COURSE DATA

Data Subject	
Code	43783
Name	Programming in applied visual basic
Cycle	Master's degree
ECTS Credits	3.0
Academic year	2020 - 2021

Study (s)			
Degree	**Center**	**Acad. year**	**Period**
2171 - M.U. en Ciencias Actuariales y Financieras	Faculty of Economics	1	First term

Subject-matter		
Degree	**Subject-matter**	**Character**
2171 - M.U. en Ciencias Actuariales y Financieras	3 - Finance and introduction to insurance	Obligatory

Coordination	
Name	**Department**
PEREZ-SALAMERO GONZALEZ, JUAN M	113 - Financial and Actuarial Economics

SUMMARY

The subject of *Finance and Introduction to Insurance* is located in the second semester of the first year after the study is attended two previous materials. One of them, dedicated to lay the technical and methodological support in which much of the later developments, and one designed to place students at the stage in which they develop their professional activity.

Thus, achieved mathematical and statistical foundations, and known general context is able to address in the second semester of a Master's specific areas: the Finance in which is located *Programming in Visual Basic for Applications*.

The *Core Syllabus* for actuarial training in Europe (2005), published by the European Advisory Group and approved by the *Instituto de Actuarios Españoles*, established between the training requirements of the Preliminary Phase *Computing* topic, with the aim of *provide a solid foundation in modern computational methods needed for the work of the actuary*, hoping that the student has a working knowledge of appropriate ICTs for that need.

Following the training requirements of the *Core Syllabus*, we develop the essentials of programming for the design of actuarial and financial applications using Visual Basic for Applications in Excel.

Microsoft Excel is a popular general-purpose program, with wide and varied possibilities, which is part of the Microsoft Office package, readily available in the professional field of actuarial and financial expert. On the other hand, ease of use and availability are key to learning a first computer programming language, and Excel VBA has the advantage of being available and, being integrated, accessible from Microsoft Excel, to which is attached a environment friendly: the Visual Basic Editor (VBE) and the leaves themselves Workbooks in Excel, which allows to cover the lens review, offering great possibilities in the financial and actuarial modeling capacity, efficiency, and automation of calculations and procedures.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

For proper training in the contents of this course the student should know the contents typical of Financial Economics is often taught in social science studies, as well as having a medium level of skill in using the Excel Spreadsheet.

OUTCOMES

2171 - M.U. en Ciencias Actuariales y Financieras

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.

- Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.

- Students should demonstrate self-directed learning skills for continued academic growth.

- Ser capaces de construir modelos adecuados al entorno económico empresarial a partir de las posibilidades que ofrecen las modernas tecnologías de la información y de la computación.

LEARNING OUTCOMES

Student must have ability to setting, modelling and solving problems of economics, finance and/or insurance via VBA whose solution is not derived from the use of a standardized procedure.

DESCRIPTION OF CONTENTS

1. Structure and application development with VBA Excel

Introduction to VBA Excel.
The development environment. VBE: The VBA Editor.
Basic elements of VBA.
Modelling in Excel and modelling in VBA Excel.

2. The VBA programming language.

Writing rules.
Variables, data types, and constants.
Arrays.
Operators.
Integrated functions.

3. Procedures and custom functions.

Types of procedures.
Sub Procedures.
Procedures calling other procedures.
Custom Functions (Function Procedures).
Functions with vector and matrix arguments.
Function calls functions and procedures and vice versa.

4. Programming Structures

Introduction to control statements.
Bifurcations and decisióon structures.
Loops.
Nested structures.

5. Objects and collections.

Objects and collections: properties and methods.
Instructions to handle objects and collections.
Object Browser.
Excel Objects.
Referencing, names yand formulas in VBA.
Predefined dialog box for messages in VBA.
Integrated dialog box.

6. Controls, properties and events.

Most common controls description.
Properties.
Events.

7. Data management and modelling applications

Advanced Models in VBA Excel.
Interaction with other applications.
Data management.
Data Analysis and Pivot Tables.
Optimization. Solver and VBA Solver functions.
Simulaction.
Effective design and applications professional appearance.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	15,00	100
Classroom practices	15,00	100
Development of group work	18,00	0
Study and independent work	10,00	0
Readings supplementary material	3,00	0
Preparation of evaluation activities	6,00	0
Preparation of practical classes and problem	8,00	0
TOTAL	75,00	

TEACHING METHODOLOGY

During the course, the teacher will work simultaneously the theoretical content with the practical one, with the focus over the design and development of actuarial and financial applications by Excel VBA.

The teacher will present the key aspects of each activity and will guide the study through the relevant literature, which the student must read to complete and delve into the matter. The student must actively participate in the development of the activity by discussing the solution, and using appropriate computer techniques for resolution.

In addition to these classroom activities, students must perform other learning-oriented independently as individual study, preparation of evaluation activities, or conducting individual or group work. For the successful implementation of these activities, mentoring, conducted either individually or in groups, is a particularly important teaching resource because it allows the teacher to know the level of achievement of

the collective, and personalized guidance to students in their training program. Consequently, throughout the formative period of the course is recommended and encourages the use of this teaching resource.

The Aula Virtual, http://aulavirtual.uv.es, facilitates the development of these methodologies as it collects all teaching materials and enables fluid communication between teacher and student.

EVALUATION

Evaluation will be based on:

- A final examination or synthesis test that consist of an objective test, multiple choice, and practical exercises.
- Continuous evaluation based on:
  ◦ Class attendance and participation in classroom learning activities.
  ◦ Follow-up testing.
  ◦ Conducting a Project Oriented Learning (individual or team work), consisting of the design and development of a financial and / or actuarial application using an original Excel VBA Project.

The written exam or synthesis will 30% of the final grade, continuous assessment 20% and the Project Oriented Learning the remaining 50%.

In any case, to pass the course will be required to obtain a minimum score of 5 out of 10 and the synthesis test must also be obtained a minimum score of 5 out of 10. Given the characteristics of the Oriented Learning Project, it is not recoverable. It requires the participation of 2 or more students and the rest of the teams to see the presentation of the Project. In second call, the existence of the minimum number of students to carry out a new Project would not be guaranteed, nor the existence of a public for the exhibition of the project. Only the rest of the continuous assessment tasks will be recoverable, on second call, under the conditions indicated by the teaching team of the subject.

The proposed activities and tasks will be evaluated, only if they will delivered on the date and manner in which stipulated. Also, the use of illegal or fraudulent methods (copying, plagiarism, impersonation, etc.) to obtain undeserved results in the evaluable tests will be penalized with a zero in the test note for those involved, subject to other penalties that may arise from the Master's Direction or from the Academic Committee.

In the second examination session, will be used the same evaluation criteria.

REFERENCES

Basic

- Bovey, R.; Wallentin, D; Bullen, S. y Green, J. (2009, Second Edition). Professional Excel Development: The Definitive Guide to Developing Applications Using Microsoft® Excel, VBA®, and .NET. Addison-Wesley Proffesional.

- Eksioglu, S.D., Seref, M. M., Ahuja, R. K., y Winston, W. L. (2011). Developing Spreadsheet-Based Decision Support Systems. Using Excel and VBA for Excel. Dynamic Ideas.

- Walkenbach, J. (2010). Excel 2010. Programación con VBA. Anaya Multimedia.

- Vergara Schmalbach, J.C. (2011). Desarrollo de aplicaciones en Microsoft Excel. EUMED-Universidad de Málaga.

Additional

- Allman, K.; Laurito, J. y Loh, M. (2011). Financial Simulation Modeling in Excel: a step-by-step guide. Jonh Wiley and Sons.

- Sengupta, C. (2010). Financial Modeling Using Excel and VBA. Jonh Wiley and Sons.

- Tung, H.; Lai, D.C.F. and Wong, M.C.S. (2010). Professional financial computing using Excel and VBA. Jonh Wiley and Sons.

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

1. Description of Contents

Without changes.

2. Workload

Without changes.

3. Teaching methodology

Teaching for the second semester of the current 2020-2021 course will be face-to-face with the appropriate security measures.

The tutorials: by email, by messages from virtual classroom, or by videoconference by appointment.

If the teaching becomes 100% online, the sessions will be held by BBC videoconference. Its programming would be available in Aula Virtual.

4. Evaluation

a)   Continuous evaluation (without changes): face-to-face.

If the teaching becomes 100% online, two continuous assessment tests will be carried out during two distance class sessions, by means of videoconference, just as it would have been done in person. One will consist of a supervised exercise in class and another in a preparatory control of the first 5 topics, consisting of a self-correcting test and a practical exercise to be delivered through the Virtual Classroom. These assignments still account for 20% of the total grade. The preparation of the VBA Project through groups will continue to account for 50% of the grade. The presentation of the same will be done by

videoconference to which other working groups must attend. The presentation, as has been done in previous courses, may be held before the final exam, on the day of the final exam or within two weeks after the final exam, these dates agreed upon with the teaching team in advance.

b)   Final test (without changes): face-to-face.

If it is impossible to do the final test face-to-face, it will be based on a test and an exam with practical exercises that will be uploaded to the virtual classroom at the scheduled time for the start of the exam. The duration of the exam will be limited and the students will have to upload a file with the exercises carried out in the virtual classroom. It continues to represent 30% of the grade and it must be passed to pass the subject. As soon as the final exam is finished, in addition to the answer files sent, each student must deliver in a Virtual Classroom, through a task enabled for it, an audio file with the reasoning and explanation of the answer given in the practical exercise, both in the control and in the final exam. The audio file can be recorded with mobile devices as an audio message, for example. You will have 30 minutes to record these explanations and deliver said Audio file in a virtual classroom. To correct the Excel file it must delivered the audio file at time. These explanations are necessary to evaluate this part.

For all tests, you can consult the course material and external tutorials.

5. References

Without changes.