

G-CODERZ PYTHON GYM



www.gteceducation.com.sg

Course Overview

Python Gym course enables the students to explore Python coding within the G-CoderZ Online Robotics Environment. Within G-CoderZ, they will be able to practice their Python coding skills on a simulated robot in a physically accurate setting. Students are required to program robots using Python and need to solve a variety of missions by implementing advanced coding and engineering concept. This course not only enhances the student's programming skills but also STEM (Science, Engineering, Technology and Mathematics) Skills.

Entry Requirement : Basic Computer Knowledge

Course Duration : 32 hrs.

Mode of Training : Face to Face Training

Course Content

Module 1: Hello Python

- Exploring the G-CoderZ Environment
- Introduction to Python and Basic Python Syntax
- Programming Basic Robotic Tasks

| Ruby's API | Computer Science | Physics |
|------------------|------------------|------------------------------|
| Set_power | Print | Weight |
| Brake_until_stop | Time | Gravity |
| | Sleep | Momentum |
| | For Loops | Newton's 3 rd Law |
| | | Friction |

Module 2: Easy Speedy

- Power and Acceleration
- Two-state Controllers
- Closed Loop Control
- Speed Control

| Ruby's API | Computer Science | Physics | Engineering |
|------------------|----------------------|---|--|
| Set_power | While | The relationship between power, acceleration and speed. | Regulating speed with closed loop control (2 state controller) |
| Brake_until_stop | If-else | | |
| | Efficiency of coding | | |

Module 3: Go the Distance

- Driving Set Distances
- The Pythagorean Theorem
- Variables
- P-Controllers

| Ruby's API | Computer Science | Physics | Engineering |
|--------------------------|----------------------------------|--|--|
| gps.get_position | Import math library | Unit conversion | open-loop control |
| cs.drive_distance | Math.sqrt; | 3d coordinate systems | Driving a given distance with closed-loop control (P-controller) |
| is_drive_distance_active | List unpacking | Pythagorean Theorem; | overshot |
| | Async function vs sync function; | Clamping values with min(max(x, lower_bound), upper_bound) | |

Module 4: Good Turn

- Turning Algorithms
- The Gyro Sensor

| Ruby's API | Computer Science | Math | Engineering |
|----------------------------|---------------------------------|----------------|-----------------|
| Is_brake_until_stop_active | Async function vs sync function | Angles | 2-motor drive |
| Gyro.get_angle_y | Break | Clamping value | The gyro sensor |
| Cs.turn_to | | | |
| Cs.is_turn_to_active | | | |

Module 5: To the Letter

- Setting a Trail
- Types of Turns
- Managing Functions

| Ruby's API | Computer Science |
|-----------------------|--|
| Robot.trail.set_trail | Custom defined functions with a single input |
| | Creation and handling of modules |

Module 6: Round Off

- Smooth Turns
- Indices
- Tuples
- Maze Solving

| Ruby's API | Math | Engineering |
|-------------------------|----------------------|---------------------------------|
| Python tuples | Geometry of a circle | Smooth turns with 2-motor drive |
| Searching Documentation | | |

Module 7: On the Radar

- Ultrasonic Sensor
- Maze Solving

| Ruby's API | Engineering |
|---------------------------------------|------------------|
| robot.us_fwd.get_distance | Distance sensors |
| robot.us_fwd.get_single_axis_rotation | Maze solving |

Module 8: Arm up

- Magnets
- Robotic Arms
- Color Sensor

| Ruby's API | Engineering | Physics |
|--|--------------|---------|
| robot.magnet_arm.is_weight_box_connected() | Robotic arms | Magnets |
| robot.magnet_arm.lift() | | |
| robot.magnet_arm.poke() | | |
| robot.cs_forward.get_color_name | | |

Module 9: Rock Along

- Encoders
- Stabilization
- Reflection Readings

| Ruby's API | Engineering | Physics |
|-------------------------------|-------------|-------------------|
| robot.el/er.get_encoder_value | Encoders | Stabilization |
| robot.el/er.reset | | Center of Gravity |
| robot.el/er.get_encoder_value | | |

Module 10: Follow Out

- Line Following
- Line Following
- Proportional Control

| Ruby's API | Engineering |
|---------------------------------------|--------------------|
| | Line Following |
| robot.us_fwd.get_single_axis_rotation | 3 State Controller |

Company Profile

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|---------------------------------------|---|
| <p>What We do :</p> | <p>G-TEC Computer Education Centre is an Information Technology company in the field of Software Training, Technology Resourcing and Knowledge Consulting. We provide Corporate Training, Project Training, and Customized Training, One to One trainings for professionals, individuals and students.</p> |
| <p>Who are our Customers :</p> | <p>We have special teaching methodologies to train people in different categories ranging from corporate clients to school level students. Over 900000 students are certified by G-TEC all over the world. We have the privilege of working with some of the most well-known companies in the world.</p> |
| <p>Where we are :</p> | <p>G-TEC Computer Education Centre is the largest computer education networks with more than 510 centers all over the world and corporate office in Singapore. We are operating in Mexico, Qatar, India, Dubai, Singapore, Kuwait, Srilanka and Iran.</p> |
| <p>Our Goal and Focus :</p> | <p>Our aim is to make IT education affordable to all sections of society through various projects associating with government's quasigovernment public and private company to reach each and every corner. Our ultimate goal is to achieve cent percentage computer literacy. We are committed to provide 100% quality training to all; our focus is to provide Quality Education World Wide.</p> |

Our Location



Nearest MRT: Dhoby Ghaut-Exit A / Little India-Exit A/ Bencoolen-Exit B

Bus Services: 64, 65, 131, 139, 147, 166, 857

Nearest Bus Stop: Peace Centre, Stop ID: 07011

1 Sophia Road, #02-03, Peace Centre, Singapore 228149.

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