



|   |                |                        |
|---|----------------|------------------------|
| <b>DENOMINACIÓN ASIGNATURA:</b> Astrodynamics and Atmospheric Flight Dynamics                               |                |                        |
| <b>POSTGRADO:</b> MÁSTER UNIVERSITARIO EN INGENIERÍA AERONÁUTICA<br><b>Profesor/a:</b> Manuel Sanjurjo Rivo | <b>ECTS:</b> 6 | <b>CUATRIMESTRE:</b> 1 |

**CRONOGRAMA DE LA ASIGNATURA (versión detallada)**

| S<br>E<br>M<br>A<br>N<br>A | S<br>E<br>S<br>I<br>Ó<br>N | DESCRIPCIÓN DEL CONTENIDO DE LA SESIÓN<br>(En su caso, incluir las recuperaciones, tutorías, entrega de trabajos, etc) | GRUPO<br>(marcar X) |   | Indicar espacio<br>Necesario distinto<br>aula (aula<br>informática,<br>audiovisual, etc..) | TRABAJO DEL ALUMNO DURANTE LA SEMANA    |                       |                                       |
|----------------------------|----------------------------|--|---------------------|---|--|---|-----------------------|---------------------------------------|
|                            |                            |  | 1                   | 2 |  | DESCRIPCIÓN                             | HORAS<br>PRESENCIALES | HORAS TRABAJO<br>Semana Máximo<br>7 H |
| 1                          | 1                          | <b>Introduction</b>  | X                   |   |  | Personal study                          | 1.6                   | 3                                     |
| 1                          | 2                          | <b>Two Body Problem</b>  | X                   |   |  | Personal study                          | 1.6                   | 3                                     |
| 2                          | 1                          | <b>Kepler's Equation</b>   | X                   |   |  | Personal study                          | 1.6                   | 3                                     |
| 2                          | 2                          | <b>Satellite State Representation (I)</b>  | X                   |   |  | Personal study                          | 1.6                   | 7                                     |
| 3                          | 1                          | <b>Satellite State Representation (and II).<br/>Coordinate systems and time systems</b>                                | X                   |   |  | Practical<br>exercise                   | 1.6                   | 7                                     |
| 3                          | 2                          | <b>Ground Track and reference systems - GMAT</b>   | X                   |   | Computer<br>Room   | Work on Lab                             | 1.6                   | 9                                     |
| 4                          | 1                          | <b>Orbital Maneuvering</b>   | X                   |   |  | Personal study<br>Practical<br>exercise | 1.6                   | 3                                     |
| 4                          | 2                          | <b>Orbital Maneuvering</b>   | X                   |   |  | Practical<br>exercise                   | 1.6                   | 4                                     |



|    |   |   |   |  |                  |                                      |     |   |
|----|---|---|---|--|------------------|--------------------------------------|-----|---|
|    |   |   |   |  |                  | Work on Lab                          |     |   |
| 5  | 1 | <b>Three Body Problem</b>                   | x |  |                  | Personal study<br>Work on Lab        | 1.6 | 3 |
| 5  | 2 | <b>Three Body Problem</b>                   | x |  |                  | Practical<br>exercise<br>Work on Lab | 1.6 | 4 |
| 6  | 1 | <b>N-Body</b>                               | x |  |                  | Personal study<br>Work on Lab        | 1.6 | 7 |
| 6  | 2 | <b>Patched-Conics</b>                       | x |  |                  | Personal study<br>Work on Lab        | 1.6 | 8 |
| 7  | 1 | <b>Lambert and B-plane targeting</b>        | x |  | Computer<br>Room | Work on Lab                          | 1.6 | 9 |
| 7  | 2 | <b>Special Perturbation Techniques</b>      | x |  |                  | Personal study<br>Work on Lab        | 1.6 | 3 |
| 8  | 1 | <b>Special Perturbation Techniques (II)</b> | x |  |                  | Personal study<br>Work on Lab        | 1.6 | 3 |
| 8  | 2 | <b>General Perturbation Techniques</b>      | x |  |                  | Personal study<br>Work on Lab        | 1.6 | 8 |
| 9  | 1 | <b>Propagator</b>                           | x |  | Computer<br>Room | Work on Lab                          | 1.6 | 9 |
| 9  | 2 | <b>Preliminary Orbit Determination</b>      | x |  |                  | Personal study<br>Work on Lab        | 1.6 | 4 |
| 10 | 1 | <b>Preliminary Orbit Determination (II)</b> | x |  |                  | Practical<br>exercise                | 1.6 | 4 |
| 10 | 2 | <b>Orbit Determination and Estimation</b>   | x |  |                  | Personal study<br>Work on Lab        | 1.6 | 3 |



|    |   |   |   |  |  |                                    |              |            |
|----|---|---|---|--|--|------------------------------------|--------------|------------|
| 11 | 1 | <b>Orbit Determination and Estimation (II)</b>    | X |  |  | Practical Exercise                 | 1.6          | 8          |
| 11 | 2 | <b>Relative Motion</b>                            | X |  |  | Practical Exercise                 | 1.6          | 7          |
| 12 | 1 | <b>Attitude Kinematics</b>                        | X |  |  | Personal study<br>Work on Lab      | 1.6          | 3          |
| 12 | 2 | <b>Attitude Dynamics. Torque Free Motion</b>      | X |  |  | Delivery<br>Astrolab               | 1.6          | 7          |
| 13 | 1 | <b>Attitude Dynamics. Controlled Motion</b>       | X |  |  | Personal study<br>Work on Lab      | 1.6          | 3          |
| 13 | 2 | <b>Exam Computer Room (Date To Be Determined)</b> | X |  |  |                                    |              |            |
| 14 | 1 | <b>Invited talk (Date To Be Determined)</b>       | X |  |  | Delivery: survey in Aula<br>Global | 2            | 3          |
| 14 | 2 | <b>Invited talk (Date To Be Determined)</b>       | X |  |  | Delivery: survey en<br>Aula Global | 2            | 3          |
|    |   |   |   |  |  |                                    | <b>Total</b> | <b>145</b> |