370546 - INTERAC - Interactions Between Microorganisms and Contact Lenses

Coordinating unit: 370 - FOOT - Terrassa School of Optics and Optometry
Teaching unit: 731 - OO - Department of Optics and Optometry
Academic year: 2019
Degree: BACHELOR'S DEGREE IN OPTICS AND OPTOMETRY (Syllabus 2009). (Teaching unit Optional)
ECTS credits: 3
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Morato Farreras, Jordi (http://futur.upc.edu/JordiMoratoFarreras)

Prior skills
To follow the course smoothly, students must have previous knowledge acquired during biology courses taken in high school and should have studied general and ocular microbiology matter.

Requirements
Should have studied general and ocular microbiology matter.

Degree competences to which the subject contributes

Specific:
0.4. Being able to relate the structure with the properties of inorganic and organic compounds and biomolecules

1.2.5. Advise the patient in the correct administration of the ocular medicines and their effects.

2. Examine the visual system to value his state and functionality

3a.3.1. 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.

3c.0.2. Choosing the appropriate therapy for that case, evaluating the different alternatives.

0. Applying the scientific basis needed for the development of the profession.

Generical:
T1. Ethical and social commitment and sustainability.

T2.2.2. Interpret and use non-verbal language

T2.3.2. Judgments (ratings) reports and surveys

T3.0.1. Being able to participate in multidisciplinary working groups, multicultural and multilingual

T3.2.1. Define the general objectives and to carry out a specific group

T4.1.3. Encourage methodical work, rigorous, consistent and innovative

T3. Teamwork

T3.0.2. Be able to organize the work of a group of people to attain a previously determined aim in the due terms
T3.3.2. Acquire communication techniques appropriate to ensure the success of teamwork

T4.0.1. Analyze and relate the knowledge and acquired skills.

T3.1.2. Flexibility to integrate into dynamic environments, multidisciplinary and multicultural.

T3.2.2. Capacity to assume different roles within the team, leadership, coordination with other members

T4.1.1. Assessing the acquisition of the course objectives.

T4.3.1. Reflect and be able to make a critic of the knowledge and developed skills and the level of achievement.

T4.2.3. Working with evidence, methodology and rigour.

T2.3.1. Display information orally and in writing of reasonably and coherent.

### Teaching methodology

15 hours of theory in large group + 24 hours of practical sessions in small group (12 hours per group) + 4 hours of presentation of work.

27 hours of cooperative learning.

Complementing and recalling the knowledge gained in General and Ocular Microbiology, recalling aseptic techniques, sterilization and disinfection will affect all aspects of this subject in general hygiene, especially those that refer to the contact lenses.

To facilitate the acquisition of these skills, students are required to work in groups. In small groups (two people), the work will be supervised and managed by teachers, as previously explained the basics of the presentations and the structure must have jobs.

Students must develop the ability to work in teams, searching and managing information optimally, defending their point of view and making critical reasoning, planning working hours and ultimately laying the foundations to become a good professional optics and optometry, especially in the field of contact lenses.

### Learning objectives of the subject

Describe the interactions of microorganisms with contact lenses in the processes of adhesion, changes in the structure eye contact-lens and resistance to antimicrobial treatments (disinfectants) and address a comprehensive approach to risk prevention microbial the use of contact lenses.

### Study load

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Hours medium group: 24h</th>
<th>32.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours small group: 6h</td>
<td>8.00%</td>
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<tr>
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<td>Self study: 45h</td>
<td>60.00%</td>
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### Content

#### Part A. MICROBIAL INTERACTIONS WITH EYE STRUCTURES AND CONTACT LENSES

**Description:**
- A1 ST. Microorganisms and health. Review of structure and pathogenesis,
- A2 ST. Epidemiology: Risk epidemiology. Epidemiological surveillance and prevention.
- A3 ST. Environmental health and environmental factors. Air quality and environmental quality.
- A4 ST. Mechanisms of pathogenesis and eye infection. Immunological defense mechanisms of the eye.
- A5 ST. Biofilms. Bacterial biofilms.
- A6 ST. Mechanisms of microbial adhesion and interaction with CL. Inhibition of adhesion.
- A7 ST. Diagnostic methods for quantification of microorganisms. Molecular methods.

**Related activities:**
- Act. 1. Initial survey course. Allocation of different projects (research work).
- Act. 2. Bibliographic Research Work (keywords and 10 references).
- Act. 3. Presentation previous work (maximum 15 slides)

<table>
<thead>
<tr>
<th>Learning time: 38h</th>
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<tbody>
<tr>
<td>Theory classes: 7h</td>
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<tr>
<td>Laboratory classes: 16h</td>
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<tr>
<td>Self study: 15h</td>
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#### Part B. INTERACTIONS OF MICROORGANISMS WITH CONTACT LENS SOLUTIONS

**Description:**
- B8 ST. Concept of sterilization and disinfection.
- B9 ST. Mechanisms of antimicrobial resistance.
- B10 ST. Contact lens solutions
- B11 ST. Interactions microorganisms-contact lens-solution

**Related activities:**
- Act. 5. Design of survey for CL users

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<th>Learning time: 14h</th>
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<tr>
<td>Theory classes: 3h</td>
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<tr>
<td>Laboratory classes: 4h</td>
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<tr>
<td>Self study: 7h</td>
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PART C. RISK PREVENTION, HEALTH AND SAFETY IN CONTACTOLOGY

**Description:**
- ST C13. Comprehensive prevention of microbial risk in contact lens practice
- ST C14. Conclusions of Survey

**Related activities:**
- Act. 7. Presentations by each group.

**Learning time:**
- Theory classes: 9h
- Laboratory classes: 4h
- Self study: 5h

Qualification system

The final grade is calculated by weighting the work done by each student in each of the tests, as detailed below:
1. Review 1 (all topics). 40%
2. Teamwork. 40%
3. Complementary tests (class tests). 20%

Regulations for carrying out activities

It is necessary to attend a minimum of 90% of practices.
It is necessary to have completed all the activities uploaded to ATENEA. Deliveries must follow the instructions given.
UPC regulations in case of copying of exams.
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Bibliography

Basic:


Complementary:

Block, Seymour S. Disinfection, sterilization and preservation. 5th ed. Lippincot Williams & Wilkins, 2000. ISBN 9780683307405.


