# COURSE DESCRIPTION CARD

NOTE: If the course consists of lectures and classes, the Course Description applies to both forms of teaching

**1.** Course title: **Risk analysis & modelling using Excel & VBA**
in Polish: **Analiza i modelowanie ryzyka z użyciem Excel & VBA**

**2.** Course code …
Number of ECTS credits: 4,0
Course completion method
Course commenced / Year …

**3**. Faculty: **Finance and Insurance**

**4**. Field of Study: **FAB**

**5.** Department of the Field of Study Coordinator: Department of Investments and Real Estates

**6.** Name of tutor: **dr Jan Kaczmarzyk** Lectures: **0** Classes: **30**
Lab classes …
**Examiner:**

**7.** Tutor's department: **Department of Public Finance**

**8.** Number of contact hours with students:

| Type of course | Full time study | Part time study |
|---|---|---|
| Lectures | | |
| Classes | **30** | |
| Foreign language classes | | |
| Lab classes | | |
| Seminars | | |
| Introductory Seminars | | |
| Other | | |
| **Total hours** | **30** | |
| Examination (hours) | | |

**9.** Course timeframe (no. of semesters): **1**

Course commencement /

Course commencement /

**10.** Stage of tertiary education: **1st**

**11.** Course status
☐ **Compulsory for the field of study …**
☐ Compulsory for the specialization: **Finance & Accounting**
☐ Optional

**12.** Requirements
Compulsory: **none**
Recommended: **none**

**13.** Course objectives:

**1. Introduction of the Excel & VBA environment as a comprehensive platform for developing financial models dedicated to risk analyzing.**

**2. Review of risk analysis methods being applied by non-financial and financial entities, including Monte Carlo approach.**

**3. Attainment (by the student) the ability of the self-dependent creation of financial models for risk analyzing using Excel & VBA.**

**14.** Teaching and learning methods:

**A.** Direct student/teacher contact hours:

| No. | Teaching methods | Description | Number of teaching hours | |
|---|---|---|---|---|
| | | | Full time study | Part time study |
| 1. | Exercises using Excel & VBA | Development of financial models dedicated to various analytical situations using Excel & VBA | **30** | 0 |
| Total | | | AS: **30** | AN: 0 |

**B.** Self-study hours:

| No. | Learning methods | Description | Number of hours | |
|---|---|---|---|---|
| | | | Full time study | Part time study |
| 1. | Self-made notes analysis | Analysis of rules, methods and examples presented during exercises. | 20 | 0 |
| 2. | „The cause & the effect" studying using literature | Knowledge about Excel & VBA supplement using dedicated literature | 20 | 0 |
| 3. | Self-dependent exercises using Excel and VBA | Self-dependent analysis of rules, methods and examples presented during exercises. | 30 | 0 |
| Total | | | BS: 70 | BN: 0 |

Total AS+BS = **100**
Examination (E) = **0**
Total AS+BS+E= **100**

Total AN+BN = 0
Examination (E) = 0
Total AN+BN+E = 0

**15.** Key words: Spreadsheets, Excel, VBA, Financial modelling, Financial analysis, Risk analysis, Monte Carlo methods, Value at Risk

**16.** Course content:

1. **Elementary Excel & VBA programming techniques for risk analyzing using Monte Carlo methods.**
2. **Market risk analysis of actively and passively managed investment portfolios using historical simulation.**
   a. **Financial data acquiring and merging using Excel.**
   b. **Volatility, threat and sensitivity measurement – the example of**

**investment funds.**

c. **The quality of portfolio management – measurement techniques.**

3. **Market risk forecasting using Monte Carlo methods (basics)**
   a. **The randomness of returns and market risk forecasting,**
   b. **The market risk forecasting of investment funds,**
   c. **The market risk forecasting of pension funds.**
4. **Corporate risk measurement and analysis using Monte Carlo methods (basics)**
   a. **Financial models for corporate risk analysis.**
   b. **Corporate risk analysis – the case of an investment project.**

**17.** Student learning outcome achieved in the course, as related to the outcome intended for the field of study. Methods of outcome achievement evaluation.

| Student learning outcome intended for the field of study / Symbols | Student learning outcome achieved in the course | Methods of assessing student learning outcome achieved in the course | Documentation |
|---|---|---|---|
| Knowledge | | | |
| FiR1_W03 | 1. Has obtained knowledge on relations between non-financial and financial entities essential for proper reflecting of economic environment in self-created financial models and self-conducted analyses using Monte Carlo methods. | 1. Exam using Excel & VBA.<br>2. Group project – A risk analysis. | 1.Spreadsheets with exam problems.<br>2.Spreadsheets with group projects. |
| FiR1_W06 | 2. Has learnt the elements of Excel & VBA essential for financial models development and risk analysis using Monte Carlo methods. | 1. Exam using Excel & VBA.<br>2. Group project – A risk analysis. | 1.Spreadsheets with exam problems.<br>2.Spreadsheets with group projects. |
| FiR1_W07 | 3. Has obtained knowledge on rules and regulations determining the behaviour of the non-financial and financial entities and their importance to the correctness of developed financial models and conducted risk analyses. | 1. Exam using Excel & VBA.<br>2. Group project – A risk analysis. | 1.Spreadsheets with exam problems.<br>2.Spreadsheets with group projects. |
| Skills | | | |
| FiR1_U04 | 1. Is able to forecast the financial situation of business entities and the situation on financial market using Monte Carlo methods on the basis of financial models self-developed in Excel & VBA. | 1. Exam using Excel & VBA.<br>2. Group project – A risk analysis. | 1.Spreadsheets with exam problems.<br>2.Spreadsheets with group projects. |
| FiR1_U06 | 2. Is able to criticize and choose effectively the elements of Excel & VBA environment to complete particular analytical tasks. | 1. Exam using Excel & VBA.<br>2. Group project – A risk analysis. | 1.Spreadsheets with exam problems.<br>2.Spreadsheets with group projects. |
| Social skills | | | |
| FiR1_K03 | 1. Projects financial models on his own and chooses the most adequate risk analysis method. | 1. Exam using Excel & VBA.<br>2. Group project – A risk analysis. | 1.Spreadsheets with exam problems.<br>2.Spreadsheets with group projects. |
| FiR1_K05 | 2. Is able to predict effects of economic ventures realized in volatile environment using self-developed financial models directed for adequate | 1. Exam using Excel & VBA.<br>2. Group project – A | 1.Spreadsheets with exam problems. |

| | | | |
|---|---|---|---|
| | risk analyses. | risk analysis. | 2.Spreadsheets with group projects. |

**18.** Methods of grading student performance:

| No. | Student performance assessment methods and course completion requirements | Description | Percentage of the final grade |
|---|---|---|---|
| 1. | Exam | Exam using Excel & VBA | 65% |
| 2. | Group project | Group project – A risk analysis. | 35% |

* If students are required to earn credits and pass an exam, the credit accounts for at least 30% of the final grade

**19.** Reading list

Compulsory reading list:

1. Segupta C.: *Financial Analysis and Modeling Using Excel and VBA, 2nd Edition*. Wydawnictwo Wiley, West Sussex 2009,
2. Walkenbach J.: *Power Programming with VBA*. Wydawnictwo Wiley, West Sussex 2013,
3. Tjia J.S.: *Building Financial Models. A Guide to Creating and Interpreting Financial Statements*. Wydawnictwo McGraw-Hill, 2004

Recommended reading:

1. Benninga S.: *Financial Modelling. Third Edition*, Wydawnictwo The Massachusetts Institute of Technology Press, Cambridge 2008
2. Rees M.: *Financial modelling in practice*, Wydawnictwo Wiley, West Sussex 2008

**20.** Language of instruction: English

**21.** Tutors' recommendations: The classes should be planned in computer labs with Excel 2013 or above.