

<b>Study Course Title</b>	<b>Digital Transformation II - Basic Programming + Data Analysis/Big Data</b>
<b>Study Course Code</b>	DatZB113
<b>Branch of Science</b>	Computer and information sciences
<b>Sub-branch of Science</b>	Computer and systems software
<b>Credits(ECTS)</b>	<b>3</b>
<b>Total Number of Contact Hours</b>	<b>30</b>
<b>Number of Lecture Hours</b>	6
<b>Number of Seminar and Practical Assignment Hours</b>	24
<b>Number of Hours for Laboratory Assignments</b>	0
<b>Independent Study Hours</b>	<b>45</b>
<b>Language of Instruction</b>	Latvian and English
<b>Course Approval Date</b>	09.10.2025
<b>Responsible Unit</b>	BA School of Business and Finance of the University of Latvia

Study form	Lectures	Seminars and Practical Assignments	Laboratory Assignments	Independent Studies
Full-time Regular Studies	6	24	0	45
Distance learning	2	4	0	69

**Course Developer**

Professional Program, lecturer Atis Verdenhofs

**Prerequisite Knowledge**

Prerequisite knowledge required for the acquisition of the course corresponds to the study program admission requirements and the general knowledge, skills and competences obtained at the previous level of education.

**Study Course Abstract**

The study course is designed to provide an introduction and foundational knowledge in two fields related to the development of information technology (IT) – programming and data analytics. Students will acquire basic knowledge of programming through practical learning of the fundamentals of one programming language. In addition, the course covers various areas of data analytics – both classical approaches and modern methods based on different types of data.

Aim of this course is to provide students with practical knowledge and understanding of the fundamentals of programming and big data analysis.

**Course Plan Full-time Regular Studies**

- 1.Introduction to Programming as a Tool. Overview of Programming Languages 1L 3Pd
  - 2.Problem Solving from a Programmer’s Perspective 1L 4Pd
  - 3.The JavaScript Programming Language 1L 4Pd
  - 4.Big Data Terminology and Analytical Systems 1L 2Pd
  - 5.Transforming Data into Knowledge, Predictive Modeling 1L 4Pd
  - 6.Principles and Applications of Data Mining. CRISP-DM Data Mining Methodology 1L 4S 3Pd
- Total 6L 4S 20Pd

**Course Plan Distance learning**

- 1. Introduction to Programming as a Tool. Overview of Programming Languages. Problem Solving from a Programmer's Perspective. The JavaScript Programming Language 1L 2Pd
  - 2. Big Data Terminology and Analytical Systems. Transforming Data into Knowledge, Predictive Modeling. Principles and Applications of Data Mining. CRISP-DM Data Mining Methodology 1L 2Pd
- Total 2L 4Pd

**Characterization of students' independent work organization and tasks**

Full-time: Group work, reflections and presentations of results.

Distance: Independent self-directed study via Moodle (video lectures, study materials, self-assessment tests, etc.). Group work and on-line reflections.

**Learning Outcomes**

Knowledge:

- 1. Basic knowledge of programming
- 2. Knows which analytical methods are available for working with big data

Skills:

- 3. Able to describe problems in a way understandable to a programmer and can search for information to solve technical issues
- 4. Understands the basics of the JavaScript programming language and can independently create simple programs
- 5. Able to develop interactive visualization tools using JavaScript
- 6. Can describe and navigate terminology related to big data and identify potential data applications
- 7. Able to apply the standardized CRISP-DM methodology to define a data mining project

Competence:

- 8. Able to apply programming knowledge to solve simple and moderately complex business problems
- 9. Able to choose an appropriate big data processing system, justify the choice, and navigate the field of big data analytics.

**Requirements for Awarding Credits**

Intermediate tests or midterms:

- 1. Test. Assessment is graded on a 10-point scale. Weighting in the overall grade – 10%.
- 2. Test. Assessment is graded on a 10-point scale. Weighting in the overall grade – 10%.
- 3. Group work. Assessment is graded on a 10-point scale. Weighting in the overall grade – 40%.

Final assessment:

- 4. Exam. Data analysis project with description of results. Assessment is graded on a 10-point scale. Weighting in the overall grade –40%.

**Criteria for Evaluating Learning Outcomes**

In accordance with Regulations of the Cabinet of Ministers of the Republic of Latvia, at the end of the course, students' knowledge is evaluated according to the following criteria: the amount and the quality of the obtained knowledge, acquired skills and competence in compliance with the planned learning outcomes.

Type of Assessment	Learning Outcomes								
	1	2	3	4	5	6	7	8	9
1. Test	+	-	+	+	+	-	-	+	-
2. Test	-	+	-	-	-	+	+	-	+
3. Group work	+	-	+	+	+	-	-	+	-
4. Exam	-	+	-	-	-	+	+	-	+

***Compulsory Reading List***

1. Wirth, R. and Hipp, J., 2000, April. CRISP-DM: Towards a standard process model for data mining
2. Azevedo, A. and Santos, M.F., 2008. KDD, SEMMA and CRISP-DM: a parallel overview.

***Further Reading List***

1. Davenport, T.H., 2013. Analytics 3.0. Harvard business review, 91(12), pp.64-72.
2. Analytics, M. (2016). The age of analytics: competing in a data-driven world. McKinsey Global Institute Research.
3. Miranda, G. M. L. (2018). Building an effective analytics organization. McKinsey & Company.
4. Shi, Y. (2022). Advances in big data analytics. Adv Big Data Anal, 10, 978-981.

***Periodicals and Other Sources***

Materials in Moodle placed by lecturers