FACULTY OF COMPUTER SCIENCE AND MANAGEMENT

SUBJECT CARD

Name in Polish: **Inżynieria finansowa**
Name in English: **Financial engineering**
Main field of study (if applicable): **Management**
Specialization (if applicable): **Organizational Management (OM)**
Level and form of studies: **1st level, full-time**
Kind of subject: **optional**
Subject code: **FBZ1187**
Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	**30**	**15**			
Number of hours of total student workload (CNPS)	**60**	**60**			
Form of crediting	**crediting with grade**	**crediting with grade**			
For group of courses mark (X) final course					
Number of ECTS points	**2**	**2**			
including number of ECTS points for practical (P) classes		**2**			
including number of ECTS points for direct teacher-student contact (BK) classes	**1**	**0,5**			

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

Knowledge of financial markets and elementary probability and statistics.

SUBJECT OBJECTIVES

C1 To provide basic information about construction, valuation and the use of derivatives in the financial markets.

SUBJECT EDUCATIONAL EFFECTS

Relating to knowledge:
PEK_W01 Knows the basic debt instruments and their valuation methods.
PEK_W02 Knows portfolio theory.
PEK_W03 Knows the four basic classes of derivatives - forwards, futures, swaps and options.
PEK_W04 Knows option pricing methods – the binomial and Black-Scholes approaches.

Relating to skills:
PEK_U01 Can build a portfolio of debt instruments and measure its sensitivity.
PEK_U02 Can construct optimal portfolios from stocks and bonds.
PEK_U03 Can evaluate forwards, futures and swaps using the (no-)arbitrage approach.
PEK_U04 Can price options using binomial trees and the Black-Scholes method.

Relating to social competences:
PEK_K01 Is aware of the need for an independent, critical assessment of the scope and level of his/her knowledge in the field of financial engineering. Is prepared for conducting self-studies in this area.
PEK_K02 Can engage in a discussion and defend his/her views regarding the methods of financial engineering.

PROGRAMME CONTENT

	Form of classes - lecture	**Number of hours**
Lec1	Introduction; Investments and investors	2
Lec2	Financial markets, stock and futures exchanges	2
Lec3	Currencies, debt instruments, yield curve	4
Lec4	Capital market, portfolio theory	4
Lec5	Forwards, futures and swaps: applications and pricing	4
Lec6	Options; Portfolios of derivatives	4
Lec7	Binomial option pricing model: valuation and hedging strategy	4
Lec8	Black-Scholes model; Sensitivity analysis	4
Lec9	Final test	2
	Total hours	**30**

	Form of classes - class	**Number of hours**
Cl1	Time value of money	2
Cl2	Debt instruments	2
Cl3	Portfolio theory	2
Cl4	Forwards, futures and swaps: applications and pricing	2
Cl5	Options; Portfolios of derivatives	2
Cl6	Binomial option pricing model: valuation and hedging strategy	3
Cl7	Black-Scholes model; Sensitivity analysis	2
	Total hours	**15**

TEACHING TOOLS USED

N1. Multimedia lecture
N2. Practical exercises
N3. Discussion
N4. Student's own work

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F –	Educational effect	Way of evaluating educational effect achievement

forming (during semester), P – concluding (at semester end)	number	
F1	PEK_W01÷PEK_W04 PEK_U01÷PEK_U04	Class participation (participation in discussions and problem solving, preparation for class activities)
F2	PEK_W01÷PEK_W04 PEK_U01÷PEK_U04	Grade based on the final test

P (L) = ½ F1 + ½ F2

P (C) = ½ F1 + ½ F2

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Z. Bodie, A. Kane, A.J. Marcus (2007) Essentials of Investments (6th ed.), McGraw-Hill

[2] J. Hull (2008) Options, Futures and Other Derivatives (7th ed.), Prentice Hall

[3] A. Weron, R. Weron (1998, ..., 2009) Inżynieria finansowa, WNT

SECONDARY LITERATURE:

[4] J. Czekaj, red., (2008) Rynki, instrumenty i instytucje finansowe, PWN

[5] E.J. Elton, M.J. Gruber, S.J. Brown, W.N. Goetzmann (2002) Modern Portfolio Theory and Investment Analysis, Wiley

[6] F.J. Fabozzi (2005) The Handbook of Fixed Income Securities", McGraw-Hill

[7] J. Franke, W. Härdle, C. Hafner (2005) Introduction to Statistics of Financial Markets, Springer

[8] K. Jajuga, T. Jajuga (1996, ..., 2007) Inwestycje, PWN

[9] P. Wilmott (2000) Paul Wilmott on Quantitative Finance, Wiley, Chichester

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

Dr hab. Rafał Weron, prof. PWr, rafal.weron@pwr.wroc.pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
Financial engineering
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY
Management
AND SPECIALIZATION **Organizational Management (OM)**

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)**	Subject objectives***	Programme content***	Teaching tool number***
PEK_W01 (knowledge)	K1_ZARZ_W03, K1_ZARZ_W11, K1_ZARZ_W24, S1_ZARZ_OM_W08	C1	**Lec1-3, Cl1-2**	N1-4
PEK_W02	K1_ZARZ_W03, K1_ZARZ_W24, S1_ZARZ_OM_W08	C1	**Lec4, Cl3**	N1-4
PEK_W03	S1_ZARZ_OM_W08	C1	**Lec5, Cl4**	N1-4
PEK_W04	K1_ZARZ_W24, S1_ZARZ_OM_W08	C1	**Lec6-8, Cl5-7**	N1-4
PEK_U01 (skills)	K1_ZARZ_U05, S1_ZARZ_OM_U08	C1	**Lec1-3, Cl1-2**	N2-4
PEK_U02	K1_ZARZ_U05, S1_ZARZ_OM_U08	C1	**Lec4, Cl3**	N2-4
PEK_U03	K1_ZARZ_U015, S1_ZARZ_OM_U08	C1	**Lec5, Cl4**	N2-4
PEK_U04	K1_ZARZ_U05, S1_ZARZ_OM_U08	C1	**Lec6-8, Cl5-7**	N2-4
PEK_K01 (copetencess)	K1_ZARZ_K01	C1	**Cl1-7**	N2-4
PEK_K02	K1_ZARZ_K06	C1	**Cl1-7**	N2-4

** - enter symbols for main-field-of-study/specialization educational effects
*** - from table above