# Syllabus

## Course description

<table>
<thead>
<tr>
<th><strong>Course title</strong></th>
<th>Fundamentals of Information Science and Microcontroller Programming</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course code</strong></td>
<td>42329</td>
</tr>
<tr>
<td><strong>Scientific sector</strong></td>
<td>INF/01</td>
</tr>
<tr>
<td><strong>Degree</strong></td>
<td>Bachelor in Wood Engineering</td>
</tr>
<tr>
<td><strong>Semester</strong></td>
<td>I</td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>I</td>
</tr>
<tr>
<td><strong>Academic Year</strong></td>
<td>2021-22</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Modular</strong></td>
<td>No</td>
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</tbody>
</table>

| **Total lecturing hours** | 36 |
| **Total lab hours**       | 24 |
| **Total exercise hours**  |    |

**Attendance**

Attendance at assigned laboratory sections is required; lecture attendance is strongly recommended.

**Prerequisites**

Registration for the course of Bachelor in Industrial and Mechanical Engineering

**Course page**

The course will provide an introduction to basic concepts in information and computer science (hardware and software), particularly those topics of fundamental importance to Engineering.

**Lecturer**

Dr. Helen C. Henninger  
Facoltà di Scienze e Tecnologie, Building K, Room 2.08  
E-mail: HelenClare.Henninger@unibz.it

**Scientific sector of the lecturer**

Ing-Inf/04

**Teaching language**

English

**Office hours**

As listed on Cockpit or by appointment

**Teaching assistant (if any)**

Hlib Babii

**Office hours**

As listed on Cockpit or by appointment

**List of topics covered**

1. Basic structure of microcontroller code (Void setup/Void loop) and microcontrollers  
2. Introduction to the prototyping board and simple circuit building.  
3. C++ Coding intro; commands, operators and control structures, creating variables, strings, arrays, data types, Functions (inbuilt and making your own)  
4. Conditional statements  
5. Controlling a servo motor using a microcontroller  
6. Using an optical flow sensor with a microcontroller  
7. Motor driver/motor control using a microcontroller  
8. Arithmetic, comparison and Boolean operators
9. Pointers and addressing
10. Interrupts

Teaching format
Classroom lectures and laboratory exercises

Learning outcomes (ILOs)
Knowledge and understanding
1. Basic software design procedures.
2. How to develop simple microprocessor programs.
3. How to interface a microprocessor with simple sensors and actuators.
4. How to implement simple electro-mechanical systems. Applying knowledge and understanding
5. Reports for hands-on laboratory exercises that complement the lectures will require you to devise and sustain arguments. Making judgements
6. On the choice of the right tools such as data types, programming approaches, or electrical components. The labs will also require you to gather and interpret relevant data. Communication skills
7. Lab reports will require you to present information, ideas, problems and solutions in clear and simple language. Learning Skills
8. Basic foundations for further study in more advanced courses in Engineering

Assessment
Formative assessment

<table>
<thead>
<tr>
<th>Form</th>
<th>Length /duration</th>
<th>ILOs assessed</th>
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</thead>
<tbody>
<tr>
<td>Labs</td>
<td>24 hours total</td>
<td>01/07/21</td>
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</table>

Summative assessment

<table>
<thead>
<tr>
<th>Form</th>
<th>%</th>
<th>Length /duration</th>
<th>ILOs assessed</th>
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</thead>
<tbody>
<tr>
<td>Final Exam</td>
<td>60</td>
<td>4 hours</td>
<td>1-4,6,8</td>
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Assessment language
English

Evaluation criteria and criteria for awarding marks
Labs: Completeness and correctness of code; quality and accuracy of lab reports (level of observation of physical processes)
Written Final Exam: Completeness and correctness of answers.
Students are required to receive an overall grade of greater than 60/100 points in order to pass the course
<table>
<thead>
<tr>
<th>Required readings</th>
<th>Course notes</th>
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<tbody>
<tr>
<td>Supplementary readings</td>
<td></td>
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