

## Syllabus

### Course description

<b>Course title</b>	Fundamentals of Information Science and Microcontroller Programming
<b>Course code</b>	42174
<b>Scientific sector</b>	ING-INF/04
<b>Degree</b>	Bachelor in Industrial Mechanical Engineering
<b>Semester</b>	I
<b>Year</b>	I
<b>Academic Year</b>	2020-2021
<b>Credits</b>	6
<b>Modular</b>	no

<b>Total lecturing hours</b>	36 hrs
<b>Total lab hours</b>	24 hrs
<b>Total exercise hours</b>	
<b>Attendance</b>	Attendance at assigned laboratory sections is required; lecture attendance is very strongly recommended.
<b>Prerequisites</b>	Registration for the course of Bachelor in Industrial and Mechanical Engineering
<b>Course page</b>	<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>

<b>Specific educational objectives</b>	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.
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<b>Lecturer</b>	Prof. Karl von Ellenrieder Facoltà di Scienze e Tecnologie, Building K, Room 2.08 Tel.: +39 0471 017172 E-mail: karl.vonellenrieder@unibz.it Web : <a href="https://next.unibz.it/en/faculties/sciencetechnology/academic-staff/person/37038-karl-dietrich-von-ellenrieder">https://next.unibz.it/en/faculties/sciencetechnology/academic-staff/person/37038-karl-dietrich-von-ellenrieder</a>
<b>Scientific sector of the lecturer</b>	ING-INF/04 - Automatica
<b>Teaching language</b>	English
<b>Office hours</b>	As listed on Cockpit or by appointment
<b>Laboratory Instructor</b>	TBD
<b>Teaching Assistant</b>	TBD
<b>Office hours</b>	As listed on Cockpit or by appointment
<b>List of topics covered</b>	The course covers the following topics:

	<ol style="list-style-type: none"> <li>1. Basic programming syntax and structure in C</li> <li>2. Functions</li> <li>3. Conditional control structures</li> <li>4. Arithmetic, comparison and Boolean operators</li> <li>5. Pointers and addressing</li> <li>6. Data types</li> <li>7. Interrupts</li> <li>8. Simple electronic circuits</li> </ol>
<b>Teaching format</b>	Classroom lectures and laboratory exercises

<b>Learning outcomes (ILOs)</b>	<p><u>Knowledge and understanding</u></p> <ol style="list-style-type: none"> <li>1. Basic software design procedures.</li> <li>2. How to develop simple microprocessor programs.</li> <li>3. How to interface a microprocessor with simple sensors and actuators.</li> <li>4. How to implement simple electro-mechanical systems.</li> </ol> <p><u>Applying knowledge and understanding</u></p> <ol style="list-style-type: none"> <li>5. Reports for hands-on laboratory exercises that complement the lectures will require you to devise and sustain arguments.</li> </ol> <p><u>Making judgements</u></p> <ol style="list-style-type: none"> <li>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.</li> </ol> <p><u>Communication skills</u></p> <ol style="list-style-type: none"> <li>7. Lab reports will require you to present information, ideas, problems and solutions in clear and simple language.</li> </ol> <p><u>Learning Skills</u></p> <ol style="list-style-type: none"> <li>8. Basic foundations for further study in more advanced courses in Engineering.</li> </ol>
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<b>Assessment</b>	<b>Formative assessment</b>			
	<b>Form</b>	<b>%</b>	<b>Length /duration</b>	<b>ILOs assessed</b>
	Labs	40	24 hours total	1-7
	<b>Summative assessment</b>			
	<b>Form</b>	<b>%</b>	<b>Length</b>	<b>ILOs</b>

			<b>/duration</b>	<b>assessed</b>
	Final Exam	60	4 hours	1-4,6,8
<b>Assessment language</b>	English			
<b>Evaluation criteria and criteria for awarding marks</b>	<p>Labs: Completeness and correctness of reports; quality of writing; level of observation of physical processes</p> <p>Written Final Exam: Completeness and correctness of answers.</p> <p>Students are required to receive an overall grade of greater than 60/100 points in order to pass the course.</p>			
<b>Required readings</b>	<p>Smith, A. G. <i>Introduction to Arduino: A piece of cake</i>, CreateSpace Independent Publishing Platform, 2011. ISBN: 978-1463698348</p> <p>Hardcopies available in library reserves, or can be downloaded here – <a href="http://www.introtoarduino.com/downloads/IntroArduinoBook.pdf">http://www.introtoarduino.com/downloads/IntroArduinoBook.pdf</a></p>			
<b>Supplementary readings</b>	<p>Blum, J. <i>Exploring Arduino: Tools and Techniques for Engineering Wizardry</i>, John Wiley &amp; Sons, 2013. ISBN: 978-1-118-54936-0</p>			