

## Spring Semester 2019

*IN THE NAME OF ONE WHO TAUGHT THE MIND TO THINK*

### School of Mechanical Engineering Sharif University of Technology

**COURSE TITLE:** ROBOTICS: Kinematics and Dynamics (Course # 28022)

**DAYS & TIME:** Sundays and Tuesdays: 7:30 to 8:45 AM

**INSTRUCTOR:** Ali Meghdari, Ph.D., Professor ; <http://meghdari.sharif.edu>  
Email: [meghdari@sharif.edu](mailto:meghdari@sharif.edu)

**OFFICE HOURS:** Tuesdays: 3:00-4:30 PM., Tel: (021) 6616-5541

**TEXT BOOK:** Introduction to Robotics, By: J. J. Craig, Pearson Prentice Hall, 3<sup>rd</sup> Ed., 2005, and John Wiley & Sons, Translated to Farsi, By: A. Meghdari & F. Mirfakhraei, E. Shojaei, S. M. Akrami, SUT Press, 1388.

#### REFERENCES:

Fundamentals of Robotics; By: R. J. Schilling, Prentice Hall, 1990.  
Robot Manipulators, By: R.P. Paul, MIT Press, 1982.

#### TOPICS:

1. Introduction to Robotics Technology & Applications
2. Review of Current Robotics Research
3. Robots Geometrical Configurations & Designs
4. Design of Robotic Grippers/End-Effectors
5. Spatial Descriptions & Transformations
6. Robot Manipulator Kinematics
7. Robot Manipulator Inverse-Kinematics

#### Mid-Term Examination:

**First Week of Ordibehesht, 1398**

8. Jacobians: Velocities & Static Forces
9. Robot Manipulator Dynamics: Newton-Euler's & Lagrangian Methods
10. Robot Trajectory Generation
11. Manipulator Mechanism Design
12. Robot Programming (Laboratory)

#### Final Examination:

**Finals Week, 1398**

#### GRADING:

Homework & Quiz:	(15 % of the Final Grade)*
Lab/Seminar Projects:	(25 % of the Final Grade)
Mid-Term Exam:	(30 % of the Final Grade)
Final Exam:	(30 % of the Final Grade)

\* Homework will be assigned and collected every other week, and they will be graded based on your valued work! Short quizzes will be given every week during the semester. **It is required for all students to register for the Robotics Laboratory course too (Course # 28231).**