

INFORMATION ON GRAPHIC AND MEDIA TECHNOLOGY STUDY PROGRAMME

Version (valid from): 2023-3 (01. 10. 2023)

Basic information

Name	Graphic and media technology
Type	Higher education professional study programme
Level	First level
KLASIUS-SRV	Academic higher education (first Bologna cycle) (16203)
ISCED	Arts (21)
KLASIUS-P	Audio-visual techniques and (multi)media production (broad programmes) (2130)
KLASIUS-P-16	Audio-visual techniques and media production (0211)
Frascati	Engineering and technology (2)
Level SQF	Level SQF 7
Level EQF	Level EQF 6
Level QF-EHEA	First level
Areas/modules/field of study	No subdivision (study programme)
Member of the University of Ljubljana	Faculty of Natural Sciences and Engineering, Aškerčeva cesta 12, 1000 Ljubljana, Slovenia
Duration (years)	3
ECTS credits per year	60
Type of study	Full-time and part-time

Basic goals of the programme

Definition of the basic objectives of the programme or general and subject-specific competences

Graphic activity is a typical service activity, since it does not market its own products, but rather services. By using graphic technology, it enables dissemination, sharing and storing information in the form of graphic products. Almost the entire production is dedicated to a familiar customer, i.e. a publishing house, a company, organisation or individual. The characteristics of the industrial production and organisation can be seen from the division of labour in the activity present here since Gutenberg. There are many companies on the market today in publishing, graphic etc. activities that partially or fully participate in the creation of graphic products. The division of labour is thus present not only in printing houses, but also more widely. The use of computer technology has resulted in intense connection with other media, distribution of production of graphic products, organisational changes of the structures, the need for new skills and major changes in the existing graphic professions and the emergence of new ones.

The perspectives of the graphic activity are evaluated very differently. The fact is that in the past, the new media did not represent a replacement for the old media, but primarily a supplement to it, filling new market niches. The same applies to the Internet, for which many predict that it will take over the role of all existing media and print media as well. We can expect that the print media will continue to adopt new technologies and successfully exploit them. These trends are already noticeable and confirmed by the growth of paper production and successful business of equipment suppliers for the graphic industry. The graphic industry has reached the period of maturity, which provides its growth rate for the following few decades and which is comparable to other “mature” industries. The turning point will come with the introduction of completely new communication technologies that will be based on e.g. natural language recognition, artificial intelligence and natural man-machine interaction.

A characteristic of the graphic activity is also the connection with a specific language area, since texts in the national language are also an integral part of the information carried by the graphic product language. This provides a perspective of the graphic activity in national frameworks and at the same time represents an obstacle to the spread of activities outside the national language area.

The basic goal of the higher education professional study programme Graphic and Media Technology is to train an expert of sufficient professional breadth who will be capable of managing, in terms of technology and execution, diverse and demanding graphic activities, and media activities related to graphic arts.

In accordance with the principles of the Bologna process, the programme presents a deviation from the philosophy of teaching with an otherwise correct arrangement of different technologies placed on selected natural sciences courses. In the default learning philosophy, besides the acquired knowledge, the addition of other competences of graduates, their skills and abilities are also important, in this case with the emphasis on practical orientation. Due to the rapid development of technological procedures in the field of graphic and media technology, graduates acquire broad initial theoretical and professional knowledge and understanding associated with the awareness and ability of continuous additional education.

General competences (learning outcomes)

- extensive professional knowledge in the field of graphic and media technology, augmented by selected knowledge in the areas of natural sciences, management, information and communication technology, aesthetics and graphic design;
- capacity to link knowledge of natural sciences with knowledge of technological fields;
- ability to demonstrate practical skills and immediately accept practical assignments;
- capacity to identify concrete and abstract practical problems, their theoretical analysis, finding solutions and taking appropriate action;
- developed ability to learn independently in the professional field;
- capacity to participate in development and research work, and transfer development and research achievements into practice;
- capacity to understand the interdependency between technology and design;
- capacity to understand artistic notation and its technological transformation into graphic products;
- ability to communicate with colleagues and experts in related disciplines, which enables active participation in group work, also in projects based on the connection of professional legalities with design practice;
- well-developed professional ethical and environmental responsibility.

Subject-specific competences (learning outcomes)

- knowledge and understanding of foundations, development and importance of communication and communication technologies, understanding visual, audio and combined communication, input process, processing and rendering of information and features of interactive communication;
- capacity of general and specific sensitivity in observation, analysis and valuation, natural, civilisational, design and artistic visual systems;
- capacity to connect natural sciences knowledge with knowledge from other (technological) fields;
- capacity to use and know technological procedures for making reproductions for all types of printing and computer image design with various software;
- knowledge and understanding of conventional and digital printing technologies;
- knowledge and understanding of colour metrics;
- knowledge and understanding of the meaning of individual elements of typography, capacity of generating new ideas (creativity) in the use and arrangement of typographic elements for various graphic products and in various media;
- knowledge and understanding of graphic materials, mastering the technological characteristics of analogue-digital conversion of originals for printed media;
- ability to use theoretical knowledge in evaluating and solving concrete ecological problems in the graphic industry;
- knowledge and understanding of the basics of postpress;
- knowledge and understanding of testing methods in graphic arts;
- knowledge of the specifics of technological processes in the production of a book, magazine, newspaper, promotional literature and other publications for print media;
- mastery of fundamental theoretical interdisciplinary skills in design, use and evaluation of user interfaces;
- knowledge and understanding of packaging materials manufacturing processes;
- knowledge and understanding of the basics and development of printing plates and production technologies for the printing forms of various printing technologies;
- mastering basic terms and fundamental concepts of data structures and data transfer;
- capacity to solve concrete work problems of graphic technology with the use of scientific methods; analysis of the value of graphic products and services, systematisation and evaluation of the complexity of work in individual graphic departments and companies;
- capacity to understand modern concepts of quality management systems and the concept of quality;
- knowledge and understanding of the workings of the graphic products and services market;

- capacity to functionally use the techniques of interpersonal communication, negotiation, teamwork, leadership and creative thinking;
- mastering the methodology of preparing a business plan;
- knowledge of the structure, content and possibilities of using bibliographic and factual databases for the contents of the study field.

Enrolment conditions

Enrolment in the programme shall be possible for any person who has successfully passed the final examination in any four-year secondary school programme, vocational matura or general matura exam.

Criteria for selection in case of limited enrolment

If the number of candidates applying for the programme exceeds the number of available enrolment places, candidates shall be selected according to the following criteria:

- overall performance at the final examination, vocational matura or general matura exam (60%);
- overall performance in the 3rd and 4th years of secondary school (40%).

Criteria for crediting knowledge and skills obtained before enrolment

Students may be credited for knowledge which corresponds to the contents of the study programme Graphic and Media Technology and which has been achieved in various forms of prior education. The department Study Committee is in charge of crediting knowledge and skills obtained before the enrolment, which is done on the basis of the student's written application and provided certificates or other documents proving the type of knowledge successfully acquired.

When crediting knowledge acquired before the enrolment, the department Study Committee will take into account the following criteria:

- whether conditions for enrolling into a specific educational programme are adequate (required prior education for starting the study programme);
- whether the scope of the completed educational programme (the number of hours of prior education as compared to the scope of the course in question) adequately compares with the credited requirements;
- whether the areas covered by the prior education programme, which the applicant would like to have credited, are comparable to the courses dealt with in the faculty study programme.

The acquired knowledge and skills may be credited as a completed study activity if the conditions for taking part in the educational programme were at least finished secondary school education, if the prior educational programme encompassed at least 75% of the scope of the course and if at least 75% of its contents cover the same areas as the course the applicant would like to have credited. If the Committee finds that the acquired knowledge can be credited, it is granted the same number of ECTS points as awarded at the faculty for the course in question. A specific example of recognition of knowledge and skills acquired before the enrolment is the recognition of Practical training if the student has had full-time employment during their studies in a graphic arts (or related) organisation for a continuous period of at least 15 weeks. In this case, the employment must be proven by an appropriate document showing the duration of the employment and the activity of the organisation. Nevertheless, during the semester of the course, the student is required to prepare a report (final seminar) related to the student's work tasks in the organisation, under the guidance of a work and faculty mentor.

Assessment methods

Assessment methods are in accordance with the Statute UL of the University of Ljubljana and are specified in the curricula.

Student obligations

To enrol in the higher year, a student must complete all practical classes and obtain the following number of ECTS credit points for enrolment in each individual year:

- minimum of 54 ECTS credit points for enrolment in the 2nd year;
- 60 ECTS credit points from the 1st year and minimum of 54 ECTS credit points from the 2nd year for enrolment in the 3rd year.

The department Study Committee may exceptionally grant progression to a higher year for a student who has achieved at least 42 ECTS credit points in the previous year if there are justified reasons for exception. Justified reasons are listed in the Statute of the University of Ljubljana.

To re-enrol in the same year of the study (repetition of the same year), students must have:

- minimum of 28 ECTS credit points for the 1st year;
- minimum of 28 ECTS credit points for the 2nd year.

During the course of studies, a student can repeat a class once or change the study programme once for having failed to meet their obligations in the former study programme.

Transfer between programmes

Transfer is possible between two study programmes:

- that ensure the acquisition of comparable competences or learning outcomes at the end of the studies;
- among which, in line with the criteria for recognising the knowledge and skills acquired before enrolling in the first-level higher education study programme Graphic and Media Technology, at least half of the obligations according to the European Credit Transfer and Accumulation System (ECTS) can be recognised from the first study programme, referring to compulsory courses of the first-level higher education study programme Graphic and Media Technology.

An individual exam passed in the original study programme is recognised as passed in the first-level higher education study programme Graphic and Media Technology if the contents of both courses are at least 75% compatible. The recognised exam is evaluated with credit points in the original study programme, not exceeding the earmarked credit points in the first-level higher education study programme Graphic and Media Technology. A candidate can enrol into the 2nd or 3rd year of the first-level higher education study programme Graphic and Media Technology through transfer if:

- they meet the conditions for enrolment in the study programme,
- vacant places are available.

The department Study Committee determines for each candidate separately the extent to which it recognises the already completed study obligations, determines other obligations and decides which year the candidate can transfer to.

Requirements for completing studies

In order to complete their studies, students must complete all obligations in all enrolled courses, prepare a thesis and orally defend it.

Requirements for completing individual parts of the programme, if contained in the programme

The programme does not contain individual parts of the programme.

Professional or scientific or artistic title (and abbreviation)

Bachelor of Applied Science (B.A.Sc.)

STUDY PROGRAMME CURRICULUM GRAPHIC AND MEDIA TECHNOLOGY

STUDY PROGRAMME CURRICULUM GRAPHIC AND MEDIA TECHNOLOGY

2025/2026

Name of study programme	Graphic and media technology
Programme characteristics	
Type	higher professional
Cycle	bachelor
University of Ljubljana members	• Faculty of Natural Sciences and Engineering, Aškerčeva cesta 12, 1000 Ljubljana, Slovenija

Year 1, obvezni

1st semester

	University Course Code	Course title	Lecturers	Contact hours					Individual student work	Total hours	ECTS	Elective
				Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study				
1.	0148191	Photography and video	Marica Starešinič	30	0	30	0	0	60	120	4	no
2.	0068071	Basics of artistic expression	Marica Starešinič	30	30	0	0	0	60	120	4	no
3.	0068072	English for specific purposes	Barbara Luštek Preskar, prof. angl. in nem.	0	60	0	0	0	60	120	4	no
4.	0068076	Introduction to graphic media	Raša Urbas	30	15	30	0	15	90	180	6	no
5.	0068073	Theoretical basics of printing processes	Andreja Drobnič Vidic, Daniel Svenšek, Gregor Skačej, Janez Cerkovnik, Pavle Saksida	90	0	0	0	0	90	180	6	no
6.	0068075	Printing 1	Deja Muck	30	15	30	0	15	90	180	6	no
		Total		210	120	90	0	30	450	900	30	

2nd semester

	Contact hours	
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	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Elective
1.	0068070	Information technologies	Aleš Hladnik	30	15	30	0	15	90	180	6	no
2.	0068066	Colour metrics	Sabina Bračko	30	30	30	0	0	90	180	6	no
3.	0148198	Graphic prepress	Raša Urbas	30	15	30	0	15	90	180	6	no
4.	0068069	Graphic materials	Diana Gregor Svetec, Sabina Bračko	30	15	30	0	15	90	180	6	no
5.	0068074	Typographic elements	Klementina Možina	45	0	45	0	0	90	180	6	no
Total				165	75	165	0	45	450	900	30	

Year 2, obvezni

1st semester

				Contact hours								
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Elective
1.	0148202	Studio Photography	Jure Ahtik	15	15	30	0	0	60	120	4	no
2.	0068080	Artistic analysis of graphic products	Marica Starešinič	30	15	0	0	15	60	120	4	no
3.	0068081	Basics of interactivity and animation	Helena Gabrijelčič Tomc	30	15	45	0	0	90	180	6	no
4.	0068082	Standardisation of graphic processes	Deja Muck, Klemen Možina	30	15	30	0	15	90	180	6	no
5.	0068083	Statistics	Stanislav Praček	30	0	30	0	0	60	120	4	no
6.	0068084	Typographic design	Klementina Možina	30	15	45	0	0	90	180	6	no
Total				165	75	180	0	30	450	900	30	

2nd semester

				Contact hours								
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Elective

1.	0068077	Finishing graphic products	Urška Vrabčič Brodnjak	30	15	15	0	0	60	120	4	no
2.	0068078	Environmental protection in graphic arts	Maja Klančnik	45	15	30	0	0	90	180	6	no
3.	0111856	Izbirni		120	60	90	0	30	300	600	20	no
		Total		195	90	135	0	30	450	900	30	

Year 2, izbirni

2nd semester

				Contact hours								
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Elective
1.	0068043	Packaging 1	Diana Gregor Svetec	30	15	15	0	0	60	120	4	yes
2.	0148212	Video	Helena Gabrijelčič Tomc	30	15	30	0	15	90	180	6	yes
3.	0068045	Testing of graphic materials	Diana Gregor Svetec	30	15	30	0	15	90	180	6	yes
4.	0068046	Interactive media 1	Aleš Hladnik	30	15	30	0	15	90	180	6	yes
5.	0068048	Printing 2	Deja Muck	30	15	30	0	15	90	180	6	yes
6.	0068049	Printing plates	Maja Klančnik	30	15	15	0	0	60	120	4	yes
7.	0075638	User interface planning	Jože Guna	30	15	15	0	0	60	120	4	yes
8.	0068060	Basics of 3D modelling	Helena Gabrijelčič Tomc	30	15	45	0	0	90	180	6	yes
9.	0644018	Packaging materials and technology	Diana Gregor Svetec	30	15	45	0	0	90	180	6	yes
		Total		270	135	255	0	60	720	1440	48	

Year 3, obvezni

1st semester

				Contact hours								
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Elective

1.	0068086	Practical training	Habilitiran učitelj	0	0	0	0	0	900	900	30	no
		Total		0	0	0	0	0	900	900	30	

2nd semester

				Contact hours								
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Elective
1.	0111857	Izbirni		157	110	76	0	17	360	720	24	no
2.	0070322	Diploma work						90	90	180	6	no
		Total		157	110	76	0	107	450	900	30	

Year 3, izbirni

2nd semester

				Contact hours								
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Elective
1.	0068052	3D technologies	Deja Muck	30	15	15	0	0	60	120	4	yes
2.	0068053	Packaging 2	Diana Gregor Svetec	30	15	15	0	0	60	120	4	yes
3.	0148212	Video	Helena Gabrijelčič Tomc	30	15	30	0	15	90	180	6	yes
4.	0068045	Testing of graphic materials	Diana Gregor Svetec	30	15	30	0	15	90	180	6	yes
5.	0068056	Information sources	Danica Dolničar	30	15	15	0	0	60	120	4	yes
6.	0068057	Interactive systems	Aleš Hladnik	30	15	30	0	15	90	180	6	yes
7.	0068058	Planning graphic production	Andrej Demšar, Urška Stanković Elesini	45	30	15	0	0	90	180	6	yes
8.	0068059	Media design	Primož Fijavž	15	15	30	0	0	60	120	4	yes
9.	0068061	Entrepreneurship	Blaž Zupan	30	0	30	0	0	60	120	4	yes
10.	0068062	Business information systems	Raša Urbas, Urška Stanković Elesini	45	45	0	0	0	90	180	6	yes
11.	0068048	Printing 2	Deja Muck	30	15	30	0	15	90	180	6	yes
12.	0068064	Quality management	Klemen Možina	30	60	0	0	0	90	180	6	yes
13.	0068047	Media visualisation	Jure Ahtik	15	30	15	0	0	60	120	4	yes

14.	0642807	User interface Technologies	Jože Guna	30	30	0			60	120	4	yes
15.	0642806	Basics of 3D animation and simulation	Helena Gabrijelčič Tomec	15	15	30			60	120	4	yes
16.	0643469	Holistic thinking and acting	Andrej Demšar	30	30				60	120	4	yes
17.	0643470	Business communication	Andreja Jaklič	30	30				60	120	4	yes
18.	0644019	Trends in packaging development	Diana Gregor Svetec	30	15	30	0	15	90	180	6	yes
19.	0643981	Information competences	Danica Dolničar	30	15	15	0	0	60	120	4	yes
Total				555	420	330	0	75	1380	2760	92	

3D TEHNOLOGIJE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	3D tehnologije
Course title:	3D technologies
Članica nosilka/UL	UL NTF
Member:	

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068052
Koda učne enote na članici/UL Member course code:	11298

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	15	0	0	60	4

Nosilec predmeta/Lecturer:	Deja Muck
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Vpis v program. Pogoji za opravljanje obveznosti je prisotnost na predavanjih, seminarjih in vajah. Zahtevana prisotnost na vajah je 100 %.

Prerequisites:

Enrolment in the programme. Attendance at lectures, seminars and tutorials is a prerequisite for fulfilling obligations. The attendance requirement for tutorials is 100%.

Vsebina:

Predstavitev delokroga 3D-tehnologij.
3D-tehnologije zajema objektov:
- kontaktne (nedestruktivne),
- nekontaktne (reflektivne, presevne)
3D-skeniranje
- zajem specifičnih površinskih značilnosti objektov (topologija, tekstura, barva)
- digitalizacija objektov, kot hitrejša in enostavnejša pot k 3D upodobitvi
Fotogrametrija in videogrametrija (video produkcija in stabilizirane glave)
Blender
- seznanitev s programom za 3D-modeliranje

Content (Syllabus outline):

Presentation of 3D-technologies workflow.
3D-technology for objects capturing:
- contact (non-destructive)
- non-contact (reflective, transmissive)
3D-scanning
- capture of specific surface characteristics of objects (topology, texture, color)
- object digitization, as a faster and simpler way for 3D vizualization
Photogrammetry and videogrammetry (video production and stabilised head)
Blender
- familiarization with the program for 3D-modeling

- grobe osnove 3D-modeliranja - pregled in priprava datotek za 3D-tisk - pregled najpogostejših napak 3D-modelov 3D-tehnologije tiska - pregled razvoja in trendov - poglobljena predstavitev najpomembnejših tehnologij (prednosti, omejitve) - predstavitev materialov, mehanizmov delovanja posameznih procesov Izbira ustreznih tehnologije za doseg želenih končnih lastnosti tiskanega 3D-objekta. 3D tehnologije in različne resničnosti. Ozaveščanje pomembnosti integracije zelenih tehnologij z usmeritvijo na trajnostnem in ekološkem vidiku na področje 3D tehnologij.	- coarse basics of 3D-modeling - review and preparation of models for 3D-printing - overview of the most common defects of 3D-models 3D-printing technologies - review of the development and trends - in-depth presentation of the most important technologies (advantages, disadvantages) - presentation materials, mechanisms of action of individual processes Selection of the appropriate technology to achieve the desired final properties of the 3D-printed object. 3D technologies and various realities. Raising awareness of the importance of integrating green technologies with a focus on sustainable and environmental aspects in the field of 3D technologies.
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Temeljna literatura in viri/Readings:

- Militello G. Laura, Sushereba E. Christen, Ramachandran Sowmya, Handbook of Augmented Reality, Training design principles, Cambridge University Press, 2023.
- Pesce Marc, Augmented Reality, Polity Press, 2021.
- Da Silva Daniel Carneiro, Special Application of Photogrametry, InTech, 2012.
- Muck Deja, Križanovskij Igor: 3D-tisk, Ljubljana, 2015.
- Christopher Barnatt: 3D printing, Second Edition, Amazon, 2014.
- Ian Gibson, David W. Rosen, Brent Stucker: Additive Manufacturing Technologies, Springer, 2010.
- Christopher Barnatt: 3D printing, The next industrial revolution, First edition, Explaining the Future, 2013.
- Paulo Jorge Bartolo; Stereolithography, Materials, Process and Applications, Springer, 2011.

Dodatna literatura in viri:

- <http://www.wohlersassociates.com>
- <http://www.3ders.org/applications.html>
- <http://reprap.org>
- www.stratasy.com
- www.3dsystems.com
- <http://www.explainingthefuture.com>
- <http://www.blender.org>

Cilji in kompetence:

Predmet omogoča pridobitev osnovnega znanja s področja 3D-tehnologij, ki so vezana na digitalizacijo, upodobitev, pripravo modela za 3D-tisk in tisk. Osnovi cilj predmeta je seznaniti študente z najpomembnejšimi trendi na področju 3D-tehnologij, ter pridobiti kakovostno znanje predvsem o prednostih in omejitvah posameznih 3D-tehnologij tiska. Pri tem se usmerja tudi na uporabo zelenih tehnologij in materialov.

Cilj je, podati znanja, ki jih bodo lahko študentje koristno uporabili v nadaljnjem delu; kot. npr. izbrati ustrežno tehnologijo 3D-zajema in 3D-tiska glede na predhodno določene želene lastnosti končnega 3D-objekta.

Eden od pomembnih ciljev je tudi integracija 3D tehnologij z različnimi resničnostmi in ozaveščanje

Objectives and competences:

The course enables the acquisition of basic knowledge in the field of 3D technologies related to digitization, rendering, model preparation and 3D printing. The basic aim of the course is to familiarize students with the main trends in the field of 3D technologies and to acquire quality knowledge, especially about the advantages and limitations of each 3D printing technology. Another focus is on the use of environmentally friendly technologies and materials.

The goal is to impart knowledge that students can usefully apply in their further work, such as selecting the appropriate 3D acquisition and 3D printing technology based on the previously defined desired properties of the final 3D object.

One of the important objectives is also to integrate 3D technologies with different realities and to raise

pomena optimizacije procesov in trajnostnega razvoja.	awareness of the importance of optimizing processes and sustainable development.
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Predvideni študijski rezultati:

Študentje bodo osvojili najnovejša znanja s področja vseh najpomembnejših 3D-tehnologij zajema in tiska. Spoznali bodo postopek priprave modelov za 3D-tisk in napake, ki lahko nastanejo ob neustrezni pripravi. Ta znanja bodo študentom omogočala večjo kreativnost, konkurenčnost in možnost samostojnega nadaljnjega dela. Spoznali bodo integracijo 3D tehnologij in različnih resničnosti in pomembnost osredotočenosti na vidik trajnostnega razvoja.

Intended learning outcomes:

Students will gain the latest knowledge from the field of major 3D-technologies for capturing and printing. They will learn the process of preparing models for 3D-printing and the defects that can occur at unsuitable preparation. This knowledge will allow students greater creativity, competitiveness and the possibility for their further independent work. They will learn about the integration of 3D technologies and different realities, as well as the importance of the sustainable development aspect.

Metode poučevanja in učenja:

Predavanja, seminarji, laboratorijske vaje in / ali projektno delo potekajo v predavalnici, v laboratoriju in / ali preko spleta s pomočjo ustrezne opreme.

Learning and teaching methods:

Lectures, seminars, laboratory exercises, and/or project work will take place in the lecture hall, in the laboratory, and/or online using appropriate equipment.

Načini ocenjevanja:

Delež/Weight

Assessment:

Teoretični del, predavanja: pisni in/ali ustni izpit	60,00 %	Theoretical part, lectures: written and/or oral exam
Vaje	40,00 %	Tutorial

Ocenjevalna lestvica:

Grading system:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10
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Reference nosilca/Lecturer's references:

Univerzitetni, visokošolski ali višješolski učbeniki z recenzijo / Reviewed university, higher education or higher vocational education textbook:
 MUCK, Deja, KRIŽANOVSKI, Igor (avtor, ilustrator). 3D-tisk : [--- tehnologije 3D-tiska, priprava 3D-modelov za tisk, pojmovnik ---]. 1. izd. Ljubljana: Pasadena, 2015. 221 str.
 Izvirni znanstveni članki / Original scientific article:
 GREGOR-SVETEC, Diana, LESKOVŠEK, Mirjam, VRABIČ BRODNJAK, Urška, STANKOVIČ ELESINI, Urška, MUCK, Deja, URBAS, Raša. Characteristics of HDPE/cardboard dust 3D printable composite filaments. Journal of materials processing technology. February 2020, vol. 276, 9 str.
 Strokovni članek / Professional article:
 ŽIŽEK, Mojca, MUCK, Deja. Reliefna reprodukcija umetniškega dela. Grafičar : revija slovenskih grafičarjev. 2020, [št.] 4, str. 16-19.
 MUCK, Deja, ŠTULAR, Meta. Zgodovina, uporaba in opolnomočenje uporabnikov na pragu 4. industrijske revolucije. Pro Bauhaus. poletje 2020, [št.] 2, str. 114-119.
 TRČEK PEČAK, Tamara, MADŽARAC, Nada, MUCK, Deja. Med izvirnikom in kopijo : kaj vidimo z očmi, kaj "vidimo" s prsti. Grafičar : revija slovenskih grafičarjev. 2019, [št.] 4, str. 10-14.
 PIVAR, Matej, MUCK, Deja. 4D - tisk : 3D - tisk s četrto dimenzijo ... Grafičar : revija slovenskih grafičarjev. 2018, [št.] 6, str. 8-11.
 JANČIČ, Valentina, GABRIJELČIČ TOMC, Helena, MUCK, Deja, ČERČE, Luka, KOPAC, Janez. Optimizacija 3D-modela skenirane človeške glave. Grafičar : revija slovenskih grafičarjev. 2016, [št.] 1, str. 9-11.
 Mentorstvo pri diplomskih delih / Supervisor for undergraduate theses:
 BAHUN, Kristjan. 3D tisk pripomočkov za kitaro : diplomsko delo = 3D printed guitar equipment : diploma thesis. Ljubljana: [K. Bahun], 2020. XII, 53 str.
 AHČIN, Nuša. Analiza in primerjava 3D zajema s strukturirano svetlobo in fotogrametrijo : diplomsko delo =

Analysis and comparison of 3D capturing with structured light and photogrammetry : diploma thesis. Ljubljana: [N. Ahčin], 2020. XI, 40 f.

BRCE, Jon. Izdelava in uporaba 3D tiskane forme za slepi tisk : diplomsko delo = Design and production of travel journal : diploma thesis. Ljubljana: [J. Brce], 2020. XII, 43 f.

ROŠER, Anja. Izdelava pripomočka za prepoznavanje in učenje barv slabovidnih otrok : diplomsko delo = Development of accessory for easier learning and recognition of colours for visually impaired children : diploma thesis. Ljubljana: [A. Rošer], 2020. XI, 31 f.

ŠORLI, Gregor. Modeliranje in 3D tisk sestavljive deske za kajtanje : diplomsko delo = 3D printing and modelling of composable kite board : diploma thesis. Ljubljana: [G. Šorli], 2020. XII, 33 f.

ŽIŽEK, Mojca. Reliefna reprodukcija umetniškega dela : diplomsko delo = Relief reproduction of an artwork : diploma thesis. Ljubljana: [M. Žižek], 2020. XIII, 59 f.

BARVNA METRIKA

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Barvna metrika
Course title:	Colour metrics
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	1. letnik	2. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068066
Koda učne enote na članici/UL Member course code:	10866

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	30	30	0	0	90	6

Nosilec predmeta/Lecturer:	Sabina Bračko
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik študija. Pogoj za opravljanje študijskih obveznosti je prisotnost pri predavanjih, seminarju in vajah. Zahtevana prisotnost na vajah je 100 %. Študent lahko pristopi k izpitu, ko je opravil seminar in kolokvij iz laboratorijskih vaj.	Enrolment into the study year. Prerequisite to complete study obligations is participation at lectures, seminar and tutorials. Requested presence at tutorials is 100 %. Student can attend the exam after passing Tutorial and Seminar.

Vsebina:	Content (Syllabus outline):
Predavanja: Svetloba in barva. Osnovne lastnosti barve. Dejavniki pri nastanku barve. Zaznavanje barve pri človeku. Teorije barvnega vida. Barvni kontrasti, barvna konstanca in metamerija. Barvne zbirke, barvni sistemi in barvni prostori. CIE sistem in predpisi za merjenje barve. Instrumentalno vrednotenje barve in določanje barvnih razlik. Določanje beline. Predpisi in standardi na področju merjenja barve. Interdisciplinarne razsežnosti barve. Seminar: podroben študij izbranih vsebin. Vaje: uporaba standardov in instrumentalnih metod za merjenje barve in beline.	Lectures: Light and colour. Basic properties of colour. Factors influencing formation of colour. Perceiving colour. Theories of colour vision. Colour contrasts, colour constancy and metamerism. Colour collections, colour systems, colour spaces. CIE system and regulations for colour measurement. Instrumental evaluation of colour and colour difference. Whiteness of materials. Regulations and standards concerning colour measurement. Interdisciplinary dimensions of colour. Seminar: detailed study of selected topic. Tutorial: application of standards and instrumental methods for whiteness and colour measurement.

Temeljna literatura in viri/Readings:

1. Interdisciplinarnost barve. 1.del: V znanosti: Ur. S. Jeler in M. Kumar. Maribor: DKS, 2001.
2. Colour Physics for Industry. 2nd ed. Ed by R. McDonald. Bradford: SDC, 1997.
3. Color for Science, Art and Technology. Ed by K. Nassau. Amsterdam: Elsevier, 1998.
4. K. Schlöpfer: Farbmatrik in der Reproduktionstechnik und im Mehrfarbe druck. St. Gallen: UGRA, 1993.
5. R.W.G. Hunt: The Reproduction of Colour. Kingston-upon-Thames: Fountain Press, 1995.
6. S. Bračko, B. Blaznik: *Osnove merjenja barv : priročnik za vaje*. Ljubljana: Naravoslovnotehniška fakulteta, 2022.

Cilji in kompetence:

Študent se seznani s teoretičnimi osnovami nastanka barve ter z zaznavanjem barve pri človeku. Spozna osnove barvne metrike ter se seznani s standardnimi metodami za merjenje barve. Predmetno specifične kompetence: - poznavanje in razumevanje fizikalno-kemijskih osnov barvne metrike, - sposobnost povezovanja teoretičnega znanja z izkušnjami in znanjem z drugih področij z namenom reševanja konkretnih problemov, - sposobnost uporabe instrumentalnih spretnosti in znanja na področju merjenja barve.

Objectives and competences:

Student is introduced to the theoretical basics of colour formation and human colour perception. He/she gains knowledge about basics of colour metrics and standard methods of colour measuring. Competences: - knowing and understanding the basics of colour metrics, - the ability to connect basic knowledge with experiences from different fields to resolve technical problems, - the ability to apply knowledge and instrumental skills in the field of colour measurement.

Predvideni študijski rezultati:

Znanje in razumevanje: - razumevanje fenomena nastanka barve, - razumevanje interdisciplinarnosti barve, - poznavanje temeljnih predpisov in standardov na področju numeričnega vrednotenja barve, - poznavanje in razumevanje dejavnikov pri zaznavanju barve, - obvladovanje metod za instrumentalno vrednotenje barve, - povezovanje teoretičnih osnov barvne metrike z aktualnimi praktičnimi problemi.

Intended learning outcomes:

Knowledge and understanding: - understanding the phenomenon of colour formation, - understanding interdisciplinary dimensions of colour, - knowing basic regulations and standards for numerical evaluation of colour, - understanding factors influencing colour perceiving, - mastering methods for instrumental colour evaluation, - connecting theoretical basics of colour metrics to actual practical problems.

Metode poučevanja in učenja:

Predavanja, seminar in laboratorijske vaje, ki potekajo pretežno v predavalnici oziroma v laboratoriju in/ali preko spleta s pomočjo ustrezne programske opreme.

Learning and teaching methods:

Lectures, seminar, laboratory work. The activities are predominantly located in the classroom and laboratory or/and on-line using suitable equipment.

Načini ocenjevanja:**Delež/Weight****Assessment:**

Poročilo o opravljenih vajah in kolokvij	30,00 %	Tutorial
zagovor seminarske naloge	20,00 %	Seminar
pisni in/ali ustni izpit	50,00 %	Written and/or oral exam
Ocena: pozitivno: 6-10, negativno: 1-5		

Ocenjevalna lestvica:**Grading system:**

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Reference nosilca/Lecturer's references:

1. BLAZNIK, Barbara, KOVAČ, Franci, BIZJAK, Grega, BRAČKO, Sabina. Fastness of dye-based ink-jet printing inks in aqueous solution in the presence and absence of oxygen. *Color research and application*. [Print ed.]. 25. mar. 2022, vol. 47, no. 5, str. 1193-1199, ilustr. ISSN 0361-2317.
2. STJEPIC, Marta, BRAČKO, Sabina. Colour memory analysis for selected associative colours = Analiza barvnega spomina za izbrane asociativne barve. *Tekstilac : glasilo slovenskih tekstilcev*. [Tiskana izd.]. 2021, vol. 64, [no.] 3, str. 260-271, ilustr. ISSN 0351-3386.

3. MOŽINA, Klementina, BRAČKO, Sabina, KOVAČEVIĆ, Dorotea, BLAZNIK, Barbara, MOŽINA, Klemen. Legibility of prints on paper made from Japanese knotweed. *Bioresources*. 2020, vol. 15, no. 2, str. 3999-4015. ISSN 1930-2126
4. KAVČIČ, Urška, MRAOVIĆ, Matija, BRAČKO, Sabina, MUCK, Deja. Printed thermochromic displays. *Coloration technology : the journal of the Society of Dyers and Colourists*. Feb. 2019, vol. 135, no. 1, str. 60-66. ISSN 1472-3581.
5. MOŽINA, Klementina, PODLESEK, Anja, BRAČKO, Sabina. Preserving typographic cultural heritage using contemporary digital technology. *Journal of cultural heritage*. 2019, vol. 36, [no.] mar.-apr., str. 166-173, ilustr. ISSN 1296-2074.

CELOSTNO RAZMIŠLJANJE IN DELOVANJE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Celostno razmišljanje in delovanje
Course title:	Holistic thinking and acting
Članica nosilka/UL	UL NTF
Member:	

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code: 0643469

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	30				60	4

Nosilec predmeta/Lecturer: Andrej Demšar

Vrsta predmeta/Course type: Izbirni/Elective

Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik študija in izbira predmeta.	Enrolment into study year and selecting the course.

Vsebina:

Vsebina predmeta bo osredinjena na študenta z namenom razvijanja njegovih kompetenc na področju njegove stroke (grafika, tekstilstvo, materiali in metalurgija, geotehnologija in rudarstvo). Vzpodbujano bo celostno in transdisciplinarno razmišljanje ter povezovanje naravoslovnih in tehnoloških znanj z družboslovnimi in humanističnimi znanji.

Na študiju primerov praks različnih strok (grafika, tekstilstvo, materiali in metalurgija, geotehnologija in rudarstvo) se bodo poskušale izluščiti dobre prakse. Med drugim bodo v okviru predmeta predstavljene naslednje vsebine: kompetence inženirjev prihodnosti, komunikacija, lateralno razmišljanje, holistična retorika - kako se sporazumevati, ustvarjalnost, karijerne in osebne odločitve.

Content (Syllabus outline):

The content of the course will be student oriented in order to develop their personal competencies on their professional field (graphic arts, textiles, materials and metallurgy, geotechnology and mining). The course will promote and encourage holistic and transdisciplinary thinking. The connecting of natural and technological knowledge with social sciences and humanities will be encouraged.

Through the study of examples of practices of different professions (graphic arts, textiles, materials and metallurgy, geotechnology and mining) good practices will be defined.

Among other, the following topics will be presented within the scope of the course: competences of engineers of the future, communication, lateral thinking, holistic rhetoric - how to communicate, creativity, career and personal decisions.

Temeljna literatura in viri/Readings:

- DEMŠAR, Andrej, ANEJA, Arun P. The future of education. V: Textiles at the crossroads : proceedings. 19th World Textile Conference AUTEX 2019. Ghent: (MaTCh), Ghent University, 2019. ISBN 978-9079-8920-6-8. [COBISS.SI-ID 3629168]
- DEMŠAR, Andrej, ANEJA, Arun P. Čas sprememb = Time of changes. Tekstilec : glasilo slovenskih tekstilcev. [Tiskana izd.]. 2017, vol. 60, priloga 3, str. 131-136, ilustr. ISSN 0351-3386. [COBISS.SI-ID 303776768], [SNIP]
- DEMŠAR, Andrej, ANEJA, Arun P. Bending the curve: a holistic approach to technology education. V: Proceedings. 16th World Textile Conference AUTEX 2016, Ljubljana, Slovenia. Ljubljana: Faculty of Natural Sciences and Engineering, Department of Textiles, Graphic Arts and Design, 2016. 6 str. ISBN 978-961-6900-17-1. [COBISS.SI-ID 3267696]
- HERMAN, Bogdana; PAVLIHA, Marko: Mala šola retorike II, Lexpera, GV Založba, 2020 (ISBN: 978-961-247-447-8)
- MUCK, Deja, KOSEC, Martina. *Pot ljubezni - pot k sebi : z metodo fraktalne risbe do svobode srca*. 1. natis. Ljubljana: Fraktalnost, 2018. 156 str., ilustr. ISBN 978-961-94420-0-5. [COBISS.SI-ID 294451200]
- MUCK, Deja. Brezmejna modrost fraktalov. Ljubljana: Fraktalnost, 2022. 198 str., ilustr. ISBN 978-961-94420-2-9
- PAVLIHA, Marko: Onkraj materialističnega prepričanja: duhovna dramila, Lexpera, GV Založba, 2021, (ISBN: 978-961-247-457-7)
- PAVLIHA, Marko: Dvanajst pred dvanajsto ali Za norost je zdravilo le modrost: eseji o iskanju svetlobe, UMco, 2014, (ISBN: 978-961-6954-07-5)
- Revolutionizing Sustainability Education; Edited By Ekaterina Ivanova, Isabel Rimanoczy, Routledge, London, 2021
- GOLDBERG, D. E., SOMERVILLE, M. : A whole new engineer : the coming revolution in engineering education, ThreeJoy Associates, 2014

Cilji in kompetence:

Osnovno vodilo predmeta je osredinjenje na študenta in na razvoj študentovih kompetenc s pomočjo celostnega (holističnega), kritičnega in transdisciplinarnega razmišljanja. Temeljni cilj predmeta je razvijanje samostojnega, odprtega in celostnega razmišljanja študentov, katerega poslanstvo je delovati v dobro širše družbene skupnosti.

Spodbujano bo:

- celostno, transdisciplinarno in kritično razmišljanje o sistemih, njihovih medsebojnih povezavah ter posledicah njihovega delovanja;
- povezovanje naravoslovnih in tehnoloških znanj z družboslovnimi in humanističnimi znanji;
- holistična retorika;
- skozi kritični premislek in celostni pristop ustvarjanje novih modelov, rešitev in vizij;
- razmišljanje o današnjem času s pogledom na včeraj, danes in jutri.

Objectives and competences:

The basic guideline of the course is the student centred learning. Focusing on the student's competencies and skills and developing desired competencies through holistic, critical, and transdisciplinary thinking.

The basic goal of the course is to develop an independent, open-minded, holistic and aware person whose highest mission is to work for the good of the humanity.

The student will be encouraged in:

- holistic, transdisciplinary and critical thinking about systems, their interrelationships and the consequences of their activity;
- connecting of natural and technological knowledge with social sciences and humanities;
- holistic rhetoric;
- creating new models, solutions and visions through critical consideration and a holistic approach;
- thinking about present reality with a view on yesterday, today and about tomorrow.

Predvideni študijski rezultati:

Razširitev študentovega pogleda na okolje in družbo ter kompleksnost njune povezanosti. Celostno, transdisciplinarno in kritično razmišljanje omogoča kompleksnejše vpoglede v odnose med naravoslovjem, tehniko, okoljem in družbo ter

Intended learning outcomes:

Expanding the student's view on the environment and society and complexity of their connection. Holistic, transdisciplinary and critical thinking enables more complex insight into relationships between natural sciences, technology, environment and society

slušatelje vzpodbuja k sprejemanju bolj odgovornih in trajnostnih odločitev.	which enable students to make more responsible and sustainable decisions.
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Metode poučevanja in učenja:

Predavanja in seminarsko delo.
Predavanja izvedejo različni učitelji različnih strok.

Learning and teaching methods:

Lectures and seminar work.
Lectures are given by different teachers of different professions.

Načini ocenjevanja:

Delež/Weight

Assