EFFECTUS
University of Applied Sciences

DESCRIPTION OF THE COURSE

GENERAL INFORMATION		
Course Holder	**dr.sc. Bojan Tomić**	
The name of the college	**FinTech**	
Study program	**Professional Undergraduate Study of Finance and Business Law**	
Status of the College	**Mandatory**	
Year	**3rd Year**	
Point value and method of teaching	**ECTS coefficient of student workload**	**5**
	Number of hours (P+V)	**30+30**

DESCRIPTION OF THE COURSE

1.1. *Objectives of the course*

The aim of this course is to introduce students to various technological innovations applicable in the financial sector.
The field of modern financial technologies is an innovative field that is rapidly evolving. By taking the course, the student should acquire unified knowledge that goes beyond dozens of different internet and other sources. The content of the course covers the FinTech industry in a broader and narrower sense. The first, broader level, comprehensively observes new technological and program achievements and their practical application in the field of finance. The second, narrower level, examines the foundations of blockchain technology through multiple perspectives, including engineering, law through the regulatory aspect, and an economic view of the new cryptocurrency ecosystem. The course is designed to provide students with an understanding of the key concepts and developments around blockchain technology, cryptocurrencies, and distributed ledger technology. Also, students are introduced to the basics of the functioning of the new primary and secondary cryptocurrency market and are presented with machine learning techniques when constructing and analyzing cryptocurrency portfolios.

Students are expected to develop:

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(a) General competencies

- understand the significance of technological innovation in the field of finance
- Differentiate between different segments of the fintech industry
- understand the possibilities of applying blockchain technology and distributed ledger technology

(a) Specific competencies.

- apply alternative lending through P2P technology
- assess the impact of alternative technologies on the traditional banking and payment system
- evaluate the practical application of blockchain technology in the transaction system and the application of distributed ledger technology in the corporate environment
- choose software tools specific to a predefined goal when analyzing the secondary cryptocurrency market

1.2. *Requirements for enrolment in the course*

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1.3. *Expected learning outcomes for the course*

Students should be able to:
I1 Interpret the impact of Fintech technology on the traditional financial system
I2 Explain the role of cryptography in the blockchain industry
I3 Present the basic properties of blockchain technology, cryptocurrencies and distributed ledger technology
I4 Identify blockchain assets according to their type and specific purpose
I5 Analyze cryptocurrency market infrastructure and securities token
I6 Interpret the results of several different machine learning models applied in the cryptocurrency market

1.4. *Course content*

Overview of financial innovations enabled by the development of IT

1. Introduction and basic concepts of the FinTech field

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2. The latest technological achievements and their application in the FinTech industry
3. Risks and potential problems of the FinTech industry

Introduction to Cryptography and Blockchain Technology

1. Introduction and Objectives of Cryptography, Basics of Symmetric and Asymmetric Cryptography, Data Hash Function and Digital Signature
2. Blockchain philosophy and the concept of cryptoeconomics, types of blockchain architecture, their characteristics and benefits

Blockchain and cryptocurrency technology

1. Bitcoin vs blockchain. Bitcoin Addresses, Transactions, and Wallets
2. Bitcoin Block Architecture, Application of Cryptography in Cryptocurrency Technology
3. Types and characteristics of the consensus mechanism

Cryptocurrencies as a new digital asset

1. Types of cryptocurrencies and new models of token securities
2. Bitcoin protocol and lightning network. Ethereum Protocol and Smart Contracts
3. Cryptocurrency regulatory framework

Cryptocurrency Market Infrastructure and Securities Token

1. Primary and Secondary Cryptocurrency Markets, Types and Market Overview
2. Primary and Secondary Markets Token Securities, DeFi and Passive Income Market

Analysis of the Blockchain Asset Market

1. Analysis of the blockchain asset market and associated risks. Investment (un)opportunity - the problem of intrinsic value and valuation models
2. The concept of machine learning (machine learning) *machine learning*) and an example of managing a cryptocurrency portfolio with machine learning
3. Introduction to alternative financial platforms – rental of algorithmic solutions for cryptocurrency portfolio management

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1.5. *Types of teaching (put X)*	☒ lectures ☐ seminars and workshops ☒ exercises ☐ Distance education ☐ Field Teaching	☐ Independent tasks ☐ Multimedia & Network ☐ laboratory ☐ Mentoring work ☐ Other_____

1.6. *Student obligations*

The obligations of students are prescribed in detail by the Statute, Study Regulations, and Student Obligations Guidelines. The key obligations of students are:
ATTENDANCE: *students are obliged to attend classes, actively follow lectures and exercises, and participate constructively in classes, and in order to acquire the right to take the exam, it is necessary to attend classes in the percentages prescribed by the Study Regulations. For each student, their presence in class is recorded through the Infoeduka digital office system. The minimum obligations are;*

- *Full-time students must attend at least 70% of the total number of classes to be eligible to sign.*
- *Part-time students need to attend at least 50% of the total number of classes to be eligible to sign.*

PASSING EXAMS: *in order to achieve a positive grade in the subject, it is necessary to achieve at least 54 points in the subject, but also at least 50% of points for each learning outcome. The method of taking the exam is described in more detail in the item Assessment and evaluation of students' work during classes and at the final exam.*

**FINAL EXAM – a student who has not met the conditions for passing the exam during the continuous examination of knowledge (has achieved a total of at least 54 points in the course and has met the lower point threshold of adoption of each learning outcome, i.e. a minimum of 50% of the points of each learning outcome), may take the learning outcomes of the course at the final exam.*

**CONTINUOUS EXAMINATION: In order to make students progress more efficiently in class, continuous examinations of knowledge (2 intermediate exams) are carried out. In this way, students acquire smaller teaching units and master the subject material more easily.*

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1.7. *Student Work Tracking (Add X to the appropriate tracking format)*

Attending classes	x	Teaching activity		Seminar paper		Experimental work	
Written exam	x	Oral exam		Essay		Research	
Project		Continuous Knowledge Assessment		Report		Practical work	
Portfolio							

1.8. *Assessment and evaluation of students' work during classes and at the final exam*

Evaluation and evaluation of students' work during classes and at the final exam is carried out on the basis of the Regulations on Studying of the EFFECTUS University of Applied Sciences. The linking of learning outcomes, teaching methods and assessment of learning outcomes is carried out as follows:

	Attending classes	Written exam	Project	Seminar paper	Practical work	Altogether
I1		16				16
I2		16				16
I3		16				16
I4		16				16
I5		16				16
I6		16				16
OUT OF OUTCOME	4					4
ALTOGETHER	4	96				100

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FORMS OF TRACKING	*NAME OF LEARNING OUTCOMES*	TEACHING METHOD	KNOWLEDGE ASSESSMENT METHOD	Maximum number of points
Written exam	*OUTCOME 1* *Interpret the impact of Fintech technology on the traditional financial system*	*Lectures and exercises*	*Exam in the form of an essay on a given topic: essay-type questions about the interpretation of the impact, but also the risk of the FinTech environment on the existing financial system*	*16*
Written exam	*OUTCOME 2* *Explain the role of cryptography in the blockchain industry*	*Lectures and exercises*	*Exam in the form of an essay on a given topic: essay-type questions to test knowledge of types of cryptographic primitives of a lower level*	*16*
Written exam	*OUTCOME 3* *Present the basic properties of blockchain technology, cryptocurrencies and distributed ledger technology*	*Lectures and exercises*	*Exam in the form of an essay on a given topic: essay-type questions of knowledge of blockchain technology and DLT technology*	*16*
Written exam	*OUTCOME 4* *Identify blockchain assets according to their type and specific purpose*	*Lectures and exercises*	*Essay exam on a given topic: essay-type questions on the topic of the development of blockchain economy and cryptocurrencies as utilization tokens*	*16*
Written exam	*OUTCOME 5*	*Lectures and exercises*	*Essay exam on a given topic: essay-type questions that test*	*16*

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	Analyze cryptocurrency market infrastructure and securities token		*knowledge of the primary and secondary cryptocurrency markets*	
Written exam	*OUTCOME 6 Interpret the results of several different machine learning models applied to the cryptocurrency market*	*Lectures and exercises*	*Essay exam on a given topic: essay-type questions of analyzing the financial benefits and risks of being included in the primary and secondary markets of cryptocurrencies and token securities*	*16*
Attending classes	*All outcomes*	*Lectures and exercises*	*Attendance records*	*4*
			TOTAL POINTS	***100***

Types of Student Workload	***Student Load Hours***	***ECTS credits***
Attending contact classes	45	1,5
Field Trips/Visits Outside the College	0	0
Independent study/research	45	1,5
Out-of-classroom preparation and preparation of seminars/presentations	0	0
Work on an out-of-classroom project assignment	0	0
Independent preparation for exams and exam time	60	2,0
Consultation activities	0	0
Other	0	0
TOTAL ECTS credits	**150**	**5**

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RATING:

In order to achieve a positive grade in the course, the student must cumulatively meet two conditions: achieve a total of at least 54 (fifty-four) points in the course and meet the lower point threshold for the adoption of each individual learning outcome, which is 50% of the total points of the learning outcomes.

Grades are calculated based on the following distribution of points:

SCORE	*RATING*
0,00 – 53,90	*Insufficient (1)*
54,00 – 64,90	*Sufficient (2)*
65,00 – 79,90	*Good (3)*
80,00 – 89,90	*Very good (4)*
90.00 and more	*Excellent (5)*

Grading is carried out in a transparent manner by collecting points. The course is evaluated with 100.00 points (with the possibility of achieving an additional 8 points on the Challenge learning outcome).

CHALLENGE LEARNING OUTCOME - the student has the opportunity to earn an additional maximum of 8 points through the Challenge learning outcome; The student independently chooses one of the activities proposed in the first lesson, and has the opportunity to independently propose an activity with which he wants to increase the number of points and, with the consent of the course holder, achieves them according to the criteria of the course. Points for the Challenge learning outcome are not distributed according to the learning outcomes, but the number achieved makes an additional number of points to the total number of points achieved according to the learning outcomes.

Before taking the final written exam, each student must meet the prescribed conditions, which primarily means that they have attended the % of classes determined by the Study Regulations and that they have received an electronically encrypted permission to take the exam.

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1.9. *Required reading and number of copies in relation to the number of students currently attending classes in the course*

Title	*Number of copies*	*Number of students*
1. Class materials (lectures and exercises), notes and published reading materials	-	-

1.10. Supplementary literature

Antonopoulos, A. (2017): Mastering Bitcoin: Programming the Open Blockchain, Sebastopol: O'Reilly Media, Inc.

Antonopoulos, A. (2019): Mastering Ethereum: Building Smart Contracts and Dapps, Sebastopol: O'Reilly Media, Inc.

Danial. K. (2019): Cryptocurrency Investing For Dummies, Hoboken: John Wiley & Sons.

Furneaux, N. (2018): Investigating Cryptocurrencies: Understanding, Extracting, and Analyzing Blockchain Evidence, Indianapolis: John Wiley & Sons.

Judmayer, A., Krombholz, K., and Weippl E. (2017): Blocks and Chains Introduction to Bitcoin, Cryptocurrencies, and Their Consensus Mechanisms, San Rafael: Morgan & Claypool Publishers.

1.11. Ways of quality monitoring that ensure the acquisition of output knowledge, skills and competencies

- *analysis of exam results, achieved results, level of understanding and knowledge during exercises, practical tasks and group work,*
- *conducting a survey among students,*
- *The evaluation of the teacher,*
- *achieved results and level of knowledge presented during the preparation and defense of the final thesis (students who choose a graduate thesis in this course),*
- *analysis of the Quality Centre's reports and*
- *Feedback from students who have already graduated and their employers on the usefulness of the content of this course in the performance of the work they do.*