Percorso Autonomo Autorizzato

Title (Titolo)	**Methods and models for the decision making (Metodi e modelli per le decisioni)**
Chief (Referente responsabile)	(DMAT, PoliMi): prof. Gianni Arioli, prof. Roberto Lucchetti
Supporting Coordinators (Altri referenti)	(DEIB, PoliMi): prof. Edoardo Amaldi, dott. Giuliana Carello, prof. Nicola Gatti, dott. Ola Jabali, prof. Federico Malucelli
Scientific collaborations and partnerships (Collaborazioni scientifiche nazionali ed internazionali)	• Lamsade Paris Dauphine, Francia • Lip 6, Paris VI, Francia • UPC Manresa, Spagna • Carnegie Mellon University (USA) • London School of Economics (UK) • Université Libre de Bruxelles, Belgio • RWTH Aachen University, Germania • Ecole Polytechnique, Montréal, Canada • University of Oxford, UK • Ecole des Mines, Nancy, France • Universitat Pompeu Fabra • University of Southampton, UK • CIRRELT (Centre interuniversitaire de recherche sur les réseaux d'entreprise, la logistique e les transports), Montréal, Canada
Description and goals (Descrizione ed obiettivi)	Decision making in complex situations is a field of relatively recent but fast growing interest, due to the progress in software and hardware, allowing today to deal with problems intractable until few years ago. Analyzing such situations requires not only new algorithms, but more importantly new theoretical tools and modeling approaches. The goal of this track is to provide students with a solid background, both form a theoretical and an algorithmic point of view, in the broad setting of decision theory, especially as far as complex decision processes are concerned.
Study Plan (Piano di studi)	The study plan is part of the PSPA (Major) of "Applied Statistics". Beyond mandatory exams, the following are specific of the track: 1) *093735 – Graph optimization* (5 CFU, mandatory): a master course of Telecommunication Engineering, to be inserted in the Study plan as autonomous course instead of a course in the Group FREE; 2) *089214 – Artificial intelligence* (5 CFU, mandatory): a master course of CSE, to be inserted in the Study plan as autonomous course instead of a course in the Group ING; 3) *089169 – Autonomous agents and multiagent systems* (5 CFU, mandatory): a master course of Computer Science and Engineering (CSE), to be inserted in the Study plan as autonomous course instead of a course in the Group ING; 4) *095972 – Optimization* (8 CFU, mandatory): to be inserted in the Study plan as required course in the Group MTM; 5) *095974 – Game theory* (8 CFU, mandatory): to be inserted in the Study plan as required course in the Group MTM; 6) *097676 – Economics and computation systems* (6 CFU, mandatory): a master course of CSE, to be inserted in the Study plan as autonomous course instead of a course in the Group ING; 7) *097683 – Machine learning systems* (5 CFU, mandatory): a master course of CSE, to be inserted in the Study plan as autonomous course instead of a course in the Group ING; 8) one course between *093269 – Discrete mathematics* (5 CFU) or *097681 – Discrete dynamical models*: a master course of CSE, to be inserted in the Study plan as autonomous course instead of a course in the Group FREE

Theses in progress (Tesi in corso)	• Games and applications • Optimization and investments
Available subjects for a MSc thesis (Tesi disponibili)	Theses in the setting of decision theory, game theory, social choice, both from a theoretical and from a more algorithmic point of view. Theses in machine learning. Theses in the area of Operation Research and in particular of Optimization with applications in a variety of fileds such as data mining, energy, healthcare, telecommunication and transportation. For the first type theses see also www.gametheory.polimi.it.
Internships (Tirocini)	ATM Milano IBM Softline MAIOR s.r.l. Banks Consulting agencies
Job opportunities (Sbocchi lavorativi)	Agencies and firms working on complex decision making problems, web firms, consulting groups.