

## Studies Plan

### Robotique 2023-24

#### Block 1

Courses			Master 1	Master 2	Exam Session	Exam	Credit
Language	Code	Section	Teacher	Specialization	o p	l e p	
E		<b>Applied machine learning</b>					
	MICRO-455	MT	Billard	4h		Win	Written 4
E		<b>Basics of mobile robotics</b>					
	MICRO-452	MT	Mondada	2h 2h		Win	Written 4
E		<b>Basics of robotics for manipulation</b>					
	MICRO-450	MT	Bouri	3h		Win	Written 3
E		<b>Model predictive control</b>					
	ME-425	GM	Jones	2h 2h		Win	Written 4

#### Block 2

Courses			Master 1	Master 2	Exam Session	Exam	Credit
Language	Code	Section	Teacher	Specialization	o p	l e p	
E		<b>Robotics practicals</b>					
	MICRO-453	MT	Billard Boero Bouri Dillenbourg Floreano Kneib Micera Mondada Sakar Skaloud		2h	Sum	During the 2 semester
E		<b>Robotics project I</b>					
	MICRO-580	MT	Profs divers	10h	10h	Sum Win	During the 10 semester
		<b>HSS : Introduction to project</b>					
		SHS				Win	3
		<b>HSS : Project</b>					
		SHS				Sum	3

#### Group 3

Courses			Master 1	Master 2	Exam Session	Exam	Credit
Language	Code	Section	Teacher	Specialization	o p	l e p	
E		<b>Advanced control systems</b>					
	ME-524	GM	Karimi		2h 1h	Sum	Written 3
E		<b>Advanced machine learning</b>					
	MICRO-570	MT			3h 1h 1h	Sum	Oral 4
F		<b>Advanced mechanisms for extreme environments</b>					
	MICRO-372	MT	Cosandier		2h 1h	Sum	Written 3
E		<b>Advanced MEMS &amp; microsystems</b>					
	MICRO-534	MT	Briand		3h	Sum	Oral 3
E		<b>Advanced satellite positioning</b>					
	ENV-542	SIE			2h 2h	Sum	During the 4 semester
E		<b>Aerial robotics</b>					
	MICRO-502	MT	Floreano		2h 1h 1h	Sum	Written 4
E		<b>Applied and industrial robotics</b>					
	MICRO-451	MT	Bouri		2h	Sum	Written 2
E		<b>Applied data analysis</b>					
	CS-401	SC	West	2h 2h		Win	Written 8
E		<b>Basics in bioinstrumentation</b>					
	BIOENG-421	SV	Merten	1h 1h 2h		Win	During the 4 semester
E		<b>Computational motor control</b>					
	CS-432	SV	Ijspeert		2h 2h	Sum	During the 4 semester

E	<b>Computer vision</b> CS-442	IN	Fua	2h	1h	Sum	Written	6
F	<b>Conceptual design of products and systems</b> MICRO-443	MT	Kejik	2h		Sum	Oral	2
E	<b>Continuous improvement of manufacturing systems</b> ME-498	GM	Kaboli	2h	2h	Sum	During the semester	5
E	<b>Controlling behavior in animals and robots</b> BIOENG-456	SV	Ramdyia	2h	2h	Sum	During the semester	4
E	<b>Convex optimization</b> MGT-418	MTE	Kuhn	2h	2h	Win	Written	5
E	<b>Deep learning</b> EE-559	EL	Cavallaro	2h	2h	Sum	During the semester	4
E	<b>Deep learning for autonomous vehicles</b> CIVIL-459	GC	Alahi	2h	4h	Sum	During the semester	6
E	<b>Deep learning for optical imaging</b> MICRO-573	MT	Psaltis	2h	1h	Sum	During the semester	3
E	<b>Distributed intelligent systems</b> ENG-466	SIE		2h	3h	Sum	Oral	5
F	<b>Embedded motor control</b> MICRO-510	MT	Hodder Köchli Perriard	1h	2h	Win	Oral	3
E	<b>Embedded system design</b> CS-476	IN	Kluter	2h	2h	Sum	During the semester	6
E	<b>Energy supply, economics and transition</b> ENG-410	SIE	Ballif Binder Thalmann	2h		Sum	Written	2
E	<b>Evolutionary robotics</b> MICRO-515	MT	Floreano	2h	1h	Sum	Written	3
E	<b>Haptic human robot interfaces</b> MICRO-553	MT	Bouri Shokur	2h	2h	Sum	Oral	4
E	<b>Image analysis and pattern recognition</b> EE-451	EL	Bozorgtabar Thiran	2h	2h	Sum	During the semester	4
E	<b>Image processing I</b> MICRO-511	MT	Unser Van De Ville	3h		Win	Written	3
E	<b>Image processing II</b> MICRO-512	MT	Sage Unser Van De Ville	3h		Sum	Written	3
E	<b>Industrial automation</b> CS-487	SC	Sommer Tournier	2h	1h	Sum	Oral	3
E	<b>Intelligent agents</b> CS-430	IN	Faltings	3h	3h	Win	During the semester	6
E	<b>Interdisciplinary project</b> MICRO-582	MT	Profs divers	10h	10h	Sum Win	During the semester	10
E	<b>Introduction to bioengineering</b> EE-526	EL	Maerkl	2h	1h	Sum	Written	3
E	<b>Learning and adaptive control for robots</b> MICRO-462	MT		2h	2h	Sum	Oral	4
E	<b>Legged robots</b> MICRO-507	MT	Ijspeert	2h	2h	Win	During the semester	4
E	<b>Lifecycle performance of product systems</b> ME-516	GM	Friot	2h	1h	Sum	During the semester	3
E	<b>Machine learning for predictive maintenance applications</b> CIVIL-426	GC	Fink	2h	2h	Win	During the semester	4

E	<b>Machine learning programming</b> MICRO-401	MT	Billard	2h		Win	During the 2 semester
E	<b>Mechanical product design and development</b> ME-410	GM	Paik	2h	1h	Win	During the 5 semester
E	<b>Micro/Nano robotics</b> ME-436	GM	Sakar	2h	1h	Sum	During the 3 semester
E	<b>Multivariable control</b> ME-422	GM	Ferrari Trecate	2h	2h	Win	Written 4
E	<b>Networked control systems</b> ME-427	GM	Ferrari Trecate	2h	1h	Win	Written 3
E	<b>Neural interfaces</b> NX-422	NX	Lacour Shoaran	4h	2h	Win	During the 6 semester
E	<b>Neural signals and signal processing</b> NX-421	NX	Micera Van De Ville	4h	2h	Win	Written 6
F	<b>Nonlinear Control Systems</b> ME-523	GM	Müllhaupt	2h	1h	Win	Oral 3
E	<b>Numerical methods in biomechanics</b> ME-484	GM	Terrier	2h	1h	Sum	Written 3
E	<b>Optimal decision making</b> MGT-483	MTE	Kuhn	2h	2h	Sum	Written 4
E	<b>Organic and printed electronics</b> MICRO-505	MT	Briand Subramanian	2h		Sum	Oral 2
E	<b>Principles of finance</b> MGT-482	MTE	Isakov	2h	2h	Win	Written 5
E	<b>Production management</b> ME-419	GM	Kaboli	2h	2h	Win	During the 5 semester
F	<b>Project management and risk analysis</b> MGT-427	MTE	Wieser	2h	1h	Win	During the 4 semester
E	<b>Reinforcement learning</b> EE-568	EL	Cevher	2h	2h	2h	Sum Oral 6
E	<b>Robotics project II</b> MICRO-581	MT	Profs divers	10h	10h	Sum Win	During the 10 semester
E	<b>Sensor orientation</b> ENV-548	SIE	Skaloud	2h	2h	Sum	During the 4 semester
E	<b>Sensors in medical instrumentation</b> EE-511	EL	Chételat Ionescu	2h	1h	Sum	Written 3
F	<b>Software architecture</b> MICRO-371	MT	Ingram Silva	2h	1h	Sum	Written 3
E	<b>System identification</b> ME-421	GM	Karimi	2h	1h	Sum	Written 3
E	<b>System programming for Systems-on-chip</b> CS-473	IN	Kluter	2h	2h	Win	During the 6 semester
E	<b>Translational neuroengineering</b> NX-423	NX	Blanke Courtine Hummel Micera	3h	3h	Sum	Written 6

#### Master project (.)

Courses			Master 1	Master 2	MP Autumn	MP Spring	Exam Session	Exam	Credit	
Language	Code	Section	Teacher	Specialization	p	l e p	l e p	l e p		
F	<b>Engineering internship credited with master project (master in Microengineering)</b> MICRO-597	MT	Profs divers		320h	320h	320h	320h	Sum Win	Term paper 0

**Master project in robotics**

MICRO-598 MT

Profs  
divers

900h

900h Sum  
Win

Oral

30

---