

Study plans (the Academic Year 2022-23)

The *General Study Plan* allows students to compose their programme according to the appropriate rules. The Master's Degree Course Management Board evaluates all submitted programmes proposed on the basis of the General Study Plan.

General Study Plan

Course	ETCS	Scientific Field Code	Type (*)	Skill Area	Pre-requirements
First Year – first term					
Language Skills	3		6	Other skills	None
Positioning and location-based services	9	ICAR/06	2	Civil Engineering	None
<i>Choice from table III</i>	<i>A = 0 or 9</i>		4	<i>Measures, analyses, decision support</i>	
<i>Choice from table IV</i>	<i>B = 0 or 9</i>		4	<i>Enabling ICT and industrial technologies</i>	
First Year – second term					
Machine Learning and big data ^[1]	9	ING-INF/05	4	Enabling ICT and industrial technologies	None
Intelligent Transportation Systems	9	ICAR/05	2	Civil Engineering	None
Road Safety or Sustainable road materials	9	ICAR/04	2	Civil Engineering	None
<i>Choice from table III</i>	<i>9 - A</i>		4	<i>Measures, analyses, decision support</i>	
<i>Choice from table IV</i>	<i>9 - B</i>		4	<i>Enabling ICT and industrial technologies</i>	
<i>Autonomous Choice (see table V for suggestions)</i>	<i>C = 0 or 6 or 9</i>		3	<i>Autonomous choice</i>	
Second Year – first term					
<i>A course from Table I or II</i>	9		2	<i>Civil Engineering</i>	
<i>A course from table IV</i>	9		4	<i>Enabling ICT and industrial technologies</i>	
Second Year – second term					
<i>A course from Table I or II</i>	9		2	<i>Civil Engineering</i>	
<i>Autonomous Choice (see table V for suggestions)</i>	<i>15 - C</i>		3	<i>Autonomous choice</i>	
Lab / Internship	9		6	Other skills	
MSC Thesis	12		5	Ing. Elettrica	

(*) Types of learning activities (Decree)

Learning Activity	1	2	3	4	5	6	7
Reference Decree 270/04	Art. 10 par. 1, a)	Art. 10 par. 1, b)	Art. 10 par. 5, a)	Art. 10 par. 5, b)	Art. 10 par. 5, c)	Art. 10 par. 5, d)	Art. 10 comma 5, e)

Table I + II: Transportation Engineering, roads and railways

Course	ETCS	Scientific Field Code	Type (*)	Pre-requirements
First-term				
Testing and validation of automated road vehicles	9	ICAR/05	2	
Traffic control	9	ICAR/05	2	Basic background on transportation modeling (ICAR/05)
Transport planning and appraisal	9	ICAR/05	2	Basic background on transportation modeling (ICAR/05)
Second term				
Freight and logistics	9	ICAR/05	2	Basic background on transportation modeling (ICAR/05)
Railway and transit services	9	ICAR/05	2	Basic background on transportation modeling (ICAR/05)
Demand analysis and forecasting (**)	9	ICAR/05	2	Basic background on transportation modeling (ICAR/05)
Road Safety	9	ICAR/04	2	
Sustainable Road Materials	9	ICAR/04	2	
Pavement Management Systems (**)	9	ICAR/04	2	
Civil Information Modeling – CIM (**)	9	ICAR/04	2	

Table III: Measures, analyses, decision support

Course	ETCS	Scientific Field Code	Type (*)	Pre-requirements
First-term				
Digital maps and geological 3D Models	9	GEO/05	4	
Statistical lab for industrial data analysis [2]	9	SECS-S/02	4	
Structural health monitoring for infrastructures	9	ICAR/09	4	Basic background on structural engineering (ICAR/09)
Measurement sensors and transducers (**)	9	ING-INF/07	4	
Second term				
Transport Geotechnics (**)	9	ICAR/07	4	Basic background on geotechniques (ICAR/07)

Table IV: Enabling ICT and industrial technologies

Course	ETCS	Scientific Field Code	Type (*)	Pre-requirements
First-term				
Electric systems in transportation	9	ING-IND/33	4	
Energy management for transportation	9	ING-IND/32	4	
Systems and Control fundamentals	9	ING-INF/04	4	
Second term				
Image processing for computer vision [4]	9	ING-INF/03	4	
Real-time systems	9	ING-INF/05	4	

Table V: Suggested alternatives for autonomous choices

Course	ETCS	Scientific Field Code	Type (*)	Pre-requirements
First-term				
Operational Research ^[5]	9	MAT/09	3	
Mathematical Physical Models ^[5]	9	MAT/07	3	
<i>All courses of the first term from Tables I to IV</i>	9		3	
Second term				
Resilience of Transportation Systems ^[8]	6	ICAR/05	3	
Smart Roads and cooperative driving ^[1]	6	ICAR/05	3	
Resilience of geotechnical systems ^[8]	6	ICAR/07	3	
Laboratorio di sicurezza stradale ^[6]	9	ICAR/04	3	
Fondamenti di diritto per l'ingegnere ^[6]	9	IUS/01	3	
Project Management per le opere civili ^[6]	9	ING-IND/35	3	
Meccanica del Veicolo ^[7]	9	ING-IND/13	3	
<i>All courses of the second term from Tables I to IV</i>	9		3	

Notes:

(**) Inactive courses for the year 2022-23

[1] From LM MOVE

[2] From LM Ingegneria Aereospaziale

[3] From LM STREGA

[4] From LM Ingegneria delle Telecomunicazioni e dei media digitali

[5] From LM Mathematical Engineering

[6] From LM ISIT – in Italian

[7] From LM Ingegneria Meccanica della produzione e della progettazione – in Italian

[8] Didattica di eccellenza

Pre-filled Study Plans

Pre-filled Study Plans are also available. These plans are automatically approved by the Educational Management Board. Three pre-filled plans are currently available:

- Smart Mobility
- Smart Planning
- Resilient Networks

Pre-filled Study Plan Smart Mobility

Course	ETCS	Scientific Field Code	Pre-requirements
First Year, first-term			
Language Skills	3		None
Positioning and location-based services	9	ICAR/06	None
Statistical Lab for Industrial data analysis	9	SECS-S/02	None
Systems and Control fundamentals	9	ING-INF/07	None
First Year, second-term			
Machine Learning and big data	9	ING-INF/05	None
Intelligent Transportation Systems	9	ICAR/05	None
Road Safety	9	ICAR/04	None
Real-time systems	9	ING-INF/05	None
Second Year, the first-term			
Testing and validation of automated road vehicles	9	ING-INF/05	None
Energy management for transportation	9	ING-IND/32	None
Second Year, second-term			
Railway and transit services	9	ICAR/05	Basic background in transportation modeling (ICAR/05)
Smart Roads and cooperative Systems	6	ICAR/05	None
Lab / Internship	9		
MSC Thesis	12		

Pre-filled Study Plan **Smart Planning**

Course	ETCS	Scientific Field Code	Pre-requirements
First Year, first-term			
Language Skills	3		None
Positioning and location-based services	9	ICAR/06	None
Digital maps and geological 3D models	9	GEO/05	None
Systems and Control fundamentals	9	ING-INF/07	None
First Year, second-term			
Machine Learning and big data	9	ING-INF/05	None
Intelligent Transportation Systems	9	ICAR/05	None
Road Safety	9	ICAR/04	None
Railway and transit services	9	ING-INF/05	None
Second Year, first-term			
Traffic control	9	ICAR/05	None
Energy management for transportation	9	ING-IND/32	None
Second Year, second-term			
Freight and logistics	9	ICAR/05	Basic background in transportation modeling (ICAR/05)
Smart Roads and cooperative Systems	6	ICAR/05	None
Lab / Internship	9		
MSC Thesis	12		

Pre-filled Study Plan **Resilient Networks**

Course	ETCS	Scientific Field Code	Pre-requirements
First Year, first-term			
Language Skills	3		None
Positioning and location-based services	9	ICAR/06	None
Digital maps and geological 3D models	9	GEO/05	None
Electric Systems in Transportation	9	ING-IND/32	None
First Year, second-term			
Machine Learning and big data	9	ING-INF/05	None
Intelligent Transportation Systems	9	ICAR/05	None
Road Safety	9	ICAR/04	None
Tunnels and underground structures	9	ICAR/07	None
Second Year, first-term			
Transport planning and appraisal	9	ING-INF/05	None
Energy management for transportation	9	ING-IND/32	None
Second Year, second-term			
Sustainable road materials	9	ICAR/04	
Resilience of transportation systems	6	ICAR/05	None
Lab / Internship	9		
MSC Thesis	12		

Special training paths

Starting from the Master's programme in Transportation And Mobility Engineering, it is possible to obtain the diploma of *Smart Infrastructure Developer*. For this, activities for an additional 10 ETCS are required.

