



# UNIVERSITÀ DEGLI STUDI DI PALERMO

Department: Physics and Chemistry – Emilio Segrè

A.Y. 2018/2019

## DEGREE COURSE IN PHYSICS

### Characteristics



Class of Master's Degree  
(MSc) on Physics (LM-17)



2 YEARS



PALERMO



FREE ACCESS



2020

### Educational objectives

The 2nd cycle Degree Course in Physics aims at providing students with the capability of promoting and developing scientific and technological innovation, managing technologies in ambits related to physic subjects in the industrial, environmental, healthcare, cultural heritage and public administration sectors.

The 2nd cycle Degree Course in Physics has a twofold educational objective. On one hand it will consolidate and enlarge basic competences in Physics which have already been acquired through the 1st cycle degree course, integrating them with advanced issues about fundamental aspects.

In order to provide students with specific competences in various specialist areas, the course might be divided in different curricula; each curriculum will be related to specific current issues as well as outstanding methodological aspects.

The possibility of choice among various curricula justifies the variability of credit intervals for class specific activities). The wider intervals are related to the "experimental-applicative" and for the "astrophysical, geophysical and space" ambits and lead to curricula in Biophysics, Physics of Matter and Astrophysics. The variability of credit interval with respect to the ambit "theoretical physics and fundamentals of physics" leads to a curriculum in Theoretical Physics. The interval of the "microphysics and structure of matter" ambit is functional to various possible curricula and is less wide than the others, being related to common subjects.

Finally, the credit interval for related activities is functional to possible other curricula.

The educational plan will in any case aim at providing:

- command of the scientific research method, joined with a sound cultural background in classic and modern physics;
- in-depth knowledge of the modern measurement equipment, of the techniques for analysing data, and of the supporting mathematical and computer tools;
- in-depth scientific and operational background in various disciplines of Physics;
- capability of operate autonomously, even with the responsibility of groups and operational projects;
- capability of using acquired competences for modelling complex systems in the field of applied sciences;

Through these educational activities the 2nd cycle degree course in Physics aims at educating graduates with competences complying with the qualifying objectives of the degree class Lm-17

### Professional opportunities

A great number of 2nd cycle graduates in Physics continue theri studies with a PhD in Physics or related areas, in Italy and abroad.

They may find professional opportunities in:

- High level scientific research, also with leading roles, in universities and public and private research institutions;
- Promotion and development of scientific and technological innovation, as well as the design and management of technologies in areas related with physics in the industrial sectors (namely microelectronics, optoelectronics, telecommunications, computer science, electronics, space industry, biomedical industry, optics), the environment, healthcare, cultural heritage and public administration.
- Knowledge and technological know-how transfer in basic research for the economic and productive system;
- Creation and use of models of complex realities also in non-scientific areas (banks, financial companies, consulting companies);
- Teaching and high level dissemination of scientific culture with respect, in particular to the various theoretical, experimental and applicative aspects of classic and modern physics.

### Final examination features

Legenda: Per. = periodo o semestre, Val. = Valutazione (V=voto, G=giudizio), TAF= Tipologia Attività Formativa (A=base, B=caratterizzante, C=Affine, S=stages, D=a scelta, F=altre)

It consists of the preparation of an original written dissertation, and of the discussion in front of an examining Board; the dissertation should be related to a specialist topic of the selected curriculum, and it should be prepared under the guidance of a supervising professor.

Subjects 1 ° year	CFU	Sem.	Val.	SSD	TAF
15316 - ADVANCED QUANTUM MECHANICS <i>Rizzuto(PA)</i>	6	1	V	FIS/02	B
05076 - MATHEMATICAL METHODS FOR PHYSICS <i>Sciacca(PO)</i>	6	1	V	MAT/07	C
15308 - RADIATION-MATTER INTERACTION <i>Di Salvo(PO)</i>	6	1	V	FIS/05	B
19782 - SPECTROSCOPY WITH LABORATORY <i>Agnello(PO)</i>	6	2	V	FIS/01	B
16180 - STATISTICAL PHYSICS <i>Passante(PA)</i>	6	2	V	FIS/03	B
Optional subjects	6				B
Optional subjects II	6				B
Optional subjects III	6				B
Free subjects	12				D
<b>60</b>					

Subjects 2 ° year	CFU	Sem.	Val.	SSD	TAF
13351 - ADVANCED SKILLS RELATED TO THE LABOUR MARKET	1	1	G		F
18698 - ENGLISH LANGUAGE - LEVEL B2	3	1	G		F
18182 - INTERNSHIP AND PRACTICE	1	1	G		S
05917 - FINAL EXAMINATION	37	2	G		E
Optional subjects IV	18				C
<b>60</b>					

## OPTIONAL SUBJECTS

Optional subjects	CFU	Sem.	Val.	SSD	TAF
05488 - QUANTUM OPTICS <i>Palma(PO)</i>	6	1	V	FIS/03	B
19765 - STRUCTURE OF MATTER - ADVANCED COURSE <i>Cannas(PO)</i>	6	1	V	FIS/03	B
07382 - THEORY OF FIELDS <i>Fiordilino(CU)</i>	6	2	V	FIS/03	B
Optional subjects II	CFU	Sem.	Val.	SSD	TAF
01583 - BIOPHYSICS <i>Leone(PO)</i>	6	1	V	FIS/07	B
19780 - COMPUTATIONAL PHYSICS WITH LABORATORY <i>Cottone(PA)</i>	6	2	V	FIS/07	B
15315 - CONDENSED MATTER PHYSICS <i>Agnello(PO)</i>	6	2	V	FIS/01	B
Optional subjects III	CFU	Sem.	Val.	SSD	TAF
01500 - ASTROPHYSICS <i>Reale(PO)</i>	6	2	V	FIS/05	B
15536 - HIGH ENERGIES ASTROPHYSICS WITH LABORATORY <i>Iaria(PA)</i>	6	1	V	FIS/05	B

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Optional subjects III	CFU	Sem.	Val.	SSD	TAF
07411 - THEORY OF RELATIVITY <i>Peres(CU)</i>	6	2	V	FIS/05	B
Optional subjects IV	CFU	Sem.	Val.	SSD	TAF
19776 - APPLIED PHYSICS TECHNIQUES AND EQUIPMENT	6	1	V		
- EXPERIMENTAL APPLIED PHYSICS TECHNIQUES FOR MEDICINE <i>Marrale(PA)</i>	3	1	V	FIS/07	C
- IONIZING RADIATIONS DETECTORS <i>Abbene(PA)</i>	3	1	V	FIS/07	C
04149 - ASTROPHYSICS - LABORATORY <i>Barbera(PA)</i>	6	1	V	FIS/05	C
19778 - BIOSYSTEMS PHYSICS WITH LABORATORY	6	1	V		
- PHYSICS OF BIOSYSTEMS <i>Cottone(PA)</i>	3	1	V	FIS/07	C
- BIOPHYSICS LABORATORY <i>Emanuele(PA)</i>	3	1	V	FIS/07	C
19764 - COMPLEX NETWORKS	6	1	V		
- COMPLEX NETWORKS MODELS <i>Mantegna(PO)</i>	3	1	V	FIS/07	C
- COMPLEX NETWORKS APPLICATIONS <i>Micciche'(PO)</i>	3	1	V	FIS/07	C
18163 - ECONOPHYSICS <i>Mantegna(PO)</i>	6	1	V	FIS/07	C
19775 - GAUGE THEORIES AND STANDARD MODEL <i>Compagno(PQ)</i>	6	1	V	FIS/02	C
19777 - NANO-PARTICLES AND NANO-STRUCTURES <i>Buscarino(PA)</i>	6	1	V	FIS/01	C
15346 - PHYSICAL CHEMISTRY OF MATERIALS <i>Pignataro(PO)</i>	6	2	V	CHIM/02	C
13586 - PHYSICS OF COMPLEX SYSTEMS <i>Spagnolo(PQ)</i>	6	1	V	FIS/02	C
02335 - PHYSICS TEACHING METHODOLOGY <i>Fazio(PO)</i>	6	1	V	FIS/08	C
19335 - STELLAR EVOLUTION <i>Argioffi(RU)</i>	6	1	V	FIS/05	C

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