VNIVERSITAT DE VALÈNCIA

Course Guide
34295 Psychophysics of vision

COURSE DATA

Data Subject	
Code	34295
Name	Psychophysics of vision
Cycle	Grade
ECTS Credits	9.0
Academic year	2018 - 2019

Study (s)

Degree	Center	Acad. year	Period
1207 - Degree in Optics and Optometry	Faculty of Physics	2	Annual

Subject-matter

Degree	Subject-matter	Character
1207 - Degree in Optics and Optometry	10 - Visual perception I	Obligatory

Coordination

Name	Department
DIEZ AJENJO, MARIA AMPARO	280 - Optics and Optometry and Vision Sciences
LUQUE COBIJA, M JOSEFA	280 - Optics and Optometry and Vision Sciences
PONS MORENO, ALVARO MAXIMO	280 - Optics and Optometry and Vision Sciences

SUMMARY

The Psychophysics of Vision course studies how to measure the visual system's response to different magnitudes and information will be combined to develop a perceptual response. It will also assess the conditions to be set for the proper establishment of a perceptual response, considering both the eye as a receptor of radiant energy from the point of view of the binocular coordination, with special attention to their applications in optometry.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

The student must have prior knowledge of anatomy and physiology of the eye and of Physiological Optics, ie the process of imaging in the human eye.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

1207 - Degree in Optics and Optometry

- To know the sensory and oculomotor mechanisms of binocular vision.
- To be able to develop skills in the evaluation and interpretation of information from psychophysical data.
- To be able to recognize and to implement good scientific practices of measurement and experimentation in psychophysics.
- To be able to perform psychophysical tests to determine levels of visual perception.
- To know how the retina works as a receptor of radiant energy.
- To know the spatial and temporal aspects of vision.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

The student must, at the end of the course, be able to apply the principles of psychophysicsof vision in the usual processes of optometric clinical practice, linking the differenttheoretical methods of detection and diagnosis of visual problems that are used in this specialty.

In particular, you must know and correctly apply the systems for
measuring visualperceptual parameters for use in clinical methodologies.

DESCRIPTION OF CONTENTS

1. Binocular Vision

Introduction to different aspects of the psychophysics of vision. Historical development of psychophysics. Evolution of vision in humans. Study and analysis of eye kinematics and dynamics. Classifications of eye movements and measure them. Convergence Analysis of binocular vision binocular zone haplópica crisp. Anomaly Detection of convergence. Binocular vision with prisms and its application in the convergence anomalies. From fusion to esteropsis. Binocular fusion, features. Binocular dominance and prevalence. The directional sense: the horopter. Measuring distances in the visual system. Monocular evaluation systems of distance and depth. Stereopsis. Anisometropia. Characteristics of aniseikonia. Compensation of aniseikonia

2. Initiation to scientif¡ic research

It will develop a research initiation work, develop a bibliographic search and development on a topic related to the contents of the subject.

3. Psychophysics of vision

Introduction to the photometry. Spectral sensitivity of the visual system (VS).
Luminance thresholds: Detection and discrimination. Vision for details. Tasks in visual acuity. Contrast curve Sensibliidad Visual System. Vision of short, intermittent stimuli. Flicker sensitivity curve. Design test optometric measure magnitudes. Planning and measurement protocol in optometry. Detection of visual pathologies by psychophysical tests.

4. Introduction to colorimetry and color vision

Trivariancia visual. Introduction to colorimetry. Color representation space.
Appearance of color. I Anomalies color deficiencies

5. Practical module

1. Psychophysical methods
2. The longitudinal horopter.
3. Clear and haplopic vision zones.
4. Stereoscopic visual acuity
5 .Visual acuity and defocus
6. Achromatic CSF
7 & 8. Introduction to colorimetry (1 & 2)

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	45,00	100
Tutorials	22,50	100
Laboratory practices	22,50	100
Attendance at events and external activities	5,00	0
Development of group work	10,00	0
Development of individual work	10,00	0
Study and independent work	75,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	15,00	0
Preparing lectures	5,00	0

Preparation of practical classes and problem	10,00	0
TOTAL	**225,00**	

TEACHING METHODOLOGY

Live Activities

Theoretical and practical classes: class-campus (with possible modalities include blended or face) where taught the theoretical matter. They reinforce the use of audiovisual methods, which exemplify more clearly the theoretical and examples to develop.Exercises will develop practical application of theoretical contents.

Small Group Theory sessions:

These sessions dedicated to student group work, withsuggested exercises to be analyzed and studied by the group. Interactivity will be soughtthrough group presentations and classroom examples, made in continuous assessment.

Practical classes: on-campus classes that will develop the theoretical concepts intopractical application in the laboratory. These classes, small group of maximum 16 students, will take place using many real systems such as virtual labs that can developthe student interactively.

Student work

- Theoretical study

- Development of work and issues raised in class

- Individual tutorials

EVALUATION

At the end of each semester an examination of multiple-choice questions will be performed on the developed theoretical blocks. Multiple-choice exams will subtract 1 correct question for each (n-1) response option. These exams may include an eliminatory block (of which will be informed at the beginning of the course) of a maximum of 10 questions, in which it is obligatory to approve to answer at least 7 questions correctly.The average grade of these two exams will compute 60% of the total grade.The work to be developed in seminar will be evaluated from the notes of continuous evaluation, attendance and the memory and exhibition of the final work. The note in this section will be 20% of the total grade.The practicum shall be evaluated by means of questionnaires covering the experiments, computations and models seen in the laboratory sessions, which must be delivered within the terms that will be announced at the beginning of each session. The qualifications of the practicum amounts to 20% of the final marks.

REFERENCES

Basic

- Referencia b1: PONS AM, MARTÍNEZ VERDÚ, FM. Fundamentos de Visión Binocular. Publicacions de la Universitat de València. (2004)

  Referencia b2: READING, R.W.: Binocular vision: Foundations and applications, Butterworths. (1983).

  Referencia b3: ÓPTICA FISIOLÓGICA, PSICOFÍSICA DE LA VISIÓN
  Artigas, J.M., Capilla, P., Felipe, A. y Pujol, J. McGraw-Hill InterAmericana. Madrid. (1995).

Additional

- Referencia c1: HOWARD IP, ROGERS BJ. Binocular vision and stereopsis. Oxford University Press. 1995.

  Referencia c2: OGLE, K.N. Researches in Binocular Vision. W.B. Saunders Company. (1950).

  Referencia c3: CARPENTER, R.H.S. Eye Movements. En Vision and visual dysfunction. Vol 8. Ed. Cronly-Dillon, J.R. Macmillan Press (1991).

  REGAN, D.: Binocular Vision. En Vision and visual dysfunction. Vol. 9. Ed. Cronly-Dillon, J.R.Macmillan Press (1991)