

## COURSE OUTLINE

### DIGITAL IMAGE PROCESSING II

#### (1) GENERAL

SCHOOL	APPLIED ARTS & CULTURE		
ACADEMIC UNIT	DEPARTMENT OF GRAPHIC DESIGN & VISUAL COMMUNICATION		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	N1-7160	SEMESTER	7 <sup>th</sup>
COURSE TITLE	DIGITAL IMAGE PROCESSING II		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		2	
Laboratory Practice		2	
Total		4	6
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Special background		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	<a href="https://eclass.uniwa.gr/courses/GD119/">https://eclass.uniwa.gr/courses/GD119/</a> (lectures) <a href="https://eclass.uniwa.gr/courses/TGT105/">https://eclass.uniwa.gr/courses/TGT105/</a> (lab)		

#### (2) LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <li>• <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i></li> <li>• <i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i></li> <li>• <i>Guidelines for writing Learning Outcomes</i></li> </ul>
<p>Upon successful completion of the course the student is expected to be able to:</p> <ul style="list-style-type: none"> <li>• understand advanced concepts related to the reception and processing of digital images.</li> <li>• study the characteristics and apply advanced techniques related to the digital image processing in the field of Graphic Arts science.</li> <li>• acquire appropriate skills for the analysis and solution of problems related to the processing of black and white and color digital images, as well as their preparation for cross media applications.</li> </ul>

### **General Competences**

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information,  
with the use of the necessary technology  
Adapting to new situations  
Decision-making  
Working independently  
Team work  
Working in an international environment  
Working in an interdisciplinary environment  
Production of new research ideas

Project planning and management  
Respect for difference and multiculturalism  
Respect for the natural environment  
Showing social, professional and ethical responsibility and sensitivity to gender issues  
Criticism and self-criticism  
Production of free, creative and inductive thinking  
.....  
Others...  
.....

- Search, analysis and synthesis of data and information, using the appropriate technologies.
- Decision making.
- Working independently
- Working in groups.
- Promoting free, creative and inductive thinking.
- Project design and management.

### (3) SYLLABUS

#### **COURSE CONTENT**

##### **Lectures**

- Binary images
- Morphological processes
- Geometric corrections
- Filters (high pass, low pass, Statistical distribution)
- Periodic and non-periodic noises
- Noise control filters
- Proof
- Image composition
- Fake colors
- Safe colors for all systems
- Real color workspaces and the need to introduce color profiles
- Color management with PostScript
- Color management with ICC-profiles
- Image compression techniques

##### **Laboratory practice**

The laboratory part of the course includes individual and group exercises, which through special software aim at:

- Understanding the parameters involved in the process of digitizing an analog original, as well as the tonal and color processing of the final digitized image.
- The analysis of advanced black and white image processing techniques as well as their use to create a color effect.
- In the analysis of advanced Retouch image techniques and in sharpening performance

- techniques.
- In the rendering of shadows on objects that are cut off from their natural environment and then placed in a new composition.
  - Improving digital images using ready-made and custom filters.
  - Creating and managing image files for multimedia applications.

**(4) TEACHING and LEARNING METHODS - EVALUATION**

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	ICT are used both in Theory and Workshops. The learning process is supported through the electronic platform e-class.	
<b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.  The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	50
	Laboratory practice	50
	Study and analysis of bibliography	10
	Tutorials	40
	Course total	150
<b>STUDENT PERFORMANCE EVALUATION</b> <i>Description of the evaluation procedure  Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other  Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Oral and written evaluation Short-answer as well as open-ended questions Problem solving Written work (essay) Laboratory work Student evaluation criteria: <ul style="list-style-type: none"> <li>• Weekly participation in the workshops.</li> <li>• Keeping the distinct time schedule.</li> <li>• Participation in debates made on relevant topics both on lectures and laboratory practice.</li> <li>• Assessment of laboratory work throughout the semester.</li> </ul> The evaluation criteria and the time schedule are posted at the start of the course at the UNIWA e-class website. All relevant information is explained in detail at the beginning as well as throughout the semester during the weekly lectures.	

## (5) ATTACHED BIBLIOGRAPHY

### **Greek Sources**

1. Αναγνωστόπουλος Ε. Χρήστος-Νικόλαος: Επεξεργασία Ψηφιακών Εικόνων, Αρχές και Εφαρμογές στο Πεδίο του Χώρου, Εκδόσεις Τζιόλα, 2018
2. Νικόλαος Η. Παπαμάρκος, Ψηφιακή Επεξεργασία και Ανάλυση Εικόνας (3η έκδοση), Νικόλαος Παπαμάρκος 2015.
3. Ι. Πήτας, Ψηφιακή επεξεργασία Εικόνας, Θεσσαλονίκη 2001.
4. Teaching material posted in the e-class.
5. R.C.Gonzalez, R.E.Woods: Ψηφιακή Επεξεργασία Εικόνας (4η έκδοση) Εκδόσεις Τζιόλα, 2011.

### **International Sources**

1. G.A.Baxes : Digital Image Processing. Principles and Applications John Wiley & Sons Inc., Toronto, 1994 .
2. W.Mikolasch: Schwarzweissreproduktion Polygraph Verl., Frankfurt a.M. 1984.
3. W.Mikolasch: Farbreproduktion, Polygraph Verl. Frankfurt a.M. 1984.
4. A. Jain: "Fundamentals of Dig. Image Processing", Prentice Hall, 1989.
5. M.D. Levine, "Vision in Man and Machine", McGraw-Hill, 1985.
6. R.C. Gonzalez and R.E. Woods, "Digital Image Processing", Addison-Wesley, New York, 1993.
7. R. Klette and P. Zamperoni, "Handbook of Image Processing Operators", John Wiley and Sons, Chichester, 1996.
8. J.C. Russ, "The Image Processing Handbook", CRC Press, Springer, IEEE Press, 1999.
9. K.R. Castleman, "Digital Image Processing", Prentice Hall, 1996.