250669 - TRACAVAARI - Advanced Treatment of Industrial Wastewater

Coordinating unit: 250 - ETSECCPB - Barcelona School of Civil Engineering
Teaching unit: 714 - ETP - Department of Textile and Paper Engineering
Academic year: 2019
Degree: MASTER'S DEGREE IN ENVIRONMENTAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
ECTS credits: 5
Teaching languages: Catalan, Spanish, English

Teaching staff
Coordinator: JOSE LUIS CORTINA PALLAS
Others: JOSE LUIS CORTINA PALLAS, MARTIN CRESPI ROSELL

Degree competences to which the subject contributes
Specific:
13340. Apply scientific concepts to environmental problems and their correlation with technological concepts.
13347. Dimension unconventional systems and advanced treatment and raise their mass balance and energy.

Learning objectives of the subject

Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Theory classes: 15h</th>
<th>12.00%</th>
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<tbody>
<tr>
<td></td>
<td>Practical classes: 10h</td>
<td>8.00%</td>
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<tr>
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<td>Laboratory classes: 10h</td>
<td>8.00%</td>
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<td>Guided activities: 10h</td>
<td>8.00%</td>
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<tr>
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<td>Self study: 80h</td>
<td>64.00%</td>
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## Content

### Unit 1: Regulations on industrial wastewater. Types of industrial waters and identification of the m

*Learning time: 12h*
- Theory classes: 2h
- Practical classes: 2h
- Laboratory classes: 1h
- Self study: 7h

### Tema 2. Processes for the purification of industrial waters

*Learning time: 12h*
- Theory classes: 3h
- Practical classes: 2h
- Self study: 7h

### Topic 3. Physical-chemical treatment processes

*Learning time: 4h 48m*
- Theory classes: 2h
- Self study: 2h 48m

### Topic 4. Biological purification processes

*Learning time: 4h 48m*
- Theory classes: 2h
- Self study: 2h 48m

### Topic 5. Advanced oxidation processes

*Learning time: 9h 36m*
- Theory classes: 2h
- Laboratory classes: 2h
- Self study: 5h 36m

### Topic 6: Technologies for the reuse of industrial effluents: integration of membrane processes

*Learning time: 19h 12m*
- Theory classes: 2h
- Practical classes: 2h
- Laboratory classes: 4h
- Self study: 11h 12m
## Bibliography

### Basic:

- APHA-AWWA-WEF. Standard Methods for the Examination of Water and Wastewater. 21th Ed.
- SAWYER AND MCCARTY.. Chemistry for environmental engineering.. McGraw-Hill,
- PARSONS S., Advanced Oxidation Processes for Water and Wastewater Treatment.. IWA publishing,
- Varis. Manuales DWA.

### Complementary:

- Varis. Manuales IWA.