SUBJECT DATASHEET

ANALYSIS OF PRODUCTION AND OPERATIONS DECISIONS

BMEGT20MN15

I. SUBJECT DESCRIPTION

1. SUBJECT DATA

Subject name
ANALYSIS OF PRODUCTION AND OPERATIONS DECISIONS

ID (subject code)   BMEGT20MN15

Type of subject
contact classes

Course types and lessons

Type	Lessons
Lecture	2
Practice	2
Laboratory	0

Type of assessment
exam grade

Number of credits
5

Subject Coordinator

Name	Position	Contact details
Dr. Koltai Tamás	professor	koltai.tamas@gtk.bme.hu

Educational organisational unit for the subject
Department of Management and Business Economics

Subject website
https://edu.gtk.bme.hu

Language of the subject
magyar - HU; angol - ENG

Curricular role of the subject, recommended number of terms
Programme: **Finance MSc (in English) from 2019/20/Term 1 AUTUMN start**
Subject Role: **Compulsory**
Recommended semester: **4**

Programme: **Finance MSc (in English) from 2019/20/Term 1 SPRING start**
Subject Role: **Compulsory**
Recommended semester: **3**

Programme: **Management and Leadership MSc (in English) from 2019/20/Term 1**
Subject Role: **Compulsory**
Recommended semester: **4**

Programme: **Master's programme in Management and Leadership from 2019/20/Term 1 (Autumn term start)**
Subject Role: **Compulsory**
Recommended semester: **4**

Programme: **Master's programme in Management and Leadership from 2020/21/Term 2 (Spring term start)**
Subject Role: **Compulsory**
Recommended semester: **3**

Programme: **Production and Operations Management specialisation**
Subject Role: **Compulsory for the specialisation**
Recommended semester: **3**

Direct prerequisites

Strong	None
Weak	None
Parallel	None
Exclusion	None

Validity of the Subject Description
Approved by the Faculty Board of Faculty of Economic and Social Sciences, Decree No: 581046/15/2021. Valid from: 24.11.2021.

2. OBJECTIVES AND LEARNING OUTCOMES

Objectives

The subject of Analysis of Production and Operations Decisions aims to teach and practice the analysis of complex production and service problems using a business simulation game, as well as solving case studies. The examined problems necessitate a series of solutions to the resource allocation tasks that often occur in management practice. The subject develops the students' ability to create independent models and formulate problems, as well as shows how complex decisions in the field of production and service management can be examined and supported with modern computer tools. With the help of the management simulation that accompanies the whole subject, the students directly apply their group decision-making skills and their previous knowledge of production and service management. The simulation game is evaluated using data envelopment analysis (DEA), which is also part of the semester curriculum. Thus, the learned evaluation and analysis method is also applied in practice.

Academic results

Knowledge

1. Knows the basic methods of complex resource allocation problems.
2. Knows and understands the tools of mathematical modelling of the studied problems.
3. Understands the connections between the areas of corporate operation and production management.
4. Has confident methodological knowledge in the field of quantitative decision analysis, understands and understands the potential possibilities of the application of modern data analysis.

Skills

1. Able to formulate problems related to production and service processes verbally and analytically, to synthesize basic theories and practical aspects, to make rational arguments, ie to form and defend one's opinion during discussions in different fields of operational communication.
2. Able to plan the process of solving production and service problems and follow the path from problem recognition to solution.
3. In his professional vocabulary, he confidently uses the basic concepts of decision analysis, operations research and informatics, the professional language of the profession, and the elements of the special vocabulary based on them.
4. Able to interpret, evaluate, and use data related to production and services in performing design and analysis calculations.

Attitude

1. Accepts that the possibility of improving certain company processes and their optimal operation can be determined by quantitative means.
2. Consciously represents the methods with which he / she works in his / her own profession and accepts the different methodological peculiarities of other disciplines.
3. It strives to make its decisions in consultation with the supervised staff and, where possible, in cooperation with them.
4. Has a comprehensive systems approach in the field of quantitative modelling.

Independence and responsibility

1. Being able to perform and manage complex tasks in accordance with the professional expectations of a professional work community.
2. Independent, constructive and assertive in forms of cooperation inside and outside the institution.

Teaching methodology

Lectures; participation in a production simulation game that accompanies the entire semester; processing case studies inde-pendently and in group work.

Materials supporting learning

- Koltai, T, Kalló N. Tatay V.: Termelési és szolgáltatási döntések elemzése, oktatási segédlet, 2017
- Szimulációs játék kézikönyv
- Egyéb, az oktatók által kiadott oktatási segédletek (https://edu.gtk.bme.hu)
- Koltai T.: Termelésmenedzsment, Typotex, 2006
- Koltai T.: Alkalmazhatók-e a termelésmenedzsment kvantitatív összefüggései a gyakorlatban, Harvard Business Manager (Magyar kiadás), 5(2), 52-59, 2003.
- Koltai T.: A kvantitatív összefüggések jelentősége a termelésmenedzsmentben, CEO magazin, 4(4), 11-14, 2003.
- Ragsdale, C. T.: Managerial Decision Modelling, Thomson, 2007.
- Lecture notes and slides uploaded to the Moodle page of the course (https://edu.gtk.bme.hu)
- Simulation game manual
- Ragsdale, C. T.: Managerial Decision Modelling, Thomson, 2007.
- Reid, R.D. & Sanders, N.R.: Operations Management: An Integrated Approach, 7th Edition, Wiley, 2020

II. SUBJECT REQUIREMENTS

TESTING AND ASSESSMENT OF LEARNING PERFORMANCE

General Rules
The learning outcomes set out in point 2.2 are assessed during the examination period by a written examination

Performance assessment methods
A. Detailed description of performance evaluations during the term: The result of the simulation game running during the semester is part of the grading of the subject. A maximum of 25 points can be reached based on the performance given in the game. A minimum of 10 points can be gained for the comple-tion of the game. The portion between 10 and 25 points is calculated proportionally based on the DEA efficiency score calculated from the results of the simulation game. For 100% efficiency you get an extra 15 points, for 0% efficiency you get an extra 0 points. The value between 0 and 15 points is given to the student as a percentage of the efficiency score. B. Performance evaluation during the examination period (exam): Written examination based on problem solving. Elements of the exam: 1. written performance evaluation: checking the theoretical background and practical application of the topics covered during the semester. The majority of the 75 points available in the exam can be obtained by solving the calculation examples (90%), a smaller proportion by answering the theoretical questions (10%).

Percentage of performance assessments, conducted during the study period, within the rating
- **Participation in the simulation game is mandatory during the semester. As a result of the simulation game, a maximum of 25 points can be obtained, which is 25% of the subject's qualification.**: 25

Percentage of exam elements within the rating
- **written exam**: 75%
- **the result of the simulation game**: 25%
- **total**: 100%

Conditions for obtaining a signature, validity of the signature
The condition for obtaining the signature is the successful completion of the simulation game.

Issuing grades

Excellent	95-100
Very good	90–94
Good	80–89
Satisfactory	65–79
Pass	50–64
Fail	0-49

Retake and late completion
According to the Code of Studies

Coursework required for the completion of the subject

participation in contact classes	14×2=28
simulation game analyses, decision making	32
independent acquisition of the written curriculum	45
exam preparation	45
total	150

Approval and validity of subject requirements
Consulted with the Faculty Student Representative Committee, approved by the Vice Dean for Education, valid from: 04.10.2021.

III. COURSE CURRICULUM

THEMATIC UNITS AND FURTHER DETAILS

Topics covered during the term
To achieve the learning outcomes set out in section 2.2, the course consists of the following thematic blocks.

1 Introduction, the description of the management simulation game that accompanies the semester.
2 Trial round of the simulation game. Preparing to start the game.
3 Application of Linear Programming (LP) in production and operations decisions (using Excel).
4 Interpretation of LP sensitivity test results. The significance and application of the objective function value function.
5 Processing of the "Coffee Blend Production" case study.
6 Processing of the "Rolling Line" case study.
7 Evaluation of the completed rounds of the simulation game, analysis of experiences.
8 Basic concepts of data envelopment analysis (DEA).
9 Graphical solution of „1 input – 1 output" case.
10 Graphical solution of „2 input – 1 output" case.
11 Modelling of general cases of radial models (input-oriented, output-oriented primary and dual models, phases I and II).
12 Investigation of non-radial models and weight constraints.
13 Computer support for DEA (Excel models, PIM-DEA software).
14 Evaluation of the result of the simulation game, summary.

Additional lecturers
Tamás Alexandra egyetemi tanársegéd tamas.alexandra@gtk.bme.hu

Approval and validity of subject requirements