240EI023 - Transports

Degree competences to which the subject contributes

Specific:

Teaching methodology

The teaching methodology is based on two types of activities. Classes in which the teacher provides concepts and skills through practical exercises illustrate how to apply the knowledge presented to solve real situations and problems; in most sessions are suggested exercises for the students to develop classroom with the support of the teacher. Practice in small groups in which students carry out activities under the supervision of a teacher. In practice you learn to use tools for simulation and students learn based on a real problem chosen by them. The work is done in groups and have to make a delivery of a written report and an oral defense. Practices and work generic work as team work, oral proficiency and written competence among others.

Learning objectives of the subject

Ensure that students acquire knowledge about the systems freight, passenger transport and internal transport. This knowledge should allow them to solve basic problems in these areas using simple algorithms and simulation tools.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 112h 30m</th>
<th>Hours large group: 27h</th>
<th>24.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group: 13h 30m</td>
<td>12.00%</td>
<td></td>
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<tr>
<td>Guided activities: 0h</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>Self study: 72h</td>
<td>64.00%</td>
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</tbody>
</table>
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<table>
<thead>
<tr>
<th>Content</th>
<th>Learning time: 11h</th>
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</thead>
<tbody>
<tr>
<td><strong>Introduction to graphs</strong></td>
<td>Theory classes: 4h</td>
</tr>
<tr>
<td></td>
<td>Self study : 7h</td>
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</tbody>
</table>

**Description:**

**Related activities:**
Exercises of graphs representing different systems. Determination of minimal paths and the concepts associated with minimal paths.

**Specific objectives:**
Understand the concept graph. Learn the graph represent different transport systems. Determine minimum paths in a graph and apply concepts related to roads minimal transportation problems.

<table>
<thead>
<tr>
<th>Freight</th>
<th>Learning time: 42h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 10h</td>
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<tr>
<td></td>
<td>Laboratory classes: 5h</td>
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<tr>
<td></td>
<td>Self study : 27h</td>
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</tbody>
</table>

**Description:**
Freight problems. Mathematical formulation of the Freight problems. Presentation of heuristic algorithms to solve.

**Related activities:**
Solving different types of problems freight using appropriate algorithms for their resolution.

**Specific objectives:**
Understanding different types of freight problems. Learn to identify types of problems. Applying the algorithms to solve each problem.
### Passenger transportation

**Description:**

**Related activities:**
Problem solving in each stage of the four stage model.

**Specific objectives:**
Get the items that make up the costs of passenger transport. Learn the graph represent the transport of a territory. Applying each stage transport planning model known as the model of four stages. Assess whether or not to implement a transportation system based on cost-benefit analysis applied to the case of passenger transport.

**Learning time:** 46h
- Theory classes: 12h
- Laboratory classes: 5h
- Self study: 29h

### Introduction to queuing theory

**Description:**
Study of the characteristics of operating systems produced in simple queues.

**Related activities:**
Exercises resolution to analyze the differences in behavior of a system with different characteristics of arrivals and service times.

**Specific objectives:**
Learn the basic models of queuing theory and systems analysis.

**Learning time:** 6h
- Laboratory classes: 2h
- Self study: 4h

### Internal transport

**Description:**
Presentation of the most common internal transport. Design of an internal transport system from the specifications of system operation.

**Related activities:**
Exercises for designed a system of internal transport for a simple installation.

**Specific objectives:**
Knowing the features and benefits of the most commonly systems used for internal transport. Being able to design the system of internal transport cases for simple installation.

**Learning time:** 7h 30m
- Laboratory classes: 2h 30m
- Self study: 5h
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Qualification system

The grade is based on three types of assessment activities: a partial test, a final examination and evaluation of the work. Both the partial test as the final exam evaluates theoretical and practical lessons. Work evaluated the theoretical and practical as well as the ability to solve real problems and skills as teamwork, written presentation and oral presentation.

The algorithm for calculating the final grade is:

\[ N_{final} = 0.2 \times NEP + \max\{0.8 \times NEF; 0.6 \times NEF + 0.2 \times NPP\} \]

with: NEP: note the work. NEF: final exam grade; NPP: note the partial test.

The exam grade will replace the re-evaluation of the exam and the final exam. The final grade is:

\[ N_{final} = 0.2 \times NEP + 0.8 \times NER \]

with NER: Note exam revaluation

Regulations for carrying out activities

Both the midterm and the final exam can only use the calculator. If in any of these tests has a theoretical part in this you can not take anything

Bibliography

Basic:


