A course on numerical methods for engineers using MATLAB mathematical software is proposed. The emphasis of the course is on the use of software applied to numerical calculation techniques frequently used in engineering. The course has a marked transversal character and is of interest to a good number of students who begin their doctoral studies.

5. Course Outline

A course on numerical methods for engineers using MATLAB mathematical software is proposed. The emphasis of the course is on the use of software applied to numerical calculation techniques frequently used in engineering. The course has a marked transversal character and is of interest to a good number of students who begin their doctoral studies.

6. Recommended Prior Knowledge

It is advisable to have some basic mathematical knowledge of linear algebra, differential calculus and differential equations, in order to make the most of the subject.

7. Student Outcomes

UPV-Generic Student Outcomes

(03) Analyzing and solving problems
(11) Life-long learning
(12) Planning and managing of time
(13) Specific tools

8. Syllabus

1. MATLAB: .m documents, programming and task automation
2. Advanced display of one-, two- and three-dimensional data
3. Solving systems of linear equations
4. Interpolation (polynomial, splines, PCHIP...). Curve Fitting
5. Numerical solving of ordinary differential equations
7. Application to signal processing (noise reduction, compression, pattern detection...)

9. Teaching and Learning Methodologies

<table>
<thead>
<tr>
<th>UN</th>
<th>LE</th>
<th>SE</th>
<th>PS</th>
<th>LS</th>
<th>FW</th>
<th>CP</th>
<th>AA</th>
<th>CH</th>
<th>NCH</th>
<th>TOTAL HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0,20</td>
<td>0,20</td>
<td>7,00</td>
<td>7,20</td>
</tr>
<tr>
<td>2</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0,30</td>
<td>0,30</td>
<td>7,00</td>
<td>7,30</td>
</tr>
<tr>
<td>3</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0,30</td>
<td>0,30</td>
<td>7,00</td>
<td>7,30</td>
</tr>
<tr>
<td>4</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0,30</td>
<td>0,30</td>
<td>7,00</td>
<td>7,30</td>
</tr>
<tr>
<td>5</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0,30</td>
<td>0,30</td>
<td>7,00</td>
<td>7,30</td>
</tr>
<tr>
<td>6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0,30</td>
<td>0,30</td>
<td>7,00</td>
<td>7,30</td>
</tr>
<tr>
<td>7</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0,30</td>
<td>0,30</td>
<td>8,00</td>
<td>8,30</td>
</tr>
</tbody>
</table>

(*) This page is an automatically translated version of the original language version, which has been approved by the UPV for official purposes.
10. Assessment

The evaluation consists of three partial tests, with a weight of 10% each, and a final examination of the subject with a weight of 70% in the evaluation.

The first partial test will be carried out at the end of teaching units 1, 2 and 3, the second test at the end of units 4 and 5, and the third test at the end of units 6 and 7. These tests will consist of carrying out some proposed exercises of a similar level to the exercises proposed at the end of each lesson, and marking the correct answers in the multiple-choice questionnaire. These exercises will be proposed through PoliformaT.

The final examination will also be carried out through PoliformaT, of the same type as the partial tests although the questions will refer to all subjects.

The material used in the course may be used for testing and a computer with MATLAB installed must be available for use.