Budapest University of Technology and Economics

Faculty of Transportation Engineering
and Vehicle Engineering

MSc in Logistics Engineering

Curriculum

Valid from September 2018
## Logistics Engineering Master Programme

### Start in February

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.01</td>
<td>Mathematics M.</td>
</tr>
<tr>
<td>1.03</td>
<td>Numerical Optimization</td>
</tr>
<tr>
<td>1.05</td>
<td>Logistics Planning Software</td>
</tr>
<tr>
<td>1.07</td>
<td>Process Planning</td>
</tr>
<tr>
<td>1.09</td>
<td>Simulations Planning</td>
</tr>
<tr>
<td>1.11</td>
<td>Specialization 1</td>
</tr>
</tbody>
</table>

### Start in September

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.01</td>
<td>Mathematics M.</td>
</tr>
<tr>
<td>2.03</td>
<td>Numerical Optimization</td>
</tr>
<tr>
<td>2.05</td>
<td>Logistics Planning Software</td>
</tr>
<tr>
<td>2.07</td>
<td>Process Planning</td>
</tr>
<tr>
<td>2.09</td>
<td>Simulations Planning</td>
</tr>
<tr>
<td>2.11</td>
<td>Specialization 1</td>
</tr>
</tbody>
</table>

### Internship
- 4 weeks
- 0 weeks
- 4 weeks
- 0 weeks

---

**Logistics Engineering Master Programme**

**Start in February**

1. **Mathematics M.**
2. **Control Theory**
3. **Numerical Optimization**
4. **Logistics Planning Software**
5. **Process Planning**
6. **Simulations Planning**
7. **Specialization 1**
8. **Specialization 2**

**Start in September**

1. **Mathematics M.**
2. **Control Theory**
3. **Numerical Optimization**
4. **Logistics Planning Software**
5. **Process Planning**
6. **Simulations Planning**
7. **Specialization 1**
8. **Specialization 2**

**Internship**
- 4 weeks
- 0 weeks
- 4 weeks
- 0 weeks
## Specializations

### Corporate logistics and operations planning specialization

<table>
<thead>
<tr>
<th>Specialization</th>
<th>Course Code</th>
<th>Year</th>
<th>Semester</th>
<th>Credit</th>
<th>Exam Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand planning and inventory management</td>
<td>KOALM328</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Control of transport logistics</td>
<td>KOALM341</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Production planning &amp; scheduling</td>
<td></td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Enterprise logistics project 1</td>
<td>KOALM344</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Enterprise logistics project 2</td>
<td>KOALM345</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

### Technical logistics specialization

<table>
<thead>
<tr>
<th>Specialization</th>
<th>Course Code</th>
<th>Year</th>
<th>Semester</th>
<th>Credit</th>
<th>Exam Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation of logistics systems</td>
<td>KOALM325</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Construction of logistics machinery</td>
<td>KOALM324</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Integrated material flow systems</td>
<td>KOALM332</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Technical logistics project 1</td>
<td>KOALM333</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Technical logistics project 2</td>
<td>KOALM340</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

### Freight forwarding management specialization

<table>
<thead>
<tr>
<th>Specialization</th>
<th>Course Code</th>
<th>Year</th>
<th>Semester</th>
<th>Credit</th>
<th>Exam Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade, Financial, Accounting Techniques</td>
<td>KOKKM138</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Forwarding marketing</td>
<td>KOKKM135</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Forwarding Management 1</td>
<td>KOKKM132</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Forwarding Management 2</td>
<td>KOKKM133</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forwarding project 1</td>
<td>KOKKM338</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Forwarding project 2</td>
<td>KOKKM342</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>
# Course description explanation

<table>
<thead>
<tr>
<th>1. Subject name</th>
<th>official name of the subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Subject name in Hungarian</td>
<td>official name of the subject in Hungarian</td>
</tr>
<tr>
<td>3. Role</td>
<td>role of the subject in the curriculum, mc = mandatory; sp = specialization; ec = elective; oc = optional</td>
</tr>
<tr>
<td>4. Code</td>
<td>Neptun code of the subject (with BME prefix)</td>
</tr>
<tr>
<td>5. Evaluation type</td>
<td>type of academic performance assessment, e = exam grade; m = mid-term grade; s = signature</td>
</tr>
<tr>
<td>6. Credits</td>
<td>credit value of the subject</td>
</tr>
<tr>
<td>7. Weekly contact hours</td>
<td>number of weekly (term-based) teaching hours for students by lecture, practice and lab</td>
</tr>
<tr>
<td>9. Working hours for fulfilling the requirements of the subject</td>
<td>contact hours – personal appearance at classes in a university, preparation for seminars – preparation at home for the classes, homework – preparation of homework and other assignments for the classes, reading written materials – reviewing and understanding the taken lessons at home, midterm preparation – recommended preparation time at home for the midterm test during the semester, exam preparation – recommended preparation time at home for the exam</td>
</tr>
<tr>
<td>10. Department</td>
<td>name of responsible department for managing the subject</td>
</tr>
<tr>
<td>11. Responsible lecturer</td>
<td>name of the person in charge of the subject (subject coordinator)</td>
</tr>
<tr>
<td>12. Lecturers</td>
<td>name of all lecturers of the subject</td>
</tr>
<tr>
<td>13. Prerequisites</td>
<td>predefined criteria for registering the subject</td>
</tr>
<tr>
<td>14. Description of lectures</td>
<td>detailed content of the lecture type course</td>
</tr>
<tr>
<td>15. Description of practices</td>
<td>detailed content of the practice type course</td>
</tr>
<tr>
<td>16. Description of laboratory practices</td>
<td>detailed content of the laboratory practice type course</td>
</tr>
<tr>
<td>17. Learning outcomes</td>
<td>results to achieve at the end of the learning process, grouped by competence</td>
</tr>
<tr>
<td>18. Requirements</td>
<td>requirements for passing the subject, aspects of performance evaluation, way to determine a grade (obtain a signature)</td>
</tr>
<tr>
<td>19. Retake and delayed completion</td>
<td>opportunity for repeat/retake and delayed completion</td>
</tr>
<tr>
<td>20. Learning materials</td>
<td>notes, textbooks, suggested literature, recommended learning support materials in printed or electronic form</td>
</tr>
</tbody>
</table>
Curriculum Supplement

All questions and conditions that regulate the study progress should be defined in this Supplement to the Curriculum. Thus, the Curriculum Supplement (curriculum appendix) contains the system of subject prerequisites, the rules for the selecting specializations, the description of the conditions for the preparation of the Master thesis and the final examination, as well as the order of the final exam.

The subject prerequisite system expresses the connections between the subjects:
- In the absence of a strong or a weak prerequisite, it is not possible to enroll in the subject, and no exceptions can be given, as it reflects the professional conditions of effective education. In the case of co-requisite subjects (simultaneous enrollment of two subjects in prerequisite connection), if the subject having a co-requisite subject is not fulfilled in the given semester, consequently the co-requisite subject also cannot be completed in that semester.
- In the absence of the recommended prerequisite, the course can be enrolled, but it should be noted that the course is preferably assumes knowledge from the recommended prerequisite subject.

1. The specific subject prerequisites are included in the subject datasheets.

2. There are no general rules for the selection of specialization and for specialization subjects.

3. Enrollment rules for the Master thesis subjects in all specializations:
Completion of mandatory and elective economic courses in the recommended curriculum and the collection of a minimum of 90 credits from the recommended curriculum and completion of a 4-week internship in case full-time course.

4. Criteria for taking the final examination:
Completion of all subjects included in the recommended curriculum, including optional subjects (all together at least 120 credits), submitting the Master thesis and, in the case of a full-time master study, fulfillment of all criterion requirements in the curriculum (4 weeks of internship).

5. Final examination order:
The final examination in front of the Final Examination Board consists of defending the Master thesis and passing oral final exams from three subjects (or subject groups). The final exam subjects (or subject groups) are assigned by the Department responsible for the specialization. The subjects must be selected partly from the professional core subjects, and from the specialization subjects, so that each subject has a minimum credit value of 3 and the knowledge of the three subjects (or subject groups) is at least 15 credits in total.
### Subject description

<table>
<thead>
<tr>
<th>1. Subject name</th>
<th><strong>Algorithm Design</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Subject name in Hungarian</td>
<td>Algoritmusok tervezése</td>
</tr>
<tr>
<td>3. Role</td>
<td>mc</td>
</tr>
<tr>
<td>4. Code</td>
<td>KOKAM326</td>
</tr>
<tr>
<td>5. Evaluation type</td>
<td>m</td>
</tr>
<tr>
<td>6. Credits</td>
<td>5</td>
</tr>
<tr>
<td>7. Weekly contact hours</td>
<td>2 lecture 0 practice 2 lab</td>
</tr>
<tr>
<td>8. Curriculum</td>
<td>L</td>
</tr>
<tr>
<td>9. Working hours for fulfilling the requirements of the subject</td>
<td>150 hours</td>
</tr>
<tr>
<td>Contact hours</td>
<td>56 hours</td>
</tr>
<tr>
<td>Preparation for seminars</td>
<td>18 hours</td>
</tr>
<tr>
<td>Homework</td>
<td>30 hours</td>
</tr>
<tr>
<td>Reading written materials</td>
<td>34 hours</td>
</tr>
<tr>
<td>Midterm preparation</td>
<td>12 hours</td>
</tr>
<tr>
<td>Exam preparation</td>
<td>0 hours</td>
</tr>
<tr>
<td>10. Department</td>
<td>Department of Control for Transportation and Vehicle Systems</td>
</tr>
<tr>
<td>11. Responsible lecturer</td>
<td>Dr. Bécsi Tamás</td>
</tr>
<tr>
<td>12. Lecturers</td>
<td>Dr. Bécsi Tamás</td>
</tr>
<tr>
<td>13. Prerequisites</td>
<td>(-); (+); (-)</td>
</tr>
</tbody>
</table>

### 14. Description of lectures
Algorithm design. Numerical complexity. The O notation. Efficiency, calculation, and memory requirements for algorithms. Algorithm descriptive tools: flowchart, structogram, pseudo code. Elements of structured programming, its relationship with the design of algorithms. In addition, the methods of designing algorithms and their optimization are presented. The theoretical background of the subject is illustrated with examples from the field of logistics. Algorithm design paradigms: algorithm reduction, divide-and-conquer, dynamic programming, "greedy" algorithm, backtracking, etc. Designing data structures from an algorithmic point of view. Lists, tree structure, graphs. Sorting, searching algorithms. Route Choice and Traveling Salesman problems.

### 15. Description of practices
In the course of laboratory tasks the implementation questions of the theoretical material of the lecture are presented. In addition, students implement algorithms in a development environment of their own choice.

### 16. Description of laboratory practices
In the course of laboratory tasks the implementation questions of the theoretical material of the lecture are presented. In addition, students implement algorithms in a development environment of their own choice.

### 17. Learning outcomes

**a) Knowledge:**
- Knows the concept of numerical complexity.
- Knows different basic algorithm design approaches.
- Knows basic data structures.

**b) Skills:**
- Can independently evaluate the complexity of an algorithm.
- Can design algorithms for well-defined tasks.

**c) Attitude:**
- Is interested in modern IT solutions.
- Capable of algorithmic thinking that can be applied in other areas.

**d) Autonomy and responsibility:**
- Is able to consult in a team in algorithmic and programming tasks, to make independent decisions.

### 18. Requirements, way to determine a grade (obtain a signature)
Two midterm exams. The final grade is the rounded average of the exams.

### 19. Retake and delayed completion
One midterm exam can be retried in the delayed completion period.

### 20. Learning materials
Lecture Notes
Subject description

1. Subject name
   Automation of logistics systems

2. Subject name in Hungarian
   Logisztikai rendszerek automatizációja

3. Role
   sp

4. Code
   KOALM325

5. Evaluation type
   e

6. Credits
   5

7. Weekly contact hours
   2 lecture 0 practice 2 lab

8. Curriculum
   L

9. Working hours for fulfilling the requirements of the subject
   150 hours

Contact hours
   56 hours

Preparation for seminars
   18 hours

Reading written materials
   22 hours

Midterm preparation
   4 hours

Homework
   40 hours

Exam preparation
   10 hours

10. Department
    Department of Material Handling and Logistics Systems

11. Responsible lecturer
    Dr. Bohács Gábor

12. Lecturers
    Gáspár Dániel, Szabó Péter

13. Prerequisites
    +/-;
    +/-;
    +/-;

14. Description of lectures
    In the course, we will systemise the company's process control, SCADA and control systems. Among others operational conditions of PLC control systems (multiple controllers), possible solutions, and communication implementation. Getting to know the communication protocols and interfaces commonly used in industry. Within the course it is in automated systems, special attention is paid to discussing the application possibilities of sensors and actuators to include operational principles and features. In addition, the process of constructing and designing a process algorithm is discussed based on a known task. Finally, determining the possible connection points of the system elements (people, machines, identification, and quality control) completes the discussed fields.

15. Description of practices

16. Description of laboratory practices
    Demonstration of sensors, actuators in an automated demonstrational systems built in the laboratory of the department, recording of sensor characteristics under laboratory conditions. Testing network data communication methods and performing complex management tasks of automated demonstrational systems built in the laboratory of the department.

17. Learning outcomes

   a) Knowledge:
      - Knowledge of system components in logistics systems control.
      - Knowledge of system control architectures of logistics systems control.

   b) Skills:
      - Ability to apply the above knowledge and related professional knowledge in the design of new equipment / components.

   c) Attitude:
      - Strives to provide with the best knowledge and skills to work with the instructors.

   d) Autonomy and responsibility:
      - In the use of the acquired knowledge the student carries out independent, responsible engineering work.

18. Requirements, way to determine a grade (obtain a signature)
    The end semester signature depends on the submission of the satisfactory home assignments, satisfactory midterm test and the acceptance of the lab records. The final grade is calculated as: 20% - midterm test, 15-15% of the homeworks and 50% of the written exam, which can be corrected orally by the students if necessary.

19. Retake and delayed completion
    The homeworks' final submission and the midterm test both can be resubmitted once.

20. Learning materials
    Students can download the subject notes in pdf format via Moodle.
1. **Subject name**
   Construction of logistics machinery

2. **Subject name in Hungarian**
   Logisztikai gépek tervezése

3. **Role**
   sp

4. **Code**
   KOALM324

5. **Evaluation type**
   e

6. **Credits**
   3

7. **Weekly contact hours**
   2 lecture 1 practice 0 lab

8. **Curriculum**
   L

9. **Working hours for fulfilling the requirements of the subject**
   90 hours

<table>
<thead>
<tr>
<th>Contact hours</th>
<th>Preparation for seminars</th>
<th>Homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>42 hours</td>
<td>8 hours</td>
<td>9 hours</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reading written materials</th>
<th>Midterm preparation</th>
<th>Exam preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 hours</td>
<td>6 hours</td>
<td>15 hours</td>
</tr>
</tbody>
</table>

10. **Department**
    Department of Material Handling and Logistics Systems

11. **Responsible lecturer**
    Dr. Bohács Gábor

12. **Lecturers**
    Odonics Boglárka, Győrváry Zsolt

13. **Prerequisites**
    ( )
    ( )
    (-)

14. **Description of lectures**

15. **Description of practices**
    During the practices examples related to the learnt machines and systems are presented and discussed.

16. **Description of laboratory practices**
    -

17. **Learning outcomes**
    a) **Knowledge:**
       - Knowledge of equipment that makes up logistics systems.
       - Knowledge of equipment design relationships.
    b) **Skills:**
       - Ability to apply the above knowledge and related professional knowledge in the design of new equipment / components.
    c) **Attitude:**
       - Strives to provide with the best knowledge and skills to work with the instructors.
    d) **Autonomy and responsibility:**
       - In the use of the acquired knowledge the student carries out independent, responsible engineering work.

18. **Requirements, way to determine a grade (obtain a signature)**
    The requirement of the signature is to fulfill the homework and one midterm test. The homework (30%), the test (20%) and the exam result (50%) are included in the final grade.

19. **Retake and delayed completion**
    The homework's final submission and the midterm test can both be resubmitted once each.

20. **Learning materials**
    Students can download the subject notes in pdf format via Moodle.
1. Subject name | Control of transport logistics
2. Subject name in Hungarian | Szállításirányítás
3. Role | sp
4. Code | KOALM341
5. Evaluation type | e
6. Credits | 3
7. Weekly contact hours | 2 lecture 0 practice 1 lab
8. Curriculum | L
9. Working hours for fulfilling the requirements of the subject | 90 hours
   Contact hours | 42 hours
   Preparation for seminars | 0 hours
   Homework | 29 hours
   Reading written materials | 0 hours
   Midterm preparation | 0 hours
   Exam preparation | 19 hours
10. Department | Department of Material Handling and Logistics Systems
11. Responsible lecturer | Dr. Kovács Gábor
12. Lecturers | Dr. Kovács Gábor, Bakos András
13. Prerequisites | (-); (+); (-)
14. Description of lectures
15. Description of practices
16. Description of laboratory practices
   Practicing the algorithmizing of mathematical modeling methods used in operational route planning through small tasks. Practicing route planning software. Preparing the homework.
17. Learning outcomes
   a) Knowledge:
      - Knowledge of GIS basics.
      - Knowledge of relevant graph theory basics.
      - Knowledge of TSP and VRP problems and methods of solving them.
      - Knowledge of transport management information systems.
   b) Skills:
      - Able to identify transport modeling problems and model them.
      - Able to solve the emerging transport management tasks by selecting and applying appropriate solution methods and tools.
   c) Attitude:
      - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.
   d) Autonomy and responsibility:
      - Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.
18. Requirements, way to determine a grade (obtain a signature)
   1 homework (weights: 25% for the part-performance check, 25% for the final submission) of each at least 50% performance is the condition of signature, exam (weight: 50%)
19. Retake and delayed completion
   The part-performance check and the final submission can both be resubmitted once.
20. Learning materials
   Students can download the subject notes in pdf format via Moodle.
1. Subject name | Control theory

2. Subject name in Hungarian | Irányításelmélet ML

3. Role | mc

4. Code | KOKAM122

5. Evaluation type | m

6. Credits | 5

7. Weekly contact hours | 2 lecture, 1 practice, 1 lab

8. Curriculum | L

9. Working hours for fulfilling the requirements of the subject | 150 hours

Contact hours | 56 hours
Preparation for seminars | 15 hours
Reading written materials | 52 hours
Midterm preparation | 27 hours

10. Department | Department of Control for Transportation and Vehicle Systems

11. Responsible lecturer | Dr. Gáspár Péter

12. Lecturers | Dr. Gáspár Péter

13. Prerequisites | - (-); (+); (-)

14. Description of lectures

15. Description of practices
Implementation of the methods learned during the lectures.

16. Description of laboratory practices
Implementation of the methods learned during the lectures.

17. Learning outcomes

a) Knowledge:
- Knows the basic dynamic system modeling paradigms, their mathematical background.
- Knows the time and frequency range description of linear time-variant systems.
- Knows the principles of regulation, their quantitative and qualitative criteria.
- Is familiar with various simple feedback control methods.
- Knows the basics of modern control theory, the principles of quadratic regulation. Knows the methods of filter design.

b) Skills:
- Capable of modeling of a specified system.
- Is able to independently design a specific system model.
- Is able to apply the estimation design methods independently.
- Is able to handle the most common control design softwares.

b) Attitude:
- Is interested in a mathematical solution to control problems.
- Endeavor to effectively apply the word technology knowledge through practical problems. Acquires system-level thinking.

d) Autonomy and responsibility:
- Can independently provide quality and quantity parameters for a system’s performance, enabling them to make decisions about system redesign.
- Can independently describe a particular system, use the appropriate mathematical formalisms.
- Is able to make decisions on the appropriate methods of solving the control task.

18. Requirements, way to determine a grade (obtain a signature)
Two midsemester exams, which are the prerequisite of the midterm grade. The final grade depends on the results of midsemester exams (with 50-50% weight).

19. Retake and delayed completion
Both midterm exams can be retried once.

20. Learning materials
Lecture Notes, Kailath: Linear Systems, Prentice Hall
### Subject description

<table>
<thead>
<tr>
<th>1. Subject name</th>
<th>Demand planning and inventory management</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Subject name in Hungarian</td>
<td>Kereslet és készlettervezés</td>
</tr>
<tr>
<td>3. Role</td>
<td>sp</td>
</tr>
<tr>
<td>4. Code</td>
<td>KOALM328</td>
</tr>
<tr>
<td>5. Evaluation type</td>
<td>e</td>
</tr>
<tr>
<td>6. Credits</td>
<td>5</td>
</tr>
<tr>
<td>7. Weekly contact hours</td>
<td>2 lecture 1 practice 1 lab</td>
</tr>
<tr>
<td>8. Curriculum</td>
<td>L</td>
</tr>
<tr>
<td>9. Working hours for fulfilling the requirements of the subject</td>
<td>150 hours</td>
</tr>
<tr>
<td>Contact hours</td>
<td>56 hours</td>
</tr>
<tr>
<td>Preparation for seminars</td>
<td>15 hours</td>
</tr>
<tr>
<td>Homework</td>
<td>40 hours</td>
</tr>
<tr>
<td>Reading written materials</td>
<td>18 hours</td>
</tr>
<tr>
<td>Midterm preparation</td>
<td>6 hours</td>
</tr>
<tr>
<td>Exam preparation</td>
<td>15 hours</td>
</tr>
<tr>
<td>10. Department</td>
<td>Department of Material Handling and Logistics Systems</td>
</tr>
<tr>
<td>11. Responsible lecturer</td>
<td>Dr. Bóna Krisztián</td>
</tr>
<tr>
<td>12. Lecturers</td>
<td>Dr. Bóna Krisztián, Sárdi Dávid</td>
</tr>
<tr>
<td>13. Prerequisites</td>
<td>-; ;</td>
</tr>
<tr>
<td>14. Description of lectures</td>
<td>The basic process of the demand planning. Defining and classification of the main input data of the demand planning, the data mining and the data preprocessing task. Mathematical modeling possibilities in the demand planning process. The statistical identification of the suitable mathematical models for the forecasting, the detection of the main statistical properties of the time series, identification of the trend process and the seasonality. Application of the identified forecasting models, parameter optimisation and prediction of the time series. The importance and several methods of the fine tuning in the demand planning. The key performance indicators of the demand planning. The necessary input data set of the inventory planning, data preprocessing. The definition and application of the inventory control systems. Mathematical modeling possibilities in the inventory planning process. Application of statistical methods and simulation tools for the investigation of the inventory processes. The interpretation of the specific costs, the service level and the reliability in the inventory planning. Defining and application of the deterministic and stochastic inventory models. Selecting of suitable inventory models for the implementation, optimisation of inventory control parameters, integration of the results into the inventory control systems. Measurement of demand and inventory planning efficiency. Specific planning tools regarding to the demand and inventory planning in the ERP systems. Specific resource planning areas in the enterprise logistics, the sales and operations planning process. The role of inventory and demand planning in the S&amp;OP process.</td>
</tr>
<tr>
<td>15. Description of practices</td>
<td>Practicing the demand and inventory planning techniques where presented in the lectures, through numerical examples. Preparation of homework.</td>
</tr>
<tr>
<td>16. Description of laboratory practices</td>
<td>Realization of demand and inventory planning examples within a computer lab.</td>
</tr>
</tbody>
</table>
| 17. Learning outcomes | a) Knowledge:  
- Knowledge of statistical methods for logistics time series investigation and knowledge of specific distribution types.  
- Knowledge of data preparation steps, data cleansing and aggregation techniques.  
- Knowledge of time series specific correlation functions.  
- Knowledge of forecasting models and parameter optimisation techniques.  
- The student knows the method of model selection by calculating specific errors.  
- The student knows the particularity of deterministic inventory models, has knowledge of building deterministic inventory models.  
- Knowledge of stochastic inventory models and optimal parameter calculation.  
  
  b) Skills:  
- Can apply the demand and inventory planning process in modelling approach.  
- Ability of recognition the connection between demand and inventory models, ability of building process structure.  
- The student is capable creating forecasts with know models, has knowledge of parameter optimisation.  
- The student is capable to create deterministic cost models independently.  
- Ability of application deterministic inventory models, calculation optimal parameters.  
- Ability of application stochastic inventory models, calculation optimal parameters.  
  
  c) Attitude:  
- Student is opened to use math and information technology tools.  
- Endeavor to understand and routinely use the methodology and tools required to solve the problems.  
  
  d) Autonomy and responsibility:  
- Makes responsible and independent suggestions for planning problems.  
- Takes responsibilities for the consequences of decisions made during the planning process. |
18. Requirements, way to determine a grade (obtain a signature)

The requirement of the signature is to fulfill the homework and one midterm test. The homework (20%), the test (30%) and the exam result (50%) are included in the final grade.

19. Retake and delayed completion

The test can be retake one time until the last day of the semester. At the delayed submission period only the test or the homework can be perform.

20. Learning materials

Students can download the learning materials in pdf format from Moodle.
Subject description

1. Subject name **Enterprise logistics project 1**

2. Subject name in Hungarian **Vállalati logisztikai projekt 1**

3. Role sp

4. Code KOALM344

5. Evaluation type m

6. Credits 7

7. Weekly contact hours 0 lecture 7 practice 0 lab

8. Curriculum L

9. Working hours for fulfilling the requirements of the subject 210 hours

<table>
<thead>
<tr>
<th>Contact hours</th>
<th>Preparation for seminars</th>
<th>Reading written materials</th>
<th>Midterm preparation</th>
<th>Homework</th>
<th>Exam preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>98 hours</td>
<td>28 hours</td>
<td>14 hours</td>
<td>0 hours</td>
<td>70 hours</td>
<td>0 hours</td>
</tr>
</tbody>
</table>

10. Department Department of Material Handling and Logistics Systems

11. Responsible lecturer Bakos András

12. Lecturers Bakos András

13. Prerequisites -

14. Description of lectures -

15. Description of practices

Within the framework of the course, project groups can be formed from the students. The students or the groups are led by mentors. The project topics may include: operations management, complex project tasks, R&D tasks, based on the interests of student’s.

16. Description of laboratory practices -

17. Learning outcomes

a) Knowledge:
   - Knowledge of logistics related topic so a choice can be made for elaborating one.
   - Knowledge of the chosen logistics topic by quantitative and qualitative indicators.
   - Knowledge of research basics.
   - Knowledge of project management skills.

b) Skills:
   - Able to process a selected logistics topic individually and in a group.
   - Able to get to know the chosen logistics topic, critically evaluate it and find the gaps.
   - Able to identify future development and research directions in the selected logistics topic.
   - Able to use project management skills in a groupwork.

c) Attitude:
   - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

d) Autonomy and responsibility:
   - Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

18. Requirements, way to determine a grade (obtain a signature)

5 part-performance checks to the mentor (10-10%), 1 documentation (30%), 1 presentation (20%).

19. Retake and delayed completion

The documentation can be resubmitted once and the presentation can be reheld once. The part-performance checks cannot be retaken.

20. Learning materials

Related national and international scientific literature.
1. Subject name | Enterprise logistics project 2
2. Subject name in Hungarian | Vállalati logisztikai projekt 2
3. Role | sp
4. Code | KOALM345
5. Evaluation type | m
6. Credits | 4
7. Weekly contact hours | Lecture: 0, Practice: 4, Lab: 0
8. Curriculum | L
9. Working hours for fulfilling the requirements of the subject | 120 hours
  | Contact hours | 56 hours | Preparation for seminars | 16 hours | Homework | 40 hours
  | Reading written materials | 8 hours | Midterm preparation | 0 hours | Exam preparation | 0 hours
10. Department | Department of Material Handling and Logistics Systems
11. Responsible lecturer | Bakos András
12. Lecturers | Bakos András
13. Prerequisites | Enterprise logistics project 1 (KOALM344), strong;
  | - (-); (-)
14. Description of lectures
15. Description of practices
As the continuation of the Enterprise logistics project, the students or project groups get operations management tasks, complex project tasks or R&D tasks, based on the interests of student’s. The task can be the continuation of what are launched in Enterprise logistics project, however, a new task also can be started. During the contact hours, the students consult with their mentors, moreover, each week brief report is held. The students present the problems and the suggested solutions, they practice the techniques of discussion, argumentation, and persuasion. The primary objective of the course is to continue, explain and apply (in lieu of this, to start a new) topic that started in Enterprise Logistics Project 1 for a logistics problem. In the exercises, project-centered consultation, reporting and ongoing evaluation of their work are carried out with students.
16. Description of laboratory practices
17. Learning outcomes
a) Knowledge:
   - Knowledge of logistics topic so a choice can be made for elaborating one.
   - Knowledge of the chosen logistics related topic.
b) Skills:
   - Able to get acquainted with the chosen topic and its literature.
   - Able to further the chosen topic, apply research and development on it.
c) Attitude:
   - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.
d) Autonomy and responsibility:
   - Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.
18. Requirements, way to determine a grade (obtain a signature)
2 part-performance checks to the mentor (25-25%), 1 documentation (30%), 1 presentation (20%).
19. Retake and delayed completion
The documentation can be resubmitted once and the presentation can be reheld once. The part-performance checks cannot be retaken.
20. Learning materials
Related national and international scientific literature.
1. Subject name
Forwarding Management 1

2. Subject name in Hungarian
Szállítmányozási menedzsment 1

3. Role
sp

4. Code
KOKKM132

5. Evaluation type
e

6. Credits
5

7. Weekly contact hours
2 lecture 2 practice 0 lab

8. Curriculum
KL

9. Working hours for fulfilling the requirements of the subject
Contact hours 56 hours
Preparation for seminars 8 hours
Homework 30 hours
Reading written materials 24 hours
Midterm preparation 12 hours
Exam preparation 20 hours

10. Department
Department of Transport Technology and Economics

11. Responsible lecturer
Dr. Mészáros Ferenc

12. Lecturers
Dr. Mészáros Ferenc, Dr. Duleba Szabolcs

13. Prerequisites
- (-);
- (+);
- (-)

14. Description of lectures

15. Description of practices
Students prepare and submit case study reports on current freight forwarding topics.

16. Description of laboratory practices
-

17. Learning outcomes
a) Knowledge:
  – The student is familiar with the basic legal system of freight forwarding.
b) Skills:
  – The student is able to recognize and apply the legal rules for freight forwarding tasks.
c) Attitude:
  – The student strives for completeness in the acquisition of knowledge, co-operates with the teacher and other students, is open towards new and innovative ideas, researches, and uses information technology and computing tools for its work.
d) Autonomy and responsibility:
  – The student is sensitive towards the environmental and social aspects of freight forwarding, asks for professional opinions of others, makes responsible decisions in organising the freight forwarding tasks, manages the challenges responsibly.

18. Requirements, way to determine a grade (obtain a signature)
Requirements for signature: fulfilment of the two midterms, report and submission (in approx. 10 pages) of a special topic within freight forwarding. There is a verbal examination at the end of the semester. Weights of requirements in final mark: reporting activity (20%), average of midterms (30%), verbal examination (50%).

19. Retake and delayed completion
There are retakes from 1st and 2nd midterms, the written report can be delayed completed and presented till end of delayed completion period.

20. Learning materials
1. Subject name | **Forwarding Management 2**

2. Subject name in Hungarian | Szállítmányozási menedzsment 2

3. Role | sp

4. Code | KOKKM133

5. Evaluation type | e

6. Credits | 5

7. Weekly contact hours | 3 lecture | 1 practice | 1 lab

8. Curriculum | KL

9. Working hours for fulfilling the requirements of the subject | 150 hours

| Contact hours | 70 hours | Preparation for seminars | 12 hours | Homework | 30 hours
| Reading written materials | 6 hours | Midterm preparation | 12 hours | Exam preparation | 20 hours

10. Department | Department of Transport Technology and Economics

11. Responsible lecturer | Dr. Mészáros Ferenc

12. Lecturer | Dr. Mészáros Ferenc, Dr. Duleba Szabolcs

13. Prerequisites | Forwarding Management 1 (KOKKM132), strong:

14. Description of lectures


15. Description of practices

Students prepare and submit case study reports on current freight forwarding topics.

16. Description of laboratory practices

Calculation tasks for the individual case studies.

17. Learning outcomes

a) Knowledge:
   – The student is familiar with the mode-specific legal system of freight forwarding.

b) Skills:
   – The student is able to recognize and apply the mode-specific legal rules for freight forwarding tasks.

18. Requirements, way to determine a grade (obtain a signature)

Requirements for signature: fulfilment of the two midterms, report and submission (in approx. 10 pages) of a special topic within freight forwarding. There is a verbal examination at the end of the semester. Weights of requirements in final mark: reporting activity (20%), average of midterms (30%), verbal examination (50%).

19. Retake and delayed completion

There are retakes from 1st and 2nd midterms, the written report can be delayed completed and presented till end of delayed completion period.

20. Learning materials

Subject description

1. Subject name: Forwarding marketing

2. Subject name in Hungarian: Szállítmányozási marketing

3. Role: sp

4. Code: KOKKM135

5. Evaluation type: m

6. Credits: 4

7. Weekly contact hours: 1 lecture, 0 practice, 2 lab

8. Curriculum: KL

9. Working hours for fulfilling the requirements of the subject: 120 hours

   - Contact hours: 42 hours
   - Preparation for seminars: 16 hours
   - Reading written materials: 36 hours
   - Midterm preparation: 6 hours
   - Homework: 20 hours

10. Department: Department of Transport Technology and Economics

11. Responsible lecturer: Dr. Kővári Botond

12. Lecturers: Dr. Kővári Botond

13. Prerequisites: - (;); (+); (-)


15. Description of practices:

16. Description of laboratory practices:

17. Learning outcomes:

   a) Knowledge:
   - Familiar with marketing strategy of a company, business plan.

   b) Skills:
   - Ability to analyse a market, make a product mix analysis.

   c) Attitude:
   - Strive to acquire the highest level of system approach.

   d) Autonomy and responsibility:
   - Responsible applies of acquired knowledge in individual or in team work.

18. Requirements, way to determine a grade (obtain a signature):

   Requirements for the midterm mark: fulfilment of one midterm test, report and submission (in approx. 10 pages) of a special topic within business planning. Weights of requirements in final mark: midterm test (60%), report and submission (40%).

19. Retake and delayed completion:

   Second test possibility for those not present on the test, possibility of delayed deadline for homework.

20. Learning materials:

   Suggested books and papers.
Subject description

1. Subject name

**Forwarding project 1**

2. Subject name in Hungarian

Szállítmányozási projekt 1

3. Role

sp

4. Code

KOKKM338

5. Evaluation type

m

6. Credits

4

7. Weekly contact hours

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Practice</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

8. Curriculum

L

9. Working hours for fulfilling the requirements of the subject

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact hours</td>
<td>42</td>
</tr>
<tr>
<td>Preparation for seminars</td>
<td>0</td>
</tr>
<tr>
<td>Homework</td>
<td>42</td>
</tr>
<tr>
<td>Midterm preparation</td>
<td>0</td>
</tr>
<tr>
<td>Exam preparation</td>
<td>0</td>
</tr>
</tbody>
</table>

10. Department

Department of Transport Technology and Economics

11. Responsible lecturer

Dr. Török Ádám

12. Lecturers

Dr. Török Ádám

13. Prerequisites

- (-);
- (+);
- (-)

14. Description of lectures

- 

15. Description of practices

Recognition and identification of problems of freight forwarding companies through programming examples. Collecting and solving practical problems in logistics using programming methods. Separate preparation and presentation of sample tasks related to business organization problems using presentation techniques. Get to know new and innovative ideas and research.

16. Description of laboratory practices

- 

17. Learning outcomes

a) Knowledge: p

- Problematic and modeling of freight forwarding companies.

b) Skills:

- Collecting and solving problems with programming methods.

c) Attitude:

- Getting to know new and innovative ideas and research.

d) Autonomy and responsibility:

- Self-discovery of business organization problems.

18. Requirements, way to determine a grade (obtain a signature)

During the semester 7 small tasks will be published and evaluated. The criterion for the completion of the subject is the acceptance of all small tasks. The semester mark is the average of the marks received for small tasks.

19. Retake and delayed completion

Three small tasks can be delayed completed.

20. Learning materials

Related national and international scientific literature.
## Subject description

<table>
<thead>
<tr>
<th>1. Subject name</th>
<th>Forwarding project 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Subject name in Hungarian</td>
<td>Szállítmányozási projekt 2</td>
</tr>
<tr>
<td>3. Role</td>
<td>sp</td>
</tr>
<tr>
<td>4. Code</td>
<td>KOKKM342</td>
</tr>
<tr>
<td>5. Evaluation type</td>
<td>m</td>
</tr>
<tr>
<td>6. Credits</td>
<td>2</td>
</tr>
<tr>
<td>7. Weekly contact hours</td>
<td>0 lecture 2 practice 0 lab</td>
</tr>
<tr>
<td>8. Curriculum</td>
<td>L</td>
</tr>
<tr>
<td>9. Working hours for fulfilling the requirements of the subject</td>
<td>60 hours</td>
</tr>
<tr>
<td>Contact hours</td>
<td>28 hours</td>
</tr>
<tr>
<td>Preparation for seminars</td>
<td>0 hours</td>
</tr>
<tr>
<td>Homework</td>
<td>28 hours</td>
</tr>
<tr>
<td>Reading written materials</td>
<td>4 hours</td>
</tr>
<tr>
<td>Midterm preparation</td>
<td>0 hours</td>
</tr>
<tr>
<td>Exam preparation</td>
<td>0 hours</td>
</tr>
<tr>
<td>10. Department</td>
<td>Department of Transport Technology and Economics</td>
</tr>
<tr>
<td>11. Responsible lecturer</td>
<td>Dr. Török Ádám</td>
</tr>
<tr>
<td>12. Lecturers</td>
<td>Dr. Török Ádám</td>
</tr>
<tr>
<td>13. Prerequisites</td>
<td>-; -; -; -;</td>
</tr>
<tr>
<td>14. Description of lectures</td>
<td></td>
</tr>
<tr>
<td>15. Description of practices</td>
<td>Recognition and identification of problems of freight forwarding companies through programming examples. Collecting and solving practical problems in logistics using programming methods. Separate preparation and presentation of sample tasks related to business organization problems using presentation techniques. Get to know new and innovative ideas and research.</td>
</tr>
<tr>
<td>16. Description of laboratory practices</td>
<td></td>
</tr>
</tbody>
</table>
| 17. Learning outcomes | a) Knowledge:  
  - Problematic and modeling of freight forwarding companies.  
 b) Skills:  
  - Collecting and solving problems with programming methods.  
 c) Attitude:  
  - Getting to know new and innovative ideas and research.  
 d) Autonomy and responsibility:  
  - Self-discovery of business organization problems. |
| 18. Requirements, way to determine a grade (obtain a signature) | During the semester 7 small tasks will be published and evaluated. The criterion for the completion of the subject is the acceptance of all small tasks. The semester mark is the average of the marks received for small tasks. |
| 19. Retake and delayed completion | Three small tasks can be delayed completed. |
| 20. Learning materials | Related national and international scientific literature. |
1. Subject name Integrated material flow systems

2. Subject name in Hungarian Integrált anyagmozgató rendszerek

3. Role sp


7. Weekly contact hours 2 lecture 1 practice 0 lab 8. Curriculum L

9. Working hours for fulfilling the requirements of the subject 120 hours

Contact hours 42 hours Preparation for seminars 8 hours Homework 19 hours
Reading written materials 36 hours Midterm preparation 0 hours Exam preparation 15 hours

10. Department Department of Material Handling and Logistics Systems

11. Responsible lecturer Dr. Bohács Gábor

12. Lecturers Gáspár Dániel, Szabó Péter, Odonics Boglárka

13. Prerequisites -( ); -( ); -( )

14. Description of lectures
Basics of production automation. Basics and typical equipment of material handling. An overview of typical production system structures, a description of the construction of equipment relevant for material handling. Formulation of integrated material handling functions. Automation of integrated material handling systems. Application of robots for material handling tasks. Special grippers and sensors. In addition to the lectures, an excursion to relevant company will be organized.

15. Description of practices
During the practices examples related to the learnt machines and systems are presented and discussed.

16. Description of laboratory practices

17. Learning outcomes

a) Knowledge:
   - Knowledge of special integrated material handling systems.
   - Knowledge of the applicability of material handling components.

b) Skills:
   - He is able to assess solutions to a certain problem.
   - Capable of creating optimal structures from the assessed components.

c) Attitude:
   - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

d) Autonomy and responsibility:
   - Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

18. Requirements, way to determine a grade (obtain a signature)
Requirements of signature: 1 homework (25% for the part-performance check, 25% for the final submission). Exam (50%).

19. Retake and delayed completion
The part-performance check and the final submission can both be resubmitted once.

20. Learning materials
Students can download the subject notes in pdf format via Moodle.
1. Subject name: Lean management

2. Subject name in Hungarian: Lean menedzsment

3. Role: mc

4. Code: KOALM322

5. Evaluation type: m

6. Credits: 4

7. Weekly contact hours: 2 lecture, 1 practice, 0 lab

8. Curriculum: L

9. Working hours for fulfilling the requirements of the subject: 120 hours

   Contact hours: 42 hours
   Preparation for seminars: 8 hours
   Homework: 30 hours
   Reading written materials: 28 hours
   Midterm preparation: 12 hours
   Exam preparation: 0 hours

10. Department: Department of Material Handling and Logistics Systems

11. Responsible lecturer: Dr. Bóna Krisztián

12. Lecturers: Sztrapkovics Balázs

13. Prerequisites:

14. Description of lectures

Introducing the continuous improvement methods. Teamwork, the establishment of a suggestion system, the importance, and techniques of motivating the employee. Creativity techniques, advantages and disadvantages of each technique. Problem-finding tools, failure analysis methods application in practice, defining the required data for each method. The bases of standardization, the steps to implement standards in the company, PDCA and SDCA cycles. The zero failure concept. The elimination of the failures (Jidoka, Poka-Yoke). Production leveling methods in lean management, mathematical formulas to apply Heijunka in the production. Process improvement techniques, and methods, the schedule of the Kaizen events. The importance of the lead time, Value Stream mapping, element symbols and steps. The bases of ergonomy. The main ergonomy principles during cell designing. The methods of REBA analysis. Introducing Just in time and Just in Sequence methods, and its impacts to the supply chain. The main goal and principles of Six Sigma method, the mathematical and statistical background. The connection between lean and six sigma.

15. Description of practices

Application of the methods and techniques which was presented in the lecture. Introducing case studies, and also apply the methods during workshops. The preparation of the solution of the homework, consultations about the homework, and making the presenta

16. Description of laboratory practices

- 

17. Learning outcomes

a) Knowledge:
   - Overview Lean Tools, Techniques & House of Lean.
   - Knowledge of failure mode analysis and problem solving methods.
   - Knowledge of value stream mapping.
   - Knowledge of pull production material supply methods

b) Skills:
   - Analysis of the processes by lean tools.
   - Planning and developing pull based production systems
   - Application of complex quality management methods

c) Attitude:
   - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

18. Requirements, way to determine a grade (obtain a signature)

The requirement of the complete the subject is to fulfill the homework and two midterm test. The homework (20%), and the tests (40%-40%) are included in the final grade.

19. Retake and delayed completion

Each midterm test can be retaken once, or one of the tests can be retaken twice if the homework and the other test is OK.

20. Learning materials

Students can download the subject notes in pdf format via Moodle.
### Subject description

1. **Subject name** | Logistics controlling  
2. **Subject name in Hungarian** | Logisztikai kontrolling  
3. **Role** | mc  
4. **Code** | KOKKM330  
5. **Evaluation type** | m  
6. **Credits** | 3  
7. **Weekly contact hours** | 2 lecture 0 practice 0 lab  
8. **Credit** | L  
9. **Working hours for fulfilling the requirements of the subject** | 90 hours  
- **Contact hours** | 28 hours  
- **Preparation for seminars** | 8 hours  
- **Homework** | 12 hours  
- **Reading written materials** | 30 hours  
- **Midterm preparation** | 12 hours  
- **Exam preparation** | 0 hours  
10. **Department** | Department of Transport Technology and Economics  
11. **Responsible lecturer** | Dr. Duleba Szabolcs  
12. **Lecturers** | Dr. Duleba Szabolcs  
13. **Prerequisites** | -; 
-;  
14. **Description of lectures**  
Creating and applying operative and strategic models for corporate logistics. Determining factors of logistics activities and their financial and accounting impact on economic and technological processes of the company. Tracking performance throughout the company by identifying performance objects companied with their analysis. Measuring performance levels by KPI. Standard definition and data system along the logistics chain. Characteristics of the aggregated information evaluation and analysis. Within the frames of the subject, based on case studies and practical considerations, possible logistics objects are overviewed, moreover their possible measures are determined and thus the students are enabled to create a complex calculation model to cover financial and technological issues of the economics of the company. The subject also sheds light on the business analysis of the logistics or supply chain by general cost analysis and gross profit calculations of the product/service units of companies operating in arbitrary sectors. Moreover, based on the introduced controlling models, the students will be capable of analyzing the sources of profit and loss in the company applying logical reason-effect considerations.  
15. **Description of practices**  
-  
16. **Description of laboratory practices**  
-  
17. **Learning outcomes**  
**a) Knowledge:**  
- The student is familiar with the position and role of logistics controlling within the organisation.  
- Capable of identifying cost types, cost centres and cost objects as well as earning objects.  
- Making distinction between direct and indirect costs of logistics activities.  
- Familiar with the elements of strategic and operative logistics controlling.  
- Familiar with the objectives and tools of Balanced Score Card (BSC).  
- Knows the basic theory and prosecution of Activity Based Costing (ABC).  
- Familiar with the theory and practice of supply chain controlling.  
- Knows the difference of logistics controlling systems between the logistics service providers and the non-logistics specified companies and the different controlling mechanisms.  
**b) Skills:**  
- The student is capable of logistics controlling calculations based on data gained from the accounting system.  
- Of logistics efficiency calculations based on carried or measures technological data.  
- Of handling simultaneously technological and economic data.  
- Of executing unit cost and cost contribution calculations aiding strategic and operational decision making and economic analysis within the frames of the company.  
- Of creating and setting up a Balanced Score Card system in an arbitrary company.  
- Of Activity Based Costing calculations and analysis.  
- Of supporting outsourcing decision making by logistics controlling analysis.  
- Of supporting divesture decision by controlling calculations.  
- Of executing Business Process Reengineering (BPR) analysis both in theory and practice.  
- Of creating and controlling supply chain controlling systems and intervene if necessary.  
**c) Attitude:**  
- Strives to perform at his/her best by using all skills in order to execute his/her studies at the highest possible level and highest reachable quality, acquiring as much knowledge as possible.  
- During his/her studies he/she cooperates with the professor and with the fellow students.
d) Autonomy and responsibility:

- Continuously striving to enhance his/her knowledge also out of the frames of the lectures in order to expand and deepen the knowledge obtained in the classes.
- Strives to get familiar with the necessary tools and devices for solving the required tasks in the subject and applies them routinely.
- Strives the accurate, precise and flawless problem solving and calculation.

18. Requirements, way to determine a grade (obtain a signature)

2 midterm tests, 1 homework, 1 presentation. The final grade is the average of the two midterm tests, and the submission and presentation of the homework.

19. Retake and delayed completion

Midterm test correction possibility for those not present on one of the tests. Homework and presentation cannot be delayed completed.

20. Learning materials

Ppt. slides; Bokor Zoltán: Logisztikai rendszerek működtetése, Department publication.
Subject description

1. Subject name: Logistics information system planning

2. Subject name in Hungarian: Logisztikai információs rendszerek tervezése

3. Role: mc


5. Evaluation type: m

6. Credits: 5

7. Weekly contact hours: 2 lecture, 0 practice, 2 lab

8. Curriculum: L

9. Working hours for fulfilling the requirements of the subject: 150 hours

   Contact hours: 56 hours
   Preparation for seminars: 18 hours
   Midterm preparation: 12 hours
   Exam preparation: 0 hours

10. Department: Department of Material Handling and Logistics Systems

11. Responsible lecturer: Dr. Tokodi Jenő

12. Lecturers: Dr. Tokodi Jenő, Lénárt Balázs

13. Prerequisites: <();

14. Description of lectures


15. Description of practices

16. Description of laboratory practices


17. Learning outcomes

   a) Knowledge:
      - Knowledge of the structure and functions of ERP systems. Knowledge of the formats and protocols in enterprise data communication. Knowledge of the internet and representation of general logistics process procedures.
      - Knowledge of the BI reporting. Knowledge of the basic logistics transactions in user level.
      - Knowledge of runtime and development environment in ERP transactions.

   b) Skills:
      - Can design logistics IT systems application by the above mentioned knowledge and the additional professional knowledge.

   c) Attitude:
      - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

   d) Autonomy and responsibility:
      - Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

18. Requirements, way to determine a grade (obtain a signature)

   As homework: successful solving the SAP Learning HUB at least 3 test min. 50%, 2 pcs of midterm test (weight: 50% - 50%).

19. Retake and delayed completion

   1-1 repeat of midterm tests.

20. Learning materials

1. Subject name: Logistics planning softwares

2. Subject name in Hungarian: Szoftverek a logisztikai tervezésben

3. Role: mc

4. Code: KOALM336

5. Evaluation type: m

6. Credits: 3

7. Weekly contact hours:

   - Lecture: 0
   - Practice: 0
   - Lab: 2

8. Curriculum: L

9. Working hours for fulfilling the requirements of the subject: 90 hours

   - Contact hours: 28 hours
   - Preparation for seminars: 14 hours
   - Homework: 36 hours
   - Reading written materials: 12 hours
   - Midterm preparation: 0 hours
   - Exam preparation: 0 hours

10. Department: Department of Material Handling and Logistics Systems

11. Responsible lecturer: Dr. Tokodi Jenő

12. Lecturers:

   - Sztrapkovics Balázs

13. Prerequisites:

   - (-);
   - (+);
   - (-)

14. Description of lectures:

15. Description of practices:

16. Description of laboratory practices:

   The main groups of softwares which is used in logistics planning. Description of drawing software required for design. Presentation of softwares which supporting visualization and representation. Description of data analysis and table based applications. The main elements of logistics designing, and the standard symbols of them. Intoducing some project management supporting softwares. Practice the application of the described softwares through lesson exercises and the homeworks. The course is held in computer lab sessions.

17. Learning outcomes:

   a) Knowledge:
      - User level knowledge of process mapping softwares.
      - User level knowledge of data analysis softwares.
      - User level knowledge of designing softwares.

   b) Skills:
      - Knowledge of softwares required for logistics engineering work.

   c) Attitude:
      - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

   d) Autonomy and responsibility:
      - Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

18. Requirements, way to determine a grade (obtain a signature):

   Successful delivery of the two home assignments is required to complete the subject. The two home assignments (50-50%) are included in the final grade.

19. Retake and delayed completion:

   Both homeworks can be replaced once by the specified deadline.

20. Learning materials:

   Students can download the subject notes in pdf format via Moodle.
Subject description

1. Subject name
Mathematics ML

2. Subject name in Hungarian
Matematika M1 logisztikai mérnököknél

3. Role
mc

4. Code
TE90MX60

5. Evaluation type
e

6. Credits
5

7. Weekly contact hours
2 lecture 2 practice 0 lab

8. Curriculum
L

9. Working hours for fulfilling the requirements of the subject
150 hours

Contact hours 56 hours
Preparation for seminars 28 hours
Midterm preparation 4 hours

Reading written materials 37 hours

Homework 0 hours
Exam preparation 25 hours

10. Department
Institute of Mathematics

11. Responsible lecturer
Dr. Sági Gábor

12. Lecturers
Dr. Sági Gábor, Dr. Kiss Sándor

13. Prerequisites
- (+)
- (++)
- (+++)

14. Description of lectures

15. Description of practices
Application of theoretical knowledge through different tasks.

16. Description of laboratory practices

17. Learning outcomes

a) Knowledge:
- The student acquires the basics of graph theory and the theory of stochastic processes. Knows the basic concepts of these areas and the basic (mathematical) items related to them.
- Knows some of the methods of solving problems with graphical and stochastic processes inspired by applications.
- Is aware of the techniques associated with the computerization of these methods and their effectiveness and limits of applicability.

b) Skills:
- In the mathematical models he is familiar with, he can accurately orient and communicate with these models.
- Is able to get acquainted with similar models, problems and methods, which are known in the literature but are not included in the curriculum, with independent work.
- Some practical problems are able to create a graph theory or stochastic model. Recognizes that the problem (inspired by engineering practice) can be easily solved by the learned methods.
- Is able to formulate accurate questions in the field of graph theory and stochastic problems in the personal interest of IT and mathematical experts; is able to interpret the answers of these experts.

c) Attitude:
- Continuously cooperates with the instructor and actively participates in the processing of the study material.
- Open to mathematical modeling, precise, logical thinking.
- Seeks to synthesize the knowledge acquired during the course with the knowledge and competences of other subjects.
- Open for communication with other scientists (mathematicians, informatics).
- Strives for accurate, error-free task solving.

d) Autonomy and responsibility:
- Uses the learned methods independently.
18. Requirements, way to determine a grade (obtain a signature)

Requirements for signature: two successful midterm tests. The final grade is the result of the exam.

19. Retake and delayed completion

Both midterm exams can be retried once.

20. Learning materials

Katona Gyula., Recski András., Szabó Csaba., A számítástudomány alapjai (in Hungarian), Typotex Kft., 2002
Szász Gábor, Matematika III (in Hungarian), Tankönyvkiadó, Budapest, 1989
Michelberger Pál, Szeidl László, Várlaki Péter, Alkalmazott folyamatstatis
1. Subject name: Numerical optimization

2. Subject name in Hungarian: Numerikus optimalizálás

3. Role: mc

4. Code: KOVRM334

5. Evaluation type: e

6. Credits: 5

7. Weekly contact hours: 3 lecture, 0 practice, 1 lab

8. Curriculum: L

9. Working hours for fulfilling the requirements of the subject: 150 hours

   Contact hours: 56 hours
   Preparation for seminars: 13 hours
   Homework: 28 hours
   Midterm preparation: 0 hours
   Exam preparation: 15 hours

10. Department: Department of Aeronautics, Naval Architecture and Railway Vehicles

11. Responsible lecturer: Dr. Rohäcs József

12. Lecturers: Dr. Bicsák György

13. Prerequisites: 

14. Description of lectures


15. Description of practices

16. Description of laboratory practices

   MATLAB application of the introduced methods.

17. Learning outcomes

   a) Knowledge:
      - Knowing the fundamentals of numerical approximation methods used in engineering instead of analytic algorithms.
      - Knowing to find and apply the most suitable numerical method for a certain problem.
   b) Skills:
      - Can implement different algorithms to a programming language and to find the best approximation method for a given mathematical problem.
   c) Attitude:
      - Interested, responsive.
   d) Autonomy and responsibility:
      - Can work individually and in teamwork.

18. Requirements, way to determine a grade (obtain a signature)

   2 midterm exams from the theoretical part, 50 points / exam. 1 project work for a group of 4-5 students, for n*100 points (n is the number of students). The points can be divided between the group members according to their wish. Grade calculation: summing all the points, the total points gives the final grade as follows:
   - 0 – 79 - 1;
   - 80 – 109 - 2;
   - 110 – 139 - 3;
19. Retake and delayed completion

Because of the point-collection system, no minimum points are determined for the midterm exams or for the project work. The retake possibilities are the following: on the replacement week the 1st midterm exam, or the 2nd midterm exam can be tried again for 50 points, or a combined 1st+2nd midterm exam retake for 100 points.

20. Learning materials

Examples, documents and training materials, given out during lectures, presentations.

György Bicsák, Dávid Szilvács, Aaron Latty: Numerical Methods


1. Subject name: Planning of extra-logistics networks

2. Subject name in Hungarian: Extralogisztikai rendszerek tervezése

3. Role: mc

4. Code: KOALM337

5. Evaluation type: m

6. Credits: 4

7. Weekly contact hours: 2 lecture, 1 practice, 0 lab

8. Curriculum: L

9. Working hours for fulfilling the requirements of the subject: 120 hours

- Contact hours: 42 hours
- Preparation for seminars: 0 hours
- Homework: 44 hours

- Reading written materials: 0 hours
- Midterm preparation: 34 hours
- Exam preparation: 0 hours

10. Department: Department of Material Handling and Logistics Systems

11. Responsible lecturer: Dr. Kovács Gábor

12. Lecturers: Dr. Kovács Gábor, Bakos András

13. Prerequisites: -

14. Description of lectures


15. Description of practices

Application of the modeling, network planning tool described in the lectures through practical examples, and preparation of the solution of the homework.

16. Description of laboratory practices

- 17. Learning outcomes

a) Knowledge:
   - Knowledge of network planning and network assessment basics.
   - Knowledge of the assignment / distribution problem and how to solve it.
   - Knowledge of centre searching problems and solutions.
   - Knowledge of network optimization at the strategic level.

b) Skills:
   - Ability to evaluate logistics networks.
   - Able to strategically optimize logistics networks.

c) Attitude:
   - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

d) Autonomy and responsibility:
   - Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

18. Requirements, way to determine a grade (obtain a signature)

1 homework (weights: 25% for the part-performance check, 25% for the final submission), 2 tests (weights: 25-25%).

19. Retake and delayed completion

The part-performance check and the final submission can both be resubmitted once. Both tests can be retaken once.

20. Learning materials

Students can download the subject notes in pdf format via Moodle.
## Subject description

**1. Subject name**
Planning of plant logistics systems

**2. Subject name in Hungarian**
Üzemi logisztikai rendszerek tervezése

**3. Role**
mc

**4. Code**
KOALM327

**5. Evaluation type**
e

**6. Credits**
5

**7. Weekly contact hours**
2 lecture, 2 practice, 0 lab

**8. Curriculum**
L

**9. Working hours for fulfilling the requirements of the subject**
150 hours

<table>
<thead>
<tr>
<th>Contact hours</th>
<th>Preparation for seminars</th>
<th>Homework</th>
<th>Exam preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>56 hours</td>
<td>12 hours</td>
<td>40 hours</td>
<td>20 hours</td>
</tr>
</tbody>
</table>

**10. Department**
Department of Material Handling and Logistics Systems

**11. Responsible lecturer**
Dr. Bóna Krisztián

**12. Lecturers**
Dr. Bóna Krisztián, Bertalan Marcell

**13. Prerequisites**
Process planning (KOALM331), strong;
Logistics planning softwares (KOALM336), strong;
Simulations planning (KOALM335), weak

**14. Description of lectures**
The specific properties and planning process of intralogistics systems in case of plant facilities. The main steps and tasks of intralogistics planning. How to create a logistics system plan in case of a plant logistics system. The facility layout planning techniques and methods, the systematic facility layout planning. The applied specific facility layout topologies and the mathematical modelling approaches of the theoretical facility layout planning problems. The models of the value creating objects, modelling the single, workshop, group and line based intralogistics networks, supporting the decisions regarding to the spatial layout. Choosing the theoretical layout planning models regarding to the previous decided spatial layouts. Defining the linear and the quadratic facility layout planning problems. The main heuristic and optimization methods and algorithms for solving the linear and quadratic facility layout planning problems. Defining the main steps of the detailed facility layout design. The material flow system architecture in a plant. The planning steps of the material flow systems in a plant. The methodology of material flow system planning, the main heuristic and optimization models. Analytical queueing theory models and simulation methods in the planning of facility logistics systems. Specific system planning and sizing task regarding to the application of the continuous and discontinuous operated material handling machines. Integration of the basic arguments of lean philosophy in the planning process.

**15. Description of practices**
Practical application of the planning techniques and methods presented on the lectures through a complex facility layout planning homework, preparation of the individual facility layout planning tasks.

**16. Description of laboratory practices**

**17. Learning outcomes**

**a) Knowledge:**
- Knowledge of the planning process and specialties in the development of the intralogistics system.
- Knowledge of the main KPIs of the intralogistics system.
- Knowledge of the individual, linear, group-based, and workshop-based topologies and models.
- The student has comprehensive knowledge of the approximation and optimization methods for solving linear and quadratic layout planning tasks.
- Knowledge of the detailed plant layout planning methodologies.
- The student knows the application of the analytical queueing models that can be used in material flow system planning.
- Knowledge of the specific system planning and system sizing methods that can be used in material flow systems.
- Knowledge of the application of lean philosophy that can be used in the planning processes.

**b) Skills:**
- Can apply the modelling approach.
- Can interpret the intralogistics network of the production objects.
- Can decide the right topology of the objects and able to select the theoretical layout planning method for this topology.
- Can apply the approximation and optimization methods of the linear and quadratic layout planning tasks.
- The student is capable of modeling material flow systems using analytical queueing theory.
- Able to use simulation systems and models in planning material flow systems.

**c) Attitude:**
- Student is opened to use math and information technology tools.
- Endeavor to understand and routinely use the methodology and tools required to solve the problems.

**d) Autonomy and responsibility:**
- Makes responsible and independent suggestions for planning problems.
- Take responsibilities for the consequences of decisions made during the planning process.
18. Requirements, way to determine a grade (obtain a signature)

The requirement of the signature is to fulfill the homework and one midterm test. The homework (30%), the test (20%) and the exam result (50%) are included in the final grade.

19. Retake and delayed completion

The midterm test, the part-performance check and the final submission can both be resubmitted once.

20. Learning materials

Students can download the subject notes in pdf format via Moodle.
1. Subject name

Planning of warehousing systems

2. Subject name in Hungarian

Raktározási rendszerek tervezése

3. Role

mc

4. Code

KOALM323

5. Evaluation type

e

6. Credits

5

7. Weekly contact hours

2 lecture 2 practice 0 lab

8. Curriculum

L

9. Working hours for fulfilling the requirements of the subject

<table>
<thead>
<tr>
<th>Contact hours</th>
<th>Preparation for seminars</th>
<th>Homework</th>
<th>Homework preparation</th>
<th>Exam preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>56 hours</td>
<td>12 hours</td>
<td>40 hours</td>
<td>6 hours</td>
<td>20 hours</td>
</tr>
</tbody>
</table>

10. Department

Department of Material Handling and Logistics Systems

11. Responsible lecturer

Dr. Bóna Krisztián

12. Lecturers

Dr. Bóna Krisztián, Sztrapkovics Balázs, Puskás Eszter

13. Prerequisites

Process planning (KOALM331), strong;
Logistics planning softwares (KOALM336), strong;
Simulations planning (KOALM335), weak

14. Description of lectures

The main material flows and processes in a warehouse. Specific logistics system planning methodology of warehousing systems. The typical logistics technology variations of storing. Planning of transporting connections and loading technology. Planning the dimensions of loading bays, and the goods preparation areas of warehouses. The order picking methods and systems. The technology of order picking. Planning of the order picking process. Planning the topology and layout of storage systems in case of a traditional warehousing system. Planning the topology and layout of storage systems in case of a very-narrow-aisle (VNA) system. The sizing tasks regarding to the applied storage equipments. How to create a logistics system plan of a warehousing technology.

15. Description of practices

Description of the practical task of planning a manual, material handling machine supported and a high bay warehousing system including the operational areas.

16. Description of laboratory practices

-

17. Learning outcomes

a) Knowledge:
   - Knowledge of the loading processes, and specific form of the transportation connections.
   - Knowledge of the goods preparation processes and technologies.
   - Knowledge of the storage technologies.
   - Knowledge of the packet goods based warehousing systems.
   - Knowledge of the system sizing methodologies.
   - Knowledge of order picking methods, aspects of choosing optimal order picking method.

b) Skills:
   - Can design warehousing systems application by the above mentioned knowledge and the additional professional knowledge.

c) Attitude:
   - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

d) Autonomy and responsibility:
   - Takes responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

18. Requirements, way to determine a grade (obtain a signature)

The requirement of the signature is to fulfill the homework and one midterm test. The homework (30%), the test (20%) and the exam result (50%) are included in the final grade.

19. Retake and delayed completion

The midterm test, the part-performance check and the final submission can both be resubmitted once.

20. Learning materials

Students can download the subject notes in pdf format via Moodle.
1. Subject name: Process planning

2. Subject name in Hungarian: Folyamattervezés

3. Role: mc

4. Code: KOALM331

5. Evaluation type: e

6. Credits: 3

7. Weekly contact hours: 2 lecture, 1 practice, 0 lab

8. Curriculum: L

9. Working hours for fulfilling the requirements of the subject: 90 hours

<table>
<thead>
<tr>
<th>Contact hours</th>
<th>Preparation for seminars</th>
<th>Homework</th>
<th>Midterm preparation</th>
<th>Exam preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>42 hours</td>
<td>0 hours</td>
<td>29 hours</td>
<td>19 hours</td>
<td></td>
</tr>
</tbody>
</table>

10. Department: Department of Material Handling and Logistics Systems

11. Responsible lecturer: Dr. Kovács Gábor

12. Lecturers: Dr. Kovács Gábor, Bakos András

13. Prerequisites: -; -; -

14. Description of lectures


15. Description of practices

Exercising process description languages (SOP, EPC, BPMN) and process planning techniques (BPR) through examples. Preparation of homework.

16. Description of laboratory practices

- 

17. Learning outcomes

a) Knowledge:
   - Knowledge of process modeling basics.
   - Knowledge of process descriptive languages.

b) skills:
   - Modeling processes with standard methods based on written and oral naive descriptions.
   - Able to detect process failures and re-design processes based on them.

c) attitude:
   - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

d) Autonomy and responsibility:
   - Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

18. Requirements, way to determine a grade (obtain a signature)

1 homework (weights: 25% for the part-performance check, 25% for the final submission) of each at least 50% performance is the condition of signature, exam (weight: 50%).

19. Retake and delayed completion

The part-performance check and the final submission can both be resubmitted once.

20. Learning materials

Students can download the subject notes in pdf format via Moodle.
1. Subject name  Production planning & scheduling

2. Subject name in Hungarian  Termelésprogramozás

3. Role  sp

4. Code  KOALM329

5. Evaluation type  e

6. Credits  4

7. Weekly contact hours  2 lecture  0 practice  1 lab

8. Curriculum  L

9. Working hours for fulfilling the requirements of the subject  120 hours

  - Contact hours: 42 hours
  - Preparation for seminars: 11 hours
  - Midterm preparation: 4 hours

  - Reading written materials: 23 hours
  - Homework: 30 hours
  - Exam preparation: 10 hours

10. Department  Department of Material Handling and Logistics Systems

11. Responsible lecturer  Dr. Tokodi Jenő

12. Lecturers  Dr. Tokodi Jenő, Nagyné Csóti Beáta

13. Prerequisites  Demand planning and inventory management (KOALM328), weak:

14. Description of lectures


15. Description of practices


16. Description of laboratory practices


17. Learning outcomes

a) Knowledge:
   - Knowledge of the procedure of creating a production plan.
   - Knowledge of the database of BOM list and routing.
   - Knowledge of the Gantt-diagram representation in practical circumstance.
   - Knowledge of the practical application of MS Project environment.
   - Knowledge of the linear nonlinear, complete programming tasks, dynamic algorithm of production programs in practical circumstance.
   - Knowledge of the MRP I.-II.-III. methodology.

b) Skills:
   - Can design IT systems of production application by the above mentioned knowledge and the additional professional knowledge.

c) Attitude:
   - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

d) Autonomy and responsibility:
   - Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

18. Requirements, way to determine a grade (obtain a signature)

For signature: successfull solving the SAP Learning HUB at least 4 test min. 50 %, 1 pcs of midterm test (20% weight), 1 pcs homework (30% weight), exam (50% weight).

19. Retake and delayed completion

1 retake of midterm test, home work closing 1 week later.

20. Learning materials

1. Subject name  
Simulations planning

2. Subject name in Hungarian  
Szimulációs tervezés

3. Role  
mc

4. Code  
KOALM335

5. Evaluation type  
m

6. Credits  
3

7. Weekly contact hours  
1 lecture  1 practice  1 lab

8. Curriculum  
L

9. Working hours for fulfilling the requirements of the subject  
90 hours

<table>
<thead>
<tr>
<th>Contact hours</th>
<th>Preparation for seminars</th>
<th>Homework</th>
<th>Midterm preparation</th>
<th>Exam preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>42 hours</td>
<td>13 hours</td>
<td>15 hours</td>
<td>12 hours</td>
<td>0 hours</td>
</tr>
</tbody>
</table>

10. Department  
Department of Material Handling and Logistics Systems

11. Responsible lecturer  
Dr. Bóna Krisztián

12. Lecturers  
Dr. Bóna Krisztián, Dr. Bohács Gábor, Bakos András

13. Prerequisites  
- (-);
- (+);
- (-)

14. Description of lectures

15. Description of practices
Practicing the tasks related to modeling and parameterization, described in the lectures, through individual tasks, and preparation of the homework.

16. Description of laboratory practices
Practicing the use of simulation techniques, simulators and simulation systems presented in the lectures within the framework of computer labs, through examples developed in the exercises, as well as the preparation of the homework.

17. Learning outcomes
a) Knowledge:
- Knowledge of modeling and simulation basics.
- Knowledge of the typical features of simulation softwares.
- Knowledge of the simulation's relationship with optimization and with artificial intelligence.

b) Skills:
- Ability to model logistics systems with analytical and simulation techniques.
- Ability to evaluate logistics systems with analytical and simulation tools.
- Ability to use simulation software or apply basic programming skills to simulation tasks.
- Ability to design logistics systems with simulation.

c) Attitude:
- Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

d) Autonomy and responsibility:
- Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

18. Requirements, way to determine a grade (obtain a signature)
The requirement of the complete the subject is to fulfill the homework and two midterm test. The homework (30%), and the tests (35-35%) are included in the final grade.

19. Retake and delayed completion
The homework can be resubmitted once. Both tests can be retaken once.

20. Learning materials
Students can download the subject notes in pdf format via Moodle.
1. Subject name | Technical logistics project 1
2. Subject name in Hungarian | Műszaki logisztikai projekt 1
3. Role | sp
4. Code | KOALM333
5. Evaluation type | m
6. Credits | 7
7. Weekly contact hours | 0 lecture  6 practice  0 lab
8. Curriculum | L
9. Working hours for fulfilling the requirements of the subject | 210 hours
   Contact hours | 84 hours
   Preparation for seminars | 28 hours
   Midterm preparation | 0 hours
   Homework | 70 hours
   Reading written materials | 28 hours
   Exam preparation | 0 hours
10. Department | Department of Material Handling and Logistics Systems
11. Responsible lecturer | Dr. Bohács Gábor
12. Lecturers | Gáspár Dániel, Szabó Péter, Dr. Rinkács Angéla, Odonics Boglárka
13. Prerequisites | -
14. Description of lectures | -
15. Description of practices
   Within the framework of the course, students get acquainted with the design problems of the major engineering areas and the applied software. During the practices, group related tasks are solved and presented after regular consultations at the end of the semester. In the exercises, project-centered consultation, reporting and ongoing evaluation of their work are carried out with students.
16. Description of laboratory practices | -
17. Learning outcomes
   a) Knowledge:
      - Knowledge of materials handling systems projects in terms of structure and activities.
   b) Skills:
      - He is able to assess solutions to a certain problem.
      - Capable of implementing his work in the framework of a project.
   c) Attitude:
      - Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.
   d) Autonomy and responsibility:
      - Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.
18. Requirements, way to determine a grade (obtain a signature)
   1 homework (50% for the final presentation, 50% for the documentation).
19. Retake and delayed completion
   The presentation and the documents submission can both be resubmitted once.
20. Learning materials
   Materials on specific issues, plus former case studies. Students can download the subject notes in pdf format via Moodle.
### Subject description

#### 1. Subject name
**Technical logistics project 2**

#### 2. Subject name in Hungarian
Műszaki logisztikai projekt 2

#### 3. Role
sp

#### 4. Code
KOALM340

#### 5. Evaluation type
m

#### 6. Credits
4

#### 7. Weekly contact hours
<table>
<thead>
<tr>
<th>Lecture</th>
<th>Practice</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

#### 8. Curriculum
L

#### 9. Working hours for fulfilling the requirements of the subject
<table>
<thead>
<tr>
<th>Contact hours</th>
<th>Reading written materials</th>
<th>Preparation for seminars</th>
<th>Midterm Preparation</th>
<th>Homework</th>
<th>Exam Preparation</th>
<th>Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>56 hours</td>
<td>8 hours</td>
<td>16 hours</td>
<td>0 hours</td>
<td>40 hours</td>
<td>0 hours</td>
<td></td>
</tr>
</tbody>
</table>

#### 10. Department
Department of Material Handling and Logistics Systems

#### 11. Responsible lecturer
Dr. Bohács Gábor

#### 12. Lecturers
Dr. Bohács Gábor, Gáspár Dániel, Szabó Péter, Dr. Rinkács Angéla, Odonics Boglárka

#### 13. Prerequisites
Technikal logistics project 2 (KOALM333), strong;

#### 14. Description of lectures

#### 15. Description of practices
Within the framework of the course, project groups are formed from the students, which groups are assigned to the mentors of the department. A project team can consist of up to four people. Project groups receive complex project tasks on technical logistics or R & D tasks, or they can choose for themselves based on their field of interest. During contact hours, students consult with the mentor instructor responsible for the project and briefly report on the progress of the project every week. Problems are raised and presented, solutions are presented. In the exercises, project-centered consultation, reporting and ongoing evaluation of their work are carried out with students.

#### 16. Description of laboratory practices

#### 17. Learning outcomes

a) Knowledge:
- Knowledge of the chosen topic in technical logistics.
- Knowledge of research methodology basics.

b) Skills:
- Able to achieve developments in the chosen technical logistics topic, from applied research aspect.

(c) Attitude:
- Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

(d) Autonomy and responsibility:
- Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

#### 18. Requirements, way to determine a grade (obtain a signature)
1 homework (50% for the final presentation, 50% for the documentation).

#### 19. Retake and delayed completion
The final submission can be resubmitted once.

#### 20. Learning materials
Related national and international scientific literature.
Subject description

1. Subject name: **Trade, Financial, Accounting Techniques**

2. Subject name in Hungarian: Kereskedelmi, pénzügyi és számviteli technikák

3. Role: sp

4. Code: KOKKM138

5. Evaluation type: e

6. Credits: 3

7. Weekly contact hours: 1 lecture, 1 practice, 1 lab

8. Curriculum: KL

9. Working hours for fulfilling the requirements of the subject: 90 hours

<table>
<thead>
<tr>
<th>Contact hours</th>
<th>Preparation for seminars</th>
<th>Homework</th>
<th>Reading written materials</th>
<th>Midterm preparation</th>
<th>Exam preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>42 hours</td>
<td>8 hours</td>
<td>0 hours</td>
<td>16 hours</td>
<td>12 hours</td>
<td>12 hours</td>
</tr>
</tbody>
</table>

10. Department: Department of Transport Technology and Economics

11. Responsible lecturer: Dr. Mészáros Ferenc

12. Lecturers: Dr. Mészáros Ferenc

13. Prerequisites: <(-); (+); (-)

14. Description of lectures

The aspects of foreign trade transportation: foreign economic theories, regulatory framework, structure, elements, creation and implementation of the foreign trade contract. Foreign trade payment methods, the role of the forwarder. Banking operations, assets, securities required for carrying out transport services. Role and function of the stock markets. Elements of the accounting system of transport companies, basic rules. Accounting rules, operations. Types and elements of Reports.

15. Description of practices

Solving financing and accounting tasks of freight forwarding.

16. Description of laboratory practices

Elaboration of seminar tasks on computer.

17. Learning outcomes

a) Knowledge:
   - The student is familiar with the rules of internal and external trade in freight forwarding, the macro-financial framework for companies and the basic accounting rules.

b) Skills:
   - The student is able to select the appropriate commercial solutions, recognizes the opportunities offered by financial transactions, and interprets the outputs of the corporate accounting system.

c) Attitude:
   - The student strives for completeness in the acquisition of knowledge, co-operates with the teacher and other students, is open to new and innovative ideas, researches, and uses information technology and computing tools for its work.

d) Autonomy and responsibility:
   - The student makes responsible decisions in the preparation and proceeding of commercial transactions, asks for professional opinions of others in its work, and manages the challenges responsibly.

18. Requirements, way to determine a grade (obtain a signature)

Requirements for signature: fulfilment of three midterms. There is a written examination at the end of the semester. Weights of requirements in final mark: average of midterms (50%), verbal examination (50%).

19. Retake and delayed completion

There are retakes from each midterms, they can be delayed completed till end of delayed completion period.

20. Learning materials

Bokor, Zoltán; Mészáros, Ferenc; Batta, Gábor (2016) Introduction to Finance (in Hungarian). Course book, BME Dept. of Transport Technology and Economics


List of offered elective economics courses
## Subject description

<table>
<thead>
<tr>
<th>1. Subject name</th>
<th>Argumentation, Negotiation and Persuasion</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Subject name in Hungarian</td>
<td>Érvelés, tárgyalás, meggyőzés</td>
</tr>
<tr>
<td>3. Role</td>
<td>ec</td>
</tr>
<tr>
<td>4. Code</td>
<td>GT41MS01</td>
</tr>
<tr>
<td>5. Evaluation type</td>
<td>m</td>
</tr>
<tr>
<td>6. Credits</td>
<td>2</td>
</tr>
<tr>
<td>7. Weekly contact hours</td>
<td>2 lecture 0 practice 0 lab</td>
</tr>
<tr>
<td>8. Curriculum</td>
<td>JKL</td>
</tr>
<tr>
<td>9. Working hours for fulfilling the requirements of the subject</td>
<td>60 hours</td>
</tr>
<tr>
<td>Contact hours</td>
<td>28 hours</td>
</tr>
<tr>
<td>Preparation for seminars</td>
<td>8 hours</td>
</tr>
<tr>
<td>Midterm preparation</td>
<td>24 hours</td>
</tr>
<tr>
<td>Exam preparation</td>
<td>0 hours</td>
</tr>
<tr>
<td>10. Department</td>
<td>Department of Philosophy and History of Science</td>
</tr>
<tr>
<td>11. Responsible lecturer</td>
<td>Dr. Láng Benedek István</td>
</tr>
<tr>
<td>12. Lecturers</td>
<td>Szabó Krisztina</td>
</tr>
<tr>
<td>13. Prerequisites</td>
<td>-();-;(-)</td>
</tr>
<tr>
<td>14. Description of lectures</td>
<td>During the course of Argumentation, Negotiation, Persuasion, students can acquire the basic theoretical and practical knowledge of all three subjects. In the persuasion-technical block we examine the techniques, psychological assumptions and social significance of manipulation, influence and persuasion. The lessons will be about rational decision-making processes, inter-group conflicts, norm-tracking and group thinking from the point of view of social psychology. Students will become familiar with the concepts of dissonance theories, perception, remembrance, framing, social categorization and attitude change through everyday examples and case studies, so they will be able to recognize and correctly interpret the relevant processes of the media and advertising industry. During the argumentation technique we discuss the peculiarities of the various types of disputes, especially the rational discussion. Students can develop their reasoning, discussion, and lecture skills by analyzing real-world dialogues, video details and personal examples, using the toolbox of logic to be able to stand their place in both the argument and rhetoric of work and private life. In negotiation techniques, we discuss the basic types and strategies of negotiation, the pitfalls of negotiating situations, and the proposed ways of avoiding them. During the lessons, the theory is put into practice through case studies and small group exercises, simulating real negotiating situations, where students can sharply &quot;test, improve their negotiating skills, and thus prepare for the challenges of the labor market.&quot;</td>
</tr>
<tr>
<td>15. Description of practices</td>
<td>-</td>
</tr>
<tr>
<td>16. Description of laboratory practices</td>
<td>-</td>
</tr>
<tr>
<td>17. Learning outcomes</td>
<td>a) Knowledge:</td>
</tr>
<tr>
<td></td>
<td>– Knows the widely used problem-solving techniques for research or scientific work.</td>
</tr>
<tr>
<td></td>
<td>– Knows the management tools and methods related to management, and the legislation needed to practice the profession.</td>
</tr>
<tr>
<td></td>
<td>b) Skills:</td>
</tr>
<tr>
<td></td>
<td>– Being able to design and manage the use of technical, economic, environmental, and human resources.</td>
</tr>
<tr>
<td></td>
<td>c) Attitude</td>
</tr>
<tr>
<td></td>
<td>– Being open and responsive to the knowledge and acceptance of professional, technological development and innovation in the field, and to the provision of authentic mediation.</td>
</tr>
<tr>
<td></td>
<td>– Seeks to adhere to and adhere to the ethical principles of work and organizational culture, and to compliance with quality requirements.</td>
</tr>
<tr>
<td></td>
<td>d) Autonomy and responsibility:</td>
</tr>
<tr>
<td></td>
<td>– Takes decisions carefully, in consultation with representatives of other fields of expertise (primarily legal, economic, energy and environmental), with full responsibility.</td>
</tr>
<tr>
<td></td>
<td>– Being responsible for sustainability, health and environmental awareness.</td>
</tr>
<tr>
<td></td>
<td>– Decisions take into account the principles and principles of environmental protection, quality, consumer protection, product liability, equal access, health and safety at work, technical, economic and legal regulations, and engineering.</td>
</tr>
<tr>
<td>18. Requirements, way to determine a grade (obtain a signature)</td>
<td>To complete the course, 2 midterm tests must be written during the semester. Type of midterms: multiple choice test and essay. 1st midterm: max. 40 points available, 2nd midterm: max. 60 points available. So a total of 100 points can be collected from the two midterms. Student can earn extra points for midterm scores as follows: Visiting lectures is not a must, there is no catalog, but anyone who enters and enriches the lesson with the sessions of the curriculum has an extra point, which is recorded at the end of each hour. It is important that students have to come and write down their points after every hour. You cannot enter a point backwards. If students send links, advertisements, a few paragraph analyzes, etc. to the curriculum, we can also reward them with extra points. Plus points can be earned no later than the last hour, then no longer.</td>
</tr>
</tbody>
</table>
19. Retake and delayed completion

Up to one of the 2 midterm tests can be replaced or improved during the delayed completion period.

20. Learning materials

https://www.filozofia.bme.hu/
1. Subject name  | Economic Analysis of Technological Processes
2. Subject name in Hungarian  | Műszaki folyamatok közgazdasági elemzése
3. Role  | ec
4. Code  | GT30MS02
5. Evaluation type  | m
6. Credits  | 2
7. Weekly contact hours  | 2 lecture 0 practice 0 lab
8. Curriculum  | JKL
9. Working hours for fulfilling the requirements of the subject  | 60 hours
   Contact hours  | 28 hours
   Preparation for seminars  | 0 hours
   Homework  | 0 hours
   Reading written materials  | 20 hours
   Midterm preparation  | 12 hours
   Exam preparation  | 0 hours
10. Department  | Department of Economics
11. Responsible lecturer  | Dr. Major Iván
12. Lecturers  | Dr. Vigh László
13. Prerequisites  | - (-); (+); (+)
14. Description of lectures
In everyday practice - unfortunately - a technical and economic solution to a problem they are looking separately, in extreme cases, the experts of the two areas do not understand each other's language. The object In this context, we are trying to link these two disciplines, primarily from the economic point of view. In doing so, several technical processes (production, innovation, raw material management (costs), etc.) from an economic point of view, we show the relevant economic aspects. In addition, we examine the market environment of companies, which has a decisive impact on product sales and revenue. Our goal is for future engineers to recognize the economic elements of their activities, which will certainly make the acceptance of their products easier.
15. Description of practices
-
16. Description of laboratory practices
-
17. Learning outcomes
a) Knowledge:
   - Knows the role of the production process, the cost of technology.
   - Knows the benefits of capacity utilization and economies of scale.
   - Knows the market environment of companies and its impact on production and sales activities.
   - Knows the relationship between technology and market structures.
   - Knows the potential and benefits of technological innovation, innovation in the markets.

b) Skills:
   - Ability to design, organize and conduct independent learning.
   - Is able to apply the general and specific economics principles, rules, relationships, procedures in solving problems in the technical field.
   - Is capable of complex planning and management of the use of technical and economic resources.
   - Is able to identify the external market environment and its changes.
   - Is able to analyze and evaluate market opportunities.
   - Is able to theoretically base economic decisions.

c) Attitude:
   - Collaborates with the instructor and student fellows to expand knowledge.
   - Expands your knowledge through continuous knowledge.
   - Open to the use of information technology tools.
   - Seek to understand the economic tools needed to solve technical problems.
   - Strives for accurate and error-free task solving.

d) Autonomy and responsibility:
   - Openly accepts well-founded critical remarks.
   - Independently performs the analysis of economic problems, the evaluation of related tools.
   - Openly accept well-founded critical remarks.
   - Uses his systemic approach in his thinking.
18. Requirements, way to determine a grade (obtain a signature)
Learning outcomes are assessed on the basis of two mid-term tests: a complex, written assessment of knowledge, skills, attitudes, and independence and responsibility types of the subject in the form of midterm tests. The tests are on the one hand test questions, which are the interpretation of certain concepts and the connection between them, as well as the calculation tasks, which examine the problem-solving ability. The topic of tests is determined by the lecturer, the available working time is 45 minutes/test. A prerequisite for obtaining a midterm grade is that the student does not have to make a replacement in the case of half of the midterm tests (i.e. one student has to reach at least 40% from one midterm test). If the student does not participate in any of the midterm tests, the course will be assessed as "Not fulfilled" (based on Code of Studies). 50-50% of the results of the two midterm test scores are counted in the final grade.

19. Retake and delayed completion
Midterm tests can be replaced once during the term. In the delayed completion period, according to the Code of Studies, the midterm tests may be supplemented by the paying a delayed completion fee.

20. Learning materials
http://kgt.bme.hu/
Subject description

1. Subject name: Investments

2. Subject name in Hungarian: Befektetések

3. Role: ec

4. Code: GT35M004

5. Evaluation type: m

6. Credits: 2

7. Weekly contact hours: 2 lecture, 0 practice, 0 lab

8. Curriculum: JKL

9. Working hours for fulfilling the requirements of the subject: 60 hours

   Contact hours: 28 hours
   Preparation for seminars: 8 hours
   Midterm preparation: 24 hours
   Exam preparation: 0 hours
   Reading written materials: 0 hours
   Homework: 0 hours
   Preparation for seminars: 8 hours
   Preparations for exams: 0 hours
   Learning materials: 0 hours

10. Department: Department of Finance

11. Responsible lecturer: Dr. Bethlendi András

12. Lecturers: Póra András

13. Prerequisites: (-); (+); (-)

14. Description of lectures

The main objective of the course is to familiarize students with: the operation of stock markets, stock exchanges, institutions and indexes on the market, the basic theoretical background of stock analysis, its main methods, and the main portfolio management strategies. During the semester, emphasis will be placed on the methodology of fundamental stock analysis.

15. Description of practices

- 

16. Description of laboratory practices

- 

17. Learning outcomes

a) Knowledge:

- Knows the widely used problem-solving techniques for research or scientific work.
- Knows the management tools and methods related to management, and the legislation needed to practice the profession.

b) Skills:

- Being able to design and manage the use of technical, economic, environmental, and human resources.


c) Attitude:

- Being open and responsive to the knowledge and acceptance of professional, technological development and innovation in the field, and to the provision of authentic mediation.
- Seeks to adhere to and adhere to the ethical principles of work and organizational culture, and to compliance with quality requirements.


d) Autonomy and responsibility:

- Takes decisions carefully, in consultation with representatives of other fields of expertise (primarily legal, economic, energy and environmental), with full responsibility.
- Being responsible for sustainability, health and environmental awareness.
- Decisions take into account the principles and principles of environmental protection, quality, consumer protection, product liability, equal access, health and safety at work, technical, economic and legal regulations, and engineering.

18. Requirements, way to determine a grade (obtain a signature)

1st midterm test from the first quarter. 2nd midterm test from the second quarter. All midterm test are 45 minutes long for 50 points; Multiple choice tests and calculation tasks.

19. Retake and delayed completion

Both midterm test can be rewritten by once.

20. Learning materials

http://www.finance.bme.hu/
Subject description

1. Subject name: Leadership and Applied Management Psychology

2. Subject name in Hungarian: Alkalmazott vezetéspszichológia

3. Role: ec

4. Code: GT52MS01

5. Evaluation type: m

6. Credits: 2

7. Weekly contact hours: 2 lecture, 0 practice, 0 lab

8. Curriculum: JKL

9. Working hours for fulfilling the requirements of the subject: 60 hours

   Contact hours: 28 hours
   Preparation for seminars: 0 hours
   Homework: 32 hours
   Reading written materials: 0 hours
   Midterm preparation: 0 hours
   Exam preparation: 0 hours

10. Department: Department of Ergonomics and Psychology

11. Responsible lecturer: Dr. Répáczki Róta

12. Lecturers: Dr. Hámornik Balázs Péter

13. Prerequisites: (-); (+); (-)

14. Description of lectures

   The aim of the subject is to develop practical skills in addition to the theoretical knowledge of leadership psychology. Within this, the issues of the process of managerial maturity, the managerial personality, the role and the role are also elaborated. The aim is also to develop practical skills, the importance of which is important for effective leadership.

15. Description of practices

16. Description of laboratory practices

17. Learning outcomes

   a) Knowledge:
   - Knows the widely used problem-solving techniques for research or scientific work.
   - Knows the management tools and methods related to management, and the legislation needed to practice the profession.

   b) Skills:
   - Being able to design and manage the use of technical, economic, environmental, and human resources.

   c) Attitude:
   - Being open and responsive to the knowledge and acceptance of professional, technological development and innovation in the field, and to the provision of authentic mediation.
   - Seeks to adhere to and adhere to the ethical principles of work and organizational culture, and to compliance with quality requirements.

   d) Autonomy and responsibility:
   - Takes decisions carefully, in consultation with representatives of other fields of expertise (primarily legal, economic, energy and environmental), with full responsibility.
   - Being responsible for sustainability, health and environmental awareness.
   - Decisions take into account the principles and principles of environmental protection, quality, consumer protection, product liability, equal access, health and safety at work, technical, economic and legal regulations, and engineering.

18. Requirements, way to determine a grade (obtain a signature)

   Participation in 70% of the lessons, preparation of two individual reports.

19. Retake and delayed completion

   According to Code of Studies.

20. Learning materials

   http://www.erg.bme.hu/
1. Subject name: **Managerial Accounting**

2. **Subject name in Hungarian:** Vezetői számvitel

3. **Role:** ec

4. **Code:** GT35M005

5. **Evaluation type:** m

6. **Credits:** 2

7. **Weekly contact hours:**
   - 2 lecture
   - 0 practice
   - 0 lab

8. **Curriculum:** JKL

9. **Working hours for fulfilling the requirements of the subject:** 60 hours

   - **Contact hours:** 28 hours
   - **Preparation for seminars:** 0 hours
   - **Homework:** 12 hours
   - **Reading written materials:** 0 hours
   - **Midterm preparation:** 12 hours
   - **Exam preparation:** 0 hours

10. **Department:** Department of Finance

11. **Responsible lecturer:** Dr. Bőcskei Elvira

12. **Lecturers:** Dr. Bőcskei Elvira

13. **Prerequisites:** -

14. **Description of lectures**

   Systematic, practice-oriented acquisition of close and contact topics in managerial accounting from theoretical and methodological knowledge of traditional cost management and responsible management accounting to new approaches.

15. **Description of practices**

16. **Description of laboratory practices**

17. **Learning outcomes**

   a) **Knowledge:**
   - Knows the widely used problem-solving techniques for research or scientific work.
   - Knows the management tools and methods related to management, and the legislation needed to practice the profession.

   b) **Skills:**
   - Being able to design and manage the use of technical, economic, environmental, and human resources.

   c) **Attitude:**
   - Being open and responsive to the knowledge and acceptance of professional, technological development and innovation in the field, and to the provision of authentic mediation.
   - Seeks to adhere to and adhere to the ethical principles of work and organizational culture, and to compliance with quality requirements.

   d) **Autonomy and responsibility:**
   - Takes decisions carefully, in consultation with representatives of other fields of expertise (primarily legal, economic, energy and environmental), with full responsibility.
   - Being responsible for sustainability, health and environmental awareness.
   - Decisions take into account the principles and principles of environmental protection, quality, consumer protection, product liability, equal access, health and safety at work, technical, economic and legal regulations, and engineering.

18. **Requirements, way to determine a grade (obtain a signature)**

   Semester tasks:
   1. A midterm grade can be obtained with a substantial mid-term job, which means that students will attend 70% of the lecture, and the lesson tasks received at the moodle will be solved on the day of the lecture, no later than midnight. (The hourly tasks allow you to reach 15 * 4 = 60 points, this is already sufficient. You can upload individual and group standalone tasks in the moodle until the deadline for each task. (You can also get 60 points for independent tasks that can be added in full. for points earned from hourly work if it reaches or exceeds 40 points The marks of the semester's performance that can be assessed in this way will be added to Neptune by end of last but one week and students will be exempt from writing in their home.
   2. If during the semester you are unable or unwilling to obtain the task in the manner described in point 1, you can complete the subject with a successful solution of at least 50% on a midterm test what is located on the moodle interface. In this case, a midterm grade can be improved by one grade from the acquired intermediate points.

19. **Retake and delayed completion**

   The midterm can be rewritten once.

20. **Learning materials**

http://www.finance.bme.hu/
1. Subject name

Quality Management

2. Subject name in Hungarian

Minőségmenedzsment

3. Role

ec

4. Code

GT20M002

5. Evaluation type

m

6. Credits

2

7. Weekly contact hours

2 lecture

0 practice

0 lab

8. Curriculum

JKL

9. Working hours for fulfilling the requirements of the subject

60 hours

Contact hours

28 hours

Preparation for seminars

4 hours

Homework

12 hours

Reading written materials

0 hours

Midterm preparation

16 hours

Exam preparation

0 hours

10. Department

Department of Management and Corporate Economics

11. Responsible lecturer

Dr. Kövesi János

12. Lecturers

Dr. Topár József, Erdei János

13. Prerequisites

- (-);

- (+);

- (-)

14. Description of lectures

Within the framework of the subject, students will become familiar with current issues and methods of developing quality management systems. They get an overview of the quality philosophies applied in the production sectors and the basics of quality management methods that support their implementation.

15. Description of practices

-

16. Description of laboratory practices

-

17. Learning outcomes

a) Knowledge:

- Knows the widely used problem-solving techniques for research or scientific work.

- Knows the management tools and methods related to management, and the legislation needed to practice the profession.

b) Skills:

- Being able to design and manage the use of technical, economic, environmental, and human resources.

c) Attitude:

- Being open and responsive to the knowledge and acceptance of professional, technological development and innovation in the field, and to the provision of authentic mediation.

- Seeks to adhere to and adhere to the ethical principles of work and organizational culture, and to compliance with quality requirements.

d) Autonomy and responsibility:

- Takes decisions carefully, in consultation with representatives of other fields of expertise (primarily legal, economic, energy and environmental), with full responsibility.

- Being responsible for sustainability, health and environmental awareness.

- Decisions take into account the principles and principles of environmental protection, quality, consumer protection, product liability, equal access, health and safety at work, technical, economic and legal regulations, and engineering.

18. Requirements, way to determine a grade (obtain a signature)

The subject ends with a mid-term grade. 80% of the grade will be determined by the results of the midterm tests held in the semester and 20% by the group or individual task result. Information about the task will be published on the presentations and on the briefings available on the website. The task is mandatory. Without this, the requirements of the subject cannot be met. The task must be submitted electronically (by e-mail) by the deadline set by the lecturer. Midterm test are 50-50 point each, task is with a maximum of 20 points. Criteria: a minimum of 45 points from the two midterms and a minimum of 18 points on each midterm test, submission of the task. Final grade: sum of midterm scores * 0.8 + task score.

19. Retake and delayed completion

Midterms can be rewritten during the delayed completion period in accordance with the regulations of Code of Studies. There is no possibility to delayed complete the semester task.

20. Learning materials

http://mvt.bme.hu/
### Subject description

1. **Subject name**: Social and Visual Communication

2. **Subject name in Hungarian**: Társadalmi és vizuális kommunikáció

3. **Role**: ec

4. **Code**: GT43MS02

5. **Evaluation type**: m

6. **Credits**: 2

7. **Weekly contact hours**: 2 lecture 0 practice 0 lab

8. **Curriculum**: JKL

9. **Working hours for fulfilling the requirements of the subject**

<table>
<thead>
<tr>
<th>Contact hours</th>
<th>Preparation for seminars</th>
<th>Homework</th>
<th>Reading written materials</th>
<th>Midterm preparation</th>
<th>Exam preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 hours</td>
<td>8 hours</td>
<td>0 hours</td>
<td>24 hours</td>
<td>0 hours</td>
<td>0 hours</td>
</tr>
</tbody>
</table>

10. **Department**: Department of Sociology and Communication

11. **Responsible lecturer**: Dr. Bárány Tibor

12. **Lecturers**: Dr. Szabó Levente

13. **Prerequisites**: 

14. **Description of lectures**

   It is impossible to communicate! And it is impossible to communicate... The general and social framework of communication. What is communication? Possible definitions, concepts. Disaster images. Representations in the media. Communication as an exchange of information. The information that is unlikely ... And the disorder that increases the information? Shannon's model. Communication as reporting property. Information you didn't want to inform? Communicative pictures? Barnlund's model. Communication as interaction. The group is above all... Illusion that consensus is emerging? Newcomb's model. Communication as participation. The ingenious stupid ants. Participation in incomprehensible group communication. Horányi's theory. Communicated. The user of the device is communicating, revolutionizing the pegasus and arbitrary symbols. Code and social systems. Politics, science, economy, art speak different languages? The institutional reality. When money is not in the tree. Image theory, perception theory. Why is the image effective? What are visual illusions about? The formation of writing. From pictorial representation to no-show signs. The agents of social communication. Rational roles and irrational individuality? A summary of social communication.

15. **Description of practices**

-  

16. **Description of laboratory practices**

-  

17. **Learning outcomes**

   a) Knowledge:
   - He / she knows all the important elements of the concept of social science, understands the relationships that underlie the scientific interpretation of society and social communication.
   - You know and understand the operating mechanisms of social phenomena and subsystems studied by communication and media science.

   b) Skills:
   - Is able to compare the basic theories and concepts of social communication, to elaborate rational arguments, ie to form opinions and defend their opinions during the various stages of communication.
   - In the field of communication and media research, it is able to make realistic value judgments based on the processed information and to formulate independent proposals based on the conclusions drawn from them.

   c) Attitude:
   - It accepts that cultural phenomena are historically and socially defined and variable.
   - Consciously represents the methods he uses in his own profession and accepts the different methodological features of other disciplines.
   - Open to all forms of professional innovation, inclusive, but not mindful of theoretical, practical and methodological innovations.

   d) Autonomy and responsibility:
   - It displays its views as a sovereign player in professional and social forums, and represents its profession, organization and professional team responsibly.

18. **Requirements, way to determine a grade (obtain a signature)**

   Two midterm tests must be written (with at least pass (2) assessments) in the course of the study period, and all of the processed texts can be downloaded on the website of the course. The curriculum processed at each lecture will appear separately on the website of the course after the given lecture (so the obligatory readings for the given midterm test will be gathered here).

   Points for each midterm test can be increased by 1-1, 3-3, by answering the question in hours (1st midterm can be increased by one of the 3 hours prior to 1st midterm, the 2nd midterm can be increased by one of the 3 between 1st and 2nd midterm) with an hourly response).
Individual performance with a thesis: discussed in individual consultations. This option is for those who want to deal with some of the topics in addition to the opportunities provided by the lessons, they need extra performance (e.g., I would like to present my thesis at a Scientific Student Conference (TDK)). Conditions: until the time of the first midterm, the choice of this alternative must be agreed with the instructor, a sketch of the ideas must be prepared, and the possibility of writing the thesis should be discussed in a personal consultation. After that, at least two times the subject has to be consulted on the process, the progress of the text, and at the end of the semester the completed thesis will be discussed, evaluated, and, if necessary, additional opportunities beyond the semester will be assessed (e.g., participation in TDK). The thesis must be submitted by the specified date. Visiting the lessons: according to Code of Studies.

The components of the semester grade are: 1st midterm 50% and 2nd midterm 50%.

19. Retake and delayed completion

The condition for participating in the supplementary midterm test is to fulfill the 1st midterm test (with a minimum of pass (2) result). Replacement options: 2 (see Semester Scheduled Program). Both midterms are rewritable for the purpose of increasing the mark, and the final mark takes the best results. The results can be viewed on the course website and discussed at the weekly consultation time or by email consultation.

20. Learning materials

https://szoc.bme.hu/
1. **Subject name**  
**Technology Management**

2. **Subject name in Hungarian**  
Technológiamenedzsment

3. **Role**  
ec

4. **Code**  
GT20M005

5. **Evaluation type**  
m

6. **Credits**  
2

7. **Weekly contact hours**  
2 lecture  0 practice  0 lab

8. **Curriculum**  
JKL

9. **Working hours for fulfilling the requirements of the subject**  
60 hours

- **Contact hours**  
28 hours

- **Preparation for seminars**  
4 hours

- **Homework**  
0 hours

- **Reading written materials**  
12 hours

- **Midterm preparation**  
16 hours

- **Exam preparation**  
0 hours

10. **Department**  
Department of Management and Corporate Economics

11. **Responsible lecturer**  
Dr. Pataki Béla

12. **Lecturers**  
Dr. Pataki Béla

13. **Prerequisites**  
- (-);  
- (+);  
- (-)

14. **Description of lectures**

**Course objectives:**
- highlight the fundamental importance of technology for the successful operation of the organization;
- to promote a deeper understanding of the competitive nature of technology;
- introduce some of the best practices in technology management.

15. **Description of practices**

16. **Description of laboratory practices**

17. **Learning outcomes**

a) **Knowledge:**
- You will be aware of the competitive nature of technology.
- Understand the role of technology and engineering in the success of organizations.
- You will know some of the best practices in technology management.

b) **Skills:**
- Will be able to carry out his engineering tasks taking into account business, economic and management aspects.
- Being in a technology area with a lower level managerial position will be able to perform basic engineering manager tasks.

c) **Attitude:**
- He strives to put his engineering skills into a business, economic, and management context.
- Responsive to innovation, constant monitoring of technical progress, active participation in development.

d) **Autonomy and responsibility:**
- He can make his decisions carefully, in consultation with representatives of other disciplines.

18. **Requirements, way to determine a grade (obtain a signature)**

To complete the subject, students need to write two, 30-minute long, max. 50-50-point midterm tests. The midterm grade is the total score available for the two midterm tests. There is no score limit to be met in any midterm tests.

19. **Retake and delayed completion**

Each midterm tests can be written immediately after each other.

20. **Learning materials**

http://mvt.bme.hu/