Course guide
370009 - OTIVIS - Visual Optics

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: 2023  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Pujol Ramo, Jaume (https://futur.upc.edu/JaumePujolRamo)

Others: Tàpias Anton, Montserrat (https://futur.upc.edu/MontserratTapiasAnton)
        Alvarez Muñoz, José Luis (https://futur.upc.edu/JoseLuisAlvarezMunoz)

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE04. (ENG) The ability to understand the process of image formation and the properties of optical systems. The ability to understand aberrations in optical systems. The ability to understand radiometric and photometric fundamentals and laws.
CE06. (ENG) The ability to recognise the eye as an optical system. The ability to understand the basic models of vision. The ability to understand ocular models and parameters.
CE12. Understand and make use of techniques for analysing, measuring, correcting and monitoring the effects of compensatory optical systems on the visual system in order to optimise their design and fit. Make use of the techniques of centring, fitting, mounting and adjusting on all kinds of optometrically prescribed lenses, visual aids and protective eyewear. Prescribe, monitor and follow up with optical corrections. Identify and analyse environmental and workplace risk factors that could lead to visual issues.
CE13. Understand the factors that limit retinal image quality. Demonstrate knowledge of the spatial and temporal aspects of vision. Carry out psychophysical tests to determine levels of visual perception. Demonstrate knowledge of the functioning of the retina as a receptor of radiant energy. Demonstrate knowledge of the basic models of vision of colour, shape and movement. Demonstrate knowledge of age-related changes in perceptual processes. Measure and interpret psychophysical data obtained from an assessment of visual perception.

Generic:
CG09. Expand and update one’s professional abilities through continuing education.
CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.

Transversal:
CT4. (ENG) Teamwork. The ability to work as a member of an interdisciplinary team, as just another member or in a leadership role, who can contribute to developing projects pragmatically and with a sense of responsibility and make commitments that take into account the resources that are available.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

Angles
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Hours medium group</td>
<td>45,0</td>
<td>30.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
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Total learning time: 150 h

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<td>Full-or-part-time:</td>
<td>1h 45m</td>
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<tr>
<td>Practical classes:</td>
<td>1h</td>
<td></td>
</tr>
<tr>
<td>Self study :</td>
<td>0h 45m</td>
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<tr>
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<tr>
<td>Related competencies :</td>
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CG9. Expand and update one's professional abilities through continuing education.
CE13. Understand the factors that limit retinal image quality. Demonstrate knowledge of the spatial and temporal aspects of vision. Carry out psychophysical tests to determine levels of visual perception. Demonstrate knowledge of the functioning of the retina as a receptor of radiant energy. Demonstrate knowledge of the basic models of vision of colour, shape and movement. Demonstrate knowledge of age-related changes in perceptual processes. Measure and interpret psychophysical data obtained from an assessment of visual perception.

| Full-or-part-time:    | 20h         |                 |
| Practical classes:    | 6h          |                 |
| Laboratory classes:   | 6h          |                 |
| Self study :          | 8h          |                 |
Related competencies:

CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.
CG9. Expand and update one’s professional abilities through continuing education.
CE04. (ENG) The ability to understand the process of image formation and the properties of optical systems. The ability to understand aberrations in optical systems. The ability to understand radiometric and photometric fundamentals and laws.
CE06. (ENG) The ability to recognise the eye as an optical system. The ability to understand the basic models of vision. The ability to understand ocular models and parameters.

Full-or-part-time: 17h
Practical classes: 6h
Laboratory classes: 4h
Self study: 7h

Related competencies:

CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.
CG9. Expand and update one’s professional abilities through continuing education.
CE04. (ENG) The ability to understand the process of image formation and the properties of optical systems. The ability to understand aberrations in optical systems. The ability to understand radiometric and photometric fundamentals and laws.
CE12. Understand and make use of techniques for analysing, measuring, correcting and monitoring the effects of compensatory optical systems on the visual system in order to optimise their design and fit. Make use of the techniques of centring, fitting, mounting and adjusting on all kinds of optometrically prescribed lenses, visual aids and protective eyewear. Prescribe, monitor and follow up with optical corrections. Identify and analyse environmental and workplace risk factors that could lead to visual issues.
CE06. (ENG) The ability to recognise the eye as an optical system. The ability to understand the basic models of vision. The ability to understand ocular models and parameters.

Full-or-part-time: 35h 45m
Practical classes: 17h
Laboratory classes: 3h
Self study: 15h 45m
### title english

**Description:**
content english

**Related competencies:**

CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.
CG9. Expand and update one's professional abilities through continuing education.
CE04. (ENG) The ability to understand the process of image formation and the properties of optical systems. The ability to understand aberrations in optical systems. The ability to understand radiometric and photometric fundamentals and laws.
CE12. Understand and make use of techniques for analysing, measuring, correcting and monitoring the effects of compensatory optical systems on the visual system in order to optimise their design and fit. Make use of the techniques of centring, fitting, mounting and adjusting on all kinds of optometrically prescribed lenses, visual aids and protective eyewear. Prescribe, monitor and follow up with optical corrections. Identify and analyse environmental and workplace risk factors that could lead to visual issues.
CE06. (ENG) The ability to recognise the eye as an optical system. The ability to understand the basic models of vision. The ability to understand ocular models and parameters.

**Full-or-part-time:** 23h
Practical classes: 11h
Laboratory classes: 2h
Self study : 10h

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### title english

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content english

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CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.
CG9. Expand and update one's professional abilities through continuing education.
CE04. (ENG) The ability to understand the process of image formation and the properties of optical systems. The ability to understand aberrations in optical systems. The ability to understand radiometric and photometric fundamentals and laws.
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**Full-or-part-time:** 7h
Practical classes: 4h
Self study : 3h
ACTIVITIES

name english

Related competencies:
CG9. Expand and update one’s professional abilities through continuing education.
CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.
CE13. Understand the factors that limit retinal image quality. Demonstrate knowledge of the spatial and temporal aspects of vision. Carry out psychophysical tests to determine levels of visual perception. Demonstrate knowledge of the functioning of the retina as a receptor of radiant energy. Demonstrate knowledge of the basic models of vision of colour, shape and movement. Demonstrate knowledge of age-related changes in perceptual processes. Measure and interpret psychophysical data obtained from an assessment of visual perception.
CT4. (ENG) Teamwork. The ability to work as a member of an interdisciplinary team, as just another member or in a leadership role, who can contribute to developing projects pragmatically and with a sense of responsibility and make commitments that take into account the resources that are available.

Full-or-part-time: 3h
Laboratory classes: 2h
Self study: 1h

name english

Related competencies:
CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry. CG9. Expand and update one’s professional abilities through continuing education.
CE13. Understand the factors that limit retinal image quality. Demonstrate knowledge of the spatial and temporal aspects of vision. Carry out psychophysical tests to determine levels of visual perception. Demonstrate knowledge of the functioning of the retina as a receptor of radiant energy. Demonstrate knowledge of the basic models of vision of colour, shape and movement. Demonstrate knowledge of age-related changes in perceptual processes. Measure and interpret psychophysical data obtained from an assessment of visual perception.
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Full-or-part-time: 3h
Laboratory classes: 2h
Self study: 1h

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CE06. (ENG) The ability to recognise the eye as an optical system. The ability to understand the basic models of vision. The ability to understand ocular models and parameters.

Full-or-part-time: 3h
Laboratory classes: 2h
Self study: 1h
**Related competencies:**

CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.

CG9. Expand and update one's professional abilities through continuing education.

CE06. (ENG) The ability to recognise the eye as an optical system. The ability to understand the basic models of vision. The ability to understand ocular models and parameters.

CE04. (ENG) The ability to understand the process of image formation and the properties of optical systems. The ability to understand aberrations in optical systems. The ability to understand radiometric and photometric fundamentals and laws.

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**Full-or-part-time:** 3h
Laboratory classes: 2h
Self study: 1h

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**Related competencies:**

CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.

CG9. Expand and update one's professional abilities through continuing education.

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CE06. (ENG) The ability to recognise the eye as an optical system. The ability to understand the basic models of vision. The ability to understand ocular models and parameters.

CT4. (ENG) Teamwork. The ability to work as a member of an interdisciplinary team, as just another member or in a leadership role, who can contribute to developing projects pragmatically and with a sense of responsibility and make commitments that take into account the resources that are available.

**Full-or-part-time:** 3h
Laboratory classes: 2h
Self study: 1h
Related competencies:

- **CG13.** Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.
- **CG9.** Expand and update one's professional abilities through continuing education.
- **CE04. (ENG)** The ability to understand the process of image formation and the properties of optical systems. The ability to understand aberrations in optical systems. The ability to understand radiometric and photometric fundamentals and laws.
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**Full-or-part-time:** 1h 30m
Laboratory classes: 1h
Self study: 0h 30m

Related competencies:

- **CG9.** Expand and update one's professional abilities through continuing education.
- **CG13.** Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.
- **CE06. (ENG)** The ability to recognise the eye as an optical system. The ability to understand the basic models of vision. The ability to understand ocular models and parameters.
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**Full-or-part-time:** 12h 45m
Practical classes: 2h
Self study: 10h 45m
Related competencies:

CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.
CG9. Expand and update one's professional abilities through continuing education.
CE06. (ENG) The ability to recognise the eye as an optical system. The ability to understand the basic models of vision. The ability to understand ocular models and parameters.
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CE04. (ENG) The ability to understand the process of image formation and the properties of optical systems. The ability to understand aberrations in optical systems. The ability to understand radiometric and photometric fundamentals and laws.

Full-or-part-time: 28h 30m
Practical classes: 2h
Self study: 26h 30m

Related competencies:

CG9. Expand and update one's professional abilities through continuing education.
CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.
CE12. Understand and make use of techniques for analysing, measuring, correcting and monitoring the effects of compensatory optical systems on the visual system in order to optimise their design and fit. Make use of the techniques of centring, fitting, mounting and adjusting on all kinds of optometrically prescribed lenses, visual aids and protective eyewear. Prescribe, monitor and follow up with optical corrections. Identify and analyse environmental and workplace risk factors that could lead to visual issues.
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CE04. (ENG) The ability to understand the process of image formation and the properties of optical systems. The ability to understand aberrations in optical systems. The ability to understand radiometric and photometric fundamentals and laws.

Full-or-part-time: 8h 30m
Practical classes: 1h
Self study: 7h 30m

Related competencies:

Full-or-part-time: 1h
Laboratory classes: 1h
Related competencies:

CG13. Demonstrate and interpret methods for critical analysis and theory development and apply them to the field of optometry.

CG9. Expand and update one's professional abilities through continuing education.

CE12. Understand and make use of techniques for analysing, measuring, correcting and monitoring the effects of compensatory optical systems on the visual system in order to optimise their design and fit. Make use of the techniques of centring, fitting, mounting and adjusting on all kinds of optometrically prescribed lenses, visual aids and protective eyewear. Prescribe, monitor and follow up with optical corrections. Identify and analyse environmental and workplace risk factors that could lead to visual issues.

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CT4. (ENG) Teamwork. The ability to work as a member of an interdisciplinary team, as just another member or in a leadership role, who can contribute to developing projects pragmatically and with a sense of responsibility and make commitments that take into account the resources that are available.

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

Full-or-part-time: 60h
Practical classes: 60h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:
- Viqueira Pérez, Valentín; Martínez-Verdú, Francisco Miguel; Fez, Dolores de. Óptica fisiológica : modelo paraxial y compensación óptica del ojo [on line]. Sant Vicente del Raspeig: Publicaciones de la Universidad de Alicante, 2003 [Consultation: 13/05/2022]. Available on: https://web-p-ebscohost-com.recursos.biblioteca.upc.edu/ehost/ebookviewer/ebook?sid=605dfc7a-57a3-4df0-84c5-7d7927e0a140%40redis&vid=0&format=EB. ISBN 8479087757.

Complementary: