

|      |                             |   |   |   |           |
|------|-----------------------------|---|---|---|-----------|
| E009 | <b>Managing credit risk</b> | L | P | S | ECTS<br>4 |
|      |                             | 2 | 0 | 2 |           |

**Course objectives.** Learn what credit risk is. Learn a part of credit risk theory. Learn what are the factors that influence the riskiness for companies, small businesses, retail. Learn how to create scoring / rating models. Learn to validate scoring / rating models. Learn the basic concepts of Basel 3 standards. The emphasis is on building, testing and implementing scoring models in practice. Through this course, students work on real data from credit institutions.

**Prerequisites.** Multivariate analysis.

#### Course content.

1. Definition of credit risk. Classic credit analysis. Financial analysis of loan applications. Disadvantages of classic credit analysis.
2. Credit risk models based on accounting data and market value. Characteristics of credit risk models. Reasons for using a credit risk model. Some known models: Altman z-score, ZETA, Ohlson, EDF model.
3. Use and application of credit scoring model. Model building principles. Feasibility study. Sample definition. Data collection. Characteristics/Feature analysis. Conclusion on rejected clients. Scorecard modeling. Validation / testing of scoring models using appropriate tests. Setting a strategy and implementing a scoring model.
4. Retail credit scoring models. Characteristics of scoring model for the retail. Model application. Model classification success. The most common methods used in building scoring models for the retail. Key variables in scoring models for the population. Project assignment: Development and validation of retail scoring models.
5. Credit scoring models for small businesses. Specificity of scoring models for SMEs. Reasons to use scoring models for SMEs. Problems in building scoring models for SMEs. Key variables in scoring models for SMEs. Project assignment: Development and validation of scoring models for SMEs.
6. Basel 3. Decision on the adequacy of the solvency margin of credit institutions. Credit risk management. Standardized approach. An approach based on internal rating models. External credit risk assessment agencies.

#### LEARNING OUTCOMES

| No. | LEARNING OUTCOMES   |
|-----|---|
| 1.  | Analyze key credit risk factors for different portfolios.                         |
| 2.  | Evaluate the ability to develop scoring / rating models.                          |
| 3.  | Develop a scoring model using the appropriate methodology.                        |
| 4.  | Validate the quality of scoring models using appropriate tests.                   |
| 5.  | Evaluate the possibility of applying scoring models as well as their limitations. |
| 6.  | Develop a scoring model report in accordance with Basel 3 standards.              |

#### RELATING THE LEARNING OUTCOMES, ORGANIZATION OF THE EDUCATIONAL PROCESS AND ASSESSMENT OF THE LEARNING OUTCOMES

| TEACHING ACTIVITY | ECTS | LEARNING OUTCOME | STUDENT ACTIVITY | EVALUATION METHOD | POINTS |     |
|-------------------|------|------------------|------------------|-------------------|--------|-----|
|                   |      |                  |                  |                   | min    | max |

|   |   |     |   |  |    |     |
|---|---|-----|---|--|----|-----|
| Attending lectures and exercises and class activity | 1 | 1-6 | Problem solving                                   | Continuous evaluation of completed tasks                             | 5  | 15  |
| 2 midterms  | 1 | 1-6 | Solving numerical tasks and theoretical questions | Grading written exams  | 20 | 30  |
| 2 project assignments                               | 2 | 1-6 | Designing the project assignments                 | Assessment of the project assignments                                | 25 | 55  |
| Ukupno  | 4 |     |   |  | 50 | 100 |
| Final exam*   | 4 | 1-6 | Written and oral exam; Project assignments        | Grade of the written and oral exam; Grade of the project assignments |    |     |

\* students who didn't take the midterms (continuous assessment) have the opportunity to pass the exam integrally within standard exam periods. The integral exam consists of a written exam and project assignments.

**Teaching methods and student assessment** Classes are taught in an IT classroom where students analyze all the practical examples using software tools (R, Statistica). The grade is formed as an average grade obtained on the basis of the following grades from: (i) task-solving activities and practical problems; (ii) 2 project assignments, where the first one is related to the development and validation of credit scoring models for retail and the second to the development and validation of credit scoring models for small and medium-sized enterprises; (iv) grades from 2 midterms, which students write during the semester.

**Can the course be taught in English:** Yes

**Basic literature:**

1. Siddiqi, N., Credit Risk Scorecard, John Wiley & Sons, Inc., New Jersey, 2006.
2. Caouette, J.B., Altman, E.I., Narayanan, P., Managing Credit Risk, John Wiley & Sons, New York, 1998.
3. N. Šarlija, Reviewed course materials available on the course website.

**Recommended literature:**

1. Hale, R.H., Credit Analysis: A Complete Guide, John Wiley & Sons, New York, 1983.
2. Hand DJ, 2001, Modelling consumer credit risk, IMA Journal of Management Mathematics, Vol: 12, Pages: 139-156
3. Mays, E. (editor), Credit Risk Modeling: Design and Application, Glenlake Publishing Company, Ltd., New York, 1998.
4. Guidelines on Credit Risk Management – Rating Models and Validation; ONB and FMA; 2004.
5. Afifi, A.A., Clark, V., Computer-Aided Multivariate Analysis, Chapman & Hall/CRC, Boca Raton, 2000.