Electrical Engineering/Electronics

Profile and Objective

The participants are taught the most important principles of electrical engineering in connection with the basics of project implementation. They will be gradually introduced to the practical handling of hardware, sensors and laboratory measuring instruments. The understanding of mechanical relationships as well as simple graphical software programming are also developed. During the electrical engineering laboratory, a project is prepared, carried out, documented and evaluated independently by the students. Conclusions must be deduced from the measurement results. The participants should be able to perform a project in a group of three persons, as well as have understood the basics of electrical engineering. The software ROBO Pro serves as a tool to program the prototype.

+ Equipment

Hardware

- Instrumentation such as oscilloscopes, multimeters, frequency generators, adjustable power supplies, etc.
- Electrotechnical accessories such as various components, plug-in boards, cables
- Tools for electronics production
- Learning kit Fischertechnik Electronics
- Learning kit Fischertechnik Robotics TXT Advanced

Software

- Robo Pro for Robotics TXT
- LT-Spice for simulation

+ Research Subjects

- Basic electrical quantities (electricity, electric current, electrical voltage, electrical resistance)
- The electrical circuit - structure and definitions
- Laws in the electrical circuit
- Measurement of current and voltage
- The main components of a DC circuit (ohmic resistor, capacitor, coil, DC sources, transistor)
- Calculations in the DC circuit

+ Further Subjects

- Teamwork
- Main features of project management
- Basic mechanical understanding
- Solution-oriented thinking
- Encouraging creativity
- Practicing independency
- Trying out methods for acquiring knowledge
- Basic time management
- Dealing with a graphical programming system