



UNIVERSITÀ DEGLI STUDI DI PALERMO

Department: Physics and Chemistry – Emilio Segrè

A.Y. 2021/2022

DEGREE COURSE IN OPTICS AND OPTOMETRY

Characteristics



Class of Bachelor's Degree
(BSc) on Physics (L-30)



3 YEARS



PALERMO



PLANNED ACCESS



2219

Educational objectives

Specific objectives:

Access to the three-year vocationally oriented Degree Course in Optics and Optometry is limited to 30 students plus two places reserved for foreigners. Access is granted through an admission test ascertaining scientific knowledge (high school level) as indicated by the University bodies.

The Course will provide optics laboratories in the Department as well as specialized internships at external facilities, under specific agreements. Elective activities enable students to deepen and/or expand specific knowledge. The final examination, with the discussion of the thesis takes place in the third year.

Graduates of this course are highly qualified professionals, responding to the real needs of companies, the market and the industry in the optics, optometry and contact fields. The objective is to guarantee in Sicily a level of training in the optical, optometric and contactology fields, competitive at national level and abroad. Graduates will not be able to access the 2nd cycle Degree in Physics.

The educational programme includes basic courses in mathematics and computer science, general physics, theoretical and practical courses in optics, experimental and applied physics, optometry and contactology as characterizing activities, and introductory courses in chemistry, biology and visual system medicine.

The vocationally oriented Degree course in Optics and Optometry aims at providing:

- adequate knowledge of the fields of classical and modern basic physics;
- adequate operational and laboratory skills in the measurement of physical quantities and in the operation of instrumentation with respect, in particular, to optical systems;
- ability to understand and use mathematical and IT tools adapted to the professional operating environment;
- theoretical and practical knowledge in specific technical subjects in the fields of optics and optometry;
- knowledge of modern instruments and new materials used in optics and contactology;
- operational and laboratory skills with respect, in particular, to the use of optical instrumentation and systems;
- basic bio-medical knowledge on the implications of the use of tools for the measurement and correction of refractive vision defects;
- knowledge of English language in the specific field of competence and for exchanging technical-scientific and commercial information;
- ability to operate professionally in the application fields of optics and optometry, even in lens manufacturing companies;
- basic management knowledge, including financial management, of small and medium-sized companies;
- ability to operate professionally both autonomously and in work groups.

To achieve the training objectives, consistently with the professional profile, the training path is designed in a way to provide the student with multidisciplinary knowledge and skills strongly oriented to professional aspects, namely to the most modern and advanced methodological techniques, not neglecting theoretical, practical, organizational-managerial commercial and industrial and research planning aspects.

According to the European reference framework for the sector of optics and optometric, the Degree Course in Optics and Optometry provides a single curriculum, divided into lectures, exercises and laboratories, professional practice and internships. During the first year, students will mainly acquire the typical L-30 basic knowledge of physics, chemistry, mathematics typical as well as, for the aspects most related to the training of opticians, knowledge of geometric optics and anatomy. During the second year students will deepen their knowledge of basic physics up to Modern Physics and, with respect to the aspects more strictly related to the optician training, they will acquire knowledge of biochemistry, eye

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physiology and pathology.

The third year provides skills related to the study of the structure of matter, materials and biomaterials for optics, optical instrumentation for astronomy and biophysics. During the three years, given the vocational nature of the course, students will spend professional practice periods at facilities outside the university, hosting laboratories equipped with modern and updated equipment.

Furthermore, to ensure a high and consistent quality of training, specialist internships are envisaged during the various years of the course, providing theoretical and practical training, as reported in the course outline. These specialized training courses will be taught by professionals recruited through a special call open only to professionals outside the University, also within specific agreements of the Degree Course with local and national Research Institutes, Companies, Schools and Professional Associations. These traineeships provide students with the basics necessary to deal with awareness and profit the subsequent practical. These practical activities will also provide the skills necessary to access the qualification exam.

In accordance with the internship regulations, an University tutor, coordinating the activities and ensuring the compliance with the agreed program will accompany the specialized competence of the professionals involved. The activities will be certified on special registers and a final report about the acquired knowledge will be provided. Given the number of training credits provided for the curricular internship activities (50 credits), a special Commission will be set up, to handle the procedural and documentary procedures with the subjects that will host the students and will support the tutoring commission in monitoring the progress of students' training throughout the curricular internship. A Coordinator of the Internship activities will be appointed; this professional will work in close collaboration with the Coordinator of the Board of the Degree Course.

Professional opportunities

Profile:

Optician and Optometrist

Functions:

Graduates in Optics and Optometry are prepared to enter the labour market in private and public realities operating in optics and vision, as well as in academic and industrial research.

Graduates in Optics and Optometry examine, with optometric techniques, visual deficiencies; they prepare, repair and sell directly to the public, on medical prescription, glasses and protective lenses or lenses correcting visual disorders due to refraction. They use optometric equipment and carry out the characterization of lens properties and the development of new optical materials.

Graduates in Optics and Optometry will in fact be able to expertly manage the most complex optical/optometric equipment and provide specialist technical/scientific support in the fields where optical methodologies/instruments are developed and used, acting as an interface between the needs of academic researchers and those working in industry, especially in the field of biomaterials applied to astrophysics, biophysics and biomedical systems.

Skills:

- classic and modern mathematics and physics;
- specific competence in the field of optics (geometric optics, optics, ophthalmic optics, instrumentation for optics, materials for optics) and its applications;
- general chemistry, anatomy-biology and visual process (ocular anatomy and histology, ocular physiology and pathology, photo physics of visual processes);
- technical and scientific support skills in all activities requiring the use of optical methodologies;

Professional opportunities:

In the industrial sector: technical researcher and/or process and quality control manager of optical instrumentation, construction of ophthalmic lenses and contact lenses. Other activities may be carried out in large, small and medium-sized optical enterprises that deal with technical articles and tools for the optical and vision sector.

In the commercial sector: product development assistant at the customer, after-sales assistance (information and refresher courses at the customer), development of market and of applications of optical products and instruments, process and quality control in production.

In the professional sector: entrepreneur, freelancer, technical professional in optical companies.

In the public sector: freelance professional, technical professional at Public Research Institutes, for activities related to the profession of optician, as well as technical staff at universities or research institutions

Final examination features

During the final exam, undergraduates must analyse a topic related to optics and optometry, to present its the key aspects in written or oral form and expose/discuss it with clarity and mastery. The final test for the achievement of the qualification aims therefore at verifying the knowledge and work carried out during the course of studies and during the practice periods as well as at verifying the student's communication skills. In accordance with the Rector's Decree 1810/2018, the final examination consists in the presentation of a written paper or an oral discussion of a thesis, on a topic chosen by the student, and connected with the subjects of the Degree Course. The topic is chosen by the candidate from a list published by the CdS at the beginning of each academic year. Among the proposed themes, there are also some related to the practice periods carried out at public and private bodies in the field of optics and optometry, within specific agreements with the University. In

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some cases the proposed themes may require the performance of a practical test in place of the written test.

| Subjects 1 ° year | CFU | Sem. | Val. | SSD | TAF |
|---|-----|------|------|---------|-----|
| 83904 - EYE SYSTEM ANATOMY AND HISTOLOGY <i>Campanella(PO)</i> | 6 | 1 | V | BIO/16 | C |
| 15540 - PHYSICS I <i>Buscarino(PA)</i> | 9 | 1 | V | FIS/01 | A |
| 03488 - PRINCIPLES OF MATHEMATICS <i>Stira(PC)</i> | 9 | 1 | V | MAT/03 | A |
| 03466 - PRINCIPLES OF CHEMISTRY <i>Martorana(CU)</i> | 6 | 1 | V | CHIM/03 | A |
| 20692 - ENGLISH LANGUAGE SKILLS - EQUIVALENT TO LEVEL B1 | 3 | 1 | G | | E |
| 20238 - OPHTHALMIC LENSES - PRACTICE <i>Militello(PO)</i> | 6 | 1 | G | | S |
| 20471 - OPTOMETRY TECHNIQUES - PRACTICE I <i>Micciche'(PO)</i> | 8 | 1 | G | | S |
| 03927 - COMPUTER SCIENCE <i>Schicchi(RD)</i> | 6 | 2 | V | INF/01 | A |
| 20474 - GEOMETRIC OPTICS LABORATORY <i>Cannas(PO)</i> | 6 | 2 | V | FIS/01 | A |

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| Subjects 2 ° year | CFU | Sem. | Val. | SSD | TAF |
|--|-----|------|------|--------|-----|
| 01567 - BIOCHEMISTRY AND PHYSIOLOGY - INTEGRATED COURSE | 10 | Ann. | V | | |
| - <i>BIOCHEMISTRY</i> <i>De Blasio(PA)</i> | 5 | 1 | | BIO/10 | B |
| - <i>GENERAL AND EYE PHYSIOLOGY</i> <i>Gambino(RD)</i> | 5 | 2 | | BIO/09 | B |
| 20235 - OPTICAL EQUIPMENT <i>Sancataldo(RD)</i> | 6 | 1 | V | FIS/07 | B |
| 07811 - PHYSICS II <i>Valenti(PO)</i> | 6 | 1 | V | FIS/07 | B |
| 20233 - PRINCIPLES OF MODERN PHYSICS <i>Napoli(PA)</i> | 6 | 1 | V | FIS/03 | B |
| 20472 - OPTOMETRY TECHNIQUES - PRACTICE II <i>Micciche'(PO)</i> | 6 | 1 | G | | S |
| 20232 - CONTACT LENSES - PRACTICE I <i>Militello(PO)</i> | 8 | 1 | G | | S |
| 20236 - EYE PATHOPHYSIOLOGY AND HYGIENE . INTEGRATED COURSE | 8 | 2 | V | | |
| - <i>EYE PATHOPHYSIOLOGY</i> <i>Pioppo(PC)</i> | 5 | 2 | | MED/30 | B |
| - <i>PRINCIPLES OF HYGIENE</i> <i>Restivo(RD)</i> | 3 | 2 | | MED/42 | C |
| Free subjects (suggested) | 6 | | | | D |

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| Subjects 3 ° year | CFU | Sem. | Val. | SSD | TAF |
|--|-----|------|------|--------|-----|
| 20242 - EQUIPMENT FOR OPTICS AND ASTRONOMY <i>Argiroffi(RU)</i> | 6 | 1 | V | FIS/05 | B |
| 11478 - PRINCIPLES OF RADIATION/MATTER INTERACTION <i>Carollo(PA)</i> | 6 | 1 | V | FIS/02 | A |

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| Subjects 3 ° year | CFU | Sem. | Val. | SSD | TAF |
|---|------------|-------------|-------------|------------|------------|
| 20243 - PRINCIPLES OF STRUCTURE OF MATTER <i>Principato(PA)</i> | 6 | 1 | V | FIS/03 | B |
| 13351 - ADVANCED SKILLS RELATED TO THE LABOUR MARKET <i>Militello(PO)</i> | 1 | 1 | G | | F |
| 20231 - CONTACT LENSES - PRACTICE II <i>Militello(PO)</i> | 11 | Ann. | G | | S |
| 20241 - OPTOMETRY TECHNIQUES - PRACTICE III <i>Militello(PO)</i> | 11 | Ann. | G | | S |
| 20246 - CHEMICAL PRINCIPLES AND TECHNOLOGIES FOR MATERIALS - INTEGRATED COURSE | 9 | 2 | V | | |
| - CHEMISTRY OF MATERIALS FOR OPTICS - LABORATORY <i>Cavallaro(RD)</i> | 6 | 2 | | CHIM/02 | C |
| - 3-D PRINTING <i>Palmeri(RD)</i> | 3 | 2 | | ING-IND/16 | C |
| 17196 - ELEMENTS OF BIOPHYSICS <i>Militello(PO)</i> | 6 | 2 | V | FIS/07 | B |
| 05917 - FINAL EXAMINATION | 3 | 2 | V | | E |
| Free subjects (suggested) II | 6 | | | | D |

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OPTIONAL SUBJECTS

| Free subjects (suggested) | CFU | Sem. | Val. | SSD | TAF |
|--|------------|-------------|-------------|------------|------------|
| 22000 - HISTORY OF OPTICS AND MODERN PHYSICS <i>Agliolo Gallitto(PA)</i> | 6 | 1 | V | FIS/08 | D |
| Free subjects (suggested) II | CFU | Sem. | Val. | SSD | TAF |
| 22000 - HISTORY OF OPTICS AND MODERN PHYSICS <i>Agliolo Gallitto(PA)</i> | 6 | 1 | V | FIS/08 | D |

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