



**Manifesto Laurea Magistrale in Informatica/Master's Degree in Computer Science - a.a. 2022-23**

AD Code ESSE3	CORSO COURSES	SSD ACADEMIC DISCIPLINE	CFU CREDITS	TAF TRAINING ACTIVITY	ANNO YEAR	SEMESTRE SEMESTER	CREDITI DA SCEGLIERE CREDITS TO CHOOSE	NOTE NOTES	Docente TITOLARE COGNOME PROFESSOR	Docente TITOLARE NOME
<b>Percorso Scienze e Tecnologie Informatiche - Computer Science and Technologies</b>										
<b>Mandatory courses</b>							<b>12</b>			
145451	Computability and computational complexity	INF/01	6	Car.	1	1			Calautti	Marco
145761	Innovation and Business in ICT	SECS-P/10	6	Affine	1	1			Pasquini	Carlo
<b>Foundation of Computer Science</b>							<b>12</b>			
145062	Machine learning	INF/01	6	Car.	1	1			Passerini	Andrea
145810	Service Design and Engineering	ING-INF/05	6	Car.	1	1			Marchese	Maurizio
145617	Distributed systems 1	ING-INF/05	6	Car.	1	2			Picco	Gian Pietro
<b>Complements of Communication and Electronic Engineering</b>							<b>6</b>			
145851	Advanced computing architectures	ING-INF/01	6	Affine	1-(2)	1			Passerone	Roberto
145462	Simulation and performance evaluation	ING-INF/03	6	Affine	1	2			Casari	Paolo
140266	Computer Vision	ING-INF/03	6	Affine	1	2		*	Conci	Nicola
145612	Advanced remote sensing systems	ING-INF/03	6	Affine	(1)-2	1			Bruzzone	Lorenzo
145614	Multimedia Data Security	ING-INF/03	6	Affine	(1)-2	1		*	Boato	Giulia
145807	Softwarized and virtualized mobile network	ING-INF/03	6	Affine	(1)-2	1			Granelli	Fabrizio
(*) 140266 Computer Vision /145614 Multimedia Data Security - Si consiglia la scelta di Signal, Image and Video come prerequisito./ It is recommended as a prerequisite to attend Signal, Image and Video.										
<b>Depth requirement</b>							<b>18</b>			
<b>Scegliere una Area /Choose one area</b>										
<i>Area Computational Foundations</i>										
145300	Concurrency	INF/01	6	Car.	1	1			Quaglia	Paola
145865	Optimization techniques	INF/01	6	Car.	1	1			Iacca	Giovanni
146114	Knowledge Graph Engineering	ING-INF/05	6	Car.	1	1		*	Giunchiglia	Fausto
145919	Knowledge and Data Integration	ING-INF/05	6	Car.	2	1		*	Giunchiglia	Fausto
145056	Formal methods	ING-INF/05	12	Car.	1	2			Sebastiani	Roberto
145586	Game Theory	ING-INF/05	6	Car.	1	2			Kuper	Gabriel

AD <i>Code ESSE3</i>	CORSO <i>COURSES</i>	SSD <i>ACADEMIC DISCIPLINE</i>	CFU <i>CREDITS</i>	TAF <i>TRAINING ACTIVITY</i>	ANNO <i>YEAR</i>	SEMESTRE <i>SEMESTER</i>	CREDITI DA SCEGLIERE <i>CREDITS TO CHOOSE</i>	NOTE <i>NOTES</i>	Docente TITOLARE COGNOME <i>PROFESSOR</i>	Docente TITOLARE NOME
145585	Quantum Machine Learning	ING-INF/05	6	Car.	(1)-2	1			Pastorello	Davide
145618	Distributed systems 2	INF/01	6	Car.	2	1		**	Tace nel 22-23	
(*) 146114 Knowledge Graph Engineering - il corso può essere selezionato esclusivamente dagli studenti della coorte 2022-23 / 145919 Knowledge Data Integration - il corso può essere selezionato solo dagli studenti della coorte 2021-22 e antecedenti. La descrizione è stata aggiornata perché ne esplicita meglio i contenuti.										
(*) 146114 Knowledge Graph Engineering can be selected only by the 2022-23 cohort of students / 145919 Knowledge Data Integration can be selected only by the 2021-22 and antecedent cohort of students. The course description has been updated to make its contents more clear.										
