

Session index (50min each)	Title	Intended Learning Outcomes	Teaching Material and Learning Activities
1	making robots balance - part 1	<ul style="list-style-type: none"> <li>• overview of the purpose of the project</li> <li>• overview of what one is expected to do and learn</li> <li>• examples of what is control</li> <li>• fundamental block scheme</li> <li>• introduction of the 'balancing problem'</li> <li>• expliciting of the meaning of the control actions</li> </ul>	<ul style="list-style-type: none"> <li>• slides</li> <li>• video</li> <li>• demonstrations with sticks</li> <li>• discussion sessions</li> </ul>
2	making robots balance - part 2	<ul style="list-style-type: none"> <li>• intuitive understanding of what feedback is</li> <li>• introduction to the robot platform</li> <li>• overview of the hardware components in the platform</li> <li>• introducing and testing different control heuristics</li> <li>• introduction to P controllers</li> <li>• testing the P controller on the robot</li> <li>• intuitions about how to tune P controllers</li> </ul>	<ul style="list-style-type: none"> <li>• slides</li> <li>• video</li> <li>• demonstrations with the robots</li> <li>• discussion sessions</li> </ul>
3	making robots balance - part 3	<ul style="list-style-type: none"> <li>• consolidating the intuitions about the P controller</li> <li>• other physical examples of P controllers</li> <li>• effects of constant disturbances</li> <li>• introduction to integral and derivative actions</li> <li>• intuitions about how to tune I and D actions</li> <li>• summary of what a PID is</li> <li>• mentioning integrals and derivatives</li> <li>• tests with different tunings with the robot</li> </ul>	<ul style="list-style-type: none"> <li>• slides</li> <li>• video</li> <li>• demonstrations with the robots</li> <li>• discussion sessions</li> </ul>