

# DARwIn-OP Introduction [DASL-104] Summer/2017

## Syllabus

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### Part 1: Course Information

#### Instructor Information

**Instructor:** Jean Chagas Vaz  
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#### Course Description

DARwIn-OP (Dynamic Anthropomorphic Robot with Intelligence–Open Platform) is a miniature-humanoid-robot platform with advanced computational power, sensors, and dynamic motion. Throughout this course you will learn the physics as well as programming basis embedded onto this powerful humanoid.

#### Prerequisite

- Basic Ubuntu commands
- C++

#### Course Requirements

- Laptop with (Ubuntu 14.05 or higher)
- Ubuntu must have VNC (VNC viewer) & Webots installed

#### Course Structure

\*This is a lab-based course which focuses on the manipulation and maintenance of DARwIn-OP and OP2. This course will be divided in four sections. Each section has its goal to be achieved at the end of the section. Furthermore, it will be discussed about the dynamics and physics beyond the DARwIn-OP humanoid.

#### Online Resources

- <http://support.robotis.com/en/product/darwin-op.htm>

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### Part 2: Topic Outline/Schedule

- **Week 01: DARwin-op Overall Overview**
  - System requirements and limitation.
  - Turning on and off Darwin-OP(Safely manners)
  - Connect DARwin OS throughout VNC
  - Inverted-Pendulum model
  - DARwin's kinematics
- **Week 02: DARwin-op servos (Dynamixel)**
  - Understanding Dynamixel motors
  - Introduction to Robo-Plus
  - Calibrating Dynamixels
  - Using Dynamixel Wizard
- **Week 03: DARwin-OP code & Simulation**
  - Understanding DARwin-OP codes
  - Navigating at Darwin's directory
  - Executing demos
  - Walking Tuner
  - Introduction to Webots
- **Week 04: Programing a new motion**
  - Introduction to action editor
  - Create a new movement (e.g DARwin-OP throw a baseball)
  - Executing DARwin-op throughout the code.

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### Part 3: Grading Policy

#### Graded Course Activities

Points	Description
Homework #1	TBD
Homework #2	TBD
Homework #3	TBD
Final Practical Exam	TBD
100	Total Points Possible

#### Letter Grade Assignment

Final grades assigned for this course will be based on the percentage of total points earned (by weekly home-works and Final practical exam) and are assigned as follows:

Letter Grade	Percentage	Performance
A	93-100%	Excellent Work
A-	90-92%	Nearly Excellent Work
B+	87-89%	Very Good Work
B	83-86%	Good Work
B-	80-82%	Mostly Good Work
C+	77-79%	Above Average Work
C	73-76%	Average Work
C-	70-72%	Mostly Average Work
D+	67-69%	Below Average Work
D	60-66%	Poor Work
F	0-59%	Failing Work