

# AUTONOMOUS AND MOBILE ROBOTICS

## 1. KEY INDICATORS

CFU/ECTS: 6

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## 2. OBJECTIVES OF THE COURSE

The course presents the basic methodologies for achieving mobility and autonomy in robotic systems.

## 3. ACQUIRED ABILITIES

The student will be able to analyze and design architectures, algorithms and modules for planning, control and localization of autonomous mobile robots.

## 4. PROGRAM OF THE COURSE

Introduction to mobile robotics. Architectures for autonomy. Fundamentals of mobile robots. Configuration space. Modeling of wheeled and legged mobile robots. Path and trajectory planning in open space. Motion planning among obstacles. Manipulation planning. Motion control: trajectory tracking and posture stabilization. Humanoid locomotion. Perception: map building and localization. Case studies.

## 5. REFERENCES

Siciliano, Sciavicco, Villani, Oriolo, "Robotics: Modelling, Planning and Control," Springer, 2009

Choset, Lynch, Hutchinson, Kantor, Burgard, Kavraki, Thrun, "Principles of Robot Motion: Theory, Algorithms and Implementations," MIT Press, 2005

Siciliano, Khatib (Eds.), "Springer Handbook of Robotics", Springer, 2008

Materiale integrativo (diapositive del corso, articoli) disponibili sul sito web del corso

## 6. COURSE WEBSITE

<http://www.dis.uniroma1.it/~oriolo/amr/>