COURSE DESCRIPTION

1. Information about the programme

1.1 Institution of higher education	**Alexandru Ioan Cuza University of Iasi**
1.2 Faculty	**Faculty of Economics and Business Administration**
1.3 Department	**Department of Finance, Money and Public Administration**
1.4 Field of study	**Finance**
1.5 Level	**Master**
1.6 Study programme/ Qualification	**Finance and Risk Management**

2. Information about the course

2.1 Course name			**Programming and Databases**				
2.2 Course coordinator			**Sabina Necula, Daniel Păvăloaia**				
2.3 Seminar coordinator			**Daniel Păvăloaia, Sabina Necula**				
2.4 Year of study	**1**	**2.5** Semester	**1**	**2.6** Type of assessment	**EVP**	**2.7** Course status	**E**

** C – Compulsory / E - Elective*

3. Total estimated time (hours alloted to teaching activities per semester)

3.1 Number of hours per week	**3**	of which: **3.2 l**ecture	**1**	**3.3** seminar/lab	**2**
3.4 Number of hours in the curriculum	**42**	of which: **3.5 l**ecture	**14**	**3.6** seminar/lab	**28**
Time distribution					hrs
Study of the textbook, coursebook, bibliography and lecture notes					**10**
Additional research in the library, online and on the field					**20**
Preparation of seminars/labs, homework, projects, portfolios and essays					**25**
Tutorials					**10**
Assessment					**8**
Other activities.....					**10**
3.7 Total number of self-study hours					**83**
3.8 Total number of hours per semester					**125**
3.9 Number of credits					**5**

4. Prerequisites (if applicable)

4.1 Curriculum-based	End User Computing
4.2 Competence-based	Computer skills

5. Conditions (if applicable)

5.1 For lectures	Video-projector, laptop with MS Office 2013, PostgreSQL and Anaconda/Python
5.2 For seminars / labs	DB Server: PostgreSQL. Workstations: MS Office 2013, PostgreSQL client (pgAdmin) and Anaconda/Python

6. Specific competencies

Professional competencies	**C1.** Analysis of the theoretical and practical aspects of financial markets, models, instruments that are used in the management of risks. **C2.** Adequate use of mathematical and statistical concepts, methods and techniques in assessing risks and performing independent research in finance. **C3.** Evaluation of the main risk factors for organizations and financial systems. **C4.** Implementing effective financial management and reporting within the business environment to ensure value creation. **C5.** Ensuring effective and appropriate governance and management of risk within an organization, in the context of an overall ethical framework.
Transversal competencies	**CT1.** Application of the professional ethical norms and values in decision-making and undertaking of complex professional tasks, independently or within a team. **CT3.** Assuming the need for continuous development to create prerequisites for career progression and adapt own professional and managerial competencies to the economic dynamics.

7. Course objectives (provided by the specific competencies grid)

7.1. Main objective	Gather and process data from structured (databases, spreadsheets) and unstructured sources with and without programming in Visual Basic for Application (VBA), SQL and Python.
7.2. Specific objectives	On completion of the course, the students will be able to: ▪ Model data using Excel's features: Pivot-tables, Scenario analysis and to grafically display it using advance charts (dynamic and pivot-charts). ▪ Study the general programming structures and apply it on VBA programming language for the purpose of improving and extending Excel's application. ▪ Analyse real-world databases ▪ Apply SQL to extract and process data from databases ▪ Import, process and visualize data in Python/Anaconda language/platform ▪ Apply various Python command/packages to data processing

8. Content

8.1	**Lectures**	**Teaching methods**	**Observations (hours & readings)**
1	Data Analysis, Analytics, Data Science– between fad and relevance. Data sources and formats. Tools for data gathering, processing, visualization and analysis.	Presentation Discussions	1 hour [Fotache, 2016] [Murell, 2013]
2	Databases. Structure and constraints. „Reading” real-world databases	Presentation Discussions Case studies	1 hour [Fotache, 2009] [Fotache, 2016]
3-4	Getting information from databases. From basic to advanced SQL queries.	Presentation Discussions Demonstrations/code Case studies	2 hours [Fotache, 2009] [Fotache, 2016]

5	Data processing, visualization and analysis in Excel 2013	Presentation Discussions Case studies Problem solving	1 hour [Jelen, 2013] [Poatsy, 2014]
6	Programming basics. Data structures. Control Structures. Examples in Visual Basic for Applications (VBA)	Presentation Discussions Code analysis	1 hour [Jelen, 2013] [Mansfield, 2010]
7-8	Programming in VBA.	Presentation Code analysis Case studies	2 hours [Jelen, 2013] [Mansfield, 2010]
9	Python as a programming language for data processing, visualization and analysis. Data structures in Python	Presentation Code analysis	1 hour [Navarro, 2015] [Fotache, 2016] [kaggle, 2019]
10	Gathering data from various sources in Python. Basic data management in Python	Presentation Code analysis Case studies	1 hour [Fotache, 2016] [Navarro, 2015] [Grolemund & Wickham, 2016]
11	Data processing in Python	Presentation Code analysis Case studies	1 hours [Fotache, 2016] [kaggle, 2019]
12-13	Programming in Python	Presentation Discussions Code analysis Case studies	2 hours [Fotache, 2016] [Navarro, 2016] [kaggle, 2019]
14	Data visualization in Python with pyplot	Presentation Discussions Code analysis Case studies	1 hour [Fotache, 2016] [kaggle, 2019]

Bibliography

Main readings:

- Fotache, M. (2015). *Databases*, UAIC, FEAA, Iaşi, (FEAA portal / Google Drive / OneDrive)
- Fotache, M. (2009). SQL. Dialecte DB2, Oracle, PostgreSQL şi SQL Server, Ed. Polirom, Iaşi
- Fotache, M. (2016). *Data Analysis with R*, UAIC, FEAA, Iaşi, (FEAA portal / Google Drive / OneDrive)
- Grolemund, G., Wickham, H. (2016)*, R for Data Science, O'Reilly*, available at http://r4ds.had.co.nz
- Jelen,B., Syrstad, T. (2010) *VBA and macros : Microsoft Excel 2010*, Que Publishing
- Mansfield, R. (2010) *Mastering VBA for Offi ce 2010* / 1st ed, Willey
- Murell, P. (2013). Introduction to Data Technologies, available at https://www.stat.auckland.ac.nz/~paul/ItDT/
- Kaggle, 2019, https://www.kaggle.com/learn/overview
- Poatsy, M.A., Mulbery, K. et all (2014), *Exploring: Microsoft Excel 2013, Comprehensive (Exploring for Office 2013),* Pearson 2014(FEAA Library)

Additional readings:

Other readings such as cases, simulations, journal papers, press articles will be provided periodically throughout the course via FEAA eLearning platform, e-mail or handed-in in class.

8.2	**Seminars / Labs**	**Teaching methods**	**Observations (hours & readings)**
1	Databases. Database servers. Installing PostgreSQL. Database management	Presentation Code writing/discussion	2 hours [Fotache, 2016]

	using SQL. Table definition and population. Editing records.	Case studies	
2	Basic SQL queries. Inner joins, aggregate queries. Grouping tuples. Intermediate SQL queries. NULLs processing, outer joins, CASE structures	Code writing/discussion Case studies	2 hours [Fotache, 2016]
3	Advanced SQL queris. Subqueries in WHERE, HAVING, FROM, and SELECT clauses. Table expressions	Code writing/discussion Case studies	2 hours [Fotache, 2016]
4	Team project: Querying databases using SQL	Project presentation	2 hours [Fotache, 2016]
5	MS Excel 2013 - Advanced modelling using Pivot-Tables, Scenario-Analysis, Conditional formatting, Advanced diagrams (dynamic charts, pivot-charts)	Problem solving	2 hours [Jelen, 2013] [Poatsy, 2014]
6	Programming basics. Data structures. Control Structures. Examples in Visual Basic for Applications (VBA)	Code writing/discussion Case studies	2 hours [Jelen, 2013] [Mansfield, 2010]
7	Programming in VBA: Form's development and data retrival and data processing in VBA.	Code writing/discussion Case studies	2 hours [Jelen, 2013] [Mansfield, 2010]
8	Team project: Advance data visualization in Excel 2013 and data processing in VBA.	Project presentation	2 hours
9	Anaconda installation and basic commands. Data structures. Importing data from (PosgreSQL) databases, CSV files, spreasheets (Excel), etc.	Code writing/discussion Case studies	2 hours [Fotache, 2016]
10	Data processing in Python	Code writing/discussion Case studies	2 hours [Fotache, 2016] [kaggle, 2019]
11	Team project: Data processing in Python	Project presentation	2 hours
12-13	Programming in Python	Code writing/discussion Case studies	4 hours [Fotache, 2016] [kaggle, 2019]
14	Team project: Programming in Python	Project presentation	2 hours

Bibliography

- Fotache, M. (2014). *Databases*, UAIC, FEAA, Iaşi, (FEAA portal / Google Drive / OneDrive)
- Fotache, M. (2015). *Data Analysis with R*, UAIC, FEAA, Iaşi, (FEAA portal / Google Drive / OneDrive)
- Jelen,B., Syrstad, T. (2013) *VBA and macros : Microsoft Excel 2013*, Que Publishing, 2013
- Mansfield, R. (2010) *Mastering VBA for Offi ce 2010* / 1st Ed, Willey 2010
- Navarro, D. (2015) - *Learning statistics with R: A tutorial for psychology students and other beginners*, University of Adelaide, Australia
- Poatsy, M.A., Mulbery, K. et all (2014), *Exploring: Microsoft Excel 2013, Comprehensive (Exploring for Office 2013),* Pearson 2014 (FEAA Library)

Other readings such as cases, simulations, journal papers, press articles will be provided periodically throughout the course via FEAA eLearning platform, e-mail or handed-in in class.

9. Corroboration of the course content with the expectations of community representatives, professional associations and representative employers from the programme's related field

This course provides students with the core knowledge, skills, and abilities that are generally accepted and applied by finance and investments professionals throughout the world. Topics are selected in accordance to the requirements of Charted Financial Analyst (CFA) and Professional Risk Manager (PRM) world-leading certifications for finance and risk management, to offer the adequate preparation for CFA and PRM exams. The course content is correlated to that of similar courses taught at renowned universities and is continuously updated based on the feedback of students and alumni.
Moreover, this is a student-centered course that follows the best practices of learning and teaching in undergraduate education through the adoption of a variety of active-learning instructional methods.

10. Assessment

Type of activity	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in final grade (%)
10.4 Lectures	▪ Accuracy of the solution to the problems enlisted in the exam paper ▪ Quality of work in a team of students and the overall evaluation of project questions	Exam - Database query using SQL Team Project on Processing spreadsheet data with Excel and VBA	20% 25%
10.5 Seminars/ Labs	▪ Quality of work in a team of students ▪ Clarity of the solution offered to various topics related to SQL, R	(Team) Project on Database query using SQL (Team) Project on Data processing in Python (Team) Project on Programming in Python	15% 20% 20%
10.6 Minimum performance standard			
A minimum passing grade of 5.00 (obtained by applying the above percentages – see column 10.3)			

Date
14.09.2020

Course Coordinator
Assoc. Prof. Daniel Păvăloaia, PhD, Hab.
Lect. Sabina-Cristiana Necula, PhD, Hab.

Seminar Coordinator
Assoc. Prof. Daniel Păvăloaia, PhD, Hab.
Lect. Sabina-Cristiana Necula, PhD, Hab.

Date of approval
23.09.2020

Head of Department
Prof. dr. Ovidiu Stoica