Course guides
370009 - OTIVIS - Visual Optics

Last modified: 04/03/2021

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: 2020
ECTS Credits: 6.0
Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Pujol Ramo, Jaume
Others: Alvarez Muñoz, José Luis
Tàpias Anton, Montserrat
Lupon Bas, Nuria

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. (ENG) The ability to 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. The ability to make use of the techniques of centring, fitting, mounting and adjusting all kinds of optometrically prescribed lenses, visual aids and protective eyewear. The ability to prescribe, monitor and follow up with optical corrections. The ability to identify and analyse environmental and workplace risk factors that could lead to visual issues.
CE13. (ENG) The ability to understand the factors that limit retinal image quality. The ability to understand the spatial and temporal aspects of vision. The ability to carry out psychophysical tests to determine levels of visual perception. The ability to understand the functioning of the retina as a receptor of radiant energy. The ability to understand the basic models of vision of colour, shape and movement. The ability to understand age-related changes to processes of perception. The ability to measure and interpret psychophysical data obtained from an assessment of visual perception.

Generical:
CG9. (ENG) The ability to expand and update one’s professional abilities through continuing education.

CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to 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>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group</td>
<td>45.0</td>
<td>30.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90.0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>15.0</td>
<td>10.00</td>
</tr>
</tbody>
</table>

**Total learning time:** 150 h

**CONTENTS**

<table>
<thead>
<tr>
<th>title english</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td>content english</td>
</tr>
<tr>
<td><strong>Full-or-part-time:</strong></td>
</tr>
<tr>
<td>1h 45m</td>
</tr>
<tr>
<td>Practical classes: 1h</td>
</tr>
<tr>
<td>Self study : 0h 45m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>title english</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td>content english</td>
</tr>
<tr>
<td><strong>Related competencies :</strong></td>
</tr>
<tr>
<td>CG9. (ENG) The ability to expand and update one’s professional abilities through continuing education.</td>
</tr>
<tr>
<td>CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.</td>
</tr>
<tr>
<td>CE13. (ENG) The ability to understand the factors that limit retinal image quality. The ability to understand the spatial and temporal aspects of vision. The ability to carry out psychophysical tests to determine levels of visual perception. The ability to understand the functioning of the retina as a receptor of radiant energy. The ability to understand the basic models of vision of colour, shape and movement. The ability to understand age-related changes to processes of perception. The ability to measure and interpret psychophysical data obtained from an assessment of visual perception.</td>
</tr>
<tr>
<td><strong>Full-or-part-time:</strong></td>
</tr>
<tr>
<td>20h</td>
</tr>
<tr>
<td>Practical classes: 6h</td>
</tr>
<tr>
<td>Laboratory classes: 6h</td>
</tr>
<tr>
<td>Self study : 8h</td>
</tr>
</tbody>
</table>
### Title English

**Description:**
content english

**Related competencies:**
CG9. (ENG) The ability to expand and update one's professional abilities through continuing education.

CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to 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.

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:** 17h
- Practical classes: 6h
- Laboratory classes: 4h
- Self study: 7h

### Title English

**Description:**
content english

**Related competencies:**
CG9. (ENG) The ability to expand and update one's professional abilities through continuing education.

CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to 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.

CE12. (ENG) The ability to 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. The ability to make use of the techniques of centring, fitting, mounting and adjusting all kinds of optometrically prescribed lenses, visual aids and protective eyewear. The ability to prescribe, monitor and follow up with optical corrections. The ability to identify and analyse environmental and workplace risk factors that could lead to visual issues.

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:** 35h 45m
- Practical classes: 17h
- Laboratory classes: 3h
- Self study: 15h 45m
Related competencies:
CG9. (ENG) The ability to expand and update one’s professional abilities through continuing education.

CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to 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.

CE12. (ENG) The ability to 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. The ability to make use of the techniques of centring, fitting, mounting and adjusting all kinds of optometrically prescribed lenses, visual aids and protective eyewear. The ability to prescribe, monitor and follow up with optical corrections. The ability to identify and analyse environmental and workplace risk factors that could lead to visual issues.

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: 23h
Practical classes: 11h
Laboratory classes: 2h
Self study: 10h

Related competencies:
CG9. (ENG) The ability to expand and update one’s professional abilities through continuing education.

CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.

CE13. (ENG) The ability to understand the factors that limit retinal image quality. The ability to understand the spatial and temporal aspects of vision. The ability to carry out psychophysical tests to determine levels of visual perception. The ability to understand the functioning of the retina as a receptor of radiant energy. The ability to understand the basic models of vision of colour, shape and movement. The ability to understand age-related changes to processes of perception. The ability to measure and interpret psychophysical data obtained from an assessment of visual perception.

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: 7h
Practical classes: 4h
Self study: 3h
### ACTIVITIES

**Related competencies:**

- **CG13.** (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.
- **CG9.** (ENG) The ability to expand and update one’s professional abilities through continuing education.

- **CE13.** (ENG) The ability to understand the factors that limit retinal image quality. The ability to understand the spatial and temporal aspects of vision. The ability to carry out psychophysical tests to determine levels of visual perception. The ability to understand the functioning of the retina as a receptor of radiant energy. The ability to understand the basic models of vision of colour, shape and movement. The ability to understand age-related changes to processes of perception. The ability to 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

---

**Related competencies:**

- **CG9.** (ENG) The ability to expand and update one’s professional abilities through continuing education.

- **CG13.** (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to 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.

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

---

**Related competencies:**

- **CG13.** (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.
- **CG9.** (ENG) The ability to 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.

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

Related competencies:

CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.
CG9. (ENG) The ability to 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.

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

name english

Related competencies:

CG9. (ENG) The ability to expand and update one's professional abilities through continuing education.
CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.
CE12. (ENG) The ability to 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. The ability to make use of the techniques of centring, fitting, mounting and adjusting all kinds of optometrically prescribed lenses, visual aids and protective eyewear. The ability to prescribe, monitor and follow up with optical corrections. The ability to identify and analyse environmental and workplace risk factors that could lead to visual issues.
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.
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:

CG9. (ENG) The ability to expand and update one’s professional abilities through continuing education.

CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.
CE06. (ENG) The ability to understand and use 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. The ability to make use of the techniques of centring, fitting, mounting and adjusting all kinds of optometrically prescribed lenses, visual aids and protective eyewear. The ability to prescribe, monitor and follow up with optical corrections. The ability to identify and analyse environmental and workplace risk factors that could lead to visual issues.

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.

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:

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory class</td>
<td>2h</td>
</tr>
<tr>
<td>Self study</td>
<td>1h</td>
</tr>
</tbody>
</table>

---

name english

### Related competencies:

CG9. (ENG) The ability to expand and update one’s professional abilities through continuing education.

CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.

CE12. (ENG) The ability to 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. The ability to make use of the techniques of centring, fitting, mounting and adjusting all kinds of optometrically prescribed lenses, visual aids and protective eyewear. The ability to prescribe, monitor and follow up with optical corrections. The ability to 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.

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.

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:

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory class</td>
<td>1h</td>
</tr>
<tr>
<td>Self study</td>
<td>0h 30m</td>
</tr>
</tbody>
</table>
Related competencies:

CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.

CG9. (ENG) The ability to 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.

CE12. (ENG) The ability to 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. The ability to make use of the techniques of centring, fitting, mounting and adjusting all kinds of optometrically prescribed lenses, visual aids and protective eyewear. The ability to prescribe, monitor and follow up with optical corrections. The ability to identify and analyse environmental and workplace risk factors that could lead to visual issues.

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:** 12h 45m

Practical classes: 2h
Self study: 10h 45m
### Related competencies:

**CG9. (ENG)** The ability to expand and update one's professional abilities through continuing education.

**CG13. (ENG)** The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.

**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.

**CE13. (ENG)** The ability to understand the factors that limit retinal image quality. The ability to understand the spatial and temporal aspects of vision. The ability to carry out psychophysical tests to determine levels of visual perception. The ability to understand the functioning of the retina as a receptor of radiant energy. The ability to understand the basic models of vision of colour, shape and movement. The ability to understand age-related changes to processes of perception. The ability to measure and interpret psychophysical data obtained from an assessment of visual perception.

**CE12. (ENG)** The ability to 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. The ability to make use of the techniques of centring, fitting, mounting and adjusting all kinds of optometrically prescribed lenses, visual aids and protective eyewear. The ability to prescribe, monitor and follow up with optical corrections. The ability to 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:** 28h 30m  
Practical classes: 2h  
Self study: 26h 30m

---

### Related competencies:

**CG13. (ENG)** The ability to make use of and understand methods for carrying out critical analyses and developing theories and to apply them to the field of optometry.

**CG9. (ENG)** The ability to 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.

**CE13. (ENG)** The ability to understand the factors that limit retinal image quality. The ability to understand the spatial and temporal aspects of vision. The ability to carry out psychophysical tests to determine levels of visual perception. The ability to understand the functioning of the retina as a receptor of radiant energy. The ability to understand the basic models of vision of colour, shape and movement. The ability to understand age-related changes to processes of perception. The ability to measure and interpret psychophysical data obtained from an assessment of visual perception.

**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. (ENG)** The ability to 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. The ability to make use of the techniques of centring, fitting, mounting and adjusting all kinds of optometrically prescribed lenses, visual aids and protective eyewear. The ability to prescribe, monitor and follow up with optical corrections. The ability to identify and analyse environmental and workplace risk factors that could lead to visual issues.

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

**Full-or-part-time:** 1h
Laboratory classes: 1h

---

name english

**Related competencies:**

CG9. (ENG) The ability to expand and update one's professional abilities through continuing education.

CG13. (ENG) The ability to make use of and understand methods for carrying out critical analyses and developing theories and to 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.

CE13. (ENG) The ability to understand the factors that limit retinal image quality. The ability to understand the spatial and temporal aspects of vision. The ability to carry out psychophysical tests to determine levels of visual perception. The ability to understand the functioning of the retina as a receptor of radiant energy. The ability to understand the basic models of vision of colour, shape and movement. The ability to understand age-related changes to processes of perception. The ability to measure and interpret psychophysical data obtained from an assessment of visual perception.

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. (ENG) The ability to 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. The ability to make use of the techniques of centring, fitting, mounting and adjusting all kinds of optometrically prescribed lenses, visual aids and protective eyewear. The ability to prescribe, monitor and follow up with optical corrections. The ability to identify and analyse environmental and workplace risk factors that could lead to visual issues.

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

---

name english

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

---

**GRADING SYSTEM**
BIBLIOGRAPHY

Basic:

Complementary: