EFFECTUS
University of Applied Sciences

DESCRIPTION OF THE COURSE

GENERAL INFORMATION		
Course Holder	**Dr.sc. Višnja Jurić**	
The name of the college	**Financial Mathematics**	
Study program	**Professional Undergraduate Study - Finance and Business Law**	
Status of the College	**Mandatory**	
Year	**1st year**	
Point value and method of teaching	**ECTS coefficient of student workload**	**6**
	Number of hours (P+V)	**30+30**

DESCRIPTION OF THE COURSE
1.1. Objectives of the College
Students are expected to develop: a) general competencies - the ability to adopt mathematical methods and calculations in the field of Financial Mathematics - application and acquired knowledge in the field of economy with an emphasis on financial operations b) specific competencies - mathematical modeling of phenomena in economic practice.

- developing motivation for choosing a particular mathematical model.
- interpreting the achieved mathematical results using economic terminology

1.2. Conditions for enrolment in the course

There are no prerequisites for enrolling in the course

1.3. Expected learning outcomes for the course

1. Apply the rules of the basic economic account to calculate simple interest.
2. Apply the rules for calculating the terms and sum of a geometric series in compound interest.
3. Use compound interest accounts in a variety of economic applications.
4. Calculate the repayment plan of different types of loans.
5. Apply the calculation of the zero point of a polynomial in economic examples.
6. Apply differential calculus in economic examples.

1.4 Course content

Percentage account.

The basics of the percentage account.

Percentage account over a hundred, lower hundred.

Simple Interest Account

Basic concepts and formula of an interest account.

Methods of interest accrual (decursive and anticipatory calculation of interest).

Compound Interest Account

Compound interest, decursive and anticipatory interest factor.

Nominal and relative interest rate. Conformal interest rate.

Equivalent interest rates

Discrete capitalization

The final and initial value of the prenumerando and postnumerando of periodic deposits/withdrawals.

EFFECTUS
University of Applied Sciences

Loan

Determining the amount of the loan and nominally equal annuities and creating a repayment table.

Control of the accuracy of the calculated elements of the repayment table. Loan Conversion

Consumer credit

Basic terms and definition.

Ways to repay a consumer loan.

Determination of zero points of polynomials.

Determination and application of elementary mathematical functions in the economy (total cost function, income function, profit function).

Determination and interpretation of zero points of polynomials of the first and second degree.

Derivatives. The application of basic differential calculus in the economy.

The concept of limits and derivatives.

Tabular derivation.

Calculation and interpretation of average and marginal cost functions.

Determination of the growth rate and coefficient of elasticity. Interpretation of the results obtained.

1.5. Types of teaching	**X lectures** ☐ seminars and workshops **X 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.

***Students** are expected to attend classes compulsorily, be active during lectures and exercises, and participate constructively in discussions and discussions during lectures and exercises. In order to acquire the right to take the exam, the student must collect the percentage of attendance prescribed by the Study Regulations. Attendance at classes of each student is registered in the system of digital office (Infoeduka).*

EFFECTUS
University of Applied Sciences

The minimum obligations of students are:
• attendance at least 70% of the total number of classes – full-time students
• attendance at least 50% of the total number of classes – part-time students
In addition to achieving the above-mentioned (prescribed) percentage of attendance, in order to obtain a positive grade, it is necessary to collect a total of at least 54 points in the subject and at least 50% of points for each stated learning outcome. The method of taking the exam is described in more detail in point 1.8. Assessment and evaluation of students' work during classes and at the final exam.

The student can earn additional points (max. 8) through the Challenge outcome (the procedure for acquiring "challenge" points is described in more detail in point 1.8).

**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.*

WRITTEN EXAM: *During the written exams, students solve a large number of open-ended problem tasks in which it is necessary to show the process of solving tasks. By solving the tasks, the student can also achieve a partial number of points if the procedure proves the part of the solution that is considered correct. In addition to problem tasks, written exams also contain a large number of questions in which it is necessary to determine the accuracy of statements and, for incorrect statements, offer correct solutions.*

**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.*

1.7. Monitoring student work

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

EFFECTUS
University of Applied Sciences

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.

	Attending classes	Written exam	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		**96**	100

EFFECTUS
University of Applied Sciences

FORMS OF TRACKING	*NAME OF LEARNING OUTCOMES*	TEACHING METHOD	KNOWLEDGE ASSESSMENT METHOD	Maximum number of points
Written exam	***OUTCOME 1*** Apply the rules of the basic economic account to calculate simple interest.	• **Lecture** • **Solving tasks on board**	**Written exam with problem tasks and binary-type questions (True/False)**	**16**
Written exam	***OUTCOME 2*** Apply the rules for calculating the terms and sum of a geometric series in compound interest.	• **Lecture** • **Solving tasks on the board** • **Discussion**	**Written exam with problem tasks. Binary Questions (True/False)**	**16**

EFFECTUS
University of Applied Sciences

	Written exam	***OUTCOME 3*** Use compound interest accounts in a variety of economic applications.	• **Lecture** • **Solve tasks on the board**	**Written exam with problem tasks**	**16**
	Written exam	***OUTCOME 4*** Calculate the repayment plan of different types of loans.	• **Lecture** • **Solve tasks on the board** • **Discussion**	**Written exam with problem tasks. Binary type questions (True/False)**	***16***
	Written exam	***OUTCOME 5*** Apply the calculation of the zero point of a polynomial	• **Lecture** • **Solve tasks on the board**	**Written exam with problem tasks. Binary type questions (True/False).**	***16***

	in economic examples.			
Written exam	***OUTCOME 6*** Apply differential calculus in economic examples.	• **Lecture** • **Solve tasks on the board**	**Written exam with problem tasks**	***16***
Attending classes	*All outcomes*	*Lectures and exercises*	*Attendance records*	***4***
				100

The acquired knowledge, skills and competencies, i.e. the degree of adoption of the learning outcomes determined by the sylllabus in each individual subject, is determined (assessed):

a. during classes in the semester - through written examinations (intermediate exams);

b. after the end of classes - by taking the final exam.

EFFECTUS
University of Applied Sciences

For the purpose of acquiring the material through smaller teaching units, during the semester, monitoring of the acquisition of students' knowledge is carried out through tests (intermediate exams) in which the acquisition of the content of outcomes 1, 2 and 3 (intermediate exam 1), and outcomes 4, 5 and 6 (intermediate exam 2) is tested.

Type of student workload	***Student Load Hours***	***ECTS credits***
Attending contact classes	60	2
Field Trips/Visits Outside the College	0	0
Independent study/research	30	1
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	75	2,5
Consultation activities	15	0,5
Other	0	0
TOTAL ECTS credits	**180**	**6**

EFFECTUS
University of Applied Sciences

RATING:

When creating the final grade, a model of accumulating points is used, a maximum of 108 points. This sum includes the Challenge learning outcome, which carries from 0 to 8 points.

In order to achieve a positive grade in the course, the student must achieve:

A total of at least 54 points

2) the minimum number of points from each individual learning outcome (50% of the total points of learning outcomes).

Grades are distributed based on the following point criterion:

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)*

The evaluation is carried out in a transparent manner by collecting points that are registered in the digital system. The course is evaluated with 100.00 points with the possibility of achieving an additional maximum of 8 points through the Challenge learning outcomes.

CHALLENGE LEARNING OUTCOME - the student independently, with the consent of the course leader, chooses the topic to be covered and is obliged, by a certain date in the semester, and before the end of the class, to report the creation and presentation of the topic Points for the Challenge Learning Outcome are not distributed by learning outcomes, but the achieved number of points is added to the total sum of points earned from other learning outcomes.

Before taking the final written exam, each student must meet the prescribed conditions (percentage) of attendance and obtain an electronically encrypted permission (signature) to take the exam

EFFECTUS
University of Applied Sciences

1.9. Required literature and number of copies in relation to the number of students currently attending classes in the course		
Title	*Number of copies*	*Number of students*
Šego, B.; Lukač, Z.; Gardijan Kedžo,M.: Financial Mathematics, Zagreb, 2019	5* *students receive compulsory literature in permanent ownership	100
1.10. Supplementary literature		
Babić,Z; Tomić Plazibat, N: Business Mathematics, University of Split, 2017.		
1.11 Methods of quality monitoring that ensure the acquisition of output knowledge, skills and competences		
• *statistical processing and analysis of exam results (checking the Gaussian curve – normal distribution of success, comparing and monitoring the results of exams of different generations, analysis of understanding of individual modules/questions on the exam, etc.),* • *conducting a survey among students* • *Evaluation and self-evaluation of teachers* • *achieved results, level of understanding and knowledge during the preparation of exams and intermediate exams* • *achieved results and level of knowledge shown during the preparation and defense of the final thesis (students who choose a diploma thesis in this course)* • *Analysis of the Quality Centre Manager's Report* • *Feedback from students who have already graduated on the usefulness of the content of this course in the performance of the tasks they are engaged in*		