



POLITECNICO
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AVVISO DI ADESIONE

E' indetta una call per l'ammissione di studenti che parteciperanno al nuovo percorso formativo "*PoliMI Ambassador in SMART INFRASTRUCTURES*" attivato nell'ambito dei corsi di laurea magistrale in:

- **MANAGEMENT OF BUILT ENVIRONMENT**
- **IINGEGNERIA CIVILE - CIVIL ENGINEERING**
- **AUTOMATION AND CONTROL ENGINEERING**
- **BIOMEDICAL ENGINEERING**
- **COMPUTER SCIENCE AND ENGINEERING**
- **ELECTRICAL ENGINEERING**
- **MECHANICAL ENGINEERING**
- **TELECOMMUNICATION ENGINEERING**

DESCRIZIONE

L'obiettivo di questo percorso formativo è quello di creare nuovi profili professionali, che siano *Ambassador in Smart Infrastructures*: laureati magistrali con elevato grado di competenze sistemiche, visione interdisciplinare, competenze digitali, attenzione alla innovazione e razionalizzazione dei processi. Il profilo di *Ambassador in Smart Infrastructures* corrisponde a una figura professionale che possieda sia competenze avanzate e specialistiche in un ambito applicativo (infrastrutture) e/o nelle tecnologie abilitanti (smart), sia competenze trasversali, complementari a quelle specialistiche, che gli consentano di ampliare le sue conoscenze nel dominio delle infrastrutture smart e di adottare un approccio sistemico alla progettazione, alla gestione, all'innovazione e allo studio del ciclo di vita delle infrastrutture.



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Il programma formativo si sviluppa lungo il percorso della LM e definisce in 130 CFU (di cui almeno 10 in sovrannumero) il numero minimo di crediti necessario per completare il percorso formativo della LM scelta e, al tempo stesso, acquisire l'attestazione di *PoliMI Ambassador in Smart Infrastructures*.

Nell'ambito del percorso formativo lo studente dovrà acquisire almeno 30 CFU in attività formative funzionali al profilo di *Ambassador in Smart Infrastructures*, scelti dalle Tabelle A e B secondo le indicazioni riportate nel seguito per ognuna delle Lauree Magistrali sopra elencate. Qualora il corso di studi di riferimento eroghi insegnamenti con modularità diverse da 10 CFU, possono essere indicate condizioni particolari (si veda l'eventuale paragrafo introduttivo alle tabelle A e B per ogni corso).

L'attestazione di "*PoliMi Ambassador in SMART INFRASTRUCTURES*" sarà riportata nel Diploma Supplement dello studente e sarà riconosciuta tramite l'erogazione di uno specifico badge digitale.

Il mancato sostenimento dei 10 CFU in sovrannumero e il mancato ottenimento di almeno 30 CFU in attività formative funzionali al profilo di *Ambassador in Smart Infrastructures*, non precluderanno allo studente la possibilità di conseguire il titolo di Laurea Magistrale.

Possono partecipare al concorso tutti e soli gli studenti del Politecnico di Milano regolarmente iscritti per l'A.A. 2021/22 alla Laurea Magistrale in uno dei corsi di studio sopra elencati.

Tabelle A e B

MANAGEMENT OF BUILT ENVIRONMENT

I seguenti insegnamenti specialistici obbligatori forniscono competenze in ambito "smart" per il curriculum "Economic curriculum".

Tabella A						
Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Tipo	Codice



INFORMATION SYSTEMS FOR THE MAINTENANCE AND MANAGEMENT	9	ENG	1	LEO	Obbligatorio	053116
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I seguenti insegnamenti specialistici obbligatori forniscono competenze in ambito “smart” per il curriculum “Technical curriculum”.

Tabella A						
Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Tipo	Codice
CONSTRUCTION MANAGEMENT	12	ENG	1	LEO	Obbligatorio	051336

Da questa tabella B di insegnamenti trasversali devono essere selezionati almeno almeno 21 CFU per gli studenti del curriculum “Economic curriculum” e almeno 20 CFU per gli studenti del curriculum “Technical curriculum”. Di questi, 6 CFU contribuiranno al conseguimento dei 120 CFU effettivi necessari per la laurea. Ulteriori almeno 15 CFU in sovrannumero per gli studenti del curriculum “Economic curriculum” e almeno 14 CFU in sovrannumero per gli studenti del curriculum “Technical curriculum” consentiranno di ottenere l’attestazione di *PoliMI Ambassador Smart Technologies*.

Tabella B						
Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice	
SMART HOSPITAL	5	ENG	2	LEO	057492	
Smart buildings, neighborhoods, and cities	5	ENG	2	LEO	057501	



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Data Modelling for Urban Performance	5	ENG	2	LEO	057530	
SENSORS, MEASUREMENTS AND SMART METERING	10	ENG	2	LEO	052590	
SMART GRIDS: COMPONENTS, FUNCTIONALITIES AND BENEFITS	10	ENG	2	LEO	054173	
Digital Business	5	ENG	2	BV	056993	
Digital Technology	5	ENG	2	BV	097384	
Technology Risk Governance	5	ENG	1	BV	057252	
Smart Maintenance Management	5	ENG	1	BV	056985	
DATA AND INFORMATION QUALITY	5	ENG	1	LEO	056490	
MACHINE LEARNING	5	ENG	2	LEO	097683	



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SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901	
DATA ACQUISITION SYSTEMS	5	ENG	1	LEO	097678	
ENERGY AND EMISSIONS IN TRANSPORTATION SYSTEMS	10	ENG	1	BV	055652	
ARTIFICIAL INTELLIGENCE AND ADVANCED SIMULATION FOR THE SAFETY, RELIABILITY AND MAINTENANCE OF ENERGY SYSTEMS	10	ENG	1	BV	053354	
Smart Cities and Urban Innovation	5	ENG	2	BV	054571	
GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422	



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POSITIONING AND LOCATION BASED SERVICES	10	ENG	2	LEO	053660	
INTERNET OF THINGS	5	ENG	2	LEO	054323	
NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING	6	ENG	1	LEO	099234	
STRUCTURAL RELIABILITY AND RISK ANALYSIS	6	ENG	2	LEO	051115	
TRANSPORT RISK MANAGEMENT IN EMERGENCY PLANNING	10	ENG	2	LC	094810	
3D MODELLING AND MAPPING FROM DRONE IMAGES	8	ENG	1	LEO	051279	
Digital Twin for energy Systems Management	5	ENG	2	BV	057554	



GLOBAL SUPPLY CHAIN PLANNING	6	ENG	1	LEO	057057	
FACILITY MANAGEMENT LAB	6	ENG	1	LEO	054754	

INGEGNERIA CIVILE - CIVIL ENGINEERING

Lo studente deve acquisire almeno 30 CFU in attività formative funzionali al profilo di *Ambassador in Smart Infrastructures*. Tali CFU devono essere acquisiti scegliendo:

- almeno 10 CFU tra gli insegnamenti previsti nel proprio PSPA e compresi nella Tabella A;
- almeno 20 CFU tra gli insegnamenti elencati nella Tabella B, di cui 10 CFU sono da intendersi in sostituzione degli insegnamenti previsti come opzionali nel proprio PSPA.

Tabella A

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
BIM FUNDAMENTALS AND APPLICATIONS	6	ENG	1	LEO	052331
BRIDGE THEORY AND DESIGN	10	ENG	1	LEO	095879
CIRCOLAZIONE E SICUREZZA STRADALE	8	ITA	1	LEO	088637
ENGINEERING SEISMOLOGY	10	ENG	1	LEO	095862



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ESERCIZIO FERROVIARIO	5	ITA	1	LEO	051740
AEROPORTI E TRASPORTO AEREO	10	ITA	1	LEO	088640
NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING	6	ENG	1	LEO	099234
STRUCTURAL RELIABILITY AND RISK ANALYSIS	6	ENG	2	LEO	051115
TECNICA ED ECONOMIA DEI TRASPORTI	10	ITA	2	LEO	088641
TRASPORTI MARITTIMI E INTERMODALI	6	ITA	2	LEO	090871
PROGETTO DI STRADE	10	ITA	2	LEO	088639
MECHANICS OF MATERIALS AND INELASTIC CONSTITUTIVE LAWS	6	ENG	2	LEO	094800
IMPIANTI SPECIALI IDRAULICI	10	ITA	2	LEO	057324



Gli insegnamenti NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING (Tabella A) e METHODS FOR SYSTEM HEALTH MONITORING AND PROGNOSIS (Tabella B) sono da considerarsi in alternativa.

Tabella B

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
RISK-BASED MANAGEMENT AND MONITORING OF INFRASTRUCTURE NETWORKS	5	ENG	1	LEO	057527
SMART MATERIALS AND METAMATERIALS	5	ENG	1	LEO/BV	057542
SMART BUILDINGS, NEIGHBORHOODS, AND CITIES	5	ENG	2	LEO	057501
METHODS FOR SYSTEM HEALTH MONITORING AND PROGNOSIS	5	ENG	1	BV	057539



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KNOWLEDGE MANAGEMENT IN INFRASTRUCTURE PROJECTS	5	ENG	2	BV	057051
QUALITY ENGINEERING ME	8	ENG	2	BV	051131
SMART MAINTENANCE MANAGEMENT	5	ENG	1	BV	056985
DATA AND INFORMATION QUALITY	5	ENG	1	LEO	056490
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901
METHODS AND TOOLS FOR SYSTEMATIC INNOVATION B - PROBLEM SOLVING AND INVENTIVE DESIGN	6	ENG	1	BV	054829
VISION BASED 3D MEASUREMENTS	6	ENG	1	BV	097457



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INFRASTRUCTURE INVESTMENT AND PROJECT FINANCE	5	ENG	1	BV	054266
GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422
POSITIONING AND LOCATION BASED SERVICES	10	ENG	2	LEO	053660
SOFTWARE ENGINEERING FOR GEOINFORMATICS	5	ENG	2	LEO	052423
PHOTOGRAMMETRY AND DRONE IMAGE PROCESSING	5	ENG	1	LEO	056822
GEOSPATIAL DATA PROCESSING TO SUPPORT SEISMIC EMERGENCY MANAGEMENT	16	ENG	2	LC	054172
GEOSPATIAL DATA PROCESSING AND CRISIS MAPPING APPLIED TO EMERGENCY MANAGEMENT	10	ENG	2	LC	053126
SEISMIC RISK ASSESSMENT FOR POST-EVENT MANAGEMENT	6	ENG	2	LC	094820
TRANSPORT MANAGEMENT IN EMERGENCY PLANNING	16	ENG	2	LC	054176



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TRANSPORT RISK MANAGEMENT IN EMERGENCY PLANNING	10	ENG	2	LC	094810
TRANSPORT SYSTEMS AND TRANSPORT RISK	6	ENG	2	LC	094811
GEOPHYSICAL DATA PROCESSING	10	ENG	1	LEO	097465
TELERILEVAMENTO	10	ITA	1	LEO	089122

AUTOMATION AND CONTROL ENGINEERING

Lo studente dovrà acquisire almeno 30 CFU in attività formative funzionali al profilo di *Ambassador in Smart Infrastructures*, scegliendo almeno 10 CFU dalla Tabella A e almeno 20 CFU dalla Tabella B.

Tabella A

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
AUTOMATION AND CONTROL IN AUTONOMOUS VEHICLES	5	ENG	1	LEO	056807
CONTROL OF INDUSTRIAL ROBOTS	5	ENG	1	LEO	090914



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CONTROL OF MOBILE ROBOTS	5	ENG	1	LEO	052366
NETWORKED CONTROL	5	ENG	1	LEO	052369
SAFETY IN AUTOMATION SYSTEMS	5	ENG	1	LEO	093060
ADVANCED MEASUREMENT SYSTEMS FOR CONTROL APPLICATIONS	5	ENG	2	BV	055513
AUTOMATION OF ENERGY SYSTEMS	5	ENG	2	LEO	090916
PRODUCTION SYSTEMS CONTROL	5	ENG	2	LEO	090915
SIMULATION TECHNIQUES AND TOOLS	5	ENG	2	LEO	097484

Tabella B

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
ADDITIVE MANUFACTURING	5	ENG	1	BV	055862



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ASSET LIFECYCLE MANAGEMENT	10	ENG	1	BV	097319
COMMUNICATION NETWORK DESIGN	5	ENG	1	LEO	096120
DIGITAL MANUFACTURING	5	ENG	1	BV	056949
ELECTRIC SYSTEM FOR TRANSPORTATION C	6	ENG	1	BV	097671
GLOBAL SUPPLY CHAIN PLANNING	5	ENG	1	BV	057012
PHOTOGRAMMETRY AND DRONE IMAGE PROCESSING	5	ENG	1	LEO	056822
SISTEMI PER L'AUTOMAZIONE E LA COMUNICAZIONE INDUSTRIALE	5	ITA	1	LEO	052577
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901



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COMPUTING INFRASTRUCTURES	5	ENG	2	LEO	095898
INTERNET OF THINGS	5	ENG	2	LEO	054323
LOCALIZATION, NAVIGATION AND SMART MOBILITY	5	ENG	2	LEO	054309
MOBILE RADIO NETWORKS	5	ENG	2	LEO	054325
PERCEPTION, LOCALIZATION AND MAPPING FOR MOBILE ROBOTS	5	ENG	2	LEO	052359
ADVANCED METHODS FOR THE OPTIMAL MANAGEMENT OF THE ELECTRICAL GRID	5	ENG	2	LEO	057504

BIOMEDICAL ENGINEERING

Lo studente dovrà acquisire almeno 30 CFU in attività formative funzionali al profilo di *Ambassador in Smart Infrastructures*. Tali CFU devono essere acquisiti scegliendo almeno 10 CFU dalla Tabella A e almeno 20 CFU dalla Tabella B.



Tabella A

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
MEDICAL INFORMATICS	10	ENG	2	LEO	054296
TECHNOLOGIES FOR SENSORS AND CLINICAL INSTRUMENTATION - BIOE 430	5	ENG	2	LEO	050493
E-HEALTH APPLICATIONS	5	ENG	1	LEO	056453
ELETTRONICA BIOMEDICA	10*	ITA	1	LEO	083099

* Solo 5 CFU sono conteggiati ai fini del profilo di *Ambassador in Smart Infrastructures*.

Tabella B

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
SMART HOSPITAL	5	ENG	2	LEO	057492
SMART SPORT INFRASTRUCTURE	5	ENG	1	BV	057536
CONTROL OF MOBILE ROBOTS	5	ENG	1	LEO	052366



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SIMULATION TECHNIQUES AND TOOLS	5	ENG	2	LEO	097484
MEASUREMENT ORIENTED DIGITAL SIGNAL PROCESSING	10	ENG	1	LEO	093585
SENSORS, MEASUREMENTS AND SMART METERING	10	ENG	2	LEO	052590
Digital Security Management	5	ENG	1	BV	055892
Digital Technology	5	ENG	2	BV	097384
COMPUTING INFRASTRUCTURES	5	ENG	2	LEO	095898
MACHINE LEARNING	5	ENG	2	LEO	097683
ROBOTICS	5	ENG	2	LEO	089013
MECHATRONIC SYSTEMS AND LABORATORY B	6	ENG	1	BV	097550
ROBOTIC SYSTEMS DESIGN	6	ENG	1	BV	053419



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VISION BASED 3D MEASUREMENTS	6	ENG	1	BV	097457
GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422
FUNDAMENTALS OF COMMUNICATION NETWORKS	5	ENG	1	LEO	094783
FUNDAMENTALS OF ELECTROMAGNETIC FIELDS	5	ENG	1	LEO	094784
INTERNET OF THINGS	5	ENG	2	LEO	054323
LOCALIZATION, NAVIGATION AND SMART MOBILITY	5	ENG	2	LEO	054309
COMMUNICATION NETWORK DESIGN	5	ENG	1	LEO	096120
3D MODELLING AND MAPPING FROM DRONE IMAGES	8	ENG	1	LEO	051279
POWER GENERATION SYSTEMS	8	ENG	2	LEO	097934



COMPUTER SCIENCE AND ENGINEERING

Lo studente dovrà acquisire almeno 30 CFU in attività formative funzionali al profilo di *Ambassador in Smart Infrastructures*. Tali CFU devono essere acquisiti scegliendo almeno 10 CFU dalla Tabella A e almeno 20 CFU dalla Tabella B.

Tabella A

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
ARTIFICIAL NEURAL NETWORKS AND DEEP LEARNING	5	ENG	1	LEO	054307
MULTIAGENT SYSTEMS	5	ENG	1	LEO	056893
DISTRIBUTED SYSTEMS	5	ENG	1	LEO	090950
MACHINE LEARNING	5	ENG	2	LEO	097683
MIDDLEWARE TECHNOLOGIES FOR DISTRIBUTED SYSTEMS	5	ENG	1	LEO	052533
TECHNOLOGIES FOR INFORMATION SYSTEMS	5	ENG	1	LEO	052537
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901



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Tabella B

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
AUTOMATION AND CONTROL IN AUTONOMOUS VEHICLES	5	ENG	1	LEO	056807
NETWORKED CONTROL	5	ENG	1	LEO	052369
PRODUCTION SYSTEMS CONTROL	5	ENG	2	LEO	090915
SIMULATION TECHNIQUES AND TOOLS	5	ENG	2	LEO	097484
SENSORS, MEASUREMENTS AND SMART METERING	10	ENG	2	LEO	052590
DIGITAL MANUFACTURING	5	ENG	1	BV	056949
ROBOTIC SYSTEMS DESIGN	6	ENG	1	BV	053419
VISION BASED 3D MEASUREMENTS	6	ENG	1	BV	097457



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ARTIFICIAL INTELLIGENCE AND ADVANCED SIMULATION FOR THE SAFETY, RELIABILITY AND MAINTENANCE OF ENERGY SYSTEMS	10	ENG	1	BV	053354
GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422
INTERNET OF THINGS	5	ENG	2	LEO	054323
MOBILE RADIO NETWORKS	5	ENG	2	LEO	054325
LOCALIZATION, NAVIGATION AND SMART MOBILITY	5	ENG	2	LEO	054309
BIM FUNDAMENTALS AND APPLICATIONS	5	ENG	1	LEO	052331
ADVANCED ENVIRONMENTAL SYSTEMS ANALYSIS [I.C.]	10	ENG	1	LEO	098634



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KNOWLEDGE MANAGEMENT IN INFRASTRUCTURE PROJECTS	5	ENG	2	BV	057051
SMART HOSPITAL	5	ENG	2	LEO	057492
SMART BUILDINGS, NEIGHBORHOODS, AND CITIES	5	ENG	2	LEO	057501
ADVANCED METHODS FOR THE OPTIMAL MANAGEMENT OF THE ELECTRICAL GRID	5	ENG	2	LEO	057504
DATA MODELING FOR URBAN PERFORMANCE	5	ENG	2	LEO	057530
SMART SPORT INFRASTRUCTURE	5	ENG	1	BV	057536



ELECTRICAL ENGINEERING

Lo studente dovrà acquisire almeno 30 CFU in attività formative funzionali al profilo di *Ambassador in Smart Infrastructures*. Tali CFU devono essere acquisiti scegliendo almeno 10 CFU dalla Tabella A e almeno 20 CFU dalla Tabella B.

Tabella A

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
AUTOMAZIONE DEI SISTEMI ELETTRICI DI TRASPORTO	5	ITA	1	LEO	052578
ELECTRIC POWER SYSTEMS	10	ENG	1	LEO	055681
ELECTROMAGNETIC COMPATIBILITY B	10	ENG	2	LEO	054165
NETWORK AUTOMATION AND PROTECTION SYSTEMS; TOOLS FOR NETWORK SIMULATION	8	ENG	2	LEO	097738
RELIABILITY ENGINEERING AND QUALITY CONTROL	10	ENG	1	LEO	055683
SENSORS, MEASUREMENTS AND SMART METERING	10	ENG	2	LEO	052590
SMART GRIDS: COMPONENTS, FUNCTIONALITIES AND BENEFITS	10	ENG	2	LEO	054173
SISTEMI PER L'AUTOMAZIONE E LA COMUNICAZIONE INDUSTRIALE	5	ITA	1	LEO	052577



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SMART MEASUREMENT ARCHITECTURES FOR ELECTRIC SYSTEMS	10	ENG	1	LEO	052570
MEASUREMENT ORIENTED DIGITAL SIGNAL PROCESSING	10	ENG	1	LEO	093585

Tabella B

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
COMMUNICATION NETWORKS FOR ELECTRICITY SYSTEMS	8	ENG	1	LEO	096101
PROJECT MANAGEMENT: PRINCIPLES & TOOLS	6	ENG	1	LEO	096094
AUTOMATION AND CONTROL IN AUTONOMOUS VEHICLES	5	ENG	1	LEO	056807
AUTOMATION OF ENERGY SYSTEMS	5	ENG	2	LEO	090916
PRODUCTION SYSTEMS CONTROL	5	ENG	2	LEO	090915
SAFETY IN AUTOMATION SYSTEMS	5	ENG	1	LEO	093060
SIMULATION TECHNIQUES AND TOOLS	5	ENG	2	LEO	097484



TECHNOLOGIES FOR SENSORS AND CLINICAL INSTRUMENTATION - BIOE 430	5	ENG	2	LEO	050493
DIGITAL BUSINESS	5	ENG	2	BV	056993
INDUSTRIAL AUTOMATION AND ROBOTICS	5	ENG	1	BV	056950
TECHNOLOGY RISK GOVERNANCE	5	ENG	1	BV	057252
MACHINE LEARNING	5	ENG	2	LEO	097683
METHODS AND TOOLS FOR SYSTEMATIC INNOVATION B - PROBLEM SOLVING AND INVENTIVE DESIGN	5	ENG	1	BV	054829
METHODS AND TOOLS FOR SYSTEMATIC INNOVATION C - INNOVATION AND INTELLECTUAL PROPERTY MANAGEMENT	5	ENG	1	BV	054831
SMART CITIES AND URBAN INNOVATION	8	ENG	2	BV	054571
PHOTOGRAMMETRY AND DRONE IMAGE PROCESSING	5	ENG	1	LEO	056822
INTERNET OF THINGS	5	ENG	2	LEO	054323
MOBILE RADIO NETWORKS	5	ENG	2	LEO	054325



LOCALIZATION, NAVIGATION AND SMART MOBILITY	5	ENG	2	LEO	054309
GLOBAL SUPPLY CHAIN PLANNING	6	ENG	1	BV	057057
NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING	6	ENG	1	LEO	099234
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901
GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422
RISK-BASED MANAGEMENT AND MONITORING OF INFRASTRUCTURE NETWORKS	5	ENG	1	LEO	057527
SMART BUILDINGS, NEIGHBORHOODS, AND CITIES	5	ENG	2	LEO	057501
SMART SPORT INFRASTRUCTURES	5	ENG	1	BV	057536
METHODS FOR SYSTEM HEALTH MONITORING AND PROGNOSIS	5	ENG	1	BV	057539



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MECHANICAL ENGINEERING

Lo studente dovrà acquisire almeno 30 CFU in attività formative funzionali al profilo di *Ambassador in Smart Infrastructures*. Tali CFU devono essere acquisiti scegliendo almeno 10 CFU dalla Tabella A coerenti con il proprio PSPA e almeno 20 CFU dalla Tabella B. Informazioni di maggiore dettaglio sulla composizione del piano di studio sono disponibili sul sito del corso di studio (<https://www.mecheng.polimi.it/laurea-magistrale/piani-di-studio/>).

Tabella A

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
ADDITIVE MANUFACTURING B	6	ENG	1	BV	055862
ADVANCED MEASUREMENT TECHNIQUES	6	ENG	1	BV	097525
AUTOMATIC CONTROL B	6	ENG	1	BV	097559
COMPUTER VISION AND REVERSE ENGINEERING	6	ENG	2	BV	097454
DESIGN METHODS	6	ENG	2	BV	097450
ELECTRIC SYSTEM FOR TRANSPORTATION C	6	ENG	1	BV	097671



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ELECTRICAL DRIVES FOR INDUSTRY AND TRANSPORT APPLICATIONS	6	ENG	2	BV	097523
HAPTICS	6	ENG	1	BV	097617
HUMAN MODELLING IN ENGINEERING	6	ENG	1	BV	097451
HYBRID AND ELECTRIC VEHICLE	6	ENG	1	BV	054362
INNOVATIONS IN METALLURGICAL PLANTS AND PROCESSES B	6	ENG	1	BV	055860
INTEGRATED MANUFACTURING SYSTEMS	8	ENG	1	BV	051130
LOGISTICS MANAGEMENT	10	ENG	2	BV	096089
MANUFACTURING SYSTEMS ENGINEERING	10	ENG	1	BV	054201



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MECHANICAL SYSTEMS RELIABILITY	6	ENG	1	BV	097502
MECHATRONIC SYSTEMS AND LABORATORY A	10	ENG	1	BV	097519
MECHATRONIC SYSTEMS AND LABORATORY B	6	ENG	1	BV	097550
METHODS AND TOOLS FOR SYSTEMATIC INNOVATION B - PROBLEM SOLVING AND INVENTIVE DESIGN	6	ENG	1	BV	054829
METHODS AND TOOLS FOR SYSTEMATIC INNOVATION C - INNOVATION AND INTELLECTUAL PROPERTY MANAGEMENT	6	ENG	1	BV	054831



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METHODS FOR VIRTUAL PROTOTYPING	6	ENG	1	BV	095890
MOBILITY: INFRASTRUCTURES AND SERVICES	8	ENG	2	BV	052079
QUALITY ENGINEERING ME	8	ENG	2	BV	051131
ROBOTIC SYSTEMS DESIGN	6	ENG	1	BV	053419
SMART STRUCTURES AND DEVICES	6	ENG	2	BV	094910
VISION BASED 3D MEASUREMENTS	6	ENG	1	BV	097457

Tabella B

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
ADVANCED MEASUREMENT SYSTEMS FOR CONTROL APPLICATIONS	5	ENG	2	BV	055513



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AUTOMATION AND CONTROL IN AUTONOMOUS VEHICLES	5	ENG	1	LEO	056807
CONTROL OF INDUSTRIAL ROBOTS	5	ENG	1	LEO	090914
CONTROL OF MOBILE ROBOTS	5	ENG	1	LEO	052366
PRODUCTION SYSTEMS CONTROL	5	ENG	2	LEO	090915
SAFETY IN AUTOMATION SYSTEMS	5	ENG	1	LEO	093060
E-HEALTH APPLICATIONS	5	ENG	1	LEO	056453
TECHNOLOGIES FOR SENSORS AND CLINICAL INSTRUMENTATION - BIOE 430	5	ENG	2	LEO	050493
ELECTRIC POWER SYSTEMS	10	ENG	2	BV	055681
ELECTROMAGNETIC COMPATIBILITY B	10	ENG	2	LEO	054165



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RELIABILITY ENGINEERING AND QUALITY CONTROL	10	ENG	1	LEO	055683
SISTEMI PER L'AUTOMAZIONE E LA COMUNICAZIONE INDUSTRIALE	5	ITA	1	LEO	052577
SMART MEASUREMENT ARCHITECTURES FOR ELECTRIC SYSTEMS	10	ENG	1	LEO	052570
DIGITAL FACTORY	5	ENG	1	BV	056954
DIGITAL MANUFACTURING	5	ENG	1	BV	056949
DIGITAL SECURITY MANAGEMENT	5	ENG	1	BV	055892
INDUSTRIAL AUTOMATION AND ROBOTICS	5	ENG	1	BV	056950
KNOWLEDGE MANAGEMENT IN INFRASTRUCTURE PROJECTS	5	ENG	2	BV	057051



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TECHNOLOGY RISK GOVERNANCE	5	ENG	1	BV	057252
SMART MAINTENANCE MANAGEMENT	5	ENG	1	BV	056985
COMPUTING INFRASTRUCTURES	5	ENG	2	LEO	095898
MACHINE LEARNING	5	ENG	2	LEO	097683
ROBOTICS	5	ENG	2	LEO	089013
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901
DIGITAL TWIN FOR ENERGY SYSTEMS MANAGEMENT	5	ENG	2	BV	057554
SMART CITIES AND URBAN INNOVATION	5	ENG	2	BV	057555
GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422



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FUNDAMENTALS OF COMMUNICATION NETWORKS	5	ENG	1	LEO	094783
FUNDAMENTALS OF ELECTROMAGNETIC FIELDS	5	ENG	1	LEO	094784
INTERNET OF THINGS	5	ENG	2	LEO	054323
LOCALIZATION, NAVIGATION AND SMART MOBILITY	5	ENG	2	LEO	054309
WIRELESS AND MOBILE PROPAGATION	5	ENG	2	LEO	054330
INFORMATION SYSTEMS FOR THE MAINTENANCE AND MANAGEMENT	9	ENG	1	LEO	053116
GLOBAL SUPPLY CHAIN PLANNING	6	ENG	1	BV	057057
BRIDGE THEORY AND DESIGN	10	ENG	1	LEO	095879



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CIRCOLAZIONE E SICUREZZA STRADALE	8	ITA	1	LEO	088637
NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING	6	ENG	1	LEO	099234
STRUCTURAL RELIABILITY AND RISK ANALYSIS	6	ENG	2	LEO	051115
TECNICA ED ECONOMIA DEI TRASPORTI	10	ITA	2	LEO	088641
TRASPORTI MARITTIMI E INTERMODALI	6	ENG	2	LEO	090871
SMART HOSPITAL	5	ENG	2	LEO	057492
SMART BUILDINGS, NEIGHBORHOODS, AND CITIES	5	ENG	2	LEO	057501



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RISK-BASED MANAGEMENT AND MONITORING OF INFRASTRUCTURE NETWORKS	5	ENG	1	LEO	057527
DATA MODELLING FOR URBAN PERFORMANCE.	5	ENG	2	LEO	057530
SMART SPORT INFRASTRUCTURES	5	ENG	1	BV	057536
METHODS FOR SYSTEM HEALTH MONITORING AND PROGNOSIS	5	ENG	1	BV	057539
SMART MATERIALS AND METAMATERIALS	5	ENG	1	LEO/BV	057542
DATA ANALYTICS FOR SMART AGRICULTURE	5	ENG	1	LEO	057498



TELECOMMUNICATION ENGINEERING

Lo studente dovrà acquisire almeno 30 CFU in attività formative funzionali al profilo di *Ambassador in Smart Infrastructures*. Tali CFU devono essere acquisiti scegliendo almeno 10 CFU dalla Tabella A e almeno 20 CFU dalla Tabella B.

Tabella A

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
DIGITAL COMMUNICATION	10	ENG	1	LEO	054312
OPTICAL COMMUNICATIONS	10	ENG	1	LEO	052482
RF SYSTEMS	10	ENG	1	LEO	052484
NETWORK DESIGN	10	ENG	1	LEO	052481
ADVANCED DIGITAL SIGNAL PROCESSING	10	ENG	1	LEO	052471
TRAFFIC THEORY	10	ENG	1	LEO	054657

Tabella B

Nome Insegnamento	CFU	Lingua	Semestre	Sede erogazione	Codice
NETWORKED CONTROL	5	ENG	1	LEO	052369
COMPUTING INFRASTRUCTURES	5	ENG	2	LEO	095898



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SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901
GEOPHYSICAL DATA PROCESSING 1	5	ENG	1	LEO	098416
DATA AND INFORMATION QUALITY	5	ENG	1	LEO	056490
MACHINE LEARNING	5	ENG	2	LEO	097683
SENSORS, MEASUREMENTS AND SMART METERING	5	ENG	2	LEO	052590
SMART CITIES AND URBAN INNOVATION	5	ENG	2	BV	057555
ELECTROMAGNETIC COMPATIBILITY B	5	ENG	2	LEO	054165
SIMULATION TECHNIQUES AND TOOLS	5	ENG	2	LEO	097484
ROBOTICS	5	ENG	2	LEO	089013



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NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING	6	ENG	1	LEO	099234
SMART BUILDINGS, NEIGHBORHOODS AND CITIES	5	ENG	2	LEO	057501
COMMUNICATION IN GREEN INFRASTRUCTURES	5	ENG	1	LEO	057517
RISK-BASED MANAGEMENT AND MONITORING OF INFRASTRUCTURE NETWORKS	5	ENG	1	LEO	057527
DATA MODELLING FOR URBAN PERFORMANCE	5	ENG	2	LEO	057530
DATA ANALYTICS FOR SMART AGRICULTURE	5	ENG	1	LEO	057498



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DOMANDA DI PARTECIPAZIONE

La domanda di partecipazione deve essere presentata tramite **apposita funzione disponibile dai Servizi online** (sezione Richieste di ammissione > Ammissione a procedure di selezione) **a partire dal 19/07/2021 ed entro le ore 12.00 (ora italiana) del 16/09/2021.**

L'elenco degli studenti iscritti al programma, per ciascun Corso di Studio, sarà pubblicato entro il **17/09/2021** alla pagina web www.polimi.it/polimi-ambassador

REQUISITI PER L'OTTENIMENTO DEL TITOLO

I requisiti per l'ottenimento del titolo di *"Polimi Ambassador in SMART INFRASTRUCTURES"* sono il conseguimento di 130 CFU (di cui almeno 10 in sovrannumero), di cui 30 CFU in attività formative funzionali al profilo di *Ambassador in Smart Infrastructures*.

TRATTAMENTO DEI DATI PERSONALI

Per quanto concerne il trattamento dei dati personali, ai sensi dell'art. 13 del Regolamento UE 2016/679 del 27 aprile 2016, si rimanda a quanto indicato alla specifica pagina web del sito di Ateneo <https://www.polimi.it/privacy>.

RESPONSABILE DEL PROCEDIMENTO

Ai sensi di quanto disposto dall'Art. 5 della Legge 7 agosto 1990, n. 241, il Responsabile del procedimento di cui al presente bando è il dr. Gianluca Attolini.

Milano, xxxxxx

Il Rettore
Prof. Ferruccio Resta



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NOTICE OF CALL

A call has been launched for the admission to the “PoliMI Ambassador in SMART INFRASTRUCTURES” training activated within the MSc degree programmes in

- **MANAGEMENT OF BUILT ENVIRONMENT**
- **INGEGNERIA CIVILE - CIVIL ENGINEERING**
- **AUTOMATION AND CONTROL ENGINEERING**
- **BIOMEDICAL ENGINEERING**
- **COMPUTER SCIENCE AND ENGINEERING**
- **ELECTRICAL ENGINEERING**
- **MECHANICAL ENGINEERING**
- **TELECOMMUNICATION ENGINEERING**

DESCRIPTION

The goal is to create a new professional profile, the *Ambassador in Smart Infrastructures*: a MSc graduate with forefront systemic skills, interdisciplinary vision, digital skills, specific aptitude to innovation. The *Ambassador in Smart Infrastructures* profile corresponds to a professional figure with both advanced, specialized skills in relevant applications (infrastructures) and/or enabling technologies (smart), as well as transversal skills, which allow students to broaden their knowledge in the field of Smart Infrastructures and to adopt a systemic approach to design, management, innovation, and study of life-cycle of infrastructures.

The training programme is articulated within the MSc educational path, and sets at 130 ECTS (thus at least extra 10 ECTS in addition to the standard MSc requirements) the minimum number of credits needed to complete the selected MSc and, at the same time, to qualify for the certification of “*PoliMI Ambassador in SMART INFRASTRUCTURES*”.

As part of the educational training, students must acquire at least 30 ECTS in courses related to the *Ambassador in Smart Infrastructures* profile, which have to be chosen from Tables A



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and B according to the instructions provided below for each of the MSc degree courses listed above.

The *Ambassador in SMART INFRASTRUCTURES* certification will be reported in the student's Diploma Supplement and a dedicated digital badge will be issued by Politecnico di Milano.

Students who will not obtain the required extra 10 ECTS and the 30 ECTS in training activities functional to the *Ambassador in Smart Infrastructures* profile will not be precluded from obtaining their MSc degree.

Only Politecnico di Milano students regularly enrolled to the MSc degree courses listed above for the academic year 2021/22 can participate to the call.

MANAGEMENT OF BUILT ENVIRONMENT

The following compulsory specialized courses provide skills in "smart infrastructures" to students attending the "Economic" track.

Table A						
Course Name	ECTS	Language	Semester	Campus	Tipo	Code
INFORMATION SYSTEMS FOR THE MAINTENANCE AND MANAGEMENT	9	ENG	1	LEO	Obbligatorio	053116

The following compulsory specialized courses provide skills in "smart infrastructures" to students attending the "Technical" track.

Table A						
Course Name	ECTS	Language	Semester	Campus	Tipo	Code
CONSTRUCTION MANAGEMENT	12	ENG	1	LEO	Obbligatorio	051336



At least 21 ECTS must be selected from the following table B of transversal courses for students attending the “Economic” track. Students attending the “Technical” track have to select at least 20 ECTS. Of these ECTS, 6 will count against the 120 required for graduation, while the other 15 (at least) will be extra ECTS for the “Economic” track and 14 ECTS (at least) will be extra ECTS for the “Technical” curriculum. The latter will entitle students to be awarded the *Polimi Ambassador in Smart Infrastructures*.

Table B						
Course Name	ECTS	Language	Semester	Campus	Code	
SMART HOSPITAL	5	ENG	2	LEO	057492	
Smart buildings, neighborhoods, and cities	5	ENG	2	LEO	057501	
Data Modelling for Urban Performance	5	ENG	2	LEO	057530	
SENSORS, MEASUREMENTS AND SMART METERING	10	ENG	2	LEO	052590	
SMART GRIDS: COMPONENTS, FUNCTIONALITIES AND BENEFITS	10	ENG	2	LEO	054173	
Digital Business	5	ENG	2	BV	056993	
Digital Technology	5	ENG	2	BV	097384	



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Technology Risk Governance	5	ENG	1	BV	057252	
Smart Maintenance Management	5	ENG	1	BV	056985	
DATA AND INFORMATION QUALITY	5	ENG	1	LEO	056490	
MACHINE LEARNING	5	ENG	2	LEO	097683	
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901	
DATA ACQUISITION SYSTEMS	5	ENG	1	LEO	097678	
ENERGY AND EMISSIONS IN TRANSPORTATION SYSTEMS	10	ENG	1	BV	055652	
ARTIFICIAL INTELLIGENCE AND ADVANCED SIMULATION FOR THE SAFETY, RELIABILITY AND MAINTENANCE OF ENERGY SYSTEMS	10	ENG	1	BV	053354	



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Smart Cities and Urban Innovation	5	ENG	2	BV	054571	
GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422	
POSITIONING AND LOCATION BASED SERVICES	10	ENG	2	LEO	053660	
INTERNET OF THINGS	5	ENG	2	LEO	054323	
NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING	6	ENG	1	LEO	099234	
STRUCTURAL RELIABILITY AND RISK ANALYSIS	6	ENG	2	LEO	051115	
TRANSPORT RISK MANAGEMENT IN EMERGENCY PLANNING	10	ENG	2	LC	094810	
3D MODELLING AND MAPPING FROM DRONE IMAGES	8	ENG	1	LEO	051279	



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Digital Twin for energy Systems Management	5	ENG	2	BV	057554	
GLOBAL SUPPLY CHAIN PLANNING	6	ENG	1	LEO	057057	
FACILITY MANAGEMENT LAB	6	ENG	1	LEO	054754	

INGEGNERIA CIVILE -CIVIL ENGINEERING

The student must acquire at least 30 ECTS in training activities functional to the *Ambassador in Smart Infrastructures profile*. These ECTS must be earned by choosing:

- at least 10 ECTS from the courses provided in the selected Track and included in Table A;
- at least 20 ECTS from the courses listed in Table B, of which 10 ECTS are intended to replace elective courses of the selected Track.

Table A

Course Name	ECTS	Language	Semester	Campus	Code
BIM FUNDAMENTALS AND APPLICATIONS	6	ENG	1	LEO	052331
BRIDGE THEORY AND DESIGN	10	ENG	1	LEO	095879
CIRCOLAZIONE E SICUREZZA STRADALE	8	ITA	1	LEO	088637
ENGINEERING SEISMOLOGY	10	ENG	1	LEO	095862



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ESERCIZIO FERROVIARIO	5	ITA	1	LEO	051740
AEROPORTI E TRASPORTO AEREO	10	ITA	1	LEO	088640
NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING	6	ENG	1	LEO	099234
STRUCTURAL RELIABILITY AND RISK ANALYSIS	6	ENG	2	LEO	051115
TECNICA ED ECONOMIA DEI TRASPORTI	10	ITA	2	LEO	088641
TRASPORTI MARITTIMI E INTERMODALI	6	ITA	2	LEO	090871
PROGETTO DI STRADE	10	ITA	2	LEO	088639
MECHANICS OF MATERIALS AND INELASTIC CONSTITUTIVE LAWS	6	ENG	2	LEO	094800
IMPIANTI SPECIALI IDRAULICI	10	ITA	2	LEO	057324



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The courses NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING (Table A) and METHODS FOR SYSTEM HEALTH MONITORING AND PROGNOSIS (Table B) are to be considered as alternatives.

Table B

Course Name	ECTS	Language	Semester	Campus	Code
RISK-BASED MANAGEMENT AND MONITORING OF INFRASTRUCTURE NETWORKS	5	ENG	1	LEO	057527
SMART MATERIALS AND METAMATERIALS	5	ENG	1	LEO/BV	057542
SMART BUILDINGS, NEIGHBORHOODS, AND CITIES	5	ENG	2	LEO	057501
METHODS FOR SYSTEM HEALTH MONITORING AND PROGNOSIS	5	ENG	1	BV	057539
KNOWLEDGE MANAGEMENT IN INFRASTRUCTURE PROJECTS	5	ENG	2	BV	057051



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QUALITY ENGINEERING ME	8	ENG	2	BV	051131
SMART MAINTENANCE MANAGEMENT	5	ENG	1	BV	056985
DATA AND INFORMATION QUALITY	5	ENG	1	LEO	056490
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901
METHODS AND TOOLS FOR SYSTEMATIC INNOVATION B - PROBLEM SOLVING AND INVENTIVE DESIGN	6	ENG	1	BV	054829
VISION BASED 3D MEASUREMENTS	6	ENG	1	BV	097457
INFRASTRUCTURE INVESTMENT AND PROJECT FINANCE	5	ENG	1	BV	054266



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GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422
POSITIONING AND LOCATION BASED SERVICES	10	ENG	2	LEO	053660
SOFTWARE ENGINEERING FOR GEOINFORMATICS	5	ENG	2	LEO	052423
PHOTOGRAMMETRY AND DRONE IMAGE PROCESSING	5	ENG	1	LEO	056822
GEOSPATIAL DATA PROCESSING TO SUPPORT SEISMIC EMERGENCY MANAGEMENT	16	ENG	2	LC	054172
GEOSPATIAL DATA PROCESSING AND CRISIS MAPPING APPLIED TO EMERGENCY MANAGEMENT	10	ENG	2	LC	053126



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SEISMIC RISK ASSESSMENT FOR POST-EVENT MANAGEMENT	6	ENG	2	LC	094820
TRANSPORT MANAGEMENT IN EMERGENCY PLANNING	16	ENG	2	LC	054176
TRANSPORT RISK MANAGEMENT IN EMERGENCY PLANNING	10	ENG	2	LC	094810
TRANSPORT SYSTEMS AND TRANSPORT RISK	6	ENG	2	LC	094811
GEOPHYSICAL DATA PROCESSING	10	ENG	1	LEO	097465
TELERILEVAMENTO	10	ITA	1	LEO	089122

AUTOMATION AND CONTROL ENGINEERING

The student must acquire at least 30 ECTS in training activities functional to the profile of *Ambassador in Smart Infrastructures*. These ECTS must be earned by choosing at least 10 ECTS from Table A and at least 20 ECTS from Table B.

Table A

Course Name	ECTS	Language	Semester	Campus	Code
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AUTOMATION AND CONTROL IN AUTONOMOUS VEHICLES	5	ENG	1	LEO	056807
CONTROL OF INDUSTRIAL ROBOTS	5	ENG	1	LEO	090914
CONTROL OF MOBILE ROBOTS	5	ENG	1	LEO	052366
NETWORKED CONTROL	5	ENG	1	LEO	052369
SAFETY IN AUTOMATION SYSTEMS	5	ENG	1	LEO	093060
ADVANCED MEASUREMENT SYSTEMS FOR CONTROL APPLICATIONS	5	ENG	2	BV	055513
AUTOMATION OF ENERGY SYSTEMS	5	ENG	2	LEO	090916
PRODUCTION SYSTEMS CONTROL	5	ENG	2	LEO	090915
SIMULATION TECHNIQUES AND TOOLS	5	ENG	2	LEO	097484

Table B



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Course Name	ECTS	Language	Semester	Campus	Code
ADDITIVE MANUFACTURING	5	ENG	1	BV	055862
ASSET LIFECYCLE MANAGEMENT	10	ENG	1	BV	097319
COMMUNICATION NETWORK DESIGN	5	ENG	1	LEO	096120
DIGITAL MANUFACTURING	5	ENG	1	BV	056949
ELECTRIC SYSTEM FOR TRANSPORTATION C	6	ENG	1	BV	097671
GLOBAL SUPPLY CHAIN PLANNING	5	ENG	1	BV	057012
PHOTOGRAMMETRY AND DRONE IMAGE PROCESSING	5	ENG	1	LEO	056822
SISTEMI PER L'AUTOMAZIONE E LA COMUNICAZIONE INDUSTRIALE	5	ITA	1	LEO	052577



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SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901
COMPUTING INFRASTRUCTURES	5	ENG	2	LEO	095898
INTERNET OF THINGS	5	ENG	2	LEO	054323
LOCALIZATION, NAVIGATION AND SMART MOBILITY	5	ENG	2	LEO	054309
MOBILE RADIO NETWORKS	5	ENG	2	LEO	054325
PERCEPTION, LOCALIZATION AND MAPPING FOR MOBILE ROBOTS	5	ENG	2	LEO	052359
ADVANCED METHODS FOR THE OPTIMAL MANAGEMENT OF THE ELECTRICAL GRID	5	ENG	2	LEO	057504

BIOMEDICAL ENGINEERING

The student must acquire at least 30 ECTS in training activities functional to the profile of *Ambassador in Smart Infrastructures*. These ECTS must be earned by choosing at least 10 ECTS



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from Table A and at least 20 ECTS from Table B.

Table A

Course Name	ECTS	Language	Semester	Campus	Code
MEDICAL INFORMATICS	10	ENG	2	LEO	054296
TECHNOLOGIES FOR SENSORS AND CLINICAL INSTRUMENTATION - BIOE 430	5	ENG	2	LEO	050493
E-HEALTH APPLICATIONS	5	ENG	1	LEO	056453
ELETTRONICA BIOMEDICA	10*	ITA	1	LEO	083099

* Only 5 ECTS are valid for the profile of *Ambassador in Smart Infrastructures*.

Table B

Course Name	ECTS	Language	Semester	Campus	Code
SMART HOSPITAL	5	ENG	2	LEO	057492
SMART SPORT INFRASTRUCTURE	5	ENG	1	BV	057536
CONTROL OF MOBILE ROBOTS	5	ENG	1	LEO	052366



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SIMULATION TECHNIQUES AND TOOLS	5	ENG	2	LEO	097484
MEASUREMENT ORIENTED DIGITAL SIGNAL PROCESSING	10	ENG	1	LEO	093585
SENSORS, MEASUREMENTS AND SMART METERING	10	ENG	2	LEO	052590
Digital Security Management	5	ENG	1	BV	055892
Digital Technology	5	ENG	2	BV	097384
COMPUTING INFRASTRUCTURES	5	ENG	2	LEO	095898
MACHINE LEARNING	5	ENG	2	LEO	097683
ROBOTICS	5	ENG	2	LEO	089013
MECHATRONIC SYSTEMS AND LABORATORY B	6	ENG	1	BV	097550
ROBOTIC SYSTEMS DESIGN	6	ENG	1	BV	053419
VISION BASED 3D MEASUREMENTS	6	ENG	1	BV	097457



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GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422
FUNDAMENTALS OF COMMUNICATION NETWORKS	5	ENG	1	LEO	094783
FUNDAMENTALS OF ELECTROMAGNETIC FIELDS	5	ENG	1	LEO	094784
INTERNET OF THINGS	5	ENG	2	LEO	054323
LOCALIZATION, NAVIGATION AND SMART MOBILITY	5	ENG	2	LEO	054309
COMMUNICATION NETWORK DESIGN	5	ENG	1	LEO	096120
3D MODELLING AND MAPPING FROM DRONE IMAGES	8	ENG	1	LEO	051279
POWER GENERATION SYSTEMS	8	ENG	2	LEO	097934

COMPUTER SCIENCE AND ENGINEERING

The student must acquire at least 30 ECTS in training activities functional to the profile of *Ambassador in Smart Infrastructures*. These ECTS must be earned by choosing at least 10 ECTS from Table A and at least 20 ECTS from Table B.



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Table A

Course Name	ECTS	Language	Semester	Campus	Code
ARTIFICIAL NEURAL NETWORKS AND DEEP LEARNING	5	ENG	1	LEO	054307
MULTIAGENT SYSTEMS	5	ENG	1	LEO	056893
DISTRIBUTED SYSTEMS	5	ENG	1	LEO	090950
MACHINE LEARNING	5	ENG	2	LEO	097683
MIDDLEWARE TECHNOLOGIES FOR DISTRIBUTED SYSTEMS	5	ENG	1	LEO	052533
TECHNOLOGIES FOR INFORMATION SYSTEMS	5	ENG	1	LEO	052537
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901

Table B

Course Name	ECTS	Language	Semester	Campus	Code
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AUTOMATION AND CONTROL IN AUTONOMOUS VEHICLES	5	ENG	1	LEO	056807
NETWORKED CONTROL	5	ENG	1	LEO	052369
PRODUCTION SYSTEMS CONTROL	5	ENG	2	LEO	090915
SIMULATION TECHNIQUES AND TOOLS	5	ENG	2	LEO	097484
SENSORS, MEASUREMENTS AND SMART METERING	10	ENG	2	LEO	052590
DIGITAL MANUFACTURING	5	ENG	1	BV	056949
ROBOTIC SYSTEMS DESIGN	6	ENG	1	BV	053419
VISION BASED 3D MEASUREMENTS	6	ENG	1	BV	097457



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ARTIFICIAL INTELLIGENCE AND ADVANCED SIMULATION FOR THE SAFETY, RELIABILITY AND MAINTENANCE OF ENERGY SYSTEMS	10	ENG	1	BV	053354
GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422
INTERNET OF THINGS	5	ENG	2	LEO	054323
MOBILE RADIO NETWORKS	5	ENG	2	LEO	054325
LOCALIZATION, NAVIGATION AND SMART MOBILITY	5	ENG	2	LEO	054309
BIM FUNDAMENTALS AND APPLICATIONS	5	ENG	1	LEO	052331
ADVANCED ENVIRONMENTAL SYSTEMS ANALYSIS [I.C.]	10	ENG	1	LEO	098634



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KNOWLEDGE MANAGEMENT IN INFRASTRUCTURE PROJECTS	5	ENG	2	BV	057051
SMART HOSPITAL	5	ENG	2	LEO	057492
SMART BUILDINGS, NEIGHBORHOODS, AND CITIES	5	ENG	2	LEO	057501
ADVANCED METHODS FOR THE OPTIMAL MANAGEMENT OF THE ELECTRICAL GRID	5	ENG	2	LEO	057504
DATA MODELING FOR URBAN PERFORMANCE	5	ENG	2	LEO	057530
SMART SPORT INFRASTRUCTURE	5	ENG	1	BV	057536

ELECTRICAL ENGINEERING

The student must acquire at least 30 ECTS in training activities functional to the profile of *Ambassador in Smart Infrastructures*. These ECTS must be earned by choosing at least 10 ECTS from Table A and at least 20 ECTS from Table B.

Table A

Course Name	ECTS	Language	Semester	Campus	Code
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AUTOMAZIONE DEI SISTEMI ELETTRICI DI TRASPORTO	5	ITA	1	LEO	052578
ELECTRIC POWER SYSTEMS	10	ENG	1	LEO	055681
ELECTROMAGNETIC COMPATIBILITY B	10	ENG	2	LEO	054165
NETWORK AUTOMATION AND PROTECTION SYSTEMS; TOOLS FOR NETWORK SIMULATION	8	ENG	2	LEO	097738
RELIABILITY ENGINEERING AND QUALITY CONTROL	10	ENG	1	LEO	055683
SENSORS, MEASUREMENTS AND SMART METERING	10	ENG	2	LEO	052590
SMART GRIDS: COMPONENTS, FUNCTIONALITIES AND BENEFITS	10	ENG	2	LEO	054173
SISTEMI PER L'AUTOMAZIONE E LA COMUNICAZIONE INDUSTRIALE	5	ITA	1	LEO	052577
SMART MEASUREMENT ARCHITECTURES FOR ELECTRIC SYSTEMS	10	ENG	1	LEO	052570
MEASUREMENT ORIENTED DIGITAL SIGNAL PROCESSING	10	ENG	1	LEO	093585

Table B

Course Name	ECTS	Language	Semester	Campus	Code
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COMMUNICATION NETWORKS FOR ELECTRICITY SYSTEMS	8	ENG	1	LEO	096101
PROJECT MANAGEMENT: PRINCIPLES & TOOLS	6	ENG	1	LEO	096094
AUTOMATION AND CONTROL IN AUTONOMOUS VEHICLES	5	ENG	1	LEO	056807
AUTOMATION OF ENERGY SYSTEMS	5	ENG	2	LEO	090916
PRODUCTION SYSTEMS CONTROL	5	ENG	2	LEO	090915
SAFETY IN AUTOMATION SYSTEMS	5	ENG	1	LEO	093060
SIMULATION TECHNIQUES AND TOOLS	5	ENG	2	LEO	097484
TECHNOLOGIES FOR SENSORS AND CLINICAL INSTRUMENTATION - BIOE 430	5	ENG	2	LEO	050493
DIGITAL BUSINESS	5	ENG	2	BV	056993
INDUSTRIAL AUTOMATION AND ROBOTICS	5	ENG	1	BV	056950
TECHNOLOGY RISK GOVERNANCE	5	ENG	1	BV	057252
MACHINE LEARNING	5	ENG	2	LEO	097683
METHODS AND TOOLS FOR SYSTEMATIC INNOVATION B - PROBLEM SOLVING AND INVENTIVE DESIGN	5	ENG	1	BV	054829



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METHODS AND TOOLS FOR SYSTEMATIC INNOVATION C - INNOVATION AND INTELLECTUAL PROPERTY MANAGEMENT	5	ENG	1	BV	054831
SMART CITIES AND URBAN INNOVATION	8	ENG	2	BV	054571
PHOTOGRAMMETRY AND DRONE IMAGE PROCESSING	5	ENG	1	LEO	056822
INTERNET OF THINGS	5	ENG	2	LEO	054323
MOBILE RADIO NETWORKS	5	ENG	2	LEO	054325
LOCALIZATION, NAVIGATION AND SMART MOBILITY	5	ENG	2	LEO	054309
GLOBAL SUPPLY CHAIN PLANNING	6	ENG	1	BV	057057
NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING	6	ENG	1	LEO	099234
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901
GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422
RISK-BASED MANAGEMENT AND MONITORING OF INFRASTRUCTURE NETWORKS	5	ENG	1	LEO	057527



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SMART BUILDINGS, NEIGHBORHOODS, AND CITIES	5	ENG	2	LEO	057501
SMART SPORT INFRASTRUCTURES	5	ENG	1	BV	057536
METHODS FOR SYSTEM HEALTH MONITORING AND PROGNOSIS	5	ENG	1	BV	057539

MECHANICAL ENGINEERING

The student must be awarded at least 30 ECTS credits by passing educational activities functional to the new *Ambassador profile in Smart Infrastructures*. Of those mentioned ECTS, 10 must be awarded by choosing courses in line with the selected track from table A and 20 - at least - by selecting courses from table B. Further and more detailed information is available on the Mechanical Engineering Programme website (<https://www.mecheng.polimi.it/master-of-science/courses-ms/?lang=en>).

Table A

Course Name	ECTS	Language	Semester	Campus	Code
ADDITIVE MANUFACTURING B	6	ENG	1	BV	055862
ADVANCED MEASUREMENT TECHNIQUES	6	ENG	1	BV	097525
AUTOMATIC CONTROL B	6	ENG	1	BV	097559
COMPUTER VISION AND REVERSE ENGINEERING	6	ENG	2	BV	097454
DESIGN METHODS	6	ENG	2	BV	097450



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ELECTRIC SYSTEM FOR TRANSPORTATION C	6	ENG	1	BV	097671
ELECTRICAL DRIVES FOR INDUSTRY AND TRANSPORT APPLICATIONS	6	ENG	2	BV	097523
HAPTICS	6	ENG	1	BV	097617
HUMAN MODELLING IN ENGINEERING	6	ENG	1	BV	097451
HYBRID AND ELECTRIC VEHICLE	6	ENG	1	BV	054362
INNOVATIONS IN METALLURGICAL PLANTS AND PROCESSES B	6	ENG	1	BV	055860
INTEGRATED MANUFACTURING SYSTEMS	8	ENG	1	BV	051130
LOGISTICS MANAGEMENT	10	ENG	2	BV	096089
MANUFACTURING SYSTEMS ENGINEERING	10	ENG	1	BV	054201
MECHANICAL SYSTEMS RELIABILITY	6	ENG	1	BV	097502
MECHATRONIC SYSTEMS AND LABORATORY A	10	ENG	1	BV	097519
MECHATRONIC SYSTEMS AND	6	ENG	1	BV	097550



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LABORATORY B

METHODS AND TOOLS FOR SYSTEMATIC INNOVATION B - PROBLEM SOLVING AND INVENTIVE DESIGN	6	ENG	1	BV	054829
METHODS AND TOOLS FOR SYSTEMATIC INNOVATION C - INNOVATION AND INTELLECTUAL PROPERTY MANAGEMENT	6	ENG	1	BV	054831
METHODS FOR VIRTUAL PROTOTYPING	6	ENG	1	BV	095890
MOBILITY: INFRASTRUCTURES AND SERVICES	8	ENG	2	BV	052079
QUALITY ENGINEERING ME	8	ENG	2	BV	051131
ROBOTIC SYSTEMS DESIGN	6	ENG	1	BV	053419
SMART STRUCTURES AND DEVICES	6	ENG	2	BV	094910
VISION BASED 3D MEASUREMENTS	6	ENG	1	BV	097457

Table B



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Course Name	ECTS	Language	Semester	Campus	Code
ADVANCED MEASUREMENT SYSTEMS FOR CONTROL APPLICATIONS	5	ENG	2	BV	055513
AUTOMATION AND CONTROL IN AUTONOMOUS VEHICLES	5	ENG	1	LEO	056807
CONTROL OF INDUSTRIAL ROBOTS	5	ENG	1	LEO	090914
CONTROL OF MOBILE ROBOTS	5	ENG	1	LEO	052366
PRODUCTION SYSTEMS CONTROL	5	ENG	2	LEO	090915
SAFETY IN AUTOMATION SYSTEMS	5	ENG	1	LEO	093060
E-HEALTH APPLICATIONS	5	ENG	1	LEO	056453
TECHNOLOGIES FOR SENSORS AND CLINICAL INSTRUMENTATION - BIOE 430	5	ENG	2	LEO	050493



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ELECTRIC POWER SYSTEMS	10	ENG	2	BV	055681
ELECTROMAGNETIC COMPATIBILITY B	10	ENG	2	LEO	054165
RELIABILITY ENGINEERING AND QUALITY CONTROL	10	ENG	1	LEO	055683
SISTEMI PER L'AUTOMAZIONE E LA COMUNICAZIONE INDUSTRIALE	5	ITA	1	LEO	052577
SMART MEASUREMENT ARCHITECTURES FOR ELECTRIC SYSTEMS	10	ENG	1	LEO	052570
DIGITAL FACTORY	5	ENG	1	BV	056954
DIGITAL MANUFACTURING	5	ENG	1	BV	056949
DIGITAL SECURITY MANAGEMENT	5	ENG	1	BV	055892
INDUSTRIAL AUTOMATION AND ROBOTICS	5	ENG	1	BV	056950



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KNOWLEDGE MANAGEMENT IN INFRASTRUCTURE PROJECTS	5	ENG	2	BV	057051
TECHNOLOGY RISK GOVERNANCE	5	ENG	1	BV	057252
SMART MAINTENANCE MANAGEMENT	5	ENG	1	BV	056985
COMPUTING INFRASTRUCTURES	5	ENG	2	LEO	095898
MACHINE LEARNING	5	ENG	2	LEO	097683
ROBOTICS	5	ENG	2	LEO	089013
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901
DIGITAL TWIN FOR ENERGY SYSTEMS MANAGEMENT	5	ENG	2	BV	057554
SMART CITIES AND URBAN INNOVATION	5	ENG	2	BV	057555



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GEOGRAPHIC INFORMATION SYSTEMS	10	ENG	1	LEO	052422
FUNDAMENTALS OF COMMUNICATION NETWORKS	5	ENG	1	LEO	094783
FUNDAMENTALS OF ELECTROMAGNETIC FIELDS	5	ENG	1	LEO	094784
INTERNET OF THINGS	5	ENG	2	LEO	054323
LOCALIZATION, NAVIGATION AND SMART MOBILITY	5	ENG	2	LEO	054309
WIRELESS AND MOBILE PROPAGATION	5	ENG	2	LEO	054330
INFORMATION SYSTEMS FOR THE MAINTENANCE AND MANAGEMENT	9	ENG	1	LEO	053116
GLOBAL SUPPLY CHAIN PLANNING	6	ENG	1	BV	057057
BRIDGE THEORY AND DESIGN	10	ENG	1	LEO	095879



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CIRCOLAZIONE E SICUREZZA STRADALE	8	ITA	1	LEO	088637
NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING	6	ENG	1	LEO	099234
STRUCTURAL RELIABILITY AND RISK ANALYSIS	6	ENG	2	LEO	051115
TECNICA ED ECONOMIA DEI TRASPORTI	10	ITA	2	LEO	088641
TRASPORTI MARITTIMI E INTERMODALI	6	ENG	2	LEO	090871
SMART HOSPITAL	5	ENG	2	LEO	057492
SMART BUILDINGS, NEIGHBORHOODS, AND CITIES	5	ENG	2	LEO	057501
RISK-BASED MANAGEMENT AND MONITORING OF INFRASTRUCTURE NETWORKS	5	ENG	1	LEO	057527



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DATA MODELLING FOR URBAN PERFORMANCE.	5	ENG	2	LEO	057530
SMART SPORT INFRASTRUCTURES	5	ENG	1	BV	057536
METHODS FOR SYSTEM HEALTH MONITORING AND PROGNOSIS	5	ENG	1	BV	057539
SMART MATERIALS AND METAMATERIALS	5	ENG	1	LEO/BV	057542
DATA ANALYTICS FOR SMART AGRICULTURE	5	ENG	1	LEO	057498

TELECOMMUNICATION ENGINEERING

The student must acquire at least 30 ECTS in training activities functional to the profile of *Ambassador in Smart Infrastructures*. These ECTS must be earned by choosing at least 10 ECTS from Table A and at least 20 ECTS from Table B.

Table A

Course Name	ECTS	Language	Semester	Campus	Code
DIGITAL COMMUNICATION	10	ENG	1	LEO	054312



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OPTICAL COMMUNICATIONS	10	ENG	1	LEO	052482
RF SYSTEMS	10	ENG	1	LEO	052484
NETWORK DESIGN	10	ENG	1	LEO	052481
ADVANCED DIGITAL SIGNAL PROCESSING	10	ENG	1	LEO	052471
TRAFFIC THEORY	10	ENG	1	LEO	054657

Table B

Course Name	ECTS	Language	Semester	Campus	Code
NETWORKED CONTROL	5	ENG	1	LEO	052369
COMPUTING INFRASTRUCTURES	5	ENG	2	LEO	095898
SYSTEMS AND METHODS FOR BIG AND UNSTRUCTURED DATA	5	ENG	1	LEO	056901
GEOPHYSICAL DATA PROCESSING 1	5	ENG	1	LEO	098416
DATA AND INFORMATION QUALITY	5	ENG	1	LEO	056490
MACHINE LEARNING	5	ENG	2	LEO	097683



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SENSORS, MEASUREMENTS AND SMART METERING	5	ENG	2	LEO	052590
SMART CITIES AND URBAN INNOVATION	5	ENG	2	BV	057555
ELECTROMAGNETIC COMPATIBILITY B	5	ENG	2	LEO	054165
SIMULATION TECHNIQUES AND TOOLS	5	ENG	2	LEO	097484
ROBOTICS	5	ENG	2	LEO	089013
NEW SENSORS AND MEASUREMENT SYSTEMS FOR CIVIL ENGINEERING	6	ENG	1	LEO	099234
SMART BUILDINGS, NEIGHBORHOODS AND CITIES	5	ENG	2	LEO	057501
COMMUNICATION IN GREEN INFRASTRUCTURES	5	ENG	1	LEO	057517



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RISK-BASED MANAGEMENT AND MONITORING OF INFRASTRUCTURE NETWORKS	5	ENG	1	LEO	057527
DATA MODELLING FOR URBAN PERFORMANCE	5	ENG	2	LEO	057530
DATA ANALYTICS FOR SMART AGRICULTURE	5	ENG	1	LEO	057498



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APPLICATION FOR PARTICIPATION

The application form must be submitted through the **specific application function available from the Online Services** (section Admission requests> Admission to selection procedures) **starting from 19/07/2021 and by 12.00 (Italian time) of 16/09/2021.**

The list of students enrolled in the program, for each Degree Course, will be published by **17/09/2021** on the web page www.polimi.it/en/polimi-ambassador

REQUIREMENTS FOR OBTAINING THE TITLE

The requirement for obtaining the title of "*Polimi Ambassador in SMART INFRASTRUCTURES*" is the achievement of 130 ECTS (of which at least 10 in excess), of which 30 ECTS in training activities pertinent to the profile of *Ambassador in Smart Infrastructures*.

TREATMENT OF PERSONAL DATA

With regard to the processing of personal data, in compliance with EU Regulation 2016/679 of 27 April 2016 on the protection of personal data and related implementing regulations, please refer to what is indicated on the specific web page of the Politecnico di Milano website <https://www.polimi.it/privacy>.

HEAD OF THE PROCEDURE

In accordance with the provisions of Art. 5 of Law, 7 August 1990, no. 241, the Head of this call for the application procedure is dr. Gianluca Attolini.

Milan, 30/06/2021

Il Rettore
Prof. Ferruccio Resta