POLITECNICO DI MILANO





Automation and Control Engineering Programme

Welcome meeting, 27 September 2016

Paolo Rocco (Chair of the Programme)

Politecnico di Milano - Dipartimento di Elettronica, Informazione e Bioingegneria

Chair and vice-chair of the programme

Chair

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Vice-chair

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Where is building 20?

Programme requirements

What are the rules to obtain your MSc degree?

- you have to earn 120 credits
- 45 credits must be taken on qualifying subjects (systems and control, identification, converters and drives, applied mechanics)
- 15 credits or more on subsidiary subjects (computer science, electronics, measurements, industrial production technologies, ...)
- a final thesis corresponding to 20 credits is mandatory

How is the programme organized?

- the programme is organized in two years, four semesters
- each student has a study plan
- study plans can be pre-approved or autonomous (see below)

Alignment courses

Code	Att form	SSD	Course title	Sem	Credits (CFU)
091223	B	ING-IND/13	FUNDAMENTALS OF MECHANICS	2	5.0
091247	B	ING-IND/32	FUNDAMENTALS OF ELECTRICAL MACHINES	1	5.0

- these courses cover introductory material in two fundamental subjects (electrical machines and mechanics)
- they can be assigned by the admission committee to students enrolling in the MSc course
- they cannot be freely selected by students

Suggested study plan – First year

If no alignment courses are assigned:

Code	Att. form.	SSD	Corse title	Sem	Credits (CFU)	CFU Group
090912	C	ING-IND/16	COMPUTER AIDED MANUFACTURING	1	10.0	10.0
088775	B	ING-IND/13	DYNAMICS OF MECHANICAL SYSTEMS	1	10.0	10.0
096297	B	ING-INF/04	MODEL IDENTIFICATION AND DATA ANALYSIS	1	10.0	10.0
096129	B	ING-INF/04	ADVANCED AND MULTIVARIABLE CONTROL	2	10.0	10.0
088860	B	ING-IND/32	DYNAMICS OF ELECTRICAL MACHINES AND DRIVES	2	10.0	10.0
--	--	--	Courses to be chosen in Group TAB2	--	--	10.0
--	--	--	Courses to be chosen in Group TAB4	--	--	

Suggested study plan – First year

If you have been assigned Fundamentals of Electrical Machines:

Code	Att. form.	SSD	Corse title	Sem	Credits (CFU)	CFU Group
090912	C	ING-IND/16	COMPUTER AIDED MANUFACTURING	1	10.0	10.0
088775	B	ING-IND/13	DYNAMICS OF MECHANICAL SYSTEMS	1	10.0	10.0
096297	B	ING-INF/04	MODEL IDENTIFICATION AND DATA ANALYSIS	1	10.0	10.0
091247	B	ING-IND/32	FUNDAMENTALS OF ELECTRICAL MACHINES	1	5.0	5.0
096129	B	ING-INF/04	ADVANCED AND MULTIVARIABLE CONTROL	2	10.0	10.0
088860	B	ING-IND/32	DYNAMICS OF ELECTRICAL MACHINES AND DRIVES	2	10.0	10.0
--	--	--	Courses to be chosen in Group TAB2	--	--	10.0
--	--	--	Courses to be chosen in Group TAB4	--	--	

Just add it to the courses in the first semester

Suggested study plan – First year

If you have been assigned Fundamentals of Mechanics:

Code	Att. form.	SSD	Corse title	Sem	Credits (CFU)	CFU Group
090912	C	ING-IND/16	COMPUTER AIDED MANUFACTURING	1	10.0	10.0
~~088775~~	~~B~~	~~ING-IND/13~~	~~DYNAMICS OF MECHANICAL SYSTEMS~~	~~1~~	~~10.0~~	~~10.0~~
096297	B	ING-INF/04	MODEL IDENTIFICATION AND DATA ANALYSIS	1	10.0	10.0
--	--	--	--	1	--	10.0
096129	B	ING-INF/04	ADVANCED AND MULTIVARIABLE CONTROL	2	10.0	10.0
088860	B	ING-IND/32	DYNAMICS OF ELECTRICAL MACHINES AND DRIVES	2	10.0	10.0
091223	B	ING-IND/13	FUNDAMENTALS OF MECHANICS	2	5.0	5.0
--	--	--	Courses to be chosen in Group TAB2	--	--	5.0
--	--	--	Courses to be chosen in Group TAB4	--	--	

You cannot attend this course now. You will attend it in the 1st semester 2016/17

Add courses for 10 credits in the first semester, for example from TAB. 1 (see below) or present a study plan with a reduced number of credits

Attend this course in the second semester

Suggested study plan – First year

If you have been assigned Fundamentals of Electrical Machines and Fundamental of Mechanics:

Code	Att. form.	SSD	Corse title	Sem	Credits (CFU)	CFU Group
090912	C	ING-IND/16	COMPUTER AIDED MANUFACTURING	1	10.0	10.0
~~088775~~	~~B~~	~~ING-IND/13~~	~~DYNAMICS OF MECHANICAL SYSTEMS~~	~~1~~	~~10.0~~	~~10.0~~
096297	B	ING-INF/04	MODEL IDENTIFICATION AND DATA ANALYSIS	1	10.0	10.0
091247	B	ING-IND/32	FUNDAMENTALS OF ELECTRICAL MACHINES	1	5.0	5.0
--	--	--	--	1	--	5.0
096129	B	ING-INF/04	ADVANCED AND MULTIVARIABLE CONTROL	2	10.0	10.0
088860	B	ING-IND/32	DYNAMICS OF ELECTRICAL MACHINES AND DRIVES	2	10.0	10.0
091223	B	ING-IND/13	FUNDAMENTALS OF MECHANICS	2	5.0	5.0
--	--	--	Courses to be chosen in Group TAB2	--	--	5.0
--	--	--	Courses to be chosen in Group TAB4	--	--	

You cannot attend this course now. You will attend it in the 1st semester 2016/17

Add it to the courses in the first semester

Add a course for 5 credits in the first semester, for example from TAB. 1 (see below) or present a study plan with a reduced number of credits

Attend this course in the second semester

Schedule of courses – First semester

	Monday	Tuesday	Wednesday	Thursday	Friday
08.15-9.15	DMS – BL.27.05	DMS – BL.28.21		CAM – CT.57	MIDA – T.2.2
09.15-10.15	DMS – BL.27.05	DMS – BL.28.21	FEM – D.3.3	CAM – CT.57	MIDA – T.2.2
10.15-11.15	CAM – BL.27.05	CAM – BL.28.21	FEM – D.3.3	DMS – CT.57	
11.15-12.15	CAM – BL.27.05	CAM – BL.28.21		DMS – CT.57	
12.15-13.15					
13.15-14.15				DMS – BL.27.07	
14.15-15.15				DMS – BL.27.07	FEM – D.2.3
15.15-16.15	MIDA – T.2.3	MIDA – T.2.1		CAM – BL.27.07	FEM – D.2.3
16.15-17.15	MIDA – T.2.3	MIDA – T.2.1		CAM – BL.27.07	
17.15-18.15	MIDA – T.2.3	MIDA – T.2.1		CAM – BL.27.07	

- CAM: Computer Aided Manufacturing
- DMS: Dynamic of Mechanical Systems
- MIDA: Model Identification and Data Analysis
- FEM: Fundamentals of Electrical Machines

Leonardo Campus

Bovisa Campus

Suggested study plan – Second year

(subject to changes)

Code	Att. form.	SSD	Course title	Sem	Credits (CFU)	CFU Group
094124	C	ING-INF/05	SOFTWARE ENGINEERING (FOR AUTOMATION)	2	5.0	5.0
--	--	--	Courses to be chosen from Group TAB1	--	--	30.0
--	--	--	Courses to be chosen from Group TAB2	--	--	
--	--	--	Courses to be chosen from Group TAB3	--	--	
--	--	--	Courses to be chosen from Group TAB4	--	--	
097467	B	ING-IND/13 ING-IND/32 ING-INF/04	PROJECT WORK	--	5.0	
090913	B	ING-IND/13 ING-IND/32 ING-INF/04	AUTOMATION AND CONTROL LABORATORY	2	5.0	5.0
090921	--	--	THESIS AND FINAL EXAM	1	20.0	20.0
090921	--	--	THESIS AND FINAL EXAM	2	20.0	

Suggested study plan – TAB 1

Code	Att. form.	SSD	Corse title	Sem	Credits (CFU)
093061	B	ING-INF/04	ADAPTIVE SYSTEMS AND LEARNING	1	5.0
090914	B	ING-INF/04	CONTROL OF INDUSTRIAL ROBOTS	1	5.0
097468	B	ING-IND/13	NOISE AND VIBRATION ENGINEERING	1	5.0
097469	B	ING-INF/04	NONLINEAR CONTROL	1	5.0
088724	C	ING-INF/01	ELECTRONIC SYSTEMS	1	10.0
089180	C	MAT/08	NUMERICAL ANALYSIS	1	5.0
093060	B	ING-INF/04	SAFETY IN AUTOMATION SYSTEMS	1	5.0
094172	B	ING-INF/04	SYSTEMS THEORY (NONLINEAR DYNAMICS)	1	5.0

Suggested study plan – TAB 2

Code	Att. form.	SSD	Corse title	Sem	Credits (CFU)
093062	B	ING-INF/04	AUTOMATION AND CONTROL IN VEHICLES	2	5.0
090916	B	ING-INF/04	AUTOMATION OF ENERGY SYSTEMS	2	5.0
097470	B	ING-IND/32	POWER ELECTRONICS AND SUPPLIES	2	5.0
090917	C	ING-IND/35	HIGH-TECH ENTREPRENEURSHIP	2	5.0
097471	B	ING-INF/04	ADVANCED PROCESS CONTROL	2	5.0
090915	B	ING-INF/04	PRODUCTION SYSTEMS CONTROL	2	5.0
097483	C	ING-IND/12 ING-INF/07	ADVANCED MEASUREMENT SYSTEMS FOR CONTROL APPLICATIONS	2	5.0
097484	B	ING-INF/04	SIMULATION TECHNIQUES AND TOOLS	2	5.0

Suggested study plan – TAB 3

Code	Att. form.	SSD	Corse title	Sem	Credits (CFU)
097413	C	ING-IND/16	ADDITIVE MANUFACTURING	1	5.0
095143	C	ING-INF/01	ANALOG CIRCUIT DESIGN	1	10.0
089169	C	ING-INF/05	AUTONOMOUS AGENTS AND MULTIAGENT SYSTEMS	1	5.0
089194	B	ING-INF/04	COMPLESSITÀ NEI SISTEMI E NELLE RETI	1	5.0
096221	--	ING-IND/26	DYNAMICS AND CONTROL OF CHEMICAL PROCESSES	1	5.0
095901	B	ING-INF/04	ICT FOR CONTROL SYSTEMS ENGINEERING	1	5.0
089166	C	ING-INF/05	IMAGE ANALYSIS	1	5.0
090931	C	ING-INF/05	MIDDLEWARE TECHNOLOGIES FOR DISTRIBUTED SYSTEMS	1	5.0
097312	C	ING-IND/17	MANUFACTURING SYSTEMS PLANNING	1	10.0
094179	C	ING-INF/07	OPTICAL MEASUREMENTS	1	5.0
090918	C	ING-INF/01	POWER ELECTRONICS	1	10.0
089184	C	ING-INF/05	SOFTWARE ENGINEERING 2	1	5.0

Suggested study plan – TAB 4

Code	Att. form.	SSD	Corse title	Sem	Credits (CFU)
089076	C	MAT/09	COMPLEMENTI DI RICERCA OPERATIVA	2	5.0
088882	C	ING-INF/05	FORMAL METHODS FOR CONCURRENT AND REAL-TIME SYSTEMS (UIC 545)	2	5.0
097485	--	ING-IND/14	MACHINE DESIGN	2	5.0
095896	B	ING-INF/04	NATURAL RESOURCES MANAGEMENT	2	10.0
089187	C	MAT/09	OTTIMIZZAZIONE DISCRETA	2	5.0

Suggested study plan – Second year

- elective courses available in the second year
- at least 20 credits to be taken from TAB1 or TAB2 (a larger number of credits is suggested)
- schedules of courses in TAB1 and TAB2 will not overlap, the same is not guaranteed for courses in TAB3 and TAB4

WARNING: compatibility of schedule is not guaranteed between courses in the first year and courses in the second year (TAB1 … TAB4)

- If you have been assigned an alignment course a study plan that satisfies all your preferences, without any overlapping of schedules, cannot be guaranteed

Autonomous study plans

- Each student is expected to present his/her study plan
- If the study plan is compliant with the suggested study plans, it is automatically approved (“pre-approved”)
- Otherwise the study plan will be considered “autonomous” and then subjected to approval by a committee
- Students can also include a maximum of 10 credits of freely chosen courses. The committee will assess the adequacy of such courses with the learning objectives of the programme
- Within these 10 credits, students in the second year may include a special course named “Project Work”: it is a course held in cooperation with companies, on design activities in the field of automation and control. Only a limited number of seats are available (an application will be required)

Responsible for study-plans evaluations

Prof. Simone Garatti
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Prof. Marcello Farina
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e-mail: marcello.farina@polimi.it

It is advisable to contact Prof. Garatti or Prof. Farina before submitting an autonomous study plan

Thesis

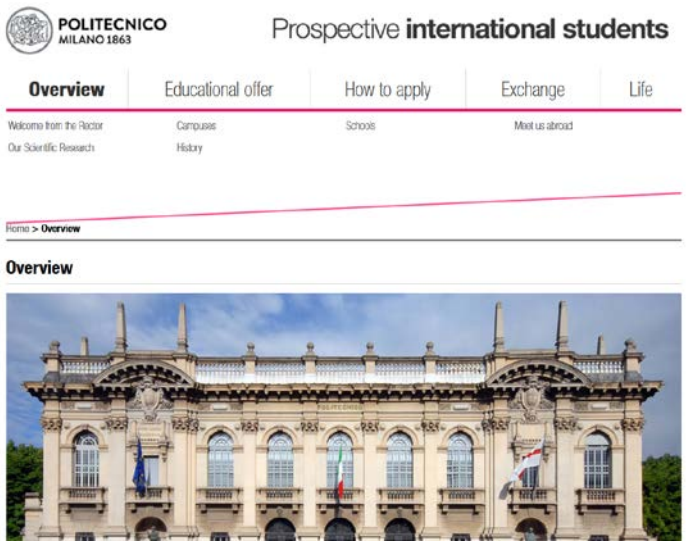
	Thesis with reviewer "Tesi"	Thesis without reviewer "Tesina"
Expected outcome	*an innovative project in the field of automation and control*	*a (maybe less) innovative project in the field of automation and control*
Reviewer required	yes	no
Maximum increment for the final grade	7/110	4/110

You can ask to any of your professors for a topic for your thesis.

Further sources of information

Polinternational

http://www.polinternational.polimi.it/



Web-site of the programme

http://ccs-automazione.elet.polimi.it/