(**) 145618 Distributed systems 2 -tace nel 2022-23										
<i>Area Data Science</i>										
145453	Data Mining	ING-INF/05	6	Car.	1-(2)	1			Velegrakis	Yannis
145972	High-Performance Computing for Data Science	ING-INF/05	6	Car.	1-(2)	1			Fiore	Sandro
145764	Deep learning	ING-INF/05	6	Car.	1	2		*	Ricci	Elisa
145683	Data Visualization Lab	INF/01	6	Car.	1	2			Jurman	Giuseppe
146114	Knowledge Graph Engineering	ING-INF/05	6	Car.	1	1		**	Giunchiglia	Fausto
145919	Knowledge and Data Integration	ING-INF/05	6	Car.	2	1		**	Giunchiglia	Fausto
145864	Human Machine Dialogue	ING-INF/05	6	Car.	(1)-2	1			Riccardi	Giuseppe
145520	Affective computing	ING-INF/05	6	Car.	2	1			Sebe	Niculae
145084	Spatial Databases	INF/01	6	Car.	1-2	1		***	Tace nel 2022-23	
(*) 145764 Deep Learning - It is required as a prerequisite: 145062 - Machine learning										
(*) 146114 Knowledge Graph Engineering - il corso può essere selezionato esclusivamente dagli studenti della coorte 2022-23 / 145919 Knowledge Data Integration - il corso può essere selezionato solo dagli studenti della coorte 2021-22 e antecedenti. La descrizione è stata aggiornata perché ne esplicita meglio i contenuti.										
(*) 146114 Knowledge Graph Engineering can be selected only by the 2022-23 cohort of students / 145919 Knowledge Data Integration can be selected only by the 2021-22 and antecedent cohort of students. The course description has been updated to make its contents more clear.										
(**) 145084 Spatial Databases - Tace a.a. 2022-23										
<i>Area Bioinformatics</i>										
145635	High-Throughput Sequencing Data Analysis	INF/01	6	Car.	1	2			Segata	Nicola
145765	Algorithms for Bioinformatics	ING-INF/05	6	Car.	1	2			Blanzieri	Enrico
145767	Bioinformatics Resources	INF/01	6	Car.	1	2			Romanel	Alessandro
146114	Knowledge Graph Engineering	ING-INF/05	6	Car.	1	1		*	Giunchiglia	Fausto
145919	Knowledge and Data Integration	ING-INF/05	6	Car.	2	1		*	Giunchiglia	Fausto
145053	Laboratory of Biological Data Mining	ING-INF/05	6	Car.	(1)-2	1			Blanzieri	Enrico
(*) 146114 Knowledge Graph Engineering - il corso può essere selezionato esclusivamente dagli studenti della coorte 2022-23 / 145919 Knowledge Data Integration - il corso può essere selezionato solo dagli studenti della coorte 2021-22 e antecedenti. La descrizione è stata aggiornata perché ne esplicita meglio i contenuti.										
(*) 146114 Knowledge Graph Engineering can be selected only by the 2022-23 cohort of students / 145919 Knowledge Data Integration can be selected only by the 2021-22 and antecedent cohort of students. The course description has been updated to make its contents more clear.										
<i>Area Software and Service Architectures</i>										

AD <i>Code ESSE3</i>	CORSO <i>COURSES</i>	SSD <i>ACADEMIC DISCIPLINE</i>	CFU <i>CREDITS</i>	TAF <i>TRAINING ACTIVITY</i>	ANNO <i>YEAR</i>	SEMESTRE <i>SEMESTER</i>	CREDITI DA SCEGLIERE <i>CREDITS TO CHOOSE</i>	NOTE <i>NOTES</i>	Docente TITOLARE COGNOME <i>PROFESSOR</i>	Docente TITOLARE NOME
146125	Advanced Programming	ING-INF/05	6	Car.	1	1			Patrignani	Marco
145085	Web Architectures	INF/01	6	Car.	1-(2)	1			Ronchetti	Marco
145867	Autonomous Software Agents	ING-INF/05	6	Car.	1	2			Giorgini	Paolo
145056	Formal methods	ING-INF/05	12	Car.	1	2			Sebastiani	Roberto
146155	Advanced HCI	ING-INF/05	6	Car.	1	2			Varni	Giovanna
145322	Security Testing	INF/01	6	Car.	(1)-2	1			Marchetto	Alessandro
145072	Requirements Engineering	INF/01	6	Car.	1-(2)	1			Tace nel 2022-23	
<i>Area Systems and Networks</i>										
145874	Robot Planning and its application	ING-INF/05	6	Car.	1-(2)	1			Palopoli	Luigi
145071	Real-Time Operating Systems and Middleware	ING-INF/05	6	Car.	1-(2)	1			Palopoli	Luigi
145065	Network Security	INF/01	6	Car.	1	2		*	Crispo	Bruno
145771	Fog and Cloud Computing	ING-INF/05	6	Car.	1	2			Siracusa	Domenico
145811	Low-power wireless networking for the Internet of Things	ING-INF/05	6	Car.	(1)-2	1			Picco	Gian Pietro
155020	Multisensory Interactive Systems	ING-INF/05	6	Car.	(1)-2	1			Turchet	Luca
145618	Distributed systems 2	INF/01	6	Car.	2	1		**	Tace nel 22-23	
(*) 145065 - Si consiglia come prerequisito 145937 Introduction to Computer and Network Security al primo semestre per gli studenti che non hanno fatto altri corsi di Security. It is recommended as a prerequisite to attend 145937- Introduction to Computer and Network Security in the first semester for students that have not done other courses in Security.										
(**) 145618 Distributed systems 2 - il corso tace nel 2022-23										
<i>Area Cybersecurity (new)</i>										
146157	Blockchain	INF/01	6	Car.	1-(2)	2			Telesca	Luigi
145519	Offensive Technologies	ING-INF/05	12	Car.	1-(2)	1		*	Massacci	Fabio
145065	Network Security	INF/01	6	Car.	1	2		*	Crispo	Bruno
145622	Cyber Security Risk Assessment	ING-INF/05	6	Car.	1	2		*	Budde	Carlos Esteban
145937	Introduction to Computer and Network Security	INF/01	6	Car.	1-(2)	1			Ranise	Silvio
145323	Privacy and Intellectual Property Rights	ING-INF/05	6	Car.	1-(2)	1			D'Andrea	Vincenzo
146156	Privacy-Enhanced Technologies	INF/01	6	Car.	1	2		**	Tace nel 2022-23	
(*) 145065 -145519 - 145622 Si consiglia come prerequisito 145937 Introduction to Computer and Network Security al primo semestre per gli studenti che non hanno fatto altri corsi di Security. It is recommended as a prerequisite to attend 145937- Introduction to Computer and Network Security in the first semester for students that have not done other courses in Security.										
(**) 146156 Privacy-Enhanced Technologies Tace nel 2022-23										
<b>Breadth requirement</b>							<b>18</b>			
Selezionare 18 crediti/Select 18 CFU from the areas above (different from the area of choice)										
<b>Free-choice courses (see list below)</b>							<b>24</b>	*		
<i>Technical Elective Courses</i>										

AD Code ESSE3	CORSO COURSES	SSD ACADEMIC DISCIPLINE	CFU CREDITS	TAF TRAINING ACTIVITY	ANNO YEAR	SEMESTRE SEMESTER	CREDITI DA SCEGLIERE CREDITS TO CHOOSE	NOTE NOTES	Docente TITOLARE COGNOME PROFESSOR	Docente TITOLARE NOME
<i>Innovation and Entrepreneurship Elective Courses</i>										
<i>Foreign Language Elective Courses (6 credits max)</i>										
	145098 <b>Internship</b>						6			
	145302 <b>Thesis</b>						24			
						Totale:	120			
<p>(*) Selezionare 24 crediti scelti liberamente fra gli insegnamenti offerti dall'Università di Trento. Gli insegnamenti elencati nelle 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.</p> <p>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.</p>										
