# 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>42174</td>
</tr>
<tr>
<td><strong>Scientific sector</strong></td>
<td>ING-INF/04</td>
</tr>
<tr>
<td><strong>Degree</strong></td>
<td>Bachelor in Industrial and Mechanical 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>2022-2023</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Modular</strong></td>
<td>no</td>
</tr>
<tr>
<td><strong>Total lecturing hours</strong></td>
<td>36 hrs</td>
</tr>
<tr>
<td><strong>Total lab hours</strong></td>
<td>24 hrs</td>
</tr>
<tr>
<td><strong>Total exercise hours</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Attendance</strong></td>
<td>Attendance at assigned laboratory sections is required; lecture attendance is very strongly recommended.</td>
</tr>
<tr>
<td><strong>Prerequisites</strong></td>
<td>Registration for the course of Bachelor in Industrial and Mechanical Engineering</td>
</tr>
<tr>
<td><strong>Course page</strong></td>
<td><a href="http://www.unibz.it/en/sciencetechnology/progs/bachelor/industrial/courses/default.html">http://www.unibz.it/en/sciencetechnology/progs/bachelor/industrial/courses/default.html</a></td>
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## Specific educational objectives

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

Prof. Karl von Ellenrieder  
Facoltà di Scienze e Tecnologie, Building L, Room 6.02  
Tel.: +39 0471 017172  
E-mail: karl.vonellenrieder@unibz.it  
Web: https://next.unibz.it/en/faculties/sciencetechnology/academic-staff/person/37038-karl-dietrich-von-ellenrieder  
Scientific sector of the lecturer: ING-INF/04 - Automatica

## Teaching language

English

## Office hours

As listed on Cockpit or by appointment

## Laboratory Instructor

TBD

## Teaching Assistant

TBD

## Office hours

As listed on Cockpit or by appointment
List of topics covered

The course covers the following topics:
1. Basic programming syntax and structure in C
2. Functions
3. Conditional control structures
4. Arithmetic, comparison and Boolean operators
5. Pointers and addressing
6. Data types
7. Interrupts
8. Simple electronic circuits

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

<table>
<thead>
<tr>
<th>Form</th>
<th>%</th>
<th>Length/duration</th>
<th>ILOs assessed</th>
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</thead>
<tbody>
<tr>
<td>Labs</td>
<td>40</td>
<td>24 hours total</td>
<td>1-7</td>
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</table>

Formative assessment
Summative assessment

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

Assessment language

English

Evaluation criteria and criteria for awarding marks

Labs: Completeness and correctness of reports; quality of writing; 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.

Required readings


Hardcopies available in library reserves, or can be downloaded here – http://www.introtoarduino.com/downloads/IntroArduinoBook.pdf

Supplementary readings