

A- General Description

Course Title - Photography

Qualification Awarded – Bachelor's degree (Licenciatura) (180 ECTS)

Admission Requirements - General Application for Admission to Higher Education, re-enter and special admission schemes. National examinations in one of the following disciplines: History, History of Culture and Arts; Mathematics. The following regional preferences are applicable: (30% of total vacancies) Coimbra, Leiria, Santarém.

Educational and Professional Goals: The degree plan is designed so as to provide the students with a technical/scientific and humanistic background in core matters such as optics, photochemistry, analogue and digital sensitometry, light sources, digital edition and colour management and complementary matters such as aesthetics, image reading, art history, contemporary art critics and photography history with emphasis to Portuguese photography history. These concepts are learned by resorting to professional facilities and equipment for capturing, recording, storing, processing and printing images obtained through optical, photochemical and digital media. This training comprising all media of photographic production and application will allow future professionals to carry out any kind of photographic job within the vast world of image creation, record and dissemination. The industry in general still lacks higher-level skilled technical staff. The basic structure of companies and the services needs specialised technical staff. The rapid pace of technological advancement requires professionals to have appropriate training. Training offered to future graduates in photography focuses on four major areas: photography in industry, technical/scientific photography, documental and editorial photography and photography for multimedia products.

Access to further studies – The bachelor's degree in Photography allows access to Master's programmes. A proposal for the Master's degree in Photography has been submitted for approval by the Ministry of Education.

Course structure diagram with credits (60 per year) - Three-year course (six semesters in total, 30 ECTS credits each):

Course Title	Year of Study	Semester	Number of credits
Elements of Physics	1	1	7
Optics	1	2	7
Digital Photography I	1	Annual	12
Photography I	1	Annual	12
Photography History	1	Annual	10
Art History and Theories	1	Annual	7

Chemistry	1	Annual	5
Applied Optics	2	1	3
Silver Printing Processes	2	1	6
Image Theories I	2	1	5
Gold, Platinum and Pigment Printing Processes	2	2	6
Digital Capture Systems	2	2	5
Image Theories II	2	2	4
Digital Photography II	2	Annual	10
Photography II	2	Annual	15
Sensitometry	2	Annual	6
Emulsions	3	1	6
Digital Printing	3	1	6
Colour Management	3	2	4
Chromogenous Processes	3	2	6
Contemporary Photography Critics	3	Annual	10
Photography III	3	Annual	15
Photography Project	3	Annual	13

Final exam, if any – Not applicable(NA).

Assessment Regulations - regulations defined for each course unit.

ECTS Departmental Coordinator – António Ventura

B – Description of individual course units	
Course Title	Elements of Physics
Course Code	96456
Type of Course	One-Semester course
Level of Course	NA
Year of Study	First
Semester	First
Number of credits	7
Name of Lecturer	Carla Alexandra de Castro Carvalho e Silva
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Provide skills that allow the students relate acquired knowledge with daily phenomena. Basic concepts of physical principles for kinematics and dynamics of motion.
Prerequisites	NA
Course contents	1 – Unit Systems 2 – One-dimensional kinematics of motion. 3 - Vectors 4 – Two-dimensional kinematics of motion. 5 – Motion dynamics 6 – Energy
Recommended Reading	Handouts and exercises available at the course webpage or at the photocopying centre. Halliday & Resnick. “Física”. Volume I, 4 ^a ed, Livros Técnicos e Científicos (Ed.). Serways. “Física”. Volume 1, 3 ^a ed, Livros Técnicos e Científicos Paul Tipler. “Física”. Volume. 1, 3 ^a ed., Editora Guanabara koogan Paul G. Hewitt. “Física Conceitual”, 9 ^a ed., Bookman.
Teaching Methods	Lectures. Theoretical/practical classes including laboratorial practice.
Assessment Methods	Practical assignments worth 1 point (out of a 0-20 grading scale). Written test during regular examination period worth 19 points.
Language of Instruction	Portuguese

