

804042 - EII-M - Image Structure and Lighting

Coordinating unit: 804 - CITM - Image Processing and Multimedia Technology Centre
Teaching unit: 804 - CITM - Image Processing and Multimedia Technology Centre
Academic year: 2019
Degree: BACHELOR'S DEGREE IN MULTIMEDIA STUDIES (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6 Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: Martínez Navarro, Beatriz
Others: Virgili Torrent, Marc

Degree competences to which the subject contributes

Specific:

4. (ENG) Aplicar conocimientos relacionados con la formación y registro de imágenes fotográficas
5. (ENG) Aplicar conocimientos relacionados con la iluminación en entornos reales y virtuales.
6. (ENG) Ser capaz de iluminar escenas reales y/o virtuales en la forma que determinen condicionantes de tipo estético, descriptivo o narrativo

Transversal:

1. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
2. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
3. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

Teaching methodology

Class sessions of two hours are divided, in general, into four areas of activity:

1. Resolution of doubts regarding the exercises proposed in the previous session.
2. Explanation and defense of the exercises resolved.
3. Acquisition of new knowledge.
4. Explanation of the next exercise and complementary materials.

These areas of activity are modulated based on the complexity of the exercises and the corresponding contents.

Learning objectives of the subject

1. Solve problems of camera adjustment and real or virtual lighting for given situations.
2. Choose image capture instruments with the design and features appropriate to a given situation.
3. Solve image processing problems based on the application of the images.
4. Communicate clearly and efficiently in oral and written presentations adapted to the type of public and the objectives of the communication using the appropriate strategies and means.
5. Plan and use the information necessary for an academic work based on a critical reflection on the information resources used.
6. Use strategies to prepare and carry out oral presentations and write texts and documents with consistent coherent content, structure and style, and a good spelling and grammar level



804042 - EII-M - Image Structure and Lighting

Study load

Total learning time: 150h	Hours large group:	0h	0.00%
	Hours medium group:	60h	40.00%
	Hours small group:	0h	0.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

804042 - EII-M - Image Structure and Lighting

Content

<p>Topic 1 - Structure of the image</p>	<p>Learning time: 18h 45m Practical classes: 7h 30m Self study : 11h 15m</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Concept of structure of the image 2. Formation of the image 3. Characteristics of the image introduced by the optics 4. Concept of focal length 5. Conjugated object and conjugate image 6. Images for capturing images <p>Related activities: Exercices of project P01.</p>	
<p>Topic 2 - Contents and shape of image</p>	<p>Learning time: 18h 45m Practical classes: 7h 30m Self study : 11h 15m</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Relative positions of object and image 2. Side increase and translation of the form 3. Relative sizes 4. Perception of rectilinear forms 5. Perception of curved forms 6. Alternatives to the translation of the form <p>Related activities: Exercices of project P01</p>	
<p>Topic 3 - Movement of image</p>	<p>Learning time: 18h 45m Practical classes: 7h 30m Self study : 11h 15m</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Movement over the image 2. Causes of the displacement of the image 3. Duration of the exhibition 4. Duration of the illumination of the subject 5. Blur component 6. Orthogonal and oblique displacements with respect to the optical axis <p>Related activities: Exercices of project P02</p>	

804042 - EII-M - Image Structure and Lighting

<p>Topic 4 - Sharpness of image</p>	<p>Learning time: 18h 45m Practical classes: 7h 30m Self study : 11h 15m</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Concept of sharpness 2. Circle of minimum confusion and tolerance circle 3. Depth of field 4. Depth of focus 5. Alternatives to the position of the sharpness plan 6. Focus on the image <p>Related activities: Exercices of project P03</p>	
<p>Topic 5 - Structure and illumination of real and virtual images</p>	<p>Learning time: 18h 45m Practical classes: 7h 30m Self study : 11h 15m</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Light and information 2. Lighting and work space 3. Natural light, ambient light and artificial lighting 4. Electromagnetic radiation and spectral composition of light 5. Continuous and discontinuous spectrum lamps 6. Procedures for measuring light <p>Related activities: Exercices of project P02</p>	
<p>Topic 6 - Lighting applied to the recording of images</p>	<p>Learning time: 18h 45m Practical classes: 7h 30m Self study : 11h 15m</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Intensity of light 2. Color of light 3. Direction of light 4. Specularity and diffusion of light 5. Light incident and reflected light 6. Contrast of light <p>Related activities: Exercices of project P01</p>	

804042 - EII-M - Image Structure and Lighting

<p>Topic 7 - Relationships between illuminants, luminaires and objects</p>	<p>Learning time: 18h 45m Practical classes: 7h 30m Self study : 11h 15m</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Types of luminaires 2. Natural light; parameters that characterize it 3. Characteristics of the subject in relation to lighting 4. Effective size of a light source 5. Own shadows, projected and concept of Falloff 6. Light and shadow in the composition of the image <p>Related activities: Exercices of project P01</p>	
<p>Topic 8 - Lighting of scenes and virtual objects</p>	<p>Learning time: 18h 45m Practical classes: 7h 30m Self study : 11h 15m</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Absorption, reflection and transmission of light 2. Distance, angle of illumination and group of angles 3. Light field and dark field 4. Contrast of the image, lighting and object 5. Dynamic Range Scenes 6. Illumination schemes <p>Related activities: Exercices of project P02</p>	

804042 - EII-M - Image Structure and Lighting

Planning of activities

<p>(ENG) PRÁCTICA P01 - CAMPO DE VISIÓN DE LA CÁMARA, CONTENIDO Y FORMA DE LA IMAGEN. COMPONENTES BÁSICOS DE LA ILUMINACIÓN</p>	<p>Hours: 12h 30m Practical classes: 2h 30m Self study: 10h</p>
<p>Description: The practice P01 consists in the realization of a series of images in which the aspects of lighting and structure of the image worked in class will be taken into account.</p> <p>Support materials: Description of project GMM_EII_P01</p> <p>Descriptions of the assignments due and their relation to the assessment: Through campus CITM</p> <p>Specific objectives:</p> <ul style="list-style-type: none"> - Know how to apply the concepts of structure of the image and lighting worked in class, depending on the type of image you want to obtain. - Know how to work the concepts explained in class, both in fixed image, moving image or image generated by computer. 	
<p>PRÁCTICA P02 - REPRESENTACIÓN DEL MOVIMIENTO, ILUMINACIÓN EN EXTERIORES Y SIMULACIÓN EN INTERIOR.</p>	<p>Hours: 25h Practical classes: 5h Self study: 20h</p>
<p>Description: This practice will consist of performing 5 different images; of product, figure, photomontage, timelapse and audiovisual clip. The depth of field, the point of view, the representation of the movement, as well as the lighting in internal and external locations, and the simulation of lighting of real environments in virtual spaces will be worked.</p> <p>Support materials: Description of project GMM_EII_P02</p> <p>Descriptions of the assignments due and their relation to the assessment: Through Campus CITM</p> <p>Specific objectives:</p> <ol style="list-style-type: none"> 1. Identification of the combination of the registration format, the focal length, the diaphragm and the distance of prey relative to the depth of field. 2. Learning the use of the lighting in the lighting of a photographic scene. 3. Learning the light / shadow relationships to obtain iconographic information of the objects in a photographic scene. 4. Identification of the descriptive differences of the visual forms of an object according to the lighting process used. 5. Learning the different ways of representing the movement 6. Integration of virtual objects into real images 7. Completion of an audiovisual clip using chroma. 	

804042 - EII-M - Image Structure and Lighting

Qualification system

Practices (50%):

- Practical P01: 20%
- Practical P02: 30%

Exams (40%):

- 1 partial exam (15%) and 1 final exam (25%):

Participation and attitude of learning (10%):

- The evaluation of the participation of the student in the formative activities of the subject, and the attitude of learning, will be assessed by monitoring their class interventions and the proportion of exercises or practices presented.

Students who do not pass the subject through the continuous evaluation will have the option of presenting themselves to the re-evaluation exam. With this exam, the two partial examinations and the final exam will be able to re-evaluate (40% of the mark of the subject).

Regulations for carrying out activities

Practices:

The practice exercises begin during the class hours in the band assigned to this and are completed outside the class schedule hours following the instructions given in the corresponding Practice Sheet document and the indications that to such effect have been given in the part of the corresponding class.

The evaluation of the practices does not only involve the resolution of the exercises proposed and the projects, but also the defense of the results when the student is required to do so at the beginning of the classes.

Any incident that does not allow to solve the practices within the indicated term will be communicated to the corresponding professor by means of message by the Virtual Campus; After this communication, the relevance or not of any cause that motivates the non-presentation of the exercise will be resolved and the alternatives will be established to complete the evaluation if the causes are justified. The reasons for non-presentation of exercises that are communicated to the faculty by the Head of Studies will also be considered justified.

Exams:

The examinations will be done by electronic document that the student must complete.

The questions and problems proposed in the exams refer to both the theoretical content of the subject and the exercises solved in the different practices. Apart from each question or problem, the contribution in points to the total mark of the exam consists.

Revisions and / or claims regarding exams will be made exclusively on the dates and times established in the Academic Calendar.

804042 - EII-M - Image Structure and Lighting

Bibliography

Basic:

- Bernal Rosso, F. Técnicas de iluminación en fotografía y cinematografía. Barcelona: Omega, 2010. ISBN 9788428213080.
- Birn, Jeremy. Técnicas de iluminación y render. Madrid: Anaya Multimedia, 2001. ISBN 8441510946.
- Brooker, Darren. Essential CG lighting techniques with 3Ds Max. 3rd ed. Oxford: Focal Press Elsevier, 2008. ISBN 9780240521176.
- Jacobson, Ralph E. [et al.]. Manual de fotografía: fotografía e imagen digital. 9ª ed. Barcelona: Omega, 2002. ISBN 8428212813.
- Millán, M.S.; Escofet, J.; Pérez, E. Óptica geométrica. Barcelona: Ariel, 2004. ISBN 8434480646.
- Mitjà, Carles. Elementos de óptica fotográfica básica. [Barcelona]: l'autor, 2009.
- Mitjà, Carles. La forma de la imagen. [Barcelona]: l'autor, 2009.
- Mitjà, Carles. Nitidez y profundidad de campo de la imagen. [Barcelona]: l'autor, 2009.
- Ray, Sidney F. Applied photographic optics: lenses and optical systems for photography, film, video, and electronic imaging. 2nd ed. London: Focal Press, 1994. ISBN 0240513509.
- Villanueva, Lluís. Perspectiva lineal: su relación con la fotografía. Barcelona: Edicions UPC, 1996. ISBN 8489636125.
- Adams, Ansel. The camera. Boston: Little Brown & Co, 1980.
- Bouillot, René. Curso de tratamiento digital de la imagen. Barcelona: Omega, 2007. ISBN 9788428212595.
- Brown, Blain. Cinematography: theory and practice: image making for cinematographers and directors. 2nd ed. Boston: Focal Press, 2011. ISBN 9780240812090.
- Carlson, V.; Carlson, S.E. Professional lighting handbook. 2nd ed. London: Focal Press, 1991. ISBN 0240800206.
- Cox, Arthur. Óptica fotográfica: un enfoque moderno de la técnica de la definición. Barcelona: Omega, 1979. ISBN 8428205590.
- Davies, A.; Fennessy, P. Electronic imaging for photographers. 2nd ed. Oxford: Focal Press, 1996. ISBN 0240514416.
- Galadí, D.; Ribas, I. Manual práctico de astronomía con CCD. Barcelona: Omega, 1998. ISBN 8428211698.
- Kerr, Norman. Techniques of photographic lighting. New York: American Photographic Book Publishing, 1982. ISBN 0817460241.
- Langford, Michael J. Tratado de fotografía: un texto avanzado para profesionales. 6ª ed. Barcelona: Omega, 1994. ISBN 8428203482.
- Marchesi, Jost J. Técnicas de iluminación profesional. 3ª ed. Allschwil: Bron Elektronik AG, 1996. ISBN 3723100619.
- Pirenne, M.H. Óptica, perspectiva, visión en la pintura, arquitectura y fotografía. Buenos Aires: Víctor Leru, 1974.
- Ray, Sidney F. Photographic imaging and electronic photography. Oxford: Focal Press, 1994. ISBN 9780240513935.
- Stroebel, Leslie. View camera technique. 6th ed. Boston [etc.]: Focal Press, 1993. ISBN 024080158X.
- Compton, Leslie [et al.]. Photographic materials and processes. Boston: Focal Press, 1986. ISBN 9780240517520.

Others resources: