Guia docent
205072 - 205072 - Recursos Espacials i Assentaments Planetaris

Última modificació: 22/04/2021

Unitat responsable: Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa
Unitat que imparteix: 758 - EPC - Departament d'Enginyeria de Projectes i de la Construcció.

MÀSTER UNIVERSITARI EN ENGINYERIA ESPACIAL I AERONÀUTICA (Pla 2016). (Assignatura optativa).

Curs: 2021
Crèdits ECTS: 3.0
Idiomes: Anglès

PROFESSORAT

Professorat responsable: IGNACIO CASANOVA HORMAECHEA

Altres:

METODOLOGIES DOCENTS

The course consists of lectures, personalized (and/or small group) tutorials, assignments, self-study and project preparation. During lectures, the instructor will offer theoretical concepts, and discuss reference materials. Homework will be assigned on a weekly basis in order to complement the content of lectures with practical exercises. Tutorials of small work groups will be carried out in order to monitor the progress of the elaboration of the final class project.

OBJECTIUS D'APRENENTATGE DE L'ASSIGNATURA

This course is designed as an advanced graduate study module for students with a strong background in the physical and/or engineering sciences, with the aim to provide an up-to-date perspective on current international efforts in the exploration and utilization of resources from space, and initiatives for the establishment of permanent (robotic and human) outposts on the surfaces of the Moon and Mars. Special attention will be put on developing criteria for a constructive and in-depth multidisciplinary analysis of reference mission definition. A complementary objective is to develop professional skills in the effective use of information and communication resources. The final class project will consist of a Case Study Analysis that will be presented in a variety of social network formats. Finally, guidelines and topic proposals will be provided to those students who express an interest in developing their Master’s Thesis Project on any subject related to the contents of the course.

HORES TOTALS DE DEDICACIÓ DE L'ESTUDIANTAT

<table>
<thead>
<tr>
<th>Tipus</th>
<th>Hores</th>
<th>Percentatge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hores aprenentatge autònom</td>
<td>48,0</td>
<td>64.00</td>
</tr>
<tr>
<td>Hores grup gran</td>
<td>27,0</td>
<td>36.00</td>
</tr>
</tbody>
</table>

Dedicació total: 75 h
### Week 1: An overview of solar system exploration

**Descripció:**
Brief history of Solar System exploration. Missions to the terrestrial planets and asteroids. Missions to the outer planets and their satellites.

**Activitats vinculades:**
Elaboration of a short report on the main technologies (instrumentation) used for planetary exploration and critical assessment of their performance.

**Dedicació:** 11h  
Grup gran/Teoria: 4h  
Aprenentatge autònom: 7h

### Week 2: Resources from Near-Earth Space

**Descripció:**

**Activitats vinculades:**
Report of categorization of different space resources according to their in-situ utilization potential

**Dedicació:** 11h  
Grup gran/Teoria: 4h  
Aprenentatge autònom: 7h

### Week 3: Resources at orbital platforms

**Descripció:**

**Activitats vinculades:**
Visit to the MELiSSA Pilot Plant at the Universitat Autònoma de Barcelona. Attendance required.

**Dedicació:** 11h  
Grup gran/Teoria: 4h  
Aprenentatge autònom: 7h

### Week 4: Permanent planetary settlements: the Moon

**Descripció:**

**Activitats vinculades:**
Short report on 1 concept (construction, science at/from, protection) and main requirements.

**Dedicació:** 11h  
Grup gran/Teoria: 4h  
Aprenentatge autònom: 7h
**Week 5: Permanent planetary settlements: Mars**

**Descripció:**

**Activitats vinculades:**
Short report on pros/cons of robotic vs. human exploration/settlement of/at Mars

**Dedicació:** 11h  
Grup gran/Teoria: 4h  
Aprentatge autònom: 7h

**Week 6: Case Study**

**Descripció:**
Critical assessment of some specific proposal from industries and/or space agencies (instructor will provide necessary reference and data) or some advanced concept proposed by the students.

**Activitats vinculades:**
Generation of a report.

**Dedicació:** 20h  
Grup gran/Teoria: 7h  
Aprentatge autònom: 13h

**SISTEMA DE QUALIFICACIÓ**