230087 - PIE - Probability and Statistics

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 749 - MAT - Department of Mathematics
Academic year: 2018
Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan

Teaching staff

Coordinator: Josep M. Aroca
Others: Miquel À. Fiol
Josep Fàbrega
Anna Lladó
Jorge Jiménez

Prior skills

Calculus of one and several variables. Linear algebra.

Degree competences to which the subject contributes

Transversal:
07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

Teaching methodology

- Lectures.
- Application classes.
- Exercises.

Learning objectives of the subject


Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>65h</th>
<th>43.33%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self study:</td>
<td>85h</td>
<td>56.67%</td>
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</table>
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## Content

<table>
<thead>
<tr>
<th>Topic</th>
<th>Learning time:</th>
<th>Description:</th>
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<tbody>
<tr>
<td><strong>1. Basic probability theory</strong></td>
<td>15h</td>
<td>Theory classes: 15h</td>
</tr>
<tr>
<td><strong>2. Random variable</strong></td>
<td>13h</td>
<td>Theory classes: 13h</td>
</tr>
<tr>
<td><strong>3. Several random variables</strong></td>
<td>14h</td>
<td>Theory classes: 14h</td>
</tr>
<tr>
<td><strong>4. Statistics I</strong></td>
<td>13h</td>
<td>Theory classes: 13h</td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td></td>
<td>Random variables relevant in statistics: n-dimensional Gaussian, Khi square, Student's t, Fisher's F. Central Limit Theorem. Populations and samples. Descriptive statistics (histograms, boxplots, scatterplots). Statistical samples: distribution and parameters. Estimation of parameters: method of the moments and method of maximum likelihood. Confidence intervals (for the mean, for the variance, for proportions, for comparing populations). Test of statistical hypotheses. P-Values.</td>
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# Statistics II

**Description:**
Fitting lines. Regression in one and several variables. Method of the least squares, orthogonality principle. Linear models. ANOVA. Non parametric tests. Bayesian statistics.

**Learning time:**
- 10h
- Theory classes: 10h

## Qualification system

- Parcial exams: 40%
- Final exam: 60%

## Bibliography

**Basic:**