Two *Smart Infrastructures Developer Study Programs* are currently available (SID_A and SID_B), they ensure compliance with the general rules of the special training path established by the University of Naples Federico II and include 10 ETCS activities additional to the master's regular path.

Smart Infrastructure Developer –SID_A

Course	ETCS	Scientific Field Code	Pre-requirements
First Year, first-term			
Language Skills	3		None
Positioning and location-based services	9	ICAR/06	None
Statistical lab for industrial data analysis	9	SECS-S/02	None
Systems and Control fundamentals (+) (*)	9	ING-INF/07	None
First Year, second-term			
Machine Learning and big data (+) (**)	9	ING-INF/05	None
Intelligent Transportation Systems	9	ICAR/05	None
Road Safety	9	ICAR/04	None
Resilience of Geotechnical Systems	6	ICAR/07	None
Second Year, first-term			
Transport Planning and Appraisal	9	ICAR/05	Basic background on transportation modeling (ICAR/05)
Energy management for transportation	9	ING-IND/32	None
Digital maps and geological 3D Models	9	GEO/05	
Second Year, second-term			
Infrastructure-Building Information Modeling (I-BIM)	9	ICAR/04	
Lab / Internship	7		None
Smart Infrastructures Lab (***) (+)	2		None
MSC Thesis	12		None
Additional activities for the Smart Infrastructure Developer diploma			
Course	ETCS	Scientific Filed Code	Pre-requirements
First or second Year, second-term			
Smart Roads and cooperative driving (◇) (*)	6	ICAR/05	None
Workshops, labs and seminars (◇), (***) (+)	4		None

(+) Ensure at least 20 ETCS are in non-characterising activities

(◇) sum up to 10 extra ETCS (additional activities with respect to a regular length of the MSc)

(*) Ensure that the activities from tables A+B of the minor program are in the range [12, 21] ETCS

(**) Ensure that the activities from table C of the minor program are in the range [6, 12] ETCS

(***) Ensure that the activities from table D of the minor program are in the range [3, 9] ETCS

Smart Infrastructure Developer –SID_B

Course	ETCS	Scientific Field Code	Pre-requirements
First Year, first-term			
Language Skills	3		None
Positioning and location-based services	9	ICAR/06	None
Digital maps and geological 3D Models)	9	SECS-S/02	None
Systems and Control fundamentals (+) (*)	9	ING-INF/07	None
First Year, second-term			
Machine Learning and big data (+) (**)	9	ING-INF/05	None
Intelligent Transportation Systems	9	ICAR/05	None
Road Safety	9	ICAR/04	None
Resilience of Transportation Systems	6	ICAR/05	None
Second Year, first-term			
Traffic Control	9	ICAR/05	Basic background on transportation modeling (ICAR/05)
Energy management for transportation	9	ING-IND/32	None
Second Year, second-term			
Freight and logistics	9	ICAR/05	Basic background on transportation modeling (ICAR/05)
Railway and transit services	9	ICAR/05	Basic background on transportation modeling (ICAR/05)
Lab / Internship	7		None
Smart Infrastructures Lab (***) (+)	2		None
MSC Thesis	12		None
Additional activities for the Smart Infrastructure Developer diploma			
Course	ETCS	Scientific Filed Code	Pre-requirements
First or second Year, second-term			
Smart Roads and Cooperative Systems (◇)	6	ICAR/05	None
Workshops, labs and seminars (◇) (***) (+)	4		None

(+) Ensure at least 20 ETCS are in non-characterising activities

(◇) sum up to 10 extra ETCS (additional activities with respect to a regular length of the MSc)

(*) Ensure that the activities from tables A+B of the minor program are in the range [12, 21] ETCS

(**) Ensure that the activities from table C of the minor program are in the range [6, 12] ETCS

(***) Ensure that the activities from table D of the minor program are in the range [3, 9] ETCS