

## Manifesto Laurea Magistrale in Informatica (Percorso Scienze e Tecnologie Informatiche)

### (1) Mandatory courses (12 CFU)

I seguenti due corsi devono essere inclusi in tutti i piani di studio.  
The following two courses must be included in all study plans.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145451 - Computability and computational complexity	MAT/01	6	Affine	1	1	Kuper G.
145290 - Economics and Management (mutuato da 140126)	SECS-P/07	6	Affine	1	1	Filippas V.

### (2) Foundation of Computer Science (12 CFU)

Selezionare 12 CFU fra i seguenti corsi relativi ai fondamenti dell'informatica.  
Select 12 CFU taken from the following courses related to the foundations of computer science.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145300 - Concurrency	INF/01	6	Car.	1	2	Quaglia P.
145062 - Machine learning	INF/01	6	Car.	1	1	Passerini A.
145462 - Simulation and performance evaluation	INF/01	6	Car.	1	2	Lo Cigno R.

### (3) Depth requirement (24 CFU)

Scegliere *una* fra le aree seguenti e selezionare 24 CFU da essa.  
Choose *one* among the following areas and select 24 CFU from it.

*Area Data Science*

<b>Titolo / Note</b>	<b>SSD</b>	<b>CFU</b>	<b>Tipo</b>	<b>Anno</b>	<b>Sem.</b>	<b>Docente</b>
145286 - Advanced Business Intelligence Techniques	INF/01	6	Car.	1-2	1	Brunato M.
145106 - Laboratory of Business Process Management and Integration	INF/01	6	Car.	1-2	2	Casati F.
145084 - Spatial Databases	INF/01	6	Car.	1-2	2	Kuper G.
145453 - Data Mining	ING-INF/05	6	Car.	1-2	2	Velegarakis Y., Palpanas T.
145449 - Big Data and Social Networks	ING-INF/05	6	Car.	1-2	2	Velegarakis Y.
145053 - Laboratory of Biological Data Mining	ING-INF/05	6	Car.	1-2	1	Blanzieri E.
145299 - Language Understanding Systems	ING-INF/05	6	Car.	1-2	2	Riccardi G.
145452 - Data and Knowledge Representation Languages	ING-INF/05	6	Car.	1-2	1	Giunchiglia F.
145382 - High-throughput methodologies: data analysis	INF/01	6	Car.	1-2	1	Mutuato da CIBIO

*Area Service Design and Engineering*

<b>Titolo / Note</b>	<b>SSD</b>	<b>CFU</b>	<b>Tipo</b>	<b>Anno</b>	<b>Sem.</b>	<b>Docente</b>
145208 - Computer Supported Co-operative working	ING-INF/05	6	Car.	1-2	2	De Angeli A.
145388 - Introduction to Service Design and Engineering	ING-INF/05	6	Car.	1-2	1	Marchese M.
145293 - Laboratory of Service Design and Engineering	ING-INF/05	6	Car.	1-2	2	TACE 2014/2015
145068 - Organizational Information Systems	INF/01	6	Car.	1-2	2	Mylopoulos J.
145072 - Requirements Engineering	INF/01	6	Car.	1-2	2	Mylopoulos J.
145298 - Security Engineering	ING-INF/05	6	Car.	1-2	1	Massacci F.
145065 - Network Security	ING-INF/05	6	Car.	1-2	2	Crispo B.
145322 - Security Testing	INF/01	6	Car.	1-2	2	Tonella P.
145045 - Agent-Oriented Software Engineering	ING-INF/05	6	Car.	1-2	2	Giorgini P.
145056 - Formal methods	ING-INF/05	12	Car.	1-2	2	Sebastiani R.

*Area Systems and Networks*

<b>Titolo / Note</b>	<b>SSD</b>	<b>CFU</b>	<b>Tipo</b>	<b>Anno</b>	<b>Sem.</b>	<b>Docente</b>
140268 - Distributed systems	ING-INF/05	6	Car.	1-2	1	Picco G.
145454 - Distributed Algorithms	INF/01	6	Car.	1-2	1	Montresor A.
145066 - Laboratory of Nomadic Communication	INF/01	6	Car.	1-2	2	Lo Cigno R.
145079 - Laboratory of Wireless Sensor Networks	ING-INF/05	6	Car.	1-2	2	Picco G.
145085 - Web Architectures	INF/01	6	Car.	1-2	1	Ronchetti M.
145065 - Network Security	ING-INF/05	6	Car.	1-2	2	Crispo B.
145458 - Laboratory of Applied robotics	ING-INF/05	6	Car.	1-2	1	Palopoli L.
145071 - Real-Time Operating Systems and Middleware	ING-INF/05	6	Car.	1-2	1	Abeni L.
145447 - Advanced computing architectures	ING-INF/05	6	Car.	1-2	1	Passerone R.
145056 - Formal methods	ING-INF/05	12	Car.	1-2	2	Sebastiani R.

**(4) Breadth requirement (18 CFU)**

Scegliere 18 CFU fra i corsi elencati nelle aree diverse dall'area scelta al punto (3).  
Select 18 CFU among the course listed distinct from the one chosen at step (3).

**(5) Free-choice courses (24 credits)**

Selezionare 24 crediti scelti liberamente fra gli insegnamenti offerti dall'Università di Trento. Gli insegnamenti elencati nella liste precedenti, quelli elencati nella lista di corsi opzionali successiva e quelli suggeriti dallo strumento di compilazione dei piani di studio di ESSE3 sono approvati automaticamente. In tutti gli altri casi, è necessaria la compilazione di un piano di studio cartaceo che sarà valutato dall'apposita commissione.

Select 24 free-choice credits among the courses offered by the University of Trento. The courses listed in the tables above, those listed in the free-choice courses table listed below, and those suggested in the online tool for study plan of ESSE3 are automatically approved. In all other cases, a personalized study plan must be completed and submitted to the commission for study plan examination.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145321 - Cryptography	MAT/02	6	Scelta	1-2	1	Mutuato da DIPMAT - 145441 - Algebraic Cryptography 1° mod.
145389 - Introduction to cell biology	BIO/13	9	Scelta	1-2	1	Viero A.
145459 - Participatory Design	ING-INF/05	6	Scelta	1-2	2	D'Andrea V.
145078 - Science Technology and Business	INF/01	6	Scelta	1-2	1	Battiti R.
145091 - Technical Writing	L-LIN/12	6	Scelta	1-2	2	CLA
145323 - Privacy and Intellectual Property Rights	ING-INF/05	6	Scelta	1-2	2	D'Andrea V.
145301 - Project course	INF/01 ING-INF/05	6	Scelta	1-2		Tutti
145289 - Research Project	INF/01 ING-INF/05	12	Scelta	1-2		Tutti
145386 - Project on applied security	ING-INF/05	18	Scelta	1-2		Tutti
140122 - Data Hiding	ING-INF/03	6	Scelta	1-2	1	Boato G.
145396 - Formal Techniques for Cryptographic Protocol Analysis	INF/01	6	Scelta	1-2	2	Mutuato da DIPMAT - 145396

**Il corso di studi si completa con / the study course is completed by:**

- Tesi / thesis : 24 CFU
- Tirocini formativi e di orientamento / internship: 6 CFU

Non Italian students who are not able to attest the knowledge of the Italian language, at least at the level A1 CEF (Common European Framework of reference for languages), must acquire the indicated level before the end of their career. (Only for **Percorso Scienze e Tecnologie Informatiche**)

### Norme transitorie – studenti iscritti al 2° anno o successivi

#### Temporary rules – students enrolled in the 2nd or subsequent years

For those students who have already passed only the Computability course and not the Computational complexity course, select at least 12 of the following credits to fulfill the “foundation of computer science requirement”

- Logic – 6 CFU (offered in 2013/2014)
- Formal methods – 12 CFU
- Concurrency – 6 CFU
- Machine Learning – 6 CFU
- Simulation and performance evaluation – 6 CFU

For those students who have already passed both the Computability course and the Computational complexity course, select at least 6 of the following credits to fulfill the “foundation of computer science requirement”

- Logic – 6 CFU (offered in 2013/2014)
- Formal methods – 12 CFU
- Concurrency – 6 CFU
- Machine Learning – 6 CFU
- Simulation and performance evaluation – 6 CFU

For those students who have not passed neither the Computability course nor the Computational complexity course, it is possible to formally ask to adopt the new Regolamento and follow the set of rules in the first part of this document.

Regole di equivalenza fra vecchi corsi e nuovi corsi  
Equivalence rules between old and new courses

<b>Vecchio corso / Old course</b>	<b>Nuovo corso / New course</b>
145107 - Data Information and Integration	145449 - Big data and social networks
145295 - Massive Data Analytics	145453 - Data Mining
145108 - Laboratory of Embedded Control Systems	145458 – Laboratory of Applied Robotics
145055 - Distributed Systems	145454 – Distributed algorithms
145061 – Logics for Data and Knowledge Representation	145452 – Data and Knowledge Representation Languages

## Manifesto (ICT Innovation)

### Specialization area: Service design and Engineering (SDE) (Entry Point)

#### (1) Mandatory courses (42 CFU)

I seguenti corsi devono essere inclusi in tutti i piani di studio.  
The following courses must be included in all study plans.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145388 - Introduction to Service Design and Engineering	ING-INF/05	6	Car.	1	1	Marchese M.
145449 - Big Data and Social Networks	ING-INF/05	6	Car.	1	2	Velegrakis Y.
145106 - Laboratory of Business Process Management and Integration	INF/01	6	Car.	1	2	Casati F.
145288 - Business Development Laboratory	SECS-P/09	9	Aff.	1	2	Bonifacio M.S.
145455 - ICT Innovation	INF/01	9	Car.	1	2	Massacci F.
145290 - Economics and Management (mutuato da 140126)	SECS-P/07	6	Aff.	1	1	Filippas V.

#### (2) Additional courses (18 CfU)

Selezionare 18 CFU fra i seguenti corsi.  
Select 18 CFU taken from the following courses.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145208 - Computer Supported Co-operative working	ING-INF/05	6	Car.	1	2	De Angeli A.
145068 - Organizational Information Systems	INF/01	6	Car.	1	2	Mylopoulos J.
145072 - Requirements Engineering	INF/01	6	Car.	1	2	Mylopoulos J.
145323 - Privacy and Intellectual Property Rights	ING-INF/05	6	Car.	1	2	D'Andrea V. Rossato A.
145298 - Security Engineering	ING-INF/05	6	Car.	1	1	Massacci F.

## Manifesto (ICT Innovation)

### Specialization area: Service design and Engineering (SDE) (Exit Point)

#### (1) Mandatory courses (6 CFU)

I seguenti corsi devono essere inclusi in tutti i piani di studio.  
The following courses must be included in all study plans.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145324 - I&E Evaluation of the MSc Thesis	INF/01	6	Car.	2	1-2	Tutti

#### (2) Additional courses (24 CFU)

Selezionare 24 CFU fra i seguenti corsi.  
Select 24 CFU taken from the following courses.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145388 - Introduction to Service Design and Engineering	ING-INF/05	6	Car./Scel.	2	1	Marchese M.
145449 - Big Data and Social Networks	ING-INF/05	6	Car./Scel.	2	2	Velegrakis Y.
145293 - Laboratory of Service Design and Engineering	ING-INF/05	6	Car./Scel.	2	2	TACE 2014/2015
145090 - Interazione Uomo-Macchina / Human-Computer Interaction (in inglese)	ING-INF/05	6	Scelta	2	1	De Angeli A.
145106 - Laboratory of Business Process Management and Integration	INF/01	6	Car./Scel.	2	2	Casati F.
145068 - Organizational Information Systems	INF/01	6	Car./Scel.	2	2	Mylopoulos J.
145072 - Requirements Engineering	INF/01	6	Car./Scel.	2	2	Mylopoulos J.
145208 - Computer Supported Co-operative working	ING-INF/05	6	Car./Scel.	2	2	De Angeli A.
145323 - Privacy and Intellectual Property Rights	ING-INF/05	6	Car./Scel.	2	2	D'Andrea V. Rossato A.
145298 - Security Engineering	ING-INF/05	6	Car./Scel.	2	1	Massacci F.

## Manifesto (ICT Innovation)

### Specialization area: Security & Privacy (S&P) (Entry Point)

#### (1) Mandatory courses (54 CFU)

I seguenti corsi devono essere inclusi in tutti i piani di studio.  
The following courses must be included in all study plans.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145298 - Security Engineering	ING-INF/05	6	Car.	1	1	Massacci F.
145065 - Network Security	ING-INF/05	6	Car.	1	2	Crispo B.
145322 - Security Testing	INF/01	6	Car.	1	2	Tonella P.
145323 - Privacy and Intellectual Property Rights	ING-INF/05	6	Car.	1	2	D'Andrea V.
145288 - Business Development Laboratory	SECS-P/09	9	Aff.	1	2	Filippas V.
145321 - Cryptography (Mutuato da DIPMAT - 145441 - Algebraic Cryptography 1° modulo)	MAT/02	6	Scelta	1	1	Sala M.
145445 - ICT Innovation	INF/01	9	Car.	1	2	Massacci F.
145290 - Economics and Management (mutuato da 140126)	SECS-P/07	6	Aff.	1	1	Filippas V.

**(2) Additional courses (6 CfU)** Selezionare 6 CFU fra i seguenti corsi.  
Select 6 CFU taken from the following courses.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
140122 - Data Hiding	ING-INF/03	6	Scelta	1	1	Boato G.
145396 - Formal Techniques for Cryptographic Protocol Analysis (Mutuato da DIPMAT - 145396)	INF/01	6	Scelta	1	2	Zunino R.



## Manifesto (ICT Innovation)

### Specialization area: Security & Privacy (S&P) (Exit Point)

#### (1) Mandatory courses (36 CFU)

I seguenti corsi devono essere inclusi in tutti i piani di studio.  
The following courses must be included in all study plans.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145324 - I&E Evaluation of the MSc Thesis	INF/01	6	Car.	2	1-2	Tutti / All

#### (2) Additional courses (24 CfU)

Scegliere 24 crediti tra le due tabelle seguenti:  
Choose 24 CFU taken from the following tables:

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145386 - Project on applied security	ING-INF/05	18	Scelta	1	1-2	Tutti / All
140122 - Data Hiding	ING-INF/03	6	Scelta	2	1	Boato G.
145396 - Formal Techniques for Cryptographic Protocol Analysis (Mutuato da DIPMAT - <a href="#">145396</a> )	INF/01	6	Scelta	2	2	Zunino R.

## Manifesto (ICT Innovation)

### Specialization area: Embedded Systems (Exit Point)

#### (1) Mandatory courses (6 CFU)

I seguenti corsi devono essere inclusi in tutti i piani di studio.  
The following courses must be included in all study plans.

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145324 - I&E Evaluation of the MSc Thesis	INF/01	6	Car.	2	1-2	Tutti

#### (2) Additional courses (24 CfU)

Scegliere 24 crediti tra le due tabelle seguenti:  
Choose 24 CFU taken from the following tables:

##### Tab 2.1 (12 - 24 CFU)

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145071 – Real Time Operating Systems	ING-INF/05	6	Car./Sce.	2	1	Abeni L.
145458 – Laboratory of Applied Robotics	ING-INF/05	6	Car./Sce.	2	1	Palopoli L.
145447 – Advanced computing architectures	ING-INF/05	6	Car./Sce.	2	1	Passerone R.
140437 – Laboratory of Wireless Sensor Networks	ING-INF/05	6	Car./Sce.	2	2	Picco G.

##### Tab 2.2 (0-12 CFU)

Titolo / Note	SSD	CFU	Tipo	Anno	Sem.	Docente
145056 – Formal methods	ING- INF/05	12	Car./Sce.	2	2	Sebastiani R.
145066 – Laboratory of Nomadic Communication	INF/01	6	Car./Sce.	2	2	Lo Cigno R.
145462 – Simulation and Performance evaluation	INF/01	6	Car./Sce.	2	2	Lo Cigno R.

145065 – Network security	ING-INF/05	6	Car./Sc.	2	2	Crispo B.
145454 - Distributed Algorithms	INF/01	6	Car./Sc.	2	1	Montresor A.
145289- Research Project	INF/01 - ING-INF/05	12	Car./Sc.	2	1-2	Tutti – no lezioni

**Il corso di studi si completa con / the study course is completed by:**

- Tesi / thesis : 24 CFU
- Tirocini formativi e di orientamento / internship: 6 CFU

Per accedere al corso di Laurea Magistrale in Informatica lo studente deve inoltre possedere comprovata conoscenza della lingua inglese (livello B1-CEF).