<table>
<thead>
<tr>
<th><strong>Course title</strong></th>
<th>Dispositivi Elettronici</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course code</strong></td>
<td>42409</td>
</tr>
<tr>
<td><strong>Scientific sector</strong></td>
<td>ING-INF/01</td>
</tr>
<tr>
<td><strong>Degree</strong></td>
<td>Bachelor in Electronics and Cyberphysical Systems (L-8)</td>
</tr>
<tr>
<td><strong>Semester</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td>9</td>
</tr>
<tr>
<td><strong>Modular</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Total lecturing hours</strong></td>
<td>54</td>
</tr>
<tr>
<td><strong>Total lab hours</strong></td>
<td>36</td>
</tr>
<tr>
<td><strong>Attendance</strong></td>
<td>Preferable. Non-attending students should contact the lecturer at the start of the course to agree on the modalities of the independent study</td>
</tr>
<tr>
<td><strong>Prerequisites</strong></td>
<td>Mathematical Analysis I, Mathematical Analysis II, Physics I, Physics II</td>
</tr>
<tr>
<td><strong>Course page</strong></td>
<td>Teams</td>
</tr>
<tr>
<td><strong>Specific educational objectives</strong></td>
<td>The objective of this course is an understanding of the physics and operation of semiconductor devices. Specifically, understanding of the formation and behavior of metal-semiconductor contacts, basic knowledge of nanotechnology and microfabrication, understanding of operation and design of MOSFETs, bipolar transistor and JFET, and understanding of the operation of memories, optical devices and sensors.</td>
</tr>
<tr>
<td><strong>Lecturer</strong></td>
<td>Prof. Paolo Lugli&lt;br&gt;Prof. Luisa Petti</td>
</tr>
<tr>
<td><strong>Contact</strong></td>
<td><a href="mailto:paolo.lugli@unibz.it">paolo.lugli@unibz.it</a>&lt;br&gt;<a href="mailto:luisa.petti@unibz.it">luisa.petti@unibz.it</a></td>
</tr>
<tr>
<td><strong>Scientific sector of lecturer</strong></td>
<td>ING-INF-01 – ELECTRONICS</td>
</tr>
<tr>
<td><strong>Teaching language</strong></td>
<td>Italian</td>
</tr>
<tr>
<td><strong>Office hours</strong></td>
<td>After consultation and agreement with lecturers</td>
</tr>
<tr>
<td><strong>Lecturing assistant (if any)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Contact LA</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Office hours LA</strong></td>
<td></td>
</tr>
<tr>
<td><strong>List of topics</strong></td>
<td>The topics covered include:&lt;br&gt;- Semiconducting materials.&lt;br&gt;- Semiconductor fabrication and characterization techniques.&lt;br&gt;- PN junctions and diodes.&lt;br&gt;- Transistors (MOSFETs; MESFETs; heterojunction transistors)&lt;br&gt;- Memories (DRAM; SRAM; Flash; resistive).&lt;br&gt;- Sensors (physical; chemical; biological sensors).&lt;br&gt;- Photonic devices (LEDs; lasers; photodiodes; solar cells).&lt;br&gt;- Passive electronic components (antennas; batteries).&lt;br&gt;- Internet-of-things and sensor networks.</td>
</tr>
<tr>
<td><strong>Teaching format</strong></td>
<td>Frontal lectures, homeworks, exercises, and laboratories.</td>
</tr>
<tr>
<td><strong>Learning outcomes</strong></td>
<td>To be defined</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------</td>
</tr>
<tr>
<td><strong>Assessment</strong></td>
<td>The exam will be in written form. One part will relate to the lecture topics, one other top the exercises. Students will have the choice to take 2 midterm exams (if negative, the students will have to take the final written exam including all covered topics).</td>
</tr>
<tr>
<td><strong>Assessment language</strong></td>
<td>Italian</td>
</tr>
<tr>
<td><strong>Evaluation criteria and criteria for awarding marks</strong></td>
<td>The assessment criteria will be the accuracy of the answers given in the written examination, with particular attention to the resolution procedure adopted and the formal correctness of the same.</td>
</tr>
<tr>
<td><strong>Required readings</strong></td>
<td>“Semiconductor Physics and Devices”, Donald A. Neamen.</td>
</tr>
<tr>
<td><strong>Supplementary readings</strong></td>
<td>“Elettronica di Millman”, Jacob Millman, Arvin Grabel, Pierangelo Terreni.</td>
</tr>
</tbody>
</table>