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| QF01/0408-4.0E | Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Artificial Intelligence Department |
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| Study plan No. | 2022/2032 | | University Specialization | | Artificial Intelligence | |
| Course No. | 0142223 | | Course name | | Data Science and Artificial Intelligence programming 1 | |
| Credit Hours | 3 hours | | Prerequisite Co-requisite | | Programming principles | |
| Course type | <input type="checkbox"/> MANDATORY UNIVERSITY REQUIREMENT | <input type="checkbox"/> UNIVERSITY ELECTIVE REQUIREMENTS | <input type="checkbox"/> FACULTY MANDATORY REQUIREMENT | <input type="checkbox"/> Support course family requirements | <input checked="" type="checkbox"/> Mandatory requirements | <input type="checkbox"/> Elective requirements |
| Teaching style | <input type="checkbox"/> Full online learning | | <input type="checkbox"/> Blended learning | | <input checked="" type="checkbox"/> Traditional learning | |
| Teaching model | <input type="checkbox"/> 2 Synchronous: 1asynchronous | | <input type="checkbox"/> 2 face to face : 1synchronous | | <input checked="" type="checkbox"/> 3 Traditional | |

Faculty member and study divisions' information (to be filled in each semester by the subject instructor)

| Name | Academic rank | Office No. | Phone No. | E-mail | |
|-----------------|---------------------------|------------|--------------------|--------------------------|----------------|
| Nesreen Hamad | Instructor | 9316 | | nesreen.hamad@zuj.edu.jo | |
| Division number | Time | Place | Number of students | Teaching style | Approved model |
| 1 | 9:30-11 Sundays, Tuesdays | | 21 | Traditional | |

Brief description

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| This course presents the python language to write scripts by applying basic and advanced concepts such as variables, conditional statements, strings, methods, lists, tuples dictionaries etc. Additionally, understanding the fundamentals of object-oriented programming in Python. |
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Learning resources

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|---|---|-------------------------------|---|---------------------------------|--|
| Course book information (Title, author, date of issue, publisher ... etc) | Paul Deitel and Harvey Deitel, "Intro to Python for Computer Science and Data Science: Learning to Program with AI, Big Data and the Cloud", Pearson Education, 2020. | | | | |
| Supportive learning resources (Books, databases, periodicals, software, applications, others) | <ol style="list-style-type: none"> Dan Bader, Joanna Jablonski and Fletcher Heisler, "Python Basics: A Practical Introduction to Python 3", 4th ed, Ron Holland Designs, 2021. John Hunt, "A Beginners Guide to Python 3 Programming", Springer International Publishing, Aug 13, 2019 John V. Guttag, "Introduction to Computation and Programming Using Python with Application to Understanding Data", MIT press, 2017 | | | | |
| Supporting websites | https://docs.python.org/ | | | | |
| The physical environment for teaching | <input checked="" type="checkbox"/> Class room | <input type="checkbox"/> labs | <input type="checkbox"/> Virtual educational platform | <input type="checkbox"/> Others | |
| Necessary equipment and software | PyCharm : https://www.jetbrains.com/pycharm/ Or Anaconda: https://www.anaconda.com/ | | | | |
| Supporting people with special needs | ----- | | | | |
| For technical support | ----- | | | | |

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Course learning outcomes (S= Skills, C= Competences K= Knowledge.)

| No. | Course learning outcomes | The associated program learning output code |
|--------------------|---|---|
| Knowledge | | |
| K1 | Understand the fundamentals of python such as variables, conditional statements, and functions. | MK2 |
| K2 | Processing Strings and Sequences. | MK2 |
| K3 | Understand the fundamentals of object-oriented programming in Python. | MK2 |
| Skills | | |
| S1 | Knowledge of the structure and model of the Python programming language. | MS2 |
| S2 | Use the Python programming language for various programming applications. | MS2 |
| S3 | Develop software in the Python programming language using OOP and compare it with OOP in Java. | MS2 |
| Competences | | |
| C1 | The ability to write basic python scripts. | MC1 |
| C2 | The ability to process strings. | MC1 |
| C3 | The ability to write scripts using lists, tuples and Dictionaries. | MC1 |
| C4 | The ability to apply OOP concepts in Python. | MC1 |

Mechanisms for direct evaluation of learning outcomes

| Type of assessment/learning style | Fully electronic learning | Blended learning | Traditional Learning (Theory Learning) | Traditional Learning (Practical Learning) |
|--|---------------------------|------------------|--|---|
| First exam | 0 | 0 | %20 | 0 |
| Second / midterm exam | %30 | %30 | %20 | 30% |
| Participation / practical applications | 0 | 0 | 10 | 30% |
| Asynchronous interactive activities | %30 | %30 | 0 | 0 |
| final exam | %40 | %40 | %50 | 40% |

Note: Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, and work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.

Schedule of simultaneous / face-to-face encounters and their topics

| Week | Subject | learning style* | Reference ** |
|------|--|-----------------|--------------|
| 1 | Introduction to Python Programming Variables and Assignment Statements Arithmetic Function print and an Intro to Single- and Double-Quoted Strings Triple-Quoted Strings Getting Input from the User | Lectures | 49-59 |
| 2 | Control Statements and Program Development Comparison Operations Logical Operators Selection Control Statements | Lectures | 73-119 |
| 3 | If statements applications For loop and applications Else with loops | Lectures | 73-119 |
| 4 | While loops | Lectures | 73-119 |

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| | nested loops | | |
| 5 | Strings: A deeper look String concatenation in operator string indexing and slicing | Lectures | 238-250 |
| 6 | string built in functions Applications | | 238-250 |
| 7 | Functions Functions in python (math functions) User defined functions Variables Scope | Lectures | 119-150 |
| 8 | Keywords arguments Default arguments Random function Lambda function Midterm Exam | Lectures | 119-150 |
| 9 | Sequences: Lists and Tuples Declaring lists Filling lists by using append Some lists functions and methods | Lectures | 155-199 |
| 10 | List comprehensions Processing 2d lists Passing lists to functions | Lectures | 155-199 |
| 11 | Tuples Applications | Lectures | 155-199 |
| 12 | Dictionaries and Sets Creating a Dictionary Iterating through a Dictionary Basic Dictionary Operations | Lectures | 209-215 |
| 13 | Dictionary Methods keys and values Applications on dictionaries | Lectures | 209-215 |
| 14 | Object-Oriented Programming Defining classes in Python Instantiating an object Access Modifiers in python | Lectures | 355-375 |
| 15 | Inheritance Applications | Lectures | 355-375 |
| 16 | Final Exam | | |

* **Learning styles:** Lecture, flipped learning, learning through projects, learning through problem-solving, participatory learning ... etc.

** **Reference:** Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.