32117 - RNS - Radio Navigation Systems

**Coordinating unit:** 230 - ETSETB - Barcelona School of Telecommunications Engineering

**Teaching unit:** 739 - TSC - Department of Signal Theory and Communications

**Academic year:** 2015

**Degree:** ERASMUS MUNDUS MASTER'S DEGREE IN RESEARCH ON INFORMATION AND COMMUNICATION TECHNOLOGIES (Syllabus 2009). (Teaching unit Optional)

**ECTS credits:** 6

**Teaching languages:** English

---

**Teaching staff**

**Coordinator:** Jordi Mallorquí

**Others:** Jordi Mallorquí, Albert Aguasca, Sebastià Blanch, Joan O'Callaghan

---

**Prior skills**

It is recommended that students have basic knowledge regarding the following subjects: Signal Processing, Radiocommunications, Antennas, Microwaves and Radar. Any gaps in students' knowledge of the topics will be filled in by consulting a basic reading list.

---

**Learning objectives of the subject**
### Content

**1. Introduction to the course**

Degree competences to which the content contributes:

**2. Types of navigation systems**

Degree competences to which the content contributes:

**3. Mathematical models for representing the earth.**

Degree competences to which the content contributes:

**4. Propagation effects**

Degree competences to which the content contributes:

**5. Direction finding and hyperbolic systems: Loran C, Decca, Omega**

Degree competences to which the content contributes:

**6. Air Traffic Control Aids**

Degree competences to which the content contributes:

**7. Orbits and Geometry.**

Degree competences to which the content contributes:

**8. Principles of satellite navigation. Observables.**

Degree competences to which the content contributes:

**9. Systems based on Doppler effect.**

Degree competences to which the content contributes:
### 10. Spread-Spectrum signals

Degree competences to which the content contributes:

### 11. NAVSTAR GPS

Degree competences to which the content contributes:

### 12. GLONASS

Degree competences to which the content contributes:

### 13. How to determine position?

Degree competences to which the content contributes:

### 14. Errors

Degree competences to which the content contributes:

### 15. GPS Receivers

Degree competences to which the content contributes:

### 16. GPS supplementary sensors

Degree competences to which the content contributes:

### 17. Kalman filtering / GPS Integration with other systems

Degree competences to which the content contributes:

### 18. Augmentation systems: differential GPS ands pseudolites

Degree competences to which the content contributes:
### Bibliography

**Basic:**


