

Course Title	Programming Principles I – Robotics Lab				
Course Code	CSE100				
Course Type	Compulsory				
Level	Bachelor (1 st cycle)				
Year / Semester	1 st Year / 1 st Semester				
Teacher's Name	TBA				
ECTS	6	Lectures / week	3 hours/ 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	<p>This course aims to provide theoretical as well as practical experience to students that are now starting out in programming. The course will introduce the basic ideas of problem solving and programming, using the principles of top-down design, stepwise refinement, and procedural abstraction. The students get practical experience with a structured programming language along with its use in the construction and execution of complete programs that solve simple algorithmic problems. Basic data types, input/output conventions, selection and iteration structures are presented. There will be an emphasis on practical training on robotics platforms that will help students understand the concepts.</p>				
Learning Outcomes	<p>Upon successful completion of this course students should be able to:</p> <ul style="list-style-type: none"> • Write, compile and run programs in a structured programming language • Apply decision/control code structures in order to control program execution and flow • Use repetition code structures to perform long-winded calculation and manipulation of output • Create and use arrays in order to store and manipulate collections of related data • Create and use methods/functions in order to modularize larger programs and reduce complexity • Declare and manipulate pointers as the basis of dynamic memory manipulation • Apply knowledge learned in solving problems using robotic platforms 				
Prerequisites	None		Co-requisites	CSE105 (for CSE students only)	
Course Content	Theoretical part				

	<p>Introduction to programming and understanding where programming 'fits' in the software development process and computer science in general. Basic familiarization with the software development platform. Declaring and initializing variables and constants. Declaring basic data types variable and manipulating their values. Basic input (obtaining input from the user) and output (showing some result to the user).</p> <p>Learning how to use control structures to manipulate the execution of the program. Using <if> and <if/else> and <switch> constructs in order to control how a program behaves.</p> <p>Understanding iteration and how to use repetition structures to enable automatic execution of multiple times. Using <for>, <while> and <do/while> constructs to program recurring instances of code and repeating through certain functionalities.</p> <p>Implementing and using advanced data structures such as arrays, as a means of collectively referring to sets of related data. Using <for> and enhanced <for> loops to go through arrays and perform actions and calculations.</p> <p>Creating and using methods (or functions) as a means for modular program design and as a tool for reducing complexity for when working with bigger problems. Learn and use to pass and return arguments.</p> <p>Brief introduction to pointers with a basis on memory allocation, memory addressing and memory access. Passing information to functions using by reference or by value capabilities.</p> <p>Laboratory part</p> <p>Utilizing robotics practical sessions throughout the course using the knowledge gained in previous weeks to design modular solutions for robot manipulation. Hands-on sessions will be held every two to three weeks and will allow students to develop code to control a robotic platform. The robots can be mobile allowing movement control, or stationary allowing sensor input and the display of values on displays.</p> <p>Sensor input code, actuator output code, display configuration and use. Use of variables for control values, array structures for sensor input, development of functions for specific parts of the robotic solution.</p>
Teaching Methodology	Face – to – face
Bibliography	“C How to Program, Global Edition” by Paul Deitel

	<p><i>"C Programming for Arduino"</i> by Julien Bayle</p> <p><i>"Beginning C for Arduino: Learn C Programming for the Arduino"</i> by Jack Purdum</p> <p><i>"Learning C for Arduino"</i> by Syed Omar Faruk Towaha</p>								
Assessment	<table border="1"> <tr> <td>Examinations</td> <td>60%</td> </tr> <tr> <td>Class Participation and Attendance</td> <td>10%</td> </tr> <tr> <td>Assignments</td> <td>30%</td> </tr> <tr> <td></td> <td>100%</td> </tr> </table>	Examinations	60%	Class Participation and Attendance	10%	Assignments	30%		100%
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Language	English								