370618 - LENTS - Ophthalmic Lenses

Coordinating unit: 370 - FOOT - Terrassa School of Optics and Optometry
Teaching unit: 731 - OO - Department of Optics and Optometry
Academic year: 2017
Degree: BACHELOR'S DEGREE IN OPTICS AND OPTOMETRY (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Spanish

Degree competences to which the subject contributes

Specific:
1. Acquire skills in patient care
2. Understand the different functions that can have glasses: compensation of ametropias, eye protection to general and labour use, low vision aids.
3. Distinguish between the characteristics of materials and designs of various types of ophthalmic lenses (including prisms and filters) and frames, and understand the basic principles of optics and not optical systems used for low vision.
4. Making use of machinery, instruments and tools needed to make assembly, adjustments, repairs and quality control of finished product.
5. Recognize if the glasses meet the standards refered to in ophthalmic optics, optical aids and eye protection.
6. Being able to take, treat, represent and interpret experimental data. "Use basic laboratory equipment and techniques"
7. Value the impact parameters psychoaesthetic, or psychosocial and economic impact to the user.

General:
8. Adaptation of all the fields of professional activity envers compatible aspects with the medium ambient (recycling, reuse of the materials,...)
9. Acquire communication techniques appropriate to ensure the success of teamwork
10. Capacity to assume different roles within the team, leadership, coordination with other members
11. Develop empathy with people
12. Judgments (ratings) reports and surveys
13. Encourage methodical work, rigorous, consistent and innovative
14. Reflect and be able to make a critic of the knowledge and developed skills and the level of achievement.
15. Locate new information and the interpretation of it in its context.
16. Value the methods used to achieve the objectives.
17. Value and incorporate technological necessary improvements for the proper development of the profession
18. Assessing the acquisition of the course objectives.
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Teaching methodology

- Reading and interpretation of literature.
- Troubleshooting forums on the virtual campus.
- Cooperative Learning in the laboratory.

Learning objectives of the subject

After the course the student should be able to:

- Understand and calculate the geometric, optical and physical important parameters of all used types of ophthalmic lenses and optometric prescriptions. Relate them to know the properties involved in the adaptation process.
- Understand the physical and chemical properties of the materials used in optics and optometry.
- Understand the processes of selection, design and manufacture of lenses.
- Understand and manage technical analysis, measurement, control and correction of optical compensating systems on the visual system, in order to optimize its design and its adaptation.
- To qualify for the calculation of geometric parameters of the visual systems of specific compensation: low vision, intraocular lenses, contact lenses and ophthalmic lenses.
- Make contact with the marketing of products.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 144h</th>
<th>Hours large group: 0h 0.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group: 36h 25.00%</td>
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<tr>
<td>Hours small group: 24h 16.67%</td>
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<tr>
<td>Guided activities: 0h 0.00%</td>
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<tr>
<td>Self study: 84h 58.33%</td>
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</tbody>
</table>
## 1. INTRODUCTION. CLASSIFICATION OF OPTHALMIC LENSES

**Learning time:** 8h  
- Self study: 8h

**Description:**  
This content works:  
- Different types of ophthalmic lenses classified according to the geometry of surfaces.  
- The functionality of the different types of lenses as compensating elements.

## 2. LENS OF SPHERICAL POWER

**Learning time:** 26h 47m  
- Theory classes: 0h  
- Practical classes: 0h  
- Laboratory classes: 1h  
- Guided activities: 0h  
- Self study: 25h 47m

**Description:**  
This content works:  
- Parameters geometric and optical characteristic of spherical lenses.  
- Relations between parameters.  
- Exact calculation of spherical lens power.  
- Procedures for measuring these parameters. Utilización de frontofocometría.

**Related activities:**  
- Resolution of exercises proposed.

## 3. LENS OF ASTIGMATIC POWER

**Learning time:** 33h 52m  
- Theory classes: 0h  
- Practical classes: 0h  
- Laboratory classes: 2h  
- Guided activities: 0h  
- Self study: 31h 52m

**Description:**  
This content works:  
- Description geometric surfaces.  
- Relations between geometric optical parameters i.  
- Methods of representation of these types of lenses.  
- Application of Lents twin cylinder. Stokes Theorem  
- Procedures for measuring parameters. Fronto management.

**Related activities:**  
- Resolution of exercises proposed.
### 4. LENSM OF PRISMATIC POWER

**Description:**
This content works:
- Concept and methods of measurement of the prismatic power.
- Methods of obtaining a prismatic lens.
- Prentice Law.
- Convention of the bases.
- Prismatic effect obtained by runout.

**Related activities:**
- Resolution of exercises proposed.

**Learning time:** 32h 46m
- Theory classes: 0h
- Practical classes: 0h
- Laboratory classes: 2h
- Guided activities: 0h
- Self study : 30h 46m

### 5. BIFOCAL LENS

**Description:**
This content works:
- Geometry of bifocals lenses related its functionality.
- Concepts of addition, image jump and optical center nearly.

**Related activities:**
- Resolution of exercises proposed.

**Learning time:** 9h 19m
- Theory classes: 0h
- Practical classes: 0h
- Laboratory classes: 0h
- Guided activities: 0h
- Self study : 9h 19m
### 6. LENS OF PROGRESSIVE ADDITION

**Description:**
- Description of surfaces.
- Recognition and obtaining of parameters.
- Advantages and disadvantages compared with bifocals lenses.

**Related activities:**
- Personal work of documentation related to the theme.

<table>
<thead>
<tr>
<th>Learning time</th>
<th>Theory classes: 0h</th>
<th>Practical classes: 0h</th>
<th>Laboratory classes: 0h</th>
<th>Guided activities: 0h</th>
<th>Self study: 10h 19m</th>
</tr>
</thead>
</table>

### 7. ABERRATIONS IN OPHTHALMIC LENS

**Description:**
- Definition and classification for the different aberrations seen in an ophthalmic lens.
- Mathematical models for simulation of aberrations associated with lens design.
- Quality Features.

**Related activities:**
- Resolution of exercises proposed.

<table>
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<tr>
<th>Learning time</th>
<th>Theory classes: 0h</th>
<th>Practical classes: 0h</th>
<th>Laboratory classes: 0h</th>
<th>Guided activities: 0h</th>
<th>Self study: 21h 38m</th>
</tr>
</thead>
</table>

### 8. MANUFACTURING OF OPHTHALMIC LENS

**Description:**
- Different types of manufacturing processes.
- Cut and polished surfaces with symmetry of revolution about a point or an axis.
- Cutting and polishing of surfaces without symmetry of revolution.
- Surface treatments.

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<tr>
<th>Learning time</th>
<th>Theory classes: 0h</th>
<th>Practical classes: 0h</th>
<th>Laboratory classes: 0h</th>
<th>Guided activities: 0h</th>
<th>Self study: 8h 19m</th>
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Qualification system

The total score will be formed from the results obtained in the following sections:

- Written test: 50%
- Laboratory test: 15%
- Practice Note: 20%
- Proposed activities: 10%
- Participation in forums: 5%

Information on the different access activities will be detailed assessment on the intranet of the subject (digital campus Atenea).

Regulations for carrying out activities

All submissions must be pursuant to the guidelines on the intranet of the subject (digital campus Atenea).

Bibliography

Basic:


Complementary:


Others resources: