370610 - FIBI - General and Ocular Physiology and Biochemistry

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

Teaching staff
Coordinator: GUADALUPE GOTZENS GARCIA
Others: Primer quadrimestre:
GUADALUPE GOTZENS GARCIA - GT5S1, GT5S1, GT5S2, GT5S2, TMACF, TMACF
CESAR URTUBIA VICARIO - GT5S1, GT5S1, GT5S2, GT5S2, TMACF, TMACF

Degree competences to which the subject contributes

Specific:
1. Anatomy, histology, physiology, biochemistry and neurophysiology of the visual system and the process of vision
2. Technical english applied to optics and optometry
3. Applying the protocols of public health in relation to visual health.
4. Apply the techniques of detection of ocular and systemic diseases with visual affectation, from the etiology, signs, symptoms and epidemiology.
5. Applying an specific anamnesis to extract relevant information.
6. Evaluate the status and evolution of postoperative ocular parameters of the patient.
7. Ability to write and interpret a report
8. Detecting the need to derive the patient with the corresponding report to the appropriate professional and be able to collaborate keeping the follow-up of the patient
9. Detecting adverse reactions caused by systemic and topical medication.
10. Determined by scanning objective procedures if eye conditions are appropriate or contraindicate the use of contact lenses of any material.
11. Design and fit contact lenses for treating specific conditions such as presbyopia, aphakia in pediatric patients, non-inflamatory corneal ectasia induced and natural, corneal degenerations, and therapeutic assistance for certain corneal diseases.
12. Designing protocols for prevention of visual health
13. Establish protocols, analyze results and elaborate the corresponding reports
14. Do properly binocular and accommodative tests.
15. Do properly refractive vision exams
16. Inform thoroughly the patient about the advantages and benefits that will have in using the recommended contact lenses, and the indications for the use of better maintenance and preservation of contact lenses.
17. Interpret refractive test results to determine the suitable optical prescription.
19. To interpret the results and determine if necessary a treatment.

20. Measure of ocular parameters presurgical of the patient

21. Perform the necessary tests to identify dysfunctions of binocular vision, both strabismus dysfunction as not strabismus dysfunction, could be enhanced by visual therapy.
22. Producing accurately diagnoses and remission reports.

23. Know interpret functional and health test results of the visual system.

24. Being able to take, treat, represent and interpret experimental data. "Use basic laboratory equipment and techniques"
25. Being able to perform literature searches.

26. Being able to relate the structure with the properties of inorganic and organic compounds and biomolecules

27. Use appropriate techniques to adapt to each case and establish guidelines for tracking users of contact lenses in order to preserve the integrity and optimal adaptation of the ocular structures.
28. Value the nervous control of the visual system.

47. Collaborate with other interdisciplinary professionals to get a comprehensive eye care

46. Perform visual examinations using preventive screening procedures in different population groups

48. Determine the visual ability using appropriate tests and techniques like the measure of visual acuity, contrast sensibility...
49. Analyze the refractive monocular state through objective and subjective techniques

50. Analyze the state of binocularity

51. Set the differential diagnosis

52. Follow up of eye diseases with involvement. (Follow up of patients with diseases affecting visual)

53. Apply pre-and postsurgical optometric protocols associated with different eye diseases and conditions

**General:**

29. Acquire communication techniques appropriate to ensure the success of teamwork

30. Apply the principles of emotional intelligence to develop a teamwork

31. Capacity to assume different roles within the team, leadership, coordination with other members

32. Define the general objectives and to carry out a specific group

33. Develop methods to encourage teamwork participation of its members, critical thinking, mutual respect, the ability to negotiate to achieve common goals
34. Judgments (ratings) reports and surveys

35. Display information orally and in writing of reasonably and coherent.
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36. Extract the main points of a text or any source of information (oral or written)

37. Flexibility to integrate into dynamic environments, multidisciplinary and multicultural.

38. Encourage methodical work, rigorous, consistent and innovative

39. Reflect and be able to make a critic of the knowledge and developed skills and the level of achievement.

40. Synthesize and organize information to convey it effectively orally and / or written

41. Locate new information and the interpretation of it in its context.

42. Working with evidence, methodology and rigour.

43. Value the methods used to achieve the objectives.

44. Value and incorporate technological necessary improvements for the proper development of the profession

45. Assessing the acquisition of the course objectives.

54. Consistently communicate the basic knowledge of optometry acquired. (Explain orally and in writing the basic knowledge)

55. Communicate (Advise and guide) in a responsible and efficient way with the patient and his environment (in order to ensure compliance with treatment)

56. Being able to participate in multidisciplinary working groups, multicultural and multilingual

57. Be able to organize the work of a group of people to attain a previously determined aim in the due terms

58. Analyze and relate the knowledge and acquired skills.

59. Expand and upgrade skills for professional practice and knowledge through continuing education

60. Be innovative and entrepreneurial

Teaching methodology

Each student will make a minimum number of self-assessments by ATENEA digital platform and a certain number of classified assessments (continuous assessment individually and in groups) with the development of a notebook that shows the monitoring and analysis of their critical learning.

Practical classes (small group) will be made by pairs of students develop the basic skills of laboratory equipment type and application of scientific method.

Learning objectives of the subject

At the end of the course the students should be able to:
Understanding the biochemical and physiological processes of the human body as the basis for the prior understanding of the functioning of the different structures of the organ of vision and its annexes by knowing:
- The composition and structure of the molecules that form living beings.
- The molecular basis of storage and the expression of biological information.
- Transformations of some biomolecules into others.
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- The function of the apparatus and systems of the human body.
- The properties and functions of different elements that compose the visual system.
- The principles and foundations of the biological processes involved in the normal visual system.
- The biochemical processes that occur in the eye and vision.
- The changes related to aging processes of perception.
- The materials and basic techniques of the laboratory.

### Study load

<table>
<thead>
<tr>
<th>Total learning time: 133h 30m</th>
<th>Hours large group:</th>
<th>0h</th>
<th>0.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>39h</td>
<td>29.21%</td>
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<tr>
<td></td>
<td>Hours small group:</td>
<td>10h 30m</td>
<td>7.87%</td>
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<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>84h</td>
<td>62.92%</td>
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### Content

#### 1. GENERAL BIOCHEMISTRY

- Learning time: 40h
  - Laboratory classes: 4h
  - Self study: 36h

#### 2. GENERAL PHYSIOLOGY

- Learning time: 42h
  - Laboratory classes: 6h
  - Self study: 36h

#### 3. OCULAR PHYSIOLOGY AND BIOCHEMISTRY

- Learning time: 72h
  - Laboratory classes: 6h
  - Self study: 66h
### Planning of activities

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
<th>Self Study</th>
</tr>
</thead>
</table>
| 1. PRACTIQUES DE LABORATORI (CONTINGUT 1) | 8h | Laboratory classes: 4h  
Self study: 4h |
| 2. PROVES EN GRUP D'AVELUACIÓ CONTÍNUA (CONTIGUT 1) | 8h | Self study: 8h |
| 3. PROVES INDIVIDUALS D'AVELUACIÓ CONTÍNUA (CONTIGUT 1) | 12h | Self study: 12h |
| 4. PROVES INDIVIDUALS D'AVELUACIÓ CONTÍNUA (CONTIGUT 2) | 12h | Self study: 12h |
| 5. PROVES EN GRUP D'AVELUACIÓ CONTÍNUA (CONTIGUT 2) | 8h | Self study: 8h |
| 6. PRACTIQUES DE LABORATORI (CONTINGUT 2) | 8h | Laboratory classes: 4h  
Self study: 4h |
| 7. PRACTIQUES DE LABORATORI (CONTINGUT 3) | 8h | Laboratory classes: 4h  
Self study: 4h |
| 8. PROVES EN GRUP D'AVELUACIÓ CONTÍNUA (CONTIGUT 3) | 8h | Self study: 8h |
| 9. PROVES INDIVIDUALS D'AVELUACIÓ CONTÍNUA (CONTIGUT 3) | 20h | Self study: 20h |
10. PROVA FINAL DE SÍNTESI

**Qualification system**

The final mark is the partial sum of the following qualifications:

\[ N_{\text{final}} = 5 \times N_{\text{pf}} + 3 \times N_{\text{aci}} + 1 \times N_{\text{acg}} + 1 \times N_{\text{eL}} \]

*\( N_{\text{final}} \): final results.
*\( N_{\text{pf}} \): final grade.
*\( N_{\text{aci}} \): continuous assessment individually.
*\( N_{\text{acg}} \): continuous assessment in groups.
*\( N_{\text{eL}} \): teaching qualification laboratory (lab, computer classroom).

**Regulations for carrying out activities**

- It is obligatory to carry out laboratory activities and continuous assessment.
- If not done any of the laboratory activities and continuous assessment will be considered as non-rated.
- Under no circumstances can have any notes or bibliography on individual valuation tests.

**Bibliography**

**Basic:**