<i>Technical Elective Courses</i>										
	145459 Participatory Design	ING-INF/05	6	Scelta	1	1			D'Andrea	Vincenzo
	145588 Molecular Biology of the Cell	BIO/10	6	Scelta	1	1			Tiberi	Luca
	145576 Quantum mechanics	FIS/01	6	Scelta	1	1			Faccioli	Pietro
	145858 Signal, Image and Video	ING-INF/03	6	Scelta	1	1			De Natale	Francesco
	145763 Bio-Inspired Artificial Intelligence	ING-INF/05	6	Scelta	1	2			Iacca	Giovanni
	146120 GPU computing	INF/01	6	Scelta	1	2			Vella	Flavio
	145866 Introduction to Robotics	ING-INF/04	6	Scelta	1	2			Saveriano	Matteo
	145859 Natural Language Understanding	ING-INF/05	6	Scelta	1	2			Riccardi	Giuseppe
	145396 Formal Techniques for Cryptographic Protocol Analysis	INF/01	6	Scelta	1	2			Zunino	Roberto
	145948 Quantum Computing	FIS/03	6	Scelta	1	2		***	Hauke	Philipp H. J.
	145561 Bayesian Statistics	MAT/06	6	Scelta	1	2			Novi Inverardi	Pier Luigi
	145820 Laboratory of Computer Science Education	INF/01	6	Scelta	1	2		**	Montesor	Alberto
	145154 Experimental Mathematics Laboratory at School Level	MAT/04	6	Scelta	1	2		**	Delladio	Silvano
	145777 Applied Cryptography	INF/01	6	Scelta	1-(2)	1			Ranise	Silvio
	146126 Programming Language Semantics	INF/01	6	Scelta	1-(2)	1			Patrignani	Marco
	145896 Statistical Methods	INF/01	6	Scelta	1-(2)	1			Coghi	Michele
	145762 Ultrasound Technologies for Medical Applications	ING-INF/03	6	Scelta	1-(2)	1			Demi	Libertario
	146122 Ethics for computer science and engineering	ING-INF/05	6	Scelta	1-(2)	2			D'Andrea	Vincenzo
	145966 Statistical Models	INF/01	6	Scelta	1-(2)	2			Vinciotti	Veronica
	145153 Experimental Physics Laboratory at High School Level I	FIS/08	6	Scelta	2	1		**	Onorato	Pasquale
	145301 Project course	ING-INF/05	6	Scelta	1-2	1-2			DISI Faculty	
	145289 Research Project	INF/01	12	Scelta	1-2	1-2			DISI Faculty	
	146169 Digital Health and Computational Epidemiology	ING-INF/05	6	Scelta	1	2			Tizzoni	Michele

AD Code ESSE3	CORSO COURSES	SSD ACADEMIC DISCIPLINE	CFU CREDITS	TAF TRAINING ACTIVITY	ANNO YEAR	SEMESTRE SEMESTER	CREDITI DA SCEGLIERE CREDITS TO CHOOSE	NOTE NOTES	Docente TITOLARE COGNOME PROFESSOR	Docente TITOLARE NOME
	146170 Applied Natural Language Processing	ING-INF/05	6	Scelta	1	2			Staiano	Jacopo
	146156 Privacy-Enhanced Technologies	INF/01	6	Scelta	1-(2)	2		*	Tace nel 2022-23	
	145589 Complexity, Cryptography and Financial Technologies	ING-INF/05	6	Scelta	1-2	1		*	Tace nel 2022-23	
(*) 145589 Complexity, Cryptography and Financial Technologies - 146156 Privacy-Enhanced Technologies - Tace nel 2022-23										
(**) 145820/145154/145153 - Corsi consigliati da abbinare a 145820-LCSE: 145153 o 145154. Per ulteriori informazioni su piani di studio individuali per soddisfare i requisiti previsti dalla normativa riguardo l'insegnamento nelle scuole secondarie, contattare il delegato ai rapporti con le scuole prof. Alberto Montresor. / Courses recommended to be combined with LCSE: 145153 or 145154. For additional information on individual study plans in compliance with law requirements for secondary school teaching, please refer to the delegate for relationships with secondary schools prof. Alberto Montresor.										
(***) 145948 Quantum Computing: si consiglia 145576 Quantum mechanics come prerequisito /145576 Quantum mechanics is recommended before attending 145948 Quantum Computing										
<i>Innovation and Entrepreneurship Elective Courses</i>										
	145459 Participatory Design	ING-INF/05		6 Scelta	1	1			D'Andrea	Vincenzo
	145518 ICT Innovation – Product Design and Development	ING-INF/05		6 Scelta	1	2			Formentini	Marco
<i>Foreign Language Elective Courses (max 6 CFU)</i>										
	140189 <b>Italian Language</b>			3 Scelta	1-2	1-2		*	Centro Linguistico di Ateneo	
	145879 Italian Language			6 Scelta	1-2	1-2		*	Centro Linguistico di Ateneo	
	145091 Technical Writing	L-LIN/12		6 Scelta	1-2	1-2			Centro Linguistico di Ateneo	
	145195 German B1			3 Scelta	1-2	1-2			Centro Linguistico di Ateneo	
	145197 Spanish B1			3 Scelta	1-2	1-2			Centro Linguistico di Ateneo	
	145196 French B1			3 Scelta	1-2	1-2			Centro Linguistico di Ateneo	
(*) 140189/145879 - Il superamento di uno di questi corsi soddisfa il requisito della conoscenza della lingua italiana (vedi Regolamento LM INFO art. 7) rispettivamente al livello A1 e A2. 145879 può essere sostituito da corsi comprendenti due livelli di una qualsiasi lingua L2 diversa dall'inglese. / Taking one of these courses satisfies the possibile requirement of knowledge of Italian (see Regolamento LM INFO art. 7) at levels A1 and A2 respectively. 145879 can be substituted by courses encompassing two levels of any L2 language different from English.										
Please note: Foreign students are required to attest basic knowledge of the Italian language at least at level A1 CEFR (Common European Framework of Reference). Students can attend the Italian language course (140189 - Prova di conoscenza della lingua italiana A1) offered by the Language Center (CLA)										
							<b>TOT</b>	<b>60</b>		
<b>Safety courses</b>										
The on-line courses “Health and Safety in the workplace General Risk training” (4 hours) and “Health and Safety in the workplace Specific risk training (Low Risk)” (4 hours) are mandatory for all the students attending courses held in computer and/or teaching labs. The courses are available through Didattica online.										
Some of the courses may have additional requirements in terms of knowledge on the safety regulations. Such requirements are explicitly mentioned in the Syllabus of the courses and can be covered through specific safety courses (medium risk) offered by the University.										