

Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
INF430	Robotics	7	3	0	0	3	4

Prerequisites	ING220
Admission Requirements	ING220

Language of Instruction	French
Course Type	Elective
Course Level	Bachelor Degree
Objective	The aim of the course on Robotics is to teach to the undergraduate students the fundamentals of the articulated robots, their components, and their structures. Kinematic modelling of the moving and articulated robots will be given.
Content	<ol style="list-style-type: none">1. Week: Robotic components : fundamental approaches2. Week: Forward kinematics : rotational matrix, rotational movement with respect to the local coordinate system, Euler angle, roll, pitch and yaw angles. An example of 6 DoF robot.3. Week: Backward kinematics: solution, existence and uniqueness of the solution4. Week: Translational motion5. Week: Dynamics of the robot joints and regulation: mathematical modelling6. Week: Working space and trajectory planning: basic presentation7. Week: vision-based sensing: introduction to image processing8. Week: midterm exam9. Week: Moving robots : trajectory following. Kinematics10. Week: Sensor technologies11. Week: Simulation and experimental study /Lego Mindstorm and Irobot programming12. Week: Simulation and experimental study /sensors13. Week: Simulation and experimental study /Programming and Robot intelligence14. Week: Simulation and experimental study, trajectory planning
References	<ol style="list-style-type: none">1) M.W. Spong, S.Hutchinson and M. Vidyasagar, "Robot Modeling and Control", Wiley, 2006.2) Phillip John McKerrow, "Introduction to Robotics", Addison-Wesley, 1991.3) Saeed B. Niku, "Introduction to Robotics. Analysis, Systems, Applications", Prentice Hall, 2001.4) Vladimir J. Lumelsky, "Sensing, Intelligence, Motion",Wiley, 2006.5) S. M. LaValle, " Planning Algorithms", Cambridge University Press, 2006. URL adresi http://planning.cs.uiuc.edu/.6) Mobile Robot Programming Toolkit (MRPT) (http://babel.isa.uma.es/mrpt/index.php/Main_Page)7) Player stage gazebo dökümantasyonu. Online URL adresi http://playerstage.sourceforge.net/

Theory Topics

Week	Weekly Contents
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