

2026/27. 1. ACADEMIC YEAR

Name of subject: Colour Theory and Colorimetry		NEPTUN-code: RTXSZ1EBNF	Number of hours: lec+gs+lab 2+0+2	Credit: 4 Requirements: term mark
Course coordinator: Ákos Borbély Ph.D.		Title: associate professor	Prerequisite: none	
Curriculum:				
Basic notions of color theory. The physical, physiological and psychological bases connected to colors. The spectrum of electromagnetic radiation, optical radiations. The structure of the human eye, photoreceptors, the structure of the retina. The general context of visual performance, the basics of color vision, the properties of color perception. Color features. The factors influencing color sensing. The methods and tools of color communication: the questions of subjective and objective color characterization; color systems, color sample atlases. The basic principles of color systems. The bases of color measurement, the objective modelling of reduced color vision. The methods and instruments of color stimulus measuring spectrophotometers. Color contrasts. Color harmony systems. The effects and functions of colors, colorful environment. The basics of color dynamic design, the relationships of people and colors. The special characteristics of color usage. The questions of color reproduction, reproducible color ranges. Colorful techniques. The most important practical methods of the professional field.				
Detailed schedule of the course:				
Week	Topics of lectures and practices/labs			Lecturers
1	Lec: Colours. The importance of colour in design.			Ákos Borbély Ph.D.
	Lab: Description of the tasks of the semester. Tools - use of tools. Painting coloured surfaces - practice.			Prof. Csilla Kelecsényi DLA
2	Lec: Use of colours in historical periods I.			Ákos Borbély Ph.D.
	Lab: Tone painting exercise.			Prof. Csilla Kelecsényi DLA
3	Lec: Historical use of colour II. Contrasts.			Ákos Borbély Ph.D.
	Lab: Colour mixing exercise. Colour wheel editing.			Prof. Csilla Kelecsényi DLA
4	Notable colour contrasts.			Ákos Borbély Ph.D.
	Lab: Colour circle painting exercise I.			Prof. Csilla Kelecsényi DLA
5	Lec: Colour harmony types.			Ákos Borbély Ph.D.
	Lab: Colour wheel painting exercise II.			Prof. Csilla Kelecsényi DLA
6	Lec: Colour functions and their role in design.			Ákos Borbély Ph.D.
	Lab: Colour and tone painting exercise I.			Prof. Csilla Kelecsényi DLA
7	Lec: Physical, physiological and psychological principles of colour, colour communication and colour systems.			Ákos Borbély Ph.D.
	Lab: Colour and tone painting exercise II.			Prof. Csilla Kelecsényi DLA
8	Lec: Spectrum of electromagnetic radiation; generation of optical radiation, spectra; luminescence, radiometric and photometric quantities.			Ákos Borbély Ph.D.
	Lab: Painting colour and tone painting exercise III.			Prof. Csilla Kelecsényi DLA
9	Lec: Structure of the human eye, photoreceptors, structure of the retina. Basics of human colour vision, properties of colour vision.			Ákos Borbély Ph.D.
	Lab: Colour and tone painting IV.			Prof. Csilla Kelecsényi DLA
10	Lec: The standard colour measurement system I-II.			Ákos Borbély Ph.D.
	Lab: Contrasts exercise I.			Prof. Csilla Kelecsényi DLA
11	Lec: Light sources, standard radiation distributions, colour reproduction.			Ákos Borbély Ph.D.
	Lab: Contrasts exercise II.			Prof. Csilla Kelecsényi DLA

2026/27. 1. ACADEMIC YEAR

12	Rector's Break	(-)
13	Lec: Seminary test (ZH)	Ákos Borbély Ph.D.
	Lab: Completion of practical work, submission	Prof. Csilla Kelecsényi DLA
14	Lec: Supplementary seminary test.	Ákos Borbély Ph.D.
	Lab: Evaluation of practical work. Substitute submission of tasks.	Prof. Csilla Kelecsényi DLA
Mid-term requirements:		
<i>Attendance at lectures and practices/labs</i> Participation in the exercises is compulsory, absence according to the TVSZ. Attendance at lectures is also compulsory, for the successful completion of the semester (exam) knowledge of the material presented in the lectures is required.		
<i>Seminary tests, reports, essays, etc.</i> Lab: Completion of practical tasks. Lec: – Week 13: 1 Seminary test. For a satisfactory final examination grade, 50% of the maximum mark must be achieved. – Week 14: Supplementary seminary test.		
<i>The method of obtaining a signature and examination conditions:</i> To obtain a mid-year mark, you must pass the final e-test and complete the practical assignments at the appropriate level. The mid-year mark is calculated as 50% of the examination and 50% of the practical work. A student who failed the test or the completion of the work at the end of the semester may attempt to obtain it once, in the first two weeks of the examination period. The final mark will be based on the written test results and the submitted work.		
Professional competencies:		
– Knowledge of basic ergonomic and psychological methods, rules and standards for the design of industrial products. – Understands and uses the online and printed literature in Hungarian and at least one foreign language. – Knows and uses the language and special terms of his/her field of specialisation in Hungarian and at least one foreign language. – Ability to justify decisions on the designed product, to test them and to support them with technical and standard test methods.		
Literature:		
Compulsory: 1. https://elearning.uni-obuda.hu/ electronic notes and aids prepared by the instructor 2. Josef Albers: Interaction of Color: 50th Anniversary Edition. Yale University Press, United States, 2020. ISBN13 9780300179354 Recommended: 3. Ákos, Borbély: Spectral and Colorimetric Evaluation of Laminated Digital Prints In: Edit, Csanák (szerk.) IJCELIT 2023. Book of Proceedings of the 9th International Joint Conference on Environmental and Light Industry Technologies, Budapest, Magyarország: Óbudai Egyetem Rejtő Sándor Könnyűipari és Környezetmérnöki Kar (2024) pp. 38-43., 6 p.		