement programs in a range of programming languages and illustrate the analytical skills to compare and contrast language features for different tasks and environments.	Assignments	60 - 80%
K1, K2, K3, S2, A1	Students will demonstrate the ability to explain the history, issues and theory of programming concepts and language design with the purpose of determining the most suitable language for various tasks and environments.	Examination/Test(s)	20 - 40%

Alignment to the Minimum Co-Operative Standards (MiCS)

The Minimum Co-Operative Standards (MiCS) are an integral part of the Co-Operative University Model. Seven criteria inform the MiCS alignment at a Course level. Although Units must undertake MiCS mapping, there is NO expectation that Units will meet all seven criteria. The criteria are as follows:

1. Co-design with industry and students
2. Co-develop with industry and students
3. Co-deliver with industry

4. FedTASK alignment
5. Workplace learning and career preparation
6. Authentic assessment
7. Industry-link/Industry facing experience

MiCS Course level reporting highlights how each Course embraces the principles and practices associated with the Co-Operative Model. Evidence of Course alignment with the MiCS, can be captured in the Course Modification Form.

MICS Mapping has been undertaken for this Unit   No

Date:

Adopted Reference Style:

APA

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)