Lego Robotics INTRO: Build & Program them

A course teaching students the basic principles of robotics: design, build and program a robot for a purpose. Participants will be challenged at the end to build their own special-purpose robot and compete in a “RoboCon” i.e., Robot Contest at the end of the semester. Students will learn the basics of modeling, design, planning, programming and control of robotic systems. They will combine knowledge from geometry, physics, kinematics, statics, dynamics and visual computer programming.

Duration:
30 hours + Final Presentation
10 three hour afternoon sessions, over Tuesdays/Thursdays
Theory & Supervised Team work + Final Presentation

Dates:
Period A: 15 October - 17 December 2013, Tuesdays
Period B: 30 January – 3 April 2014, Thursdays

Times:
16:00 - 19:00
Refreshments included

Fee:
Euro 325,00 per person

Venue:
British Council, Kolonaki Square, 17, Athens

Number of participants:
Minimum 6, maximum 20 participants

Computer Level:
Internet and Applications Usage

www.britishcouncil.gr
www.ait.gr
Lego Robotics INTRO:
Build & Program them

Trainers and Methodology:
The training team is composed of AIT professors and researchers and BC teachers— all highly qualified and highly experienced professionals. Besides of holding a Ph.D. from renowned universities in technology, our trainers are engaged in relevant scientific research.

Our methodology is hands-on and based on group work to deliver on a final challenge. The course is broken up into two parts: theoretical and practical. During the theoretical part, students will learn how transform all their knowledge into detailed plans to solve a problem and to implement them, i.e. devise and implement an algorithm—a skill of paramount importance in engineering. They will also learn design principles for building special-purpose robots: built for speed or light-weight, or to utilize sensors, and display results.

During the practical part of the course, students will work a LEGO robotics platform and learn the tools to build and program LEGO robots. They will learn principles of programming and the NXT Lego programming tools. They will be exposed to many examples and many designs as well as how to utilize input from sensors.

As a final challenge, students will be organized into teams of 3 or 4 and be required to design, build and program a special-purpose robot for a specific task. A “RoboCont” – a Robot Contest – will be held at the end of the semester, in which teams will be tested and evaluated on how successful they have been with their design. Their performance will be measured according to specific criteria, such as task completion, speed, durability, and accuracy.

Target:
The training is aimed at anyone who has an interest in science and engineering. It is a simplified transfer of a corresponding first year University courses. Students acquire basic programming skills and are exposed to the multi-disciplinary way of thinking, they will draw on different areas of knowledge, such as geometry, physics, mathematics, programming, and efficient design, to successfully complete the course. Further, the exposure of the students to a challenging technical topic as well as the need to work in teams will open up new directions in their thinking about university education options and careers paths.

Course structure
Three Hour Sessions:
1. Course Overview, History of Robotics, Videos, Robotic Applications, Related AIT Courses, Splitting into Working teams
2. Programming Motion, Angles, Rotations. The Brick, The Tools Commands, Programming the Brick
3. PC tool, transferring code PC → Brick
5. Program Flow: Conditions and Loops
6. Nested Loops, Specialty Blocks Programming
8. Lab work: Supervised term project work
9. Lab work: Supervised term project work
10. Supervised term project work

Final Presentation by students to their peers and parents

Contact us to discuss your training
customerservices@britishcouncil.gr  T +30 210 369 2333
Lego Robotics INTRO: Build & Program them

A course teaching students the basic principles of robotics: design, build and program a robot for a purpose. Participants will be challenged at the end to build their own special-purpose robot and compete in a “RoboCon” i.e., Robot Contest at the end of the semester. Students will learn the basics of modeling, design, planning, programming and control of robotic systems. They will combine knowledge from geometry, physics, kinematics, statics, dynamics and visual computer programming.

Duration:
30 hours + Final Presentation

Times:
16:00 - 19:00
Refreshments included

Fee:
Euro 325,00

Venue:
British Council, Kolonaki Square, 17

Number of participants:
Minimum 6, maximum 20 participants

Computer Knowledge Level:
Internet and Applications Usage

Trainers and Methodology:
The training team is composed of AIT professors and researchers and BC teachers – all highly qualified and highly experienced professionals. Besides of holding a Ph.D. from renowned universities in technology, our trainers are engaged in relevant scientific research.

Our methodology is hands-on and based on group work to deliver on a final challenge. The course is broken up into two parts: theoretical and practical. During the theoretical part, students will learn how transform all their knowledge into detailed plans to solve a problem and to implement them, i.e. devise and implement an algorithm – a skill of paramount importance in engineering. They will also learn design principles for building special-purpose robots: built for speed or light-weight, or to utilize sensors, and display results.

During the practical part of the course, students will work a LEGO robotics platform and learn the tools to build and program LEGO robots. They will learn principles of programming and the NXT Lego programming tools. They will be exposed to many examples and many designs as well as how to utilize input from sensors.

As a final challenge, students will be organized into teams of 3 or 4 and be required to design, build and program a special-purpose robot for a specific task. A “RoboCon” – a Robot Contest – will be held at the end of the semester, in which teams will be tested and evaluated on how successful they have been with their design. Their performance will be measured according to specific criteria, such as task completion, speed, durability, and accuracy.

Target:
The training is aimed at anyone who has an interest in science and engineering. It is a simplified transfer of a corresponding first year University courses. Students acquire basic programming skills and are exposed to the multi-disciplinary way of thinking; they will draw on different areas of knowledge, such as geometry, physics, mathematics, programming, and efficient design, to successfully complete the course. Further, the exposure of the students to a challenging technical topic as well as the need to work in teams will open up new directions in their thinking about university education options and careers paths.

The modules:
1 Course Overview, History of Robotics, Videos, Robotic Applications, Related AIT Courses, Splitting into Working teams
2 Programming Motion, Angles, Rotations. The Brick, The Tools Commands, Programming the BRICK, The PC Tool, transferring code PC  Brick
3 Sensors & Sensor Readings, Exploring Motions, Exploring sensors, Exploring Display
4 Program Flow: Conditions and Loops
5 Nested Loops, Specialty Blocks Programming
6 Building Tips, First Challenge: Designing Robots for a purpose – Line Following Robot (2 techniques)
7 Lab work: Supervised term project work
8 Lab work: Supervised term project work
9 Lab work: Supervised term project work
10 Supervised term project work
11 Final Presentation

Contact us to discuss your training
customerservices@britishcouncil.gr   T +30 210 369 2333

www.britishcouncil.gr
www.ait.gr