B – Description of individual course units	
Course Title	Optics
Course Code	96457
Type of Course	One-Semester course
Level of Course	NA
Year of Study	First
Semester/Trimester	Second
Number of credits	7
Name of Lecturer	Carla Alexandra de Castro Carvalho e Silva
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Acquisition of physical principles associated with the Theory of Light. The students will develop skills that allow them to understand the electromagnetic spectrum and interpret an object's colour. They will be provided with Optics foundations in order to understand concepts such as prisms, mirrors, lenses (magnifying glass, microscope, etc.)
Prerequisites	NA
Course contents	1 – Light properties and propagation. Colour analysis. 2 – Fundamentals and basic laws of Geometric Optics. 3 – Light refraction. 4 – Spherical lenses 5 – Light reflection. 6 – Wave Optics
Recommended Reading	Handouts and exercises available at the course webpage or at the photocopying centre. Halliday & Resnick. "Física". Vol. 4, Livros Tec. e Científicos (Ed.). M. Margarida Costa & Maria José Almeida. "Fundamentos de Física", Almedina (Ed.).Coimbra. 1993. Hecht, Eugene. "Óptica". Fundação Gulbenkian. 1991. Paul G. Hewitt. "Física Conceitual", 9ªed., Bookman.
Teaching Methods	Lectures. Theoretical/practical classes including laboratorial practice. Practical assignments in the Physics laboratory.
Assessment Methods	Laboratorial assignments worth 3 points (out of a 0-20 grading scale) Written test during regular examination period worth 17 points.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Digital Photography I
Course Code	96453
Type of Course	Annual
Level of Course	I
Year of Study	First
Semester/Trimester	Annual
Number of credits	12
Name of Lecturer	Luís Ribeiro
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Provide the students with technical and practical skills that allow them to produce and edit digital image making use of appropriate software and hardware. Allow understanding and application of operation techniques with the digital camera.
Prerequisites	NA
Course contents	Digital Image. Image manipulation processes. Concepts of image resolution and dimension. Paradigital photometry. Colour temperature. Digital noise control.
Recommended Reading	Evening, M., Adobe Photoshop CS3 for Photographers, FP, 2007 Tarrant, Jon, Understanding Digital Cameras, Focal Press, 2007 Photomontages – photographie expérimentale de l'étranger, Dir. Robert Delpire, Tours : Nathan, 2001 Darley, Andrew- Visual Digital Culture, 1 ^a Ed. London: Rout., 2000.
Teaching Methods	Theoretical/practical classes involving presentation of course contents.
Assessment Methods	Continuous assessment of class and project work carried out over the year. Theoretical/practical exercises to assess application of concepts, techniques and methodologies. Two mid-term tests. Final mark is the weighted average of all assessment components. Minimum pass attendance ratio is 1/3 of the total number of classes in the scheduled program.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Photography I
Course Code	96451
Type of Course	Annual
Level of Course	I
Year of Study	First
Semester/Trimester	Annual
Number of credits	12
Name of Lecturer	Márcio Vilela
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Provide awareness of image formation processes and its photosensitive components as well as the ability to operate a 35mm camera and devise technical and creative exercises and projects. The concepts of photo image, its structure and various interpretations will be discussed in class in order to provide the students with appropriate analysis skills for the execution of their projects.
Prerequisites	NA
Course contents	Photosensitive materials. Photograms. Stenopeic photography. The 35mm camera and its mechanisms. Photometry, aperture control. Shutter speeds. Aperture, diaphragm and depth of field. Focal distances and their usage. Laboratory techniques, printing and development.
Recommended Reading	Boris Kossoy, Fotografia e História Giséle Freund, Fotografia e Sociedade Roland Barthes, Câmara Clara Naomi Rosemblum, A World History of Photography
Teaching Methods	Theoretical/practical classes involving presentation of course contents.
Assessment Methods	Continuous assessment of practical work done in class. Written test, presentation, defence and discussion of practical assignments proposed. Weighted average of individual assignments (60%), written test (20%) and class work (20%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Photography History
Course Code	96454
Type of Course	Annual
Level of Course	NA
Year of Study	First
Semester/Trimester	Annual
Number of credits	10
Name of Lecturer	José Soudo
Objectives of the course (preferably expressed in terms of learning outcomes competences)	The student should be able to create a framework of cultural, political and historical references allowing them to observe and interpret photographs, read and interpret photographers and understand and reflect upon the most significant moments of Portuguese history in photographic terms.
Prerequisites	NA
Course contents	From Leonardo Da Vinci to modern Photography. Photography and Art; Photography Aesthetics. The 19 th -century modernity - Photography in the 20 th century. Analysis of works by the most representative photographers, “schools”, aesthetic currents, organized groups, image agencies, publications of each decade. Portuguese photography in History.
Recommended Reading	A short history of photography - Walter Benjamin History of photography - Naomi Roseblum History of photography - John Szarkowski Photography: History of an art - Jean Luc Duvall Histoire de la photographie - Jean Luc Lemagny
Teaching Methods	Lectures: expositive activities; case studies; multimedia presentations.
Assessment Methods	Continuous assessment consisting of two written tests worth 40% and research assignments worth 60% of final grading. Minimum passing grade in every assessment component is 10.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Art History and Theories
Course Code	96452
Type of Course	Annual
Level of Course	NA
Year of Study	First
Semester/Trimester	Annual
Number of credits	7
Name of Lecturer	Valter Ventura
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Provide the students with basic concepts that allow them to develop visual skills to identify and distinguish the different creative languages throughout the history of theories and ideas. Understand the usage of image over time as a vehicle for power, spirituality, rupture and individualism and how its codes accumulated and subsist to the present day.
Prerequisites	NA
Course contents	History and Myth or the History of Art History. Antiquity – the reality canons and codification, Art in the construction of empires, cosmogenies and mythologies. Middle Age – the Kingdom of Heaven in the Kingdom of Men, the power of symbols. Modern Age – the renaissance and the reinvention of History, the profane and the sacred, communicating through metaphors, art and social status, art as a profession, art critics. Contemporary Age – academism and vanguards, modern art for a modern world, the machine world and the industrial image, from post-modern to multicultural, the continuity of symbols.
Recommended Reading	AA.VV, <i>Art in Theory (3 vols.)</i> , 2000. BENJAMIN (Walter), <i>Sobre Arte, Técnica, Linguagem e Política</i> . CALINESCU (Matei), <i>As 5 Faces da Modernidade</i> , 1999. CHEVALIER (Jean), <i>Dicionário de Símbolos</i> , 1997. GOMBRICH (E.H.), <i>The Story of Art</i> , 1995.
Teaching Methods	Lectures.
Assessment Methods	Continuous assessment. Mid-term test and/or Final Exam
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Chemistry
Course Code	96455
Type of Course	Annual
Level of Course	NA
Year of Study	First
Semester/Trimester	Annual
Number of credits	5
Name of Lecturer	Manuel Rosa
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Develop skills that allow understanding of general chemistry matters and its application to photographic processes. Understand the chemical variables involved in development processes.
Prerequisites	NA
Course contents	Structure of matter. Chemical bond. Stoichiometry. Chemical balance. Oxidation-reduction. Organic chemistry. The chemistry of black-and-white photography. The chemistry of colour photography. Paper chemistry. The chemistry of dyes and toners.
Recommended Reading	Hirsch, R., 1991. Photographic Possibilities – The expressive use of ideas, materials and processes, Focal Press, Boston. Pombeiro, A.J., 1998. Técnicas e Operações Unitárias em Química Laboratorial, Fundação Calouste Gulbenkian, Lisboa. Reger, D., Goode, S. e Mercer, E., 1997. Química: Princípios e Aplicações, Fundação Calouste Gulbenkian, Lisboa. Stroebel, L., Compton, J., Current, I. e Zakia, R., 2000. Basic Photographic Materials and Processes, Focal Press, Boston. Chang, R., 1995. Química, McGraw-Hill, 5ª ed., Lisboa.
Teaching Methods	Lectures providing the theoretical foundations and practical classes consisting of laboratory work and tests for handling the different developing products and techniques.
Assessment Methods	Continuous assessment requires minimum score of 10 (out of a 0-20 grading scale). Final mark is the average of the theoretical component (60%) and the practical component (40%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Applied Optics
Course Code	964513
Type of Course	One-Semester course
Level of Course	NA
Year of Study	Second
Semester/Trimester	First
Number of credits	3
Name of Lecturer	Rui Gonçalves
Objectives of the course (preferably expressed in terms of learning outcomes competences)	An insight of the problems and solutions associated with optical systems used in photography with a view to maximization of results.
Prerequisites	Basics of mathematics and optics.
Course contents	<ol style="list-style-type: none"> 1 – The role of lenses in photography and its optical requirements. 2 – Image formation, simple and compound lens systems. 3 – The performance of compound lens systems. 4 – Aberrations – common optical defects in lens systems. 5 – Lens colour correction. Lens speed. 6 – Optical flare. 7 – Resolving power of lenses and optical systems. 8 – Field depth and focal depth.
Recommended Reading	<p>Sidney F. Ray, <i>Applied Photographic Optics</i>, Focal Press, 2002</p> <p>Sidney F. Ray, <i>Photographic - Lenses. Optics</i>, Series Editor: Technical Pocket Books, Focal Press 1994</p> <p>Sidney F. Ray, <i>Technology Imaging Science</i>, Series Editor: Technical Pocket Books, Focal Press 1994</p> <p>Arthur Fox, trad. Ramón Álvarez, <i>Optica Fotográfica: un enfoque moderno de la técnica de la definición</i>, Barcelona, 1979</p>
Teaching Methods	Lectures providing concepts, principles and applications associated with the operation of photo cameras.
Assessment Methods	A written mid-term test during the regular examination period.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Silver Printing Processes
Course Code	964512
Type of Course	One-Semester course
Level of Course	NA
Year of Study	Second
Semester/Trimester	First
Number of credits	6
Name of Lecturer	Luís Pavão and Paula Lourenço
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Provide knowledge of photographic non-conventional processes. Promote acquisition of learning and critical skills. Learn how to handle with photographic chemistry. Promote accuracy in describing procedures and materials.
Prerequisites	NA
Course contents	Density. Printing paper. Printing process: Salted paper. Printing process: Albumen. The dupe. Printing-out paper. Printing-out paper turnings. Developing paper. Developing paper turnings.
Recommended Reading	Clerc, L. P.; <i>Photography Theory and Practice</i> ; Edited By George Brown, Pitman & Sons, London, 1937 Glaucidés, Pierre; <i>Photographic Chemistry</i> , volume two; Fountain Press, London, 1960. Crawford, William, <i>The Keepers of Light</i> , New York, Morgan & Morgan, 1979.
Teaching Methods	Lectures providing the theoretical and historical foundations and practical laboratory sessions (understanding and testing).
Assessment Methods	Continuous assessment consisting of two written tests, a theoretical presentation and laboratory reports. Final mark is the average of the two assessment components and minimum pass score is 10 (out of a 0-20 scale). A mark below 10 is allowed in one of the assessment components (one practical work or one theoretical test).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Image Theories I
Course Code	964511
Type of Course	One-Semester course
Level of Course	I
Year of Study	Second
Semester/Trimester	First
Number of credits	5
Name of Lecturer	Valter Ventura
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Provide the students with mental space and time to reflect on the different fields associated with theory, analysis, execution and use of media, publishing, artistic and memory image. Promote critical skills in students that will allow them to evaluate their own work.
Prerequisites	NA
Course contents	New analysis of contemporary artistic currents: the accumulated codes and a reflection on the age of reproducibility. Image as Modernity. The Symbol, the Sign, the Icon. The photographic image as a modern look.
Recommended Reading	BARTHES (Roland), <i>A Câmara Clara</i> , 2001. BERGER (John), <i>Modos de ver</i> , Barcelona, 2005. CALABRESE (Omar), <i>A Idade Neobarroca</i> , 1999. DUBOIS (Philippe), <i>O Acto Fotográfico</i> , 1991. FOUCAULT (Michel), <i>Vigiar e Punir</i> , 2003. HUYGHE (René), <i>O Poder da Imagem</i> , 1998. MAH (Sérgio), <i>A Fotografia e o Privilégio de um Olhar Moderno</i> , 2003. SONTAG (Susan), <i>On Photography</i> , 2002. SONTAG (Susan), <i>Olhando o Sofrimento dos Outros</i> , 2003.
Teaching Methods	Lectures. Practical classes (based on material provided by the students). Critical analysis of assignments, projects and studies.
Assessment Methods	Continuous Assessment: Mid-term test and/or Final Exam, Presentation of projects, studies and critical essays.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Gold, Platinum and Pigment Printing Processes
Course Code	964515
Type of Course	One-Semester course
Level of Course	NA
Year of Study	Second
Semester/Trimester	Second
Number of credits	6
Name of Lecturer	Luís Pavão and Paula Lourenço
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Provide knowledge of photographic non-conventional processes. Promote acquisition of learning and critical skills. Learn how to handle with photographic chemistry. Promote accuracy in describing procedures and materials.
Prerequisites	NA
Course contents	Photographic processes types. Paper selection. Contact printing negatives. Printing process: Gum dichrome. The printing process: cyanotype. Alternative printing supports. The printing process: Platinum type. The printing process: crysotype
Recommended Reading	<ul style="list-style-type: none"> – Ware, Mike, <i>Cyanotype – The history, Science and Art of Photographic Printing in Prussian Blue</i>. National Museum of Photography, Film and Television, Bradford, 1999. – Scopick, David, <i>The gum bichromate book: non-silver methods for photographic printmaking</i>, Focal Press, Boston London, 1991.
Teaching Methods	Lectures providing the theoretical and historical foundations and practical laboratory sessions (understanding and testing).
Assessment Methods	Continuous assessment consisting of two written tests, a theoretical presentation and laboratory reports. Final mark is the average of the two assessment components and minimum pass score is 10 (out of a 0-20 scale). A mark below 10 is allowed in one of the assessment components (one practical work or one theoretical test).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Digital Capture Systems
Course Code	964516
Type of Course	One-Semester course
Level of Course	NA
Year of Study	Second
Semester/Trimester	Second
Number of credits	5
Name of Lecturer	Cláudio Melo
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Development of skills which will allow understanding digitalization processes of photographic supports – negatives, slides and proofs.
Prerequisites	Digital Photography I
Course contents	Understanding and experimental application of the digitalization processes. Understanding the functioning of the different devices and respective software. Methods of digitalization of flat proofs, black-and-white negatives, colour negatives and colour slides.
Recommended Reading	- Blatner, david – real world scanning and halftones (3rd edition), david blatner; glenn fleishman; steve roth; conrad chavez , berkeley: peachpit press, 2004
Teaching Methods	Lectures providing the theoretical foundations and techniques to be applied in laboratory sessions.
Assessment Methods	Continuous assessment: Assiduity, commitment and creative development (30%). Practical assignments (20%). Theoretical tests (20%). Final work including report writing.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Image Theories II
Course Code	964514
Type of Course	One-Semester course
Level of Course	II
Year of Study	Second
Semester/Trimester	Second
Number of credits	4
Name of Lecturer	António Ventura
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Image Theories II consists of an in-depth analysis of image-related matters studied in the first semester of the course. The students should be able to approach image in general (not just photographic) in a critical and analytical way as well as make a critical appreciation of their classmates' assignments gaining awareness of their own artistic standpoint.
Prerequisites	Image Theories I
Course contents	Image as an imitation, mediation or vestige of reality. Photography as the basis for Modernity. <<Photography as a panoptical instrument: image in the construction of societies. Image in the post-historic frontier. The narrative image: the age of mute cinema, edition and production. The real image: the photograph as scientific evidence. Image, propaganda and power. From mechanical reproducibility to the loss of materiality: the digital era. The master piece and the copy.
Recommended Reading	BERGER (John), <i>Modos de ver</i> , Barcelona, 2005. CALABRESE (Omar), <i>A Idade Neobarroca</i> , 1999. FOUCAULT (Michel), <i>Vigiar e Punir</i> , 2003. HUYGHE (René), <i>O Poder da Imagem</i> , 1998.
Teaching Methods	Lectures. Practical classes (based on material provided by the students). Critical analysis of assignments, projects and studies.
Assessment Methods	Continuous Assessment: Mid-term test and/or Final Exam Presentation of projects, studies and critical essays.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Digital Photography II
Course Code	96459
Type of Course	Annual
Level of Course	II
Year of Study	Second
Semester/Trimester	Annual
Number of credits	10
Name of Lecturer	Cláudio Melo; Luís Ribeiro.
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Methods and techniques for digital image edition; production optimization processes; processes for the manipulation of images and for colour correction and control; operating with the SLR digital camera and medium-size digital back. Features and functioning methods of digital cameras.
Prerequisites	Digital Photography I
Course contents	CCD, CMOS sensors: impact of the technical parameters in the properties of a digital image. Optimization of the signal/noise ratio and raw file stop latitude. Digital photometry techniques. Image management and metadata generation and management. Thethered studio workflow and photo reports –lighting ratios for portrait photography and bench lighting techniques. Advanced post-production techniques applied to edition, retouch and colour correction in the publishing, fashion and product sectors. Colour adjustment and correction with adjustment layers, channels, masks and vectors. Noise control techniques. Action parameterization and script use. Hardware optimization and Photoshop configuration.
Recommended Reading	Haynes, B. - Photoshop 7 Artistry: Mastering The Digital Image- Barry Haynes; Wendy Crumpler, Pearson Education, 2002.
Teaching Methods	Lectures providing the theoretical foundations and techniques to be applied in laboratory or studio sessions.
Assessment Methods	Continuous assessment (30%) Practical assignments including report writing (20%). Theoretical/practical tests (20%). Final work including report writing (30%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Photography II
Course Code	96458
Type of Course	Annual
Level of Course	II
Year of Study	Second
Semester	Annual
Number of credits	15
Name of Lecturer	José Soudo, Duarte Netto, Márcio Vilela
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Provide the students with technical and creative knowledge that allows them to maximize available tools for multi-purpose photographic production using small- and medium-size cameras, all photosensitive supports, all types of lighting and all light spectra.
Prerequisites	Photography I
Course contents	Handling any type of camera and lens; perspective; magnification; depth of field; basic photometry; ISO scale; reproducibility; integrated and autonomous photometers; analogue and digital photosensitive supports; chemical and digital processing. Magnification from any support. Colour theory in photography; light sources and its spectra; light modelling.
Recommended Reading	Manual de Técnicas Fotográficas; Manual de Óptica Fotográfica; Manual de Iluminação Fotográfica; Manual de Cor Fotográfica – José Soudo e Manuel Silveira Ramos – ed: Cenjor
Teaching Methods	Lectures: expositive and explorative activities, case studies; multimedia presentations. Practical classes: the discovery method; case studies; individual and group assignments; field work; studio; analogue and digital laboratory.
Assessment Methods	Continuous assessment: two written tests (40%); practical assignments with report (60%). Minimum pass score of 10 in both theoretical and practical components.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Sensitometry
Course Code	964510
Type of Course	Annual
Level of Course	NA
Year of Study	Second
Semester/Trimester	Annual
Number of credits	6
Name of Lecturer	Rui Gonçalves
Objectives of the course (preferably expressed in terms of learning outcomes competences)	The response to light of photosensitive, chemical and physical materials.
Prerequisites	Basics of mathematics and physics.
Course contents	<p>1 – Fundamentals of mathematics and physics</p> <p>2 – Natural light and artificial sources of light.</p> <p>3 – The human eye.</p> <p>4 – Densitometers and sensitometers.</p> <p>5 – Sensitometric results and applications.</p> <p>6 – Photographic photometry.</p> <p>7- Photoelectric effect. Digital detector. Current colour CCD.</p> <p>8 – Digital performance.</p> <p>9 – Case study on the scientific application of image.</p>
Recommended Reading	<p>C. Arnold, P. Rolls, J. Stewart, <i>Applied Photography</i> Edited by D. Spencer, Focal Press Limited, 1971</p> <p>Pierre Glaflkidès, <i>Chimie et Physique Photographiques</i>, Deuxième Partie, Edition de L'Usine, 1987</p> <p>Jack Eggleston, <i>Sensitometry for Photographers</i>, Focal Press, 1990</p> <p>José Pinto Peixoto, <i>A Radiação Solar e o Ambiente</i>, Comissão Nacional do Ambiente, 1981</p>
Teaching Methods	Lectures providing concepts, principles and applications associated with the operation of photo cameras.
Assessment Methods	A written mid-term test during the regular examination period.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Emulsions
Course Code	964521
Type of Course	One-Semester course
Level of Course	NA
Year of Study	Third
Semester/Trimester	First
Number of credits	6
Name of Lecturer	Luís Pavão and Paula Lourenço
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Provide in-depth knowledge of the white and black photographic process. Promote acquisition of learning and critical skills. Promote accuracy in describing procedures and materials used.
Prerequisites	NA
Course contents	Emulsions: fundamentals. Emulsion manufacturing process. Gelatine. Emulsion behaviour and photographic processes. Colour sensitivity of the photographic emulsions. Support preparation. Characteristic curve and sensitivity.
Recommended Reading	Wall, E.J., <i>Photographic Emulsions, their preparation and coating on glass, celluloid and paper, experimentally and on the large scale</i> ; American Photographic Publishing Co. Boston, 1929. Hayball White, Laurie, <i>Advanced Infrared Photography Handbook</i> . Amherst Media, Inc., Amherst, New York, 2001. Croome, R. J.; Clegg, F. G. : <i>Photographic Gelatin</i> . The Focal Press, London and New York, 1965. Arnaud, P.; <i>Curso de Química Orgânica</i> , Dinalivro, Lisboa, 1989, tradução de Mário Nogueira.
Teaching Methods	Lectures providing the theoretical and historical foundations and practical laboratory sessions (understanding and testing).
Assessment Methods	Continuous assessment consisting of two written tests, a theoretical presentation and laboratory reports. Final mark is the average of the two assessment components and minimum pass score is 10 (out of a 0-20 scale). A mark below 10 is allowed in one of the assessment components.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Digital Printing
Course Code	964520
Type of Course	One-Semester course
Level of Course	NA
Year of Study	Third
Semester/Trimester	First
Number of credits	6
Name of Lecturer	Cláudio Melo; Luís Ribeiro.
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Development of skills that will allow in-depth knowledge of the main printing methods and technologies.
Prerequisites	Digital Photography II; Digital Capture Systems
Course contents	Principles of printer technology: ink jet; thermal wax; thermal sublimation, laser and offset. Basics of half-tone and tone reproduction. Paper and ink properties. Correction and edition techniques for ink jet printing. Edit and finish techniques. Author books.
Recommended Reading	<ul style="list-style-type: none"> - Blatner, david – real world scanning and halftones (3rd edition), david blatner; glenn fleishman; steve roth; conrad chavez , berkeley: peachpit press, 2004 - Johnson, harald – mastering digital printing – the photographers and artist's guide to high-quality digital output/ harald johnson, cincinnati: muska&lipman, 2003. isbn: 1 929685 65 3
Teaching Methods	Lectures providing the theoretical foundations and techniques to be applied in laboratory sessions.
Assessment Methods	Continuous assessment: Assiduity, commitment and creative development (30%). Practical assignments (15%). Theoretical tests (15%). Final work including report writing (20%). Mid-term test (20%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Colour Management
Course Code	964523
Type of Course	One-Semester course
Level of Course	NA
Year of Study	Third
Semester/Trimester	Second
Number of credits	4
Name of Lecturer	Cláudio Melo
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Development of skills will allow: understanding capture, edition and printing processes making use of ICC colour profiles and colour management modules of the various software packages for Mac and PC.
Prerequisites	Digital Photography II; Digital Capture Systems; Digital Printing
Course contents	Understanding the theoretical foundations of a colour management system and CIE mediation system. Calibration and characterization of CRT and LCD screens. Generation of colour profiles for SRL cameras and digital backs using the Profile Maker software. Methods and techniques for the generation of profiles for ink jet printers, minilab (frontier), lambda or offset.
Recommended Reading	Blatner, David – Real World Scanning And Halftones (3rd Edition), David Blatner; Glenn Fleishman; Steve Roth; Conrad Chavez , Berkeley: Peachpit Press, 2004 Fraser, Bruce – Real World Color Management/ Bruce Fraser; Chris Murphy; Fred Bunting, Berkeley: Peachpit Press, 2003. Johnson, Harald – Mastering Digital Printing – The Photographers And Artist’s Guide To High-Quality Digital Output/ Harald Johnson, Cincinnati: Muska&Lipman, 2003.
