Although the students are engaged with a fun and rewarding lab experience, the educational pedagogy is centered on fundamental learning objectives. After the successful conclusion of this class, students should be able to understand the basic components of a computer, write C language programs that perform I/O functions and implement simple data structures, manipulate numbers in multiple formats, and understand how software uses global memory to store permanent information and the stack to store temporary information. Our goal is for students to learn these concepts:

0) Understanding how the computer stores and manipulates data,
1) The understanding of embedded systems using modular design and abstraction,
2) C programming: considering both function and style,
3) The strategic use of memory,
4) Debugging and verification using a simulator and on the real microcontroller,
5) How input/output using switches, LEDs, DACs, ADCs, motors, and serial ports,
6) The implementation of an I/O driver, multithreaded programming,
7) Understanding how local variables and parameters work,
8) Analog to digital conversion (ADC), periodic sampling,
9) Simple motors (e.g., open and closed-loop stepper motor control),
10) Digital to analog conversion (DAC), used to make simple sounds,
11) Design and implementation of elementary data structures.