[Robotic Drives & Physics: Robotics, learn by building III](https://www.udemy.com/course/robotic-drives-and-physics/)

*Udemy*

# 2. Watcha gonna need: explanation of parts in the kit

Note: Air pumps can be dangerous, so we should avoid anything that has more than 20 or 30 psi. We could get one for aquariums as these are normally not very powerfull.

# 2. Physics kit table assembly

# 3. Simple machines: Levers and why they are important

# 4. Gears, compound gears & mechanica advantage

# 5. Building our experimental gear drive

# 6. Mechanical Mayhem challenge

# 7. Strap Drives

# 8. Arm robot design challenge

# 9. Arm robot design challenge – part 2

# 10. Backlash: The nemesis of robotics

# 11. The Wedge / threads / ball screw drive

(A cunha / roscas / acionamento por fuso de esferas)

# 12. Anti-backlash gears

(engrenagens anti-folga)

# 13. DC Brushed motors

# 14. Exploring real world DC motors on a forklift

(forklift = empilhadora)

# 15. Back EMF

# 16. Toggle mechanism and building a robot gripper

# 17. Electrical generation & 3 Phase AC power

# 18. Regenerative braking

# 19. Regenerative braking II: A pratical application

# 20. Servos and feedback, part 1

A ***servo*** is a mechanical system operating in a ***closed loop*** to apply specific movement flow, speed or pressure.

The closed loop is composed of a controller, which is the is controlling a drive mechanism, which is modifying the feedback which the controller reads in order to know what to do with the drive mechanism.

In robotics, almost all of our feedback is positional, sometimes pressure.

But what we care the most about is where a robot is in space and the positions of the various axes.

So we want reliable, high resolution and accurate position sensors.

I'll spend the next lesson on what is called an AC resolver, which works on inductance.

Now inductors work whether or not they're dirty, right?

It's the same with capacitors and capacitive sensors are very reliable.

# 21. Servos and feedback, part 2

# 22. Stepper motors

# 23. Stepper motors II: Driving them around

# 24. Updated Brushless DC motor wiring

Ulisses note: Not very interesting, it’s just about some wiring, like position of pins in cables of a motor in the KIT.

# 25. Brushless DC (BLDC) motors

Ulisses note: Not very interesting: mostly just electronics

# 26. Building our 3 phase H-bridge to drive a BLDC

Ulisses note: Not very interesting: mostly just electronics

# 27. Driving BLDC in close loop with hall effect sensors

Ulisses note: Not very interesting: mostly just electronics

# 28. PWMAC – simulating and AC wave using PWM

Ulisses note: Not very interesting: mostly just electronics

# 29. Hardware hacking a BLDC into an AC servor motor, part 1

Ulisses note: Not very interesting: mostly just electronics

# 30. Hardware hacking a BLDC into an AC servor motor, part 2

Ulisses note: Not very interesting: mostly just electronics

# 31. Submarine Robot Case Study, part 1

Ulisses note: an introduction to the history and goals of the project – not very useful to me

# 32. Submarine Robot Case Study, part 2: Buoyancy Control

Ulisses note: not very useful to me

# 33. Submarine Robot Case Study, part 3: Densisty and Buoyancy

Ulisses note: not very useful to me

# 34. Submarine Robot Case Study, part 4: Pressure Vessels

Ulisses note: not very useful to me

# 35. Strain Wave Drive, aka Harmonic Drive

Ulisses note: Not very interesting: mostly just electronics

# 36. The Cycloidal drive

# 37. Rovot safety & interlockings

# 38. AC motors, part I

Ulisses note: not very useful to me

# 39. AC motors, part II: Sunchronous & Asynchronous

Ulisses note: not very useful to me

# 40. DC dynamic brakes

Ulisses note: not very useful to me

# 41. AC dynamic brakes

Ulisses note: not very useful to me

# 42. Safety with air and fluid power

Ulisses note: not super useful to me

# 43. Physics kit backboard assembly, part 1

Ulisses note: not super useful to me

# 44. New Hydraulic pump in assembly

Ulisses note: not super useful to me

# 45. Physics kit backboard assembly, part 2

Ulisses note: not super useful to me

# 46. Air tank assembly

Ulisses note: not super useful to me

# 47. Assembling power cylindres

# 48. Extra parts with power cylinders

# 49. Homebuilt Power cylinder tear-down

# 50. Power cylinder physics

# 51 Solenoids

# 52. Using our pneumatic system

# 53 Measuring force from our power cylinders

# 54. Air muscles

# 55. Counterweights & Balances

# 56. Springs and animatronics

# 57. Resolvers: An introduction

# 58. Reading Resolvers using hysteresis