Course Title	Dynamic Languages				
Course Code	ACSC430				
Course Type	Compulsory				
Level	BSc (Level 1)				
Year / Semester	4th (Fall/Spring)				
Teacher’s Name	Prof Efthyvoulos Kyriacou, Dr Christos Markides				
ECTS	6	Lectures / week	2	Laboratories/week	2
Course Purpose	The course introduces students to the Python programming language, as a language with a simple syntax, and a powerful set of libraries, a rich programming environment, and widely used in many scientific areas for data exploration. The aim of the course is to concentrate on the diverse areas of using the Python programming language, from simple applications, web and Internet development, scientific and numeric computing, to desktop GUI applications, embedded systems developments, and business applications. The course introduces 3rd party frameworks that are widely used in the industry.				
Learning Outcomes	By the end of the course, the students should be able to: 1. Discuss the trends in dynamic languages and explore the rich programming environment, powerful libraries, and frameworks. 2. Understand the design principles of dynamic language programming, and programs written in variety of styles. 3. Apply dynamic languages to appropriate problem areas such as from simple computational problems, to desktop applications, web applications and embedded systems. 4. Identify different ways of thinking about programming and computation that are introduced with dynamic languages. 5. Appraise the theory and practice of programming using a dynamic language. 6. Design and implement programs using a dynamic language for a variety of problems.				
Prerequisites	ACSC288, ACSC382	Co-requisites	None		
Course Content	• **Introduction to Python**: Overview, variables and simple data types, control statements, strings, lists and list manipulation, dictionaries, user input, defining functions, classes and instances, files and exception handling. • **Desktop GUI Applications**: GUI frameworks, cross-platform and cross-browser frameworks, Tkinter, wxPython, and kivy, canvas and widgets, and window control, labels, buttons, message widget, variable classes, radiobuttons, checkboxes, entry widgets, sliders, text widgets, dialogs, layout management, creating menus, and events and binds.				

	• **Web Applications**: 3rd party frameworks, web application development using Django, creating project and accessing databases, defining and activating models, defining and migrating entry models, template development and inheritance, deploying pages, sites, styling and deploying a web application. • **Embedded Systems Applications**: Python on embedded systems such as Raspberry Pi, using NumPy and Matplotlib, hardware and GPIO implementations on RP, bitwise operations, sensors and IoT programming on RPi.
Teaching Methodology	The taught part of course is delivered to the students by means of lectures, conducted with the aid of computer presentations. Lectures are complimented with in-class examples/exercises and laboratory work carried out. Laboratory sessions involve applying techniques learned in class and solving problems through small exercises in Python. Lecture notes/presentations and Lab exercises are available on the e-learning platform and the web for students to use in combination with the textbooks.
Bibliography	Textbooks: • Eric Matthes, ***Python Crash Course***, 2nd Edition, No Starch Press, 2019, ISBN: 978-1593279288. References: • Nat Dunn, ***Actionable Python 3.8***, 1st Edition, Webucator, 2020, ISBN: 978-1951959029. • Python Documentation, (2020). Available [Online]: https://www.python.org/doc/. • Notes/Manuals on Python Documentation and tools are available on the Course's Web Site and online.
Assessment	Students are assessed on the theoretical aspects of the course through a midterm, and the final exam, while lab exercises cover the applied and hand-on aspects of the course. Coursework will comprise of one midterm, a set of lab exercises, and three-hour closed book exam. The weights for each assessment component are: • Labs and Assignments 40% • Midterm 20% • Final Exam 40%
Language	English