270655 - ASM - Advanced Statistical Modelling

Coordinating unit: 270 - FIB - Barcelona School of Informatics
Teaching unit: 715 - EIO - Department of Statistics and Operations Research
Academic year: 2019
Degree: MASTER'S DEGREE IN INNOVATION AND RESEARCH IN INFORMATICS (Syllabus 2012). (Teaching unit Optional)
ECTS credits: 6  Teaching languages: English

Prior skills
Not specified

Teaching methodology
There is a weekly 3 hours session. The first two hours are devoted to the exposition of the theoretical subjects by the teacher. The last hour is dedicated to implement these contents: Each student has his laptop in class and he or she performs the tasks proposed by the teacher. Each session ends with an assignment to students who must be delivered the following session.

Learning objectives of the subject
1. At the end of the course the student will be able to propose and estimate simple and multiple linear regression models. She will also be able to interpret and validate the estimated models.
2. At the end of the course the student will be able to propose, estimate, interpret and validate generalized linear models.
3. At the end of the course the student will be able to propose, estimate, interpret and validate non-parametric versions of linear regression models and generalized linear models.
4. At the end of the course the student will know properly how to choose the smoothing parameters which in nonparametric regression models control the trade-off between good fit to the observed sample and good generalization.
5. At the end of the course the student, facing a real problem of modeling and / or prediction, will know to choose the most suitable regression model (parametric, non-parametric and semi-parametric).

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Theory classes: 24h 16.00%</th>
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<tbody>
<tr>
<td></td>
<td>Practical classes: 12h 8.00%</td>
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<tr>
<td></td>
<td>Laboratory classes: 12h 8.00%</td>
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<tr>
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<td>Guided activities: 6h 4.00%</td>
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<tr>
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<td>Self study: 96h 64.00%</td>
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Parametric Modelling

**Degree competences to which the content contributes:**

**Description:**

Nonparametric Modelling

**Degree competences to which the content contributes:**

**Description:**
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Planning of activities

| **Presentation of Theme 1 (parametric regression models) in class** | **Hours**: 75h  
Theory classes: 22h 30m  
Practical classes: 0h  
Laboratory classes: 0h  
Guided activities: 0h  
Self study: 52h 30m |
| --- | --- |
| **Description**:  
Presentation of Theme 1 (parametric regression models) in class |
| **Specific objectives**:  
1, 2, 5 |

| **Presentation of Theme 2 (non-parametric regression models) in class** | **Hours**: 75h  
Theory classes: 22h 30m  
Practical classes: 0h  
Laboratory classes: 0h  
Guided activities: 0h  
Self study: 52h 30m |
| --- | --- |
| **Description**:  
Presentation of Theme 2 (non-parametric regression models) in class |
| **Specific objectives**:  
3, 4, 5 |

Qualification system

Homework will be assigned at the end of each session and it will be due the following session. Homework grades will be worth 50% of your course grade. The other 50% of your course grade will come from a final exam.

Course Grade = 0.5 * Hwk Grade + 0.5 * Exam Grade
Bibliography

Basic:


