

## COURSE OUTLINE

### (1) GENERAL

|                                                                                                                                                                                                                                                                       |                                          |                              |                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------|-----------------|
| <b>SCHOOL</b>                                                                                                                                                                                                                                                         | SCHOOL OF FINE ARTS                      |                              |                 |
| <b>ACADEMIC UNIT</b>                                                                                                                                                                                                                                                  | DEPARTMENT OF FINE ARTS AND ART SCIENCES |                              |                 |
| <b>LEVEL OF STUDIES</b>                                                                                                                                                                                                                                               | UNDERGRADUATE                            |                              |                 |
| <b>COURSE CODE</b>                                                                                                                                                                                                                                                    | <b>ETEΠ527</b>                           | <b>SEMESTER</b>              | <b>5th, 7th</b> |
| <b>COURSE TITLE</b>                                                                                                                                                                                                                                                   | Digital Art III                          |                              |                 |
| <b>INDEPENDENT TEACHING ACTIVITIES</b><br><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> |                                          | <b>WEEKLY TEACHING HOURS</b> | <b>CREDITS</b>  |
|                                                                                                                                                                                                                                                                       |                                          | 3                            | 3               |
|                                                                                                                                                                                                                                                                       |                                          |                              |                 |
|                                                                                                                                                                                                                                                                       |                                          |                              |                 |
| <i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>                                                                                                                                              |                                          |                              |                 |
| <b>COURSE TYPE</b><br><i>general background, special background, specialised general knowledge, skills development</i>                                                                                                                                                | Skills Development                       |                              |                 |
| <b>PREREQUISITE COURSES:</b>                                                                                                                                                                                                                                          |                                          |                              |                 |
| <b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>                                                                                                                                                                                                                      | Greek, English                           |                              |                 |
| <b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>                                                                                                                                                                                                                      | Yes                                      |                              |                 |
| <b>COURSE WEBSITE (URL)</b>                                                                                                                                                                                                                                           |                                          |                              |                 |

### (2) LEARNING OUTCOMES

#### Learning outcomes

*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.*

*Consult Appendix A*

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of Digital Art Forms III, students will have developed a comprehensive set of skills that combines technical training in creative coding with deep exploration of color theory and practice in digital arts. They will thoroughly understand the fundamental principles of color interaction and be able to apply them creatively through the p5.js programming language, developing interactive works that explore the dynamic relationship between color, form, and movement. Mastering these skills will enable them to design and implement original digital art works where algorithmic processes meet aesthetic sensitivity and artistic expression.

Participants will acquire the ability to critically analyze color systems and understand the scientific, perceptual, and cultural dimensions of color in digital creation. They will be able to program complex color harmonies and transitions, create dynamic palettes that respond to data or interactions, and explore the expressive power of color through computational methods. Additionally, they will become familiar with advanced creative coding techniques, including the use of randomness, noise, and algorithmic systems to create visually captivating and conceptually rich works.

Finally, students will have developed a mature artistic voice in the field of digital arts, combining technical excellence with conceptual clarity and aesthetic innovation. They will be able to position

their work within the broader context of contemporary digital art and articulate their creative choices clearly, both at technical and theoretical levels.

### **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...*  
*.....*

The course cultivates autonomous work capabilities through the development of personal artistic projects, while simultaneously enhancing creativity and innovation through exploring new expressive possibilities at the intersection of art and technology. Participants develop strong problem-solving skills as they learn to translate abstract artistic ideas into functional code, addressing technical challenges in creative ways. Critical and analytical thinking is strengthened through systematic analysis of visual phenomena and evaluation of aesthetic outcomes, while the ability to synthesize information from different fields of knowledge—programming, color theory, art history—leads to original creative solutions.

Digital Art Forms III also promotes the development of presentation and communication skills, as students learn to document and present their creative process and final works. Flexibility in thinking and adaptability are cultivated through the continuous experimentation that characterizes creative coding, where unexpected results often lead to new artistic directions. Finally, familiarity with contemporary digital tools and methodologies equips participants with the necessary skills to follow and actively participate in developments in the field of digital arts, providing them with the foundation for lifelong learning and professional development in the rapidly changing space of technologically-mediated artistic creation.

### (3) SYLLABUS

The course is structured around three interconnected thematic axes that develop in parallel and cross-fertilize throughout the semester. The first axis focuses on deepening understanding of color as a fundamental element of visual communication, exploring both its scientific and aesthetic dimensions. Students study different color models and systems (RGB, HSB, LAB), the psychology and symbolism of color, as well as historical and contemporary approaches to color harmony.

Additionally, phenomena such as color contrast, simultaneous contrast, and optical illusions related to color are examined, with emphasis on their application in the digital environment.

The second axis concerns technical training in the p5.js programming language, with particular emphasis on its capabilities for color expression and dynamic visualization. Participants become familiar with advanced color manipulation techniques, including the creation of custom color palettes, programmatic implementation of color transitions and gradients, and the use of algorithms for dynamic generation of color schemes. They are also introduced to the use of noise functions and randomness for creating organic color patterns, as well as developing interactive systems where color responds to external stimuli such as mouse movement, sound, or other input data.

The third axis focuses on digital art and creative applications of computational color. Through studying works by pioneering artists such as Vera Molnár, Casey Reas, and Rafael Lozano-Hemmer, students understand how algorithmic processes can become tools of artistic expression. They explore techniques such as particle systems, cellular automata, and fractals, always with emphasis on their color dimension. The course concludes with the development of personal projects where students synthesize all acquired knowledge to create original works that explore the expressive possibilities of color in the digital medium, from abstract compositions and data visualizations to interactive installations and generative animations.

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

| <b>DELIVERY</b><br><i>Face-to-face, Distance learning, etc.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Face-to-face, Distance learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------|----------|---|----------------------|---|---------------------|---|-------------------------------------------------------------------------------------|---|-------------------------------------|----|--|--|--|--|--|--|--|--|--------------|----|
| <b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b><br><i>Use of ICT in teaching, laboratory education, communication with students</i>                                                                                                                                                                                                                                                                                                                                                                                             | Use of ICT in Teaching, Laboratory Education and Communication with students                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |
| <b>TEACHING METHODS</b><br><i>The manner and methods of teaching are described in detail.</i><br><i>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.</i><br><i>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>                         | <table border="1"> <thead> <tr> <th><i>Activity</i></th><th><i>Semester workload</i></th></tr> </thead> <tbody> <tr> <td>Lectures</td><td>3</td></tr> <tr> <td>Laboratory Exercises</td><td>3</td></tr> <tr> <td>Artistic laboratory</td><td>9</td></tr> <tr> <td>Practical exercises where various methods are applied and case studies are analyzed</td><td>6</td></tr> <tr> <td>Independent study, project creation</td><td>21</td></tr> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> <tr> <td>Course total</td><td>42</td></tr> </tbody> </table>                                                                                                                                                               | <i>Activity</i> | <i>Semester workload</i> | Lectures | 3 | Laboratory Exercises | 3 | Artistic laboratory | 9 | Practical exercises where various methods are applied and case studies are analyzed | 6 | Independent study, project creation | 21 |  |  |  |  |  |  |  |  | Course total | 42 |
| <i>Activity</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <i>Semester workload</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |
| Lectures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |
| Laboratory Exercises                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |
| Artistic laboratory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |
| Practical exercises where various methods are applied and case studies are analyzed                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |
| Independent study, project creation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |
| Course total                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |
| <b>STUDENT PERFORMANCE EVALUATION</b><br><i>Description of the evaluation procedure</i><br><i>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</i><br><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i> | <p>Student performance assessment is based on the cumulative evaluation of the following criteria:</p> <ol style="list-style-type: none"> <li><b>Laboratory performance (40%):</b> Oral participation and contribution to the course, student interest and awareness during course delivery, as well as regular class attendance are evaluated.</li> <li><b>Completion of individual project (60%):</b> Individual student effort is evaluated through the project they are required to complete within the specified timeframe. During presentation, the application of taught material as well as further individual exploration of the topic are examined.</li> <li><b>Formative assessment:</b> Mid-semester formative assessment is conducted to monitor student progress.</li> </ol> |                 |                          |          |   |                      |   |                     |   |                                                                                     |   |                                     |    |  |  |  |  |  |  |  |  |              |    |

## (5) ATTACHED BIBLIOGRAPHY

### Primary Sources for p5.js and Creative Programming

- McCarthy, L., Reas, C., & Fry, B. (2015). *Getting started with p5.js: Making interactive graphics in JavaScript and Processing*. Make Community.
- Shiffman, D. (2015). *Learning Processing: A beginner's guide to programming images, animation, and interaction* (2nd ed.). Morgan Kaufmann.
- Arslan, E. (2018). *Learn JavaScript with p5.js: Coding for visual learners*. Apress.
- p5.js Reference. (n.d.). *p5.js official documentation*. <https://p5js.org/reference/>
- Shiffman, D. (n.d.). *The Coding Train* [YouTube channel].  
<https://www.youtube.com/c/TheCodingTrain>

### Basic Color Theory

- Albers, J. (2013). *Interaction of color* (Rev. ed.). Yale University Press. (Original work published 1963)
- Itten, J. (1961). *The art of color*. Reinhold Publishing Corporation.

### Art, Perception and Creative Process

- Arnheim, R. (1974). *Art and visual perception: A psychology of the creative eye* (Rev. ed.). University of California Press.
- Funk, M., & Zhang, Y. (2023). *Coding art: A guide to unlocking your creativity with the Processing language and p5.js in four simple steps* (2nd ed.). Apress.
- Reas, C., & Fry, B. (2014). *Processing: A programming handbook for visual designers and artists* (2nd ed.). MIT Press.

### Online Sources for Color

- Briggs, D. (2017). *The dimensions of colour*. <http://www.huevaluechroma.com/>
- MacEvoy, B. (n.d.). *Color vision and art*. Handprint. <http://handprint.com/LS/CVS/color.html>

### Additional Bibliography (Optional)

*For students who wish to deepen their knowledge in color science and digital art*

### Advanced Color Theory and Science

- De Grandis, L. (1986). *Theory and use of color*. Harry N. Abrams.
- Kuehni, R. G. (2012). *Color: An introduction to practice and principles* (3rd ed.). John Wiley & Sons.
- Livingstone, M. (2014). *Vision and art: The biology of seeing* (Rev. and expanded ed.). Abrams.
- Zuffi, S. (2012). *Color in art*. Abrams.

### Digital Art and Computational Aesthetics

- Maeda, J. (2004). *Creative code: Aesthetics + computation*. Thames & Hudson.
- Pearson, M. (2011). *Generative art: A practical guide using Processing*. Manning Publications.
- Bohnacker, H., Gross, B., Laub, J., & Lazzeroni, C. (2012). *Generative design: Visualize, program, and create with Processing*. Princeton Architectural Press.

### Technical Aspects of Color Science (Advanced Level)

- Agoston, G. A. (1987). *Color theory and its application in art and design* (2nd ed.). Springer-Verlag.
- Fairchild, M. D. (2013). *Color appearance models* (3rd ed.). John Wiley & Sons.
- Foster, D. H. (2011). Color constancy. *Vision Research*, 51(7), 674-700.  
<https://doi.org/10.1016/j.visres.2010.09.006>
- Küppers, H. (1982). *The basic law of color theory* (R. Marcinik, Trans.). Barron's.