

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

17.MAY-28.JUN.2024

SAP OVERVIEW

This SAP aims to give an initial introduction to students with some knowledge of a programming language and is oriented to engineering applications.

The Python programming language is an object-oriented, high-level programming language with dynamic semantics. It is open source and available for all major platforms. Python is being used by a large and supportive community of users.

Since Python supports modules and packages, program modularity and code reuse are encouraged. Many Python modules and packages have been made available by contributors, expanding Python capabilities and applications.

LEARNING OUTCOMES

At the end of this RUN-EU SAP, you will be able to:

- Develop abstract thinking skills and acquire fundamental concepts associated with programming language.
- Learn the basic steps of developing a program as a solution to a problem.
- Design and analyse algorithms for problem solving.
- Understand the principles of structured programming.
- Understand the elementary concepts of Python programming language.
- Analyse and interpret programs coded in Python programming language.
- Develop programs using Python.
- Understand the structure and organisation of data and to use the most appropriate data when solving a problem.

+INFO: www.run-eu.eu

Organised by: TUS, IPLeiria, IPCA

DATE From **17 May to 28 June 2024**

Face-to-Face Weeks: TUS, Limerick, Ireland 24-28 June

MODE OF DELIVERY Blended

LANGUAGE OF INSTRUCTION English

ECTS CREDITS 3

ACADEMIC RECOGNITION

To be defined by each home institution
In general terms, most students will have this RUN-EU 2.0 SAP certified in the Diploma Supplement, as a minimal condition.

ELIGIBLE PARTICIPANTS

All RUN-EU 2.0 Undergraduate and Postgraduate Students

HOW TO APPLY

Fill in the application form ([QR](#) or [website](#))



DEADLINE FOR APPLICATIONS

5 May 2024

CONTACT DETAILS

Carlos Campos (IPLeiria)
carlos.campos@ipleiria.pt

Sajjad Sajjadi (TUS)
sajjad.sajjadi@tus.ie

SHORT ADVANCED PROGRAMME

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

17.MAY-28.JUN.2024

SELECTION CRITERIA

Background, motivation, wide representation of subject areas/fields and balanced participation of RUN-EU 2.0 member institutions. Maximum 35 participants.

The selection team will also take steps towards ensuring a diverse and representative group of students.

LEARNING AND TEACHING STRATEGY

Active learning, learner-centred teaching, collaborative methods

Activities: problem solving tasks; discussions; project work; role play; presentations; peer teaching/learning

Live sessions (whole class/group work), independent (group/individual) work + mentor support, site visits.

PREREQUISITES

No specific prerequisites

COURSES LEADERS | LECTURERS

Courses leaders

Sajjad Sajjadi (TUS)
Ana Lemos (IPLeiria)
Carlos Campos (IPLeiria)
Paulo Madeira (IPLeiria)
Teresa Abreu (IPCA)

+INFO: www.run-eu.eu

PHYSICAL MOBILITY | SCHOLARSHIPS AVAILABLE

The selected students will receive travel grants based on the travel distance and the subsistence costs in the country the SAP is offered in. (To be managed by Home Institution)

Travel

Athlone/Thurles - Limerick: €36
Austria - Ireland: €270
Finland - Ireland: €380
Hungary - Ireland: €330
Portugal - Ireland: €270
The Netherlands - Ireland: €260
Spain - Ireland: €260
Belgium - Ireland: €220

Subsistence

The subsistence grant for Ireland is €900, except for students who already come from TUS Limerick.

MEANS AND CRITERIA FOR ASSESSMENT

Active participation
Learner portfolio
Final presentation
Reflection

CERTIFICATION

The participants who successfully complete this RUN-EU 2.0 SAP, will receive a Certificate of Participation and a Transcript of Records jointly issued by the organising institutions.

SHORT ADVANCED PROGRAMME

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

17.MAY-28.JUNE.2024

PROGRAMME AT A GLANCE

+INFO: www.run-eu.eu

GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
FRIDAY 17/5										WELCOME & OPENING	
MONDAY 20/5										LECTURE	
TUESDAY 21/5										LECTURE	
WEDNESDAY 22/5										TEAM WORK	
THURSDAY 23/5										LECTURE	
FRIDAY 24/5										TEAM WORK	
MONDAY 27/5										LECTURE	
TUESDAY 28/5										TEAM WORK	

SHORT ADVANCED PROGRAMME



ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

17.MAY-28.JUNE.2024

PROGRAMME AT A GLANCE

+INFO: www.run-eu.eu

GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
WEDNESDAY 29/5											LECTURE
FRIDAY 31/5											TEAM WORK
MONDAY 3/6											LECTURE
TUESDAY 4/6											LECTURE
WEDNESDAY 5/6											LECTURE
THURSDAY 6/6											LECTURE
MONDAY 10/6											TEAM WORK
TUESDAY 11/6											TEAM WORK



Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them. Grant Agreement Number: 101124674.

SHORT ADVANCED PROGRAMME

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

17.MAY-28.JUNE.2024

PROGRAMME AT A GLANCE

+INFO: www.run-eu.eu

	GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
	GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
	GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
TUESDAY 12/6												CLOSING SESSION
MONDAY 24/6		WELCOME & OPENING	TEAM BUILDING		LUNCH BREAK			TEAM WORK: COACHING				
TUESDAY 25/6				TEAM WORK: COACHING		LUNCH BREAK		TEAM WORK: COACHING				
WEDNESDAY 26/6				CULTURAL ACTIVITY		LUNCH BREAK		CULTURAL ACTIVITY				
THURSDAY 27/6				TEAM WORK: COACHING		LUNCH BREAK		TEAM WORK: COACHING	PROJECT PRESENTATIONS			
FRIDAY 28/6				PROJECT PRESENTATIONS	QUALITY ASSESSMENT							

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

+INFO: www.run-eu.eu

17 MAY

FRIDAY 16H00-18H00 GMT - ONLINE

GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
FRIDAY 17/5										WELCOME & OPENING	

Welcome & Opening

- 🕒 16h00-18h00
- 👥 Group Work
- 👤 Sajjad Sajjadi (TUS), Ana Lemos (IPLeiria), Carlos Campos (IPLeiria), Paulo Madeira (IPLeiria), Teresa Abreu (IPCA)

📄 In this welcome and opening session the participants will do their individual presentation. Afterwards professors will present the objectives, program, and schedule of the course.

20 MAY

MONDAY 16H00-19H00 GMT - ONLINE

GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
MONDAY 20/5										LECTURE	

Anaconda Framework & Data Types in Python

- 🕒 16h00-19h00
- 👤 Individual Work
- 👤 Live Lecture
- 👤 Sajjad Sajjadi (TUS), Ana Lemos (IPLeiria), Carlos Campos (IPLeiria), Paulo Madeira (IPLeiria), Teresa Abreu (IPCA)

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

+INFO: www.run-eu.eu

23 MAY

THURSDAY 16H00-19H00 GMT - ONLINE

GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
THURSDAY 23/5											LECTURE

Python Lists & Python Control Structures

🕒 16h00-19h00

👤 Individual Work

👤 Sajjad Sajjadi (TUS), Ana Lemos (IPLeiria), Carlos Campos (IPLeiria), Paulo Madeira (IPLeiria), Teresa Abreu (IPCA)

📄 The lecture is divided in two parts. The aim of the first part is to present and study lists in python. The most common methods and operations on lists will be presented. In the second part, control structures in python, namely, "if" structures, "for" and "while" structures are presented with examples and their applications.

24 MAY

FRIDAY 16H00-19H00 GMT - ONLINE

GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
FRIDAY 24/5											TEAM WORK

Examples & Exercises

🕒 16h00-19h00

👤 Group Work

👤 Live Session

👤 Teresa Abreu (IPCA), Sajjad Sajjadi (TUS), Ana Lemos (IPLeiria), Carlos Campos (IPLeiria), Paulo Madeira (IPLeiria)



ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

+INFO: www.run-eu.eu

27 MAY

MONDAY 16H00-19H00 GMT - ONLINE

GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
MONDAY 27/5										LECTURE	

Python Tuples & Python Functions & Modules

🕒 16h00-19h00

👤 Individual Work

👥 Sajjad Sajjadi (TUS), Ana Lemos (IPLeiria), Carlos Campos (IPLeiria), Paulo Madeira (IPLeiria), Teresa Abreu (IPCA)

📄 This lecture has two parts. The first part is dedicated to present and explore tuples in python. The most common methods and operations using tuples will be presented. The second part is dedicated to the study of functions and modules in python.

28 MAY

TUESDAY 16H00-19H00 GMT - ONLINE

GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
TUESDAY 28/5										TEAM WORK	

Examples & Exercises

🕒 16h00-19h00

👤 Group Work

👤 Live Session

👥 Ana Lemos (IPLeiria), Carlos Campos (IPLeiria), Paulo Madeira (IPLeiria), Sajjad Sajjadi (TUS), Teresa Abreu (IPCA)

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

+INFO: www.run-eu.eu

29 MAY

WEDNESDAY 16H00-19H00 GMT - ONLINE

GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
WEDNESDAY 29/5											LECTURE

Python Dictionaries & Python Specific Modules

🕒 16h00-19h00

👤 Individual Work

👤 Ana Lemos (IPLeiria), Carlos Campos (IPLeiria), Paulo Madeira (IPLeiria), Sajjad Sajjadi (TUS), Teresa Abreu (IPCA)

📄 The first part of the lecture is dedicated to present and explore dictionaries in python. The most common methods and operations with dictionaries are presented. In the second part of the lecture some specific python modules are studied, namely, the modules math, random, matplotlib, numpy and scipy.

31 MAY

FRIDAY 16H00-19H00 GMT - ONLINE

GMT+2	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	21h00
GMT+1	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
FRIDAY 31/5											TEAM WORK

Examples & Exercises

🕒 16h00-19h00

👤 Group Work

👤 Live Session

👤 Teresa Abreu (IPCA), Sajjad Sajjadi (TUS), Ana Lemos (IPLeiria), Carlos Campos (IPLeiria), Paulo Madeira (IPLeiria)

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

+INFO: www.run-eu.eu

24 JUNE

MONDAY 9H00-17H00 - TUS MOYLISH

GMT+2	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	8h00	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00
MONDAY 24/6			WELCOME & OPENING	TEAM BUILDING	LUNCH BREAK			TEAM WORK: COACHING			

Welcome Opening Presentation

- 🕒 9h00-10h30
- 👤 Individual Work

👤 Sajjad Sajjadi (TUS)
Ana Lemos (IPLeiria)
Carlos Campos (IPLeiria)
Paulo Madeira (IPLeiria)
Teresa Abreu (IPCA)

Team Building Defining Groups & Coaching

- 🕒 10h30-12h00
- 👤 Group Work
Live Session

👤 Sajjad Sajjadi (TUS)

📄 Teaming, individual presentation, aims for the SAP and instructions for group work. Select the topics of the group projects and planning activities.

Team Work: Coaching

- 🕒 14h00-17h00
- 👤 Group Work
Live Session

👤 Sajjad Sajjadi (TUS)
Ana Lemos (IPLeiria)
Carlos Campos (IPLeiria)
Paulo Madeira (IPLeiria)
Teresa Abreu (IPCA)

- 📄 Project development and python programming with coaching support.

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

+INFO: www.run-eu.eu

25 JUNE

TUESDAY 9H00-17H00 - TUS MOYLISH

GMT+2	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00	
GMT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	
GMT	8h00	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	
TUESDAY 25/6			TEAM WORK: COACHING			LUNCH BREAK		TEAM WORK: COACHING				

Team Work: Coaching

🕒 09h00-12h00, 14h00-17h00

👥 Group Work
Live Session

👤 Sajjad Sajjadi (TUS)
Ana Lemos (IPLeiria)
Carlos Campos (IPLeiria)
Paulo Madeira (IPLeiria)
Teresa Abreu (IPCA)

📄 Project development and python programming with coaching support.

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

+INFO: www.run-eu.eu

26 JUNE

WEDNESDAY 9H00-17H00 - TUS MOYLISH

GMT+2	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	8h00	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00
WEDNESDAY 26/6			CULTURAL ACTIVITY			LUNCH BREAK		CULTURAL ACTIVITY			

Enterprise Visit

- 🕒 9h00-12h00
- 👥 Group Work

👤 Sajjad Sajjadi (TUS)
Ana Lemos (IPLeiria)
Carlos Campos (IPLeiria)
Paulo Madeira (IPLeiria)
Teresa Abreu (IPCA)

Cultural Visit

- 🕒 14h00-17h00
- 👥 Group Work

👤 Sajjad Sajjadi (TUS)
Ana Lemos (IPLeiria)
Carlos Campos (IPLeiria)
Paulo Madeira (IPLeiria)
Teresa Abreu (IPCA)

- 📄 Guided tour of the city and historical monuments

SHORT ADVANCED PROGRAMME

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

+INFO: www.run-eu.eu

27 JUNE

THURSDAY 9H00-17H00 - TUS MOYLISH

GMT+2	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	8h00	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00
THURSDAY 27/6			TEAM WORK: COACHING		LUNCH BREAK		TEAM WORK: COACHING	PROJECT PRESENTATIONS			

Team Work: Coaching

🕒 09h00-12h00, 14h00-17h00

👥 Group Work
Live Session

👤 Sajjad Sajjadi (TUS)
Ana Lemos (IPLeiria),
Carlos Campos (IPLeiria)
Paulo Madeira (IPLeiria)
Teresa Abreu (IPCA)

📄 Project development and python programming with coaching support.

Project Presentations

🕒 15h30-17h00

👥 Group Work
Live Session

👤 Sajjad Sajjadi (TUS)
Ana Lemos (IPLeiria),
Carlos Campos (IPLeiria)
Paulo Madeira (IPLeiria)
Teresa Abreu (IPCA)

📄 Presentations of group work will be given by participants in this session.

ENGINEERING APPLICATIONS IN PYTHON 3RD EDITION

+INFO: www.run-eu.eu

28 JUNE

FRIDAY 9H00-12H00 - TUS MOYLISH

GMT+2	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00	20h00
GMT+1	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00	19h00
GMT	8h00	9h00	10h00	11h00	12h00	13h00	14h00	15h00	16h00	17h00	18h00
FRIDAY 28/6			PROJECT PRESENTATIONS	QUALITY ASSESSMENT							

Project Presentations

🕒 9h00-11h00

👥 Group Work
Live Session

👤 Sajjad Sajjadi (TUS)
Ana Lemos (IPLeiria),
Carlos Campos (IPLeiria)
Paulo Madeira (IPLeiria)
Teresa Abreu (IPCA)

📄 Presentations of group work will be given by participants in this session.

Quality Assessment

🕒 11h00-12h00

👥 Group Work

👤 Sajjad Sajjadi (TUS)
Ana Lemos (IPLeiria)
Carlos Campos (IPLeiria)
Paulo Madeira (IPLeiria)
Teresa Abreu (IPCA)

📄 Group Learning Reflection,
LearnWell questionnaire and
feedback session.