



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Financial Fundamentals for Engineers

Course

Field of study

Pharmaceutical Engineering

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

4/7

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

15

Tutorials

0

Laboratory classes

0

Projects/seminars

15

Other (e.g. online)

0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Piotr Tomasz Mitkowski

e-mail: piotr.mitkowski@put.poznan.pl

tel. 61 665 2789

Responsible for the course/lecturer:

dr hab. inż. Jacek Różański

e-mail: jacek.rozanski@put.poznan.pl

tel. 61 665 2147

Prerequisites

Students starting this subject should have basic knowledge in mathematics, physics, chemistry, engineering graphics, pharmaceutical industry equipments, pharmaceutical technology, and materials technology. They should also have the ability to use spreadsheets, and be ready to work in a team.



Course objective

The aim of the course is to obtain basic knowledge enabling financial analysis in the area of the assessment of economic efficiency of industrial investment, taking into consideration of legal and financial aspects relevant to the pharmaceutical industry.

Course-related learning outcomes

Knowledge

1. Has basic knowledge of macro- and microeconomics. (K_W22, K_W20)
2. Knows the basic concepts of financial accounting. (K_W28)
3. Knows the methods of economic assessment of investment projects. (K_W28, K_W21)
4. Knows the methods of estimating investment costs in fixed assets, production costs, sales revenues and profit in the chemical and related industries. (K_W28)

Skills

1. Is able to use basic terminology in the field of financial accounting. (K_U23)
2. Is able to determine the payback time, return on investment, internal rate of return and perform the break-even analysis and the net present value analysis. (K_U20, K_U23)
3. Is able to estimate investment costs using methods based on historical costs. (K_U23)
4. Is able to estimate: working capital, variable and fixed production costs and profit for production processes in the pharmaceutical industry. (K_U23)
5. Is able to solve economic problems individually and in a team, and present them (K_U25).

Social competences

1. Student is aware of the advantages and limitations of individual and group work in solving interdisciplinary problems in industry. Is aware of the responsibility for jointly implemented tasks as part of teamwork. (K_K2)
2. Student is aware of the professionalism and compliance with the rules of professional ethics (K_K3, K_K8).
3. Student knows the limits of their own knowledge and understands the need for continuous education and raising their professional competences. (K_K1)
4. Student is able to think and act in a creative and entrepreneurial way. (K_K6)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is verified during the test. The test consists of about 30 closed questions. Minimum threshold: 50% points. The topics, on the basis of which questions are formed, will be sent to students by e-mail using the university e-mail system or made available in the university e-Learning system.



Skills and knowledge acquired during project classes are verified on the basis of the project and its presentation.

Programme content

The following topics will be discussed as part of the course:

1. Basic concepts of financial accounting (revenues, costs, profit, tax, depreciation)
2. Economic assessment of projects
 - 2.2. Cash flow
 - 2.3. Basic methods of economic assessment (payback time, return on investment, break-even analysis)
 - 2.4. Time value of money
 - 2.5. Net present value
 - 2.6. Internal rate of return
 - 2.7. Equal payment streams
 - 2.8. Project selection under limited investment resources
 - 2.9. Sensitivity Analysis
 - 2.10. Economic analysis of the ecological effect of the investment
3. Estimation of investment costs in fixed assets
 - 3.2. Accuracy and purpose of capital cost estimates
 - 3.3. Historical costs
 - 3.4. Step counting methods
 - 3.5. Factorial method
 - 3.6. Estimating infrastructure investment costs
 - 3.7. Cost escalation (inflation)
 - 3.8. Investment location
 - 3.9. Validity of cost estimates
4. Estimating production costs
 - 4.1. Working capital
 - 4.2. Variable and fixed production costs



- 4.3. Media cost
- 4.4. Consumables costs
- 4.5. Waste disposal costs
- 4.6. Labor costs
- 5. Estimating sales revenues and profit

Teaching methods

- 1. Lecture: multimedia presentation, illustrated with examples on the board.
- 2. Project: multimedia presentation, illustrated with tasks solved using a spreadsheet.

Bibliography

Basic

- 1. Mitkowski P.T., Róžański J., Analiza ekonomiczna procesów przemysłowych, Wydawnictwo Politechniki Poznańska, 2012.
- 2. Rekowski M., Wprowadzenie do mikroekonomii, Wydawnictwo Akademi Ekonomicznej w Poznaniu, 2001.
- 3. Chadwick L., Rachunkowość zarządcza dla niewtajemniczonych, Agencja Wydawnicza Placet, 1997.

Additional

- 1. Gabrusewicz W., Kamela-Sowińska A., Poetschke H., Rachunkowość zarządcza, Wydawnictwo Akademi Ekonomicznej w Poznaniu, 2001.
- 2. Sinnott R.K. Towler G.: Chemical Engineering Design, 5th Edition, Elsevier, 2009.
- 3. Solińska M., Soliński I., Efektywność ekonomiczna proekologicznych inwestycji rozwojowych w energetyce odnawialnej, Uczelniane Wydawnictwa naukowo-Dydaktyczne AGH, Kraków 2003.
- 4. Coulson J.M., Richardson J.F.: Chemical Engineering, vol. VI, Butterworth Heinemann, Oxford 1999-2002.
- 5. Perry R. H., Green D. W., Perry's chemical engineering handbook, seventh edition, McGraw-Hill, 1997.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	40	1,6
Student's own work (literature studies, preparation for tests, project preparation) ¹	35	1,4

¹ delete or add other activities as appropriate