

Valid from 2024.HS

Module description: Python for Data Analysis			
Module Code	w.BA.XX.2DAPyt.XX		
ECTS Credits	3		
Language of Instruction/Examination	German		
Module Description	This module deals with processing and evaluating structured data using Python. The goal is to provide guidelines on the parts of the Python programming language and its data-oriented library ecosystem used to perform data analysis effectively - especially the data analysis library "Pandas". This module uses concrete cases to illustrate how Python can be used to solve many typical data analysis problems.		
Organizational Unit	IWA Ltg.		
Module Coordinator	Armin Bänziger-Aiba		
Program and Specialization	<ul style="list-style-type: none"> • Business Administration - Specialization in Accounting, Controlling, Auditing • Business Administration - Specialization in Banking and Finance • Business Administration - Specialization in Banking and Finance (FLEX) • Business Administration - Specialization in Behavioral Design • Business Administration - Specialization in Economics and Politics • Business Administration - Specialization in Financial Management • Business Administration - Specialization in General Management • Business Administration - Specialization in General Management (Flex) • Business Administration - Specialization in Marketing • Business Administration - Specialization in Risk and Insurance • Business Information Technology - Specialization in Business Information Systems 		
Legal Framework	Academic Regulations BSc dated 29.01.2009, for the degree programs in Business Administration, International Management, Business Information Technology, Business Law, Business Law and Applied Law, first adopted on 12.05.2009		
Module Category	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Module Type Compulsory Elective</td> <td style="width: 40%;">Program Phase Main Study Period</td> </tr> </table>	Module Type Compulsory Elective	Program Phase Main Study Period
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Prerequisite Knowledge	w.BA.XX.2Stat.XX (or similar introduction to statistics)		
Contribution to Program Learning Objectives (by the concerned Module)	<ul style="list-style-type: none"> • Professional Competence • Methodological Competence • Social Competence • Self-Competence 		
Contribution to Program Learning Objectives	<p>Professional Competence</p> <ul style="list-style-type: none"> • Knowing and Understanding Content of Theoretical and Practical Relevance • Apply, Analyze, and Synthesize Content of Theoretical and Practical Relevance <p>Methodological Competence</p> <ul style="list-style-type: none"> • Problem-Solving & Critical Thinking • Scientific Methodology • Work Methods, Techniques, and Procedures • Information Literacy • Creativity & Innovation <p>Social Competence</p> <ul style="list-style-type: none"> • Oral Communication <p>Self-Competence</p> <ul style="list-style-type: none"> • Self-Management & Self-Reflection • Ethical & Social Responsibility • Learning & Change 		

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Module Learning Objectives	<p>Students...</p> <ul style="list-style-type: none"> • can capture, comment on, and execute Python code in the Jupyter notebook. • are familiar with the main principles of the Python programming language for data analysis, in particular the handling of lists, conditional statements, loops, and functions. • know the key libraries for data analysis, especially and know which library is useful in which context. • are able to import and export data in some of the common formats. • can clean, prepare, combine, and reshape data in Pandas. • visualize data using Pandas and Matplotlib. • are able to aggregate data and use group operations. • manipulate time series and panel data. • analyze (large) data sets in Pandas. • engage to a large extent in self-study to acquire the skills required. 																														
Module Content	<ul style="list-style-type: none"> • Essentials of Python and Jupyter Notebooks • Data structures and functions in Python • Fundamentals of NumPy • Introduction to Pandas • Uploading and saving data and data formats • Processing data - cleansing and transformation • Processing data - combining and reshaping • Plotting and visualization • Aggregation of data and group operations • Time series • Examples of extensive data analysis 																														
Links to other modules	<p>This module is linked to the following modules:</p> <ul style="list-style-type: none"> • w.BA.XX.2ISL.XX • w.BA.XX.3Stat-FLEX.XX • w.BA.XX.3Stat-WIN.XX • w.BA.XX.2Stat-en.XX • w.BA.XX.2Stat-flex.XX • w.BA.XX.2Stat.XX 																														
Digital Learning Resources	<ul style="list-style-type: none"> • Practice and Application Exercises (with Key) • Multiple Choice Tests • Jupyter notebooks (Python code with explanations and quiz questions) 																														
Methods of Instruction	<ul style="list-style-type: none"> • Application Tasks • Exercises • Interactive Instruction 	<p>Social Settings Used:</p> <ul style="list-style-type: none"> • Individual Work 																													
Type of Instruction	<table border="1"> <thead> <tr> <th></th> <th>Classroom Instruction</th> <th>Guided Self-Study</th> <th>Autonomous Self-Study</th> </tr> </thead> <tbody> <tr> <td>Large Class</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>Small Class</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>Group Instruction</td> <td>12 h</td> <td>58 h</td> <td></td> </tr> <tr> <td>Practical Work</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>Seminar</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>Total</td> <td>12 h</td> <td>58 h</td> <td>20 h</td> </tr> </tbody> </table>				Classroom Instruction	Guided Self-Study	Autonomous Self-Study	Large Class	-	-		Small Class	-	-		Group Instruction	12 h	58 h		Practical Work	-	-		Seminar	-	-		Total	12 h	58 h	20 h
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Performance Assessment	End-of-module exam	Form	Length (min.)	Weighting
	Written exam	closed book	45	100
	Permitted Resources	Spec. calculator acc. to leaflet "Utilities"	With dictionary	
	Others	Assessment	Length (min.)	Weighting
	-	-	-	-
Classroom Attendance Requirement	None			
Compulsory Reading				
Recommended Reading	<ul style="list-style-type: none"> McKinney, W. (2022). Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Jupyter. 3rd edition. Sebastopol, CA [u. a.]: O'Reilly. ISBN 978-1098104030. The module follows the structure of the textbook. The scripts are self-explanatory (and shortened), so that the textbook is not strictly required. The 3rd edition (Open Edition) is freely available at https://wesmckinney.com/book/. 			
Comments	This module is offered as a FLEX module. Classes are held approximately every three weeks (Weeks 1, 4, 7, 10, 13, and 14). In the intervals, content is developed in commented Jupyter notebook sessions. (In each case, students will study a notebook with the new Python functionalities and, based on this, do an exercise, which has a key.)			