2024 / 25

School of Science and Computing
+353 (0)51 302037
Eleanor.Reade@setu.ie
www.wit.ie/schools/science_computing

Ollscoil Teicneolaíochta an Oirdheiscirt

South East Technological University

Module Descriptor

Embedded Systems Scripting (Computing and Mathematics)

Embedded Systems Scripting (A11961)

Short Title: Embedded Systems Scripting
Department: Engineering Technology
Credits: 5 **Level:** Advanced

Description of Module / Aims

Embedded Systems Scripting module introduces the learner to the Linux operating system, commonly used command sets, bash shell scripting and a scripting language such as Python. The module will cover Python program syntax from the basic to the advanced to enable the learner design and develop complex scripts.

Programmes

		stage/semester/status
EMBS-0002	BEng (Hons) in Electrical and Automation Engineering (International) (WD_ETRIC_BI)	3 / 5 / M
EMBS-0002	BEng (Hons) in Information Engineering (International) (WD_EEELC_BI)	3 / 5 / M
EMBS-0002	BSc (Hons) in Applied Computing (WD_KACCM_B)	3 / 5 / E
EMBS-0002	BSc (Hons) in Applied Computing (WD_KCOMP_B)	3 / 5 / E
EMBS-0002	BSc (Hons) in Computer Science (WD_KCMSC_B)	3 / 5 / E
EMBS-0002	BSc (Hons) in the Internet of Things (International) (WD_KINTT_BI)	3 / 5 / M
	BEng (Hons) in Automation Engineering with Data Intelligence (WD_EAUTO_B)	3 / 5 / M
DASA-0001	BEng (Hons) in Electronic Engineering (WD_EONIC_B)	3 / 5 / M

Indicative Content

- Introduction to Linux - Use of the command line, Customising the shell, File and directory management, Basic text editing, Useful commands and utilities, Text processing
- Introduction to Bash Shell Scripting - Basic bash script syntax, Variables, Conditionals, Loops, Shell commands
- Variables and Data Types
- Lists
- Basic Operators
- String Formatting
- Flow of Control
- Loops
- Functions
- Classes and Objects
- Dictionaries
- Modules and Packages
- Advanced Functionality - Generators, Decorators, Regular Expressions, Exception Handling, Sets, Serialisation, Partial Functions, Code Introspection, Closures

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Use the command shell to administer a Unix-like operating system, including basic shell commands, the Unix manual, and a text editor
2. Write short shell scripts to automate simple repetitive and scheduled tasks
3. Design complex scripts in a scripting language such as Python
4. Develop complex scripts in a scripting language such as Python

Learning and Teaching Methods

- This course will be presented by a combination of lectures and computer-based practicals whilst capitalising on a web-enhanced learning environment
- The lectures will be used to introduce new topics and their related concepts
- The emphasis on course delivery will be hands-on, problem solving both individually and in small class groups using problem based worksheets during the practical sessions
- Self-directed learning will be encouraged throughout the duration of the module

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	24	
Practical	24	
Independent Learning	87	

Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	100%	
Practical	80%	1,2,3,4
In-Class Assessment	20%	1,2,3,4

Assessment Criteria

70% – 100%: The learner has: attained the module learning outcomes at an excellent level; demonstrated a comprehensive knowledge of the associated subject matter; achieved an excellent level of the skills required for the subject matter; demonstrated the ability to carry out further investigation and problem solving associated with the subject matter.

60% – 69%: The learner has: attained the module learning outcomes at a very good level; demonstrated a detailed knowledge of the associated subject matter; achieved a very good level of the skills required for the subject matter.

50% – 59%: The learner has: attained the module learning outcomes at a good level; demonstrated a good knowledge of the associated subject matter; achieved a good level of the skills required for the subject matter.

40% – 49%: The learner has: attained the module learning outcomes at a basic level; demonstrated a basic knowledge of the associated subject matter; achieved a basic level of the skills required for the subject matter.

<40%: The learner has not: attained the module learning outcomes; demonstrated sufficient knowledge of the associated subject matter; demonstrated a sufficient level of the skills required for the subject matter.

Essential Material(s)

- Lutz, M. *Learning Python*. 5th. Sebastopol, CA: O'Reilly Media, 2013.
- McGrath, M. *Linux in easy steps*. 5th. England: In Easy Steps, 2010.

Supplementary Material(s)

- McGrath, M. *Python in easy steps*. England: In Easy Steps, 2013.
- Shaw, Z. *Learn Python the hard way*. 3rd. Crawsville, Indiana: Addison Wesley, 2013.

Requested Resources

- Room Type: Computer Lab