Course guide
370024 - OINFANTIL - Paediatric Optometry and Strabismus

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Unit in charge: Terrassa School of Optics and Optometry
Teaching unit: 731 - OO - Department of Optics and Optometry.

Degree: BACHELOR'S DEGREE IN OPTICS AND OPTOMETRY (Syllabus 2020). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 6.0 **Languages:** English

LECTURER

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DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE20. Measure, interpret and treat refractive errors. Describe the sensory and oculomotor mechanisms of binocular vision. Identify the principles of and measure, interpret and treat accommodative and binocular vision anomalies. Demonstrate skills in communication, recording data and writing clinical histories. Demonstrate skills in the interpretation and clinical judgement of results of vision tests, to establish the most suitable diagnosis and treatment. Demonstrate skills in instrumental assessment tests of visual function and eye health. Carry out a complete medical history. Identify, apply and interpret instrumental tests relating to visual health problems. Demonstrate the clinical skills required for the examination and treatment of patients. Examine, diagnose and treat visual anomalies with an emphasis on differential diagnosis. Describe the nature and organisation of types of clinical care. Describe the protocols that are applied to patients.
CE24. Identify and apply vision screening techniques to various populations.

Generical:
CG1. Demonstrate knowledge of, design and apply prevention and maintenance programmes relating to the population’s visual health.
CG2. Carry out each stage of visual examinations effectively: medical history, selection and implementation of diagnostic tests, establishment of a prognosis, selection and execution of treatment and, if necessary, preparation of referral reports that establish levels of collaboration with other professionals, to ensure the best possible care for the patient.
CG3. Advise and guide patients and relatives during the entire treatment.
CG5. Give opinions and produce reports and expert reports when necessary.
CG8. Plan and carry out research projects that contribute to the production of knowledge in the field of optometry and disseminate this scientific knowledge via the typical communication channels.
CG9. Expand and update one’s professional abilities through continuing education.
CG11. Locate new information and interpret it in context.

CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.
CG14. Demonstrate knowledge, skills and abilities in patient healthcare.
CG16. Participate effectively in both single-discipline and multidisciplinary work groups on projects related to optometry.

Transversal:
CT7. Foreign language. Demonstrate knowledge of a foreign language, preferably English, at an oral and written level that is consistent with graduates' future needs.

CT5. Efficient use of informacion resources. To manage data and technical and scientific information adquisition, organization, analysis and visualization and to provide a critical appraisal of the results of this management

TEACHING METHODOLOGY

Mid size group lessons will consist of:
MD1 - Participatory expository class of theoretical and practical content.
MD2 - Active methodologies in the classroom (learning based on clinical case seminars, role-playing games, cooperative learning...), through which the students' debate and critical spirit will be encouraged.
All the information regarding the syllabus program and lecture presentations for each unit will be available on the Atenea platform.
Small group lessons will consist of:
MD3 - Clinical cases solving seminars with the participation of students, practical and/or exercises related to the contents of the subject.
MD4 - Clinical practice in the teaching laboratory.
MD5 - Reading and analysing texts and papers related to the contents of the subject.
MD6 - Solving exercises and clinical cases. Participation in questions about clinical cases that are presented in the Forums of the Atenea virtual campus.
The small group sessions will be divided into clinical practice sessions in the teaching laboratory and seminar sessions with resolution of clinical cases and active learning of the students. Practical handbooks and scripts for the clinical examination methodology will be found on the Atenea platform and must be read and printed, if necessary. The results of the tests and clinical examination techniques obtained in each examined case will be collected in a dossier (collection of handbook), which must be handed over to the professors when requested for their subsequent analysis and evaluation, and as evidence of the work done. Attendance to these practical small group sessions is mandatory.
Description of tasks in automonous learning hours:
Autonomous learning hours should be dedicated to studying the content, individually solving the proposed exercises and questions, and participating in the questions proposed in each of the Atenea forums. The professors will provide students with the necessary resources (texts and/or articles, as well as appropriate self-assessment exercises or problems) and guidance to help them achieve the learning objectives of the subject. This learning will be guided through the Atenea intranet, which will not only be the communication medium used to announce any changes regarding the course but also a tool to present and share study material, and through which tutoring sessions will be encouraged to provide guidance and resolve doubts. Therefore, to properly follow the course, it is necessary to frequently consult Atenea.

LEARNING OBJECTIVES OF THE SUBJECT

Knowledge:
- Demonstrate knowledge of the maturation process of visual systems and the normal sensory and motor development of vision in infants.
- Demonstrate knowledge of the expected normal values at this age: VA, refractive values, binocular status.
- Demonstrate knowledge of developmental anomalies and frequent congenital eye conditions that lead to visual impairment in infants and the clinical characteristics and epidemiology of these children.
- Demonstrate knowledge of appropriate clinical tests and techniques for examining infants of different ages.
- Demonstrate knowledge of the definition, prevalence, classification and mechanisms of amblyopia.
- Demonstrate knowledge of clinical examinations and tests to assess and manage infants with strabismus (diagnosis, treatment and management of the most common clinical forms of esotropia and non-paralytic esotropia, not including vertical, cyclotorsional or paretic strabismus).
- Demonstrate knowledge of treatment options for amblyopia according to scientific evidence.
- Demonstrate knowledge of the objectives and characteristics of vision screening in paediatric population as tools of prevention: suitable protocols, cut-off criteria, sensitivity and specificity.
- Demonstrate knowledge of the role of the optometrist in the detection, assessment, management and referral of infants with deviations from the normal patterns of visual development to identify and handle situations that require referral/interprofessional collaboration.

Practical skills:
- Demonstrate communication skills with paediatric patients.
- Demonstrate an understanding of visual assessment techniques in newborns.
- Demonstrate clinical skills in assessing preschool children: VA, refractive values, binocular status (binocular alignment, motility/comitance, accommodation, vergence), colour vision and eye health.
- Demonstrate clinical skills in examining patients with amblyopia.
- Demonstrate clinical skills in examining patients with strabismus, including incomitant deviations.
- Interpret the results of the tests that are carried out.
- Assess binocular status (accommodation, sensory and motor fusion, and motility) in children aged under 6 years.
- Manage preschool children who have or are at risk of developing a binocular vision anomaly.

STUDY LOAD

Type	Hours	Percentage
Hours small group	30,0	20.00
Self study	90,0	60.00
Hours medium group	30,0	20.00

Total learning time: 150 h

CONTENTS

Unit 1: Clinical examination of infants and preschool children

Description:
Development of visual function.
Clinical history.
VA - Characteristics and suitable techniques in preschool children.
Refractive examination: Appropiate techniques to determine refractive error in preschool children. Cycloplegia.
Sensory and motor examination of binocular vision (BV). Appropiate techniques and characteristics of BV assessment in preschool children: methods to determine objectively the alignment of visual axes (cover test, Hirschberg, Bruckner), motor fusion (forias, reserves and near point of convergence), sensory fusion and stereopsis.
Examination of colour vision in infants and the implications of anomalies.
Techniques for the examination of eye health in infants and preschool children.

Related activities:
P1, P2, S, E1, E2

Full-or-part-time: 14h
Practical classes: 5h
Self study : 9h

Unit 2: Refractive development: prescription criteria in preschool children

Description:
Development of refractive error from birth and the process of emmetropisation. Expected values.
Refractive prescription criteria in preschool children. Application of cycloplegia. Seminar of cases on refractive prescription criteria in preschool children.

Related activities:
P1, S, E1, E2

Full-or-part-time: 12h
Practical classes: 3h
Self study : 9h

Unit 3: Amblyopia

Description:
Diagnosis and mangement of amblyopia

Related activities:
P1, S, E1, E2

Full-or-part-time: 8h
Practical classes: 2h
Self study : 6h

Unit 4: Developmental anomalies of vision and associated visual impairment

Description:
Congenital embryonic and ocular developmental anomalies: common conditions that lead to visual impairment in infants.
Visual and ocular disorders in Down's Syndrome and other trisomies.

Specific objectives:
P1, S, E2

Full-or-part-time: 8h
Practical classes: 2h
Self study : 6h

Unit 5: Clinical examination of strabismus

Description:
Sensory examination (suppression, abnormal correspondence, eccentric fixation). Suppression scotoma examination techniques.
Abnormal correspondence examination techniques: synoptophore, red filter, Bagolini, Bielschowsky. Eccentric fixation examination techniques: Haidinger, ophthalmoscope.
Motor examination: concept of comitance and secondary deviation associated with paralytic strabismus. Ocular motility examination techniques: double rod Maddox, Bielschowsky and torticolis, three-step test, Hess Lancaster screen test, prisma cover test.

Related activities:
P2, S, E2

Full-or-part-time: 16h
Practical classes: 4h
Self study : 12h

Subject 6: Diagnosis and management of strabismus

Description:
Diagnosis, treatment and management by the optometrist of the most common non-paralytic strabismus (esotropia and exotropia).
Seminar on cases of strabismus associated with refractive errors and binocular vision anomalies.
Acquired strabismus and associated diplopia: diplopia treatment strategies.

Related activities:
P2, S, E2

Full-or-part-time: 18h
Practical classes: 6h
Self study : 12h

ACTIVITIES

P1: Practical sessions - clinical exam in preschool children

Description:
Practical sessions of clinical examination in preschool children

Full-or-part-time: 24h
Self study: 12h
Laboratory classes: 12h

P2: practical sessions - clinical examen in strabismus

Description:
Practical sessions of specific tests for the evaluation of strabismus

Full-or-part-time: 24h
Self study: 12h
Laboratory classes: 12h

S: Clinical Cases Seminars

Description:
- Criteria for refractive error prescription in preschool children
- Amblyopia
- Strabismus associated with refractive errors and binocular vision anomalies

Full-or-part-time: 9h
Self study: 3h
Practical classes: 6h

E1: Written test on children's vision - midterm exam

Full-or-part-time: 2h
Practical classes: 2h

E2: Final written test on all course contents

Full-or-part-time: 2h
Practical classes: 2h

EUROPEAN DIPLOMA IN OPTOMETRY COMPETENCES

Description:
This module contributes to the European Diploma in Optometry competencies indicated in the following link:
https://drive.google.com/drive/folders/1bwmHBsvkrGnY63DfXAnWZB_i0I2pXa-I?usp=drive_link

GRADING SYSTEM

Written test 1: Midterm exam on children's vision 20%
Written Test 2: Global and final exam on all course contents 40%
Assessment of clinical skills and methods for the examination of children 10%
Written test on examination techniques in strabismus 10%
Completion of lab guides about children's vision examination and examination techniques in strabismus 20%

Assessment of transversal competences:
CT5: By means of the completion of the course's lab guides.
CT7: The subject is taught in English, the assessment tests will be in English, so this competence will be intrinsically assessed.

To be able to retake the final exam, in case of failing, it will be necessary to meet the general conditions established each year by the Academic Regulations for undergraduate and master's studies of the UPC (NAGRAMA) and the particulars established by the FOOT (final mark equal to or higher than 3,50). The reassessment will consist of a single test on all the subjects developed during the course. If the reassessment exam is a "pass", a final grade of 5 will be obtained in the course. Otherwise, the highest mark between the one obtained in the previous assessment and that of the re-assessment will be maintained.

EXAMINATION RULES.

- Attendance to practical sessions is mandatory.
- Attendance to all assessment activities is mandatory.
- In the event of partial or total plagiarism in any of the assessments activities, the provisions of the General Academic Regulations of UPC will be applied: "Irregular actions that may lead to a significant variation in the qualification of one or more students constitute a fraudulent performance of an act of evaluation. This action involves the descriptive and numerical grade of 0 for the actual test and the total assessment act and the course, without prejudice to the disciplinary process that may arise as a result of fraudulent activity performed. If the student considers the decision to be wrong, he or she may file a complaint with the dean of the school and, if the answer is not satisfactory, he or she may lodge an appeal with the principal. The total or partial reproduction of the academic or research works, or their use for any other purpose, must have the explicit permission of the authors. It is the responsibility of the dean of the school to resolve the allegations on the aspects not included in the regulations".

BIBLIOGRAPHY

Basic:
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- Wright, Kenneth W; Spiegel, Peter H; Thompson, Lisa S. Handbook of pediatric strabismus and amblyopia [on line]. New York: Springer, 2006 [Consultation: 29/10/2024]. Available on: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=323700. ISBN 9780387279244.
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- Rosenbloom, Alfred A; Morgan, Meredith W. Principles and practice of pediatric optometry. Philadelphia: Lippincott, 1990. ISBN 0397509170.
- Scheiman, Mitchell; Wick, Bruce. Clinical management of binocular vision: heterophoric, accommodative, and eye movement disorders [on line]. 5th edition. Philadelphia: Wolters Kluwer Health, 2020 [Consultation: 24/07/2024]. Available on: https://oce-ovid-com.recursos.biblioteca.upc.edu/book?SerialCode=02148837. ISBN 9781496399731.

Complementary:
- Optometric clinical practice guideline care of the patient with strabismus: esotropia and exotropia [on line]. [Consultation: 10/05/2022]. Available on: https://www.aoa.org/AOA/Documents/Practice%20Management/Clinical%20Guidelines/Consensus-based%20guidelines/Care%20of%

20Patient%20with%20Strabismus%20Esotropia%20and%20Exotropia.pdf.- Bhola, Rahul. "Intermittent exotropia: a major review". EyeRounds.org [on line]. 2006 [Consultation: 10/05/2022]. Available on: https://webeye.ophth.uiowa.edu/eyeforum/tutorials/intermittent-exotropia.htm.- Scheiman Mitchell M; Rouse, Michael W. Optometric management of learning-related vision problems. 2nd ed. st. Louis [etc.]: Mosby Elsevier, 2006. ISBN 0323029655.
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- Borràs Garcia, M. Rosa [et al.]. Visión binocular: diagnóstico y tratamiento [on line]. Barcelona: Edicions UPC, 1996 [Consultation: 23/02/2023]. Available on: http://hdl.handle.net/2099.3/36218. ISBN 848301159X.
- Griffin, John R; Grisham, J. David. Binocular anomalies: diagnosis and vision therapy. 4ª ed. Boston: Butterworth-Heinemann, 2002. ISBN 0750673699.