Content

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

Prerequisites	
Admission Requirements	

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 fundemantals of the articulated robots, their components, and their structures. Kinematic modelling of the moving and articulated robots will be given.
Content	1. Week: Robotic components : fundamental approaches 2. Week: Forward kinematics : rotational matrix, rotational movement with respect to the local coordinate system, Euler angle, roll, pitch and yaw angles. An exapmle of 6 DoF robot. 3. Week: Backward kinematics: solution, existencea and uniqueness of the solution 4. Week: Translational motion 5. Week: Dynamics of the robot joints and regulation: mathematical modelling 6. Week: Working space and trajectory planning: basic presentation 7. Week: vision-based sensing: introduction to image processing 8. Week: midterm exam 9. Week: Moving robots : trajectory following. Kinematics 10. Week: Sensor technologies 11. Week: Simulation and experimental study /Lego Mindstorm and Irobot programming 12. Week: Simulation and experimental study /sensors 13. Week: Simulation and experimental study /Programming and Robot intelligence 14. Week: Simulation and experimental study, trajectory planning
References	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

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