Teaching Methods	Lectures providing the theoretical foundations and techniques to be applied in laboratory sessions.
Assessment Methods	Continuous assessment: Assiduity, commitment and creative development (30%). Practical assignments (20%). Theoretical tests (20%). Final work including report writing (30%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Chromogenous Processes
Course Code	964522
Type of Course	One-Semester course
Level of Course	NA
Year of Study	Third
Semester/Trimester	Second
Number of credits	6
Name of Lecturer	Luís Pavão and Paula Lourenço
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Understanding the basics of colour photography. Understanding the functioning of customary colour printing processes. Understanding colour processes from a chronological perspective. Visual sensitivity in what concerns colour adjustment. Gaining colour printing experience.
Prerequisites	NA
Course contents	Colour magnification. Chromogenous negatives and colour printing. Colour development and sensitometry. The different printing processes. Dominant spot colour. Colour analysis methods. History of the chromogenous process.
Recommended Reading	<ul style="list-style-type: none"> - Welford, S, Spencer, D. A.: <i>L. P. Clerc's Photography Theory and Practice, # 6 Colour Processes</i>, edited by D.A. Spencer, Focal Press, London and New York, 1971. - Coe, Brian, <i>Colour Photography, The first hundred years 1840-1940</i>, Ash & Grant, London, 1978 - Wall, E. J., <i>The History of Three-Color Photography</i>, American Photographic Publishing Company, Boston, USA, 1925 - Friedman, Joseph S., <i>History of Color Photography</i>, The Focal Press, London and New York, 1968.
Teaching Methods	Lectures providing the theoretical and historical foundations and practical laboratory sessions (understanding and testing).
Assessment Methods	Continuous assessment consisting of two written tests, a theoretical presentation and laboratory reports. Final mark is the average of the two assessment components and minimum pass score is 10 (out of a 0-20 scale). A mark below 10 is allowed in one of the assessment components.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Contemporary Photography Critics
Course Code	964519
Type of Course	Annual
Level of Course	NA
Year of Study	Third
Semester/Trimester	Annual
Number of credits	10
Name of Lecturer	Duarte Amaral Netto, Invited Professors
Course Title	Provide skills in contemporary knowledge and photographic practices.
Prerequisites	NA
Course contents	The evolution of portrait photography. New documental practices. The inheritance of German photography. New Objectivity and “archive project” containing daily-life images. The contemporary presence of German Objectivity: the same assumptions in the construction of a photographed world? Photography and cinema. Video Art. Fiction and reality, photographic construction. Analogies and appropriations in contemporary photography.
Recommended Reading	Benjamin, Walter – Sobre Arte, Técnica, Linguagem e Política. Relógio d`Água. 1992.; Berger, John – Sobre o Olhar. Editorial Gustavo Gili.; Berger, John – Sobre las propiedades del retrato fotográfico. Editorial Gustavo Gili. 2006.; Freund, Gisele – Fotografia e Sociedade. Col. Comunicação e Linguagens, Ed. Vega.; Freund, Gisele – La fotografía como documento social. Col. FotoGGrafia, Editorial Gustavo Gili.; Krauss, Rosalind – O Fotográfico. Col. FotoGGrafia, Editorial Gustavo Gili.; Sontag, Susan – On Photography. Penguin. 2002.; Wall, Jeff – Selected Essays and Interviews. Moma, NY.; Wells, Liz – The Photography Reader. Routledge. Third Edition, 2004
Teaching Methods	Lectures resorting to audiovisual media to present and explore course content.
Assessment Methods	Continuous assessment consisting of oral presentations (70%) and a final written assessment (30%).
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Photography III
Course Code	964517
Type of Course	Annual
Level of Course	III
Year of Study	Third
Semester	Annual
Number of credits	15
Name of Lecturer	José Soudo, Valter Ventura
Objectives of the course (preferably expressed in terms of learning outcomes competences)	Provide the students with technical and creative knowledge that allows them to maximize available tools for multi-purpose photographic production using any sort of camera, photosensitive support on any sort of lighting from any spectrum of light.
Prerequisites	Photography II
Course contents	Medium and large-size cameras; use of all optical media and all photosensitive supports; relevant chemical and computer processes. Analytical photometry. “Zone system”. Photographic colour. Colour theory. Light sources and spectra and its appropriateness to supports. Light control and modelling.
Recommended Reading	-The Camera, The Negative, The Print – Ansel Adams – ed: Little Brown & comp; Lighting for photography – Walter Nurnberg – ed: Focal Press; Photography with large format cameras – ed: Amphoto; The life of a photography – Lawrence Keefe – ed: Focal Press; Manual de Técnicas Fotográficas, Manual de Óptica Fotográfica, Manual de Iluminação Fotográfica, Manual de Cor Fotográfica – José Soudo e Manuel Silveira Ramos – ed: Genjor
Teaching Methods	Lectures: expositive and explorative method, case studies; multimedia presentations. Practical classes: the discovery method; case studies; individual and group assignments; field work; studio; analogue and digital laboratory.
Assessment Methods	Continuous assessment: three written tests (40%); practical assignments with report (60%). Minimum pass score of 10 in both theoretical and practical components.
Language of Instruction	Portuguese

B – Description of individual course units

Course Title	Photography Project
Course Code	964518
Type of Course	Annual
Level of Course	NA
Year of Study	Third
Semester	Annual
Number of credits	13
Name of Lecturer	José Soudo
Objectives of the course (preferably expressed in terms of learning outcomes competences)	The students will carry out individual Projects where they will have the opportunity to apply the concepts learned and use their full creative capacity. This concept of Project includes the students' active involvement within an environment of absolute freedom to learn. Project should be the result of a personal motivation and of a profound reflection upon its object.
Prerequisites	NA
Course contents	Author photographers will be giving conferences on their fields of specialty. In collaboration with the lecturer, they will analyse the work in progress for each Project.
Recommended Reading	Kodak encyclopedia of practical Photography- ed: Amphoto; The Camera The Negative The Print – Ansel Adams – ed : Little Brown and Comp; Óptica – Eugéne Hecht – ed: Fundação Calouste Gulbenkian; Lighting for photography – Walter Nurnberg - ed: F. Press; The life of a photography – Lawrence Keefe - ed: F. Press.
Teaching Methods	Lectures: expositive and explorative method, case studies; multimedia presentations; Conference/Seminar. Practical classes: the discovery method; case studies analysis; individual and group assignments; field work; studio; analogue and digital laboratory.
Assessment Methods	The projects will be analysed in pre-established dates according to the “work in progress” concept. Final Project and Report will be submitted for appreciation by a jury and presented orally.
Language of Instruction	Portuguese