

Code.....

Course item:

1. INFORMATION ABOUT THE COURSE**A. Basic information**

Name of course	Financial Engineering
Study level	<i>first degree</i>
Unit running the study programme	<i>Faculty of Management, Department of IT for Management</i>
Study programme	<i>Management and Production Engineering</i>
Speciality	
Name of teacher (s) and his academic degree	<i>Hubert Zarzycki, PhD</i>
Introductory courses	<i>Information Technologies</i>
Prerequisites	<i>Fundamentals of finance, basic skills in spreadsheet</i>

B. Semester/week schedule of classes

Semester	Lectures	Classes	Laboratories	Project	Seminars	Field exercises	ECTS
summer	30	30					3

2. EFFECTS OF EDUCATION (acc. to National Qualifications Framework)

Knowledge	<i>on successful completion of the course student will be acquainted with fundamental Financial Engineering theory. On Financial Engineering lectures a student shall be acquainted with the problems of stock markets. Most popular present day financial derivatives shall be analysed as well as methods of creating strategies based on these instruments. After the subject completion the student will have the ability to explain and solve fundamental matters connected with Financial Engineering.</i>
Skills	<i>on successful completion of the course student is supposed to characterise and apply financial engineering knowledge to practical applications with the usage of spreadsheet. The participant of the studies will have the possibility of the investment analysis. He will also apply selected pricing methods of stocks, bonds, futures and options.</i>
Competences	<i>after the subject completion the student will have the ability to explain and solve fundamental matters connected with financial engineering and can cooperate with financial analytics and business managers.</i>

3. TEACHING METHODS

<i>multimedia lecture, lab</i>

4. METHODS OF EXAMINATION

<i>test of closed questions, lab grades</i>

5. SCOPE

Lecture	<i>The course is designed to give student an understanding of the risk management and to describe different financial products as well as related pricing and hedging techniques. General theory and definitions of financial engineering, segments of financial market and special role of a capital market shall be shown. Following time value of money, securities and different instruments of money market. Then details of bonds, equities and indices. Markowitz portfolio theory and model. Assessment of market risk with Value at Risk (VaR). Currency and interest rate swaps. After initial introductions to</i>
---------	---

	<i>forward, futures and options, analytical and numerical methods of option valuing shall be demonstrated, e.g. standard Black and Scholes; Cox, Ross and Rubbinstein lattice approach as well as Monte Carlo method. Implied volatility techniques. Selected exotic options will be depicted. Finally several investment strategies shall be presented.</i>
<i>Laboratories</i>	<i>Time value of money calculations: present and future value, effective interest rate, annuity, lifetime annuity, depreciation credit, internal and external rate of return, real rate of return, risk premium, VaR. Valuation of bonds: clean and dirty price, yield to maturity and its properties, coupon yield, current yield, average maturity. Valuation of shares: expected rate of return, investment risks, rate of return variance, semivariance and average deviation. The construction and estimation of stock market indices. Markowitz portfolio. Derivatives. Pricing of futures and forward contracts. Interest rate and currency swaps.</i>

6. LITERATURE

Basic literature	<i>Hull J., 2009. Options, Futures and Other Derivatives. Prentice Hall, New Jersey.</i>
Supplementary literature	<i>Elton E.J., Gruber M.J., 1991. Modern portfolio theory and investment analysis. John Wiley and Sons, New York. Jajuga K., Kuziak K., Markowski P., 1998. Inwestycje finansowe. Seria Rynek kapitałowy. Wydawnictwo AE we Wrocławiu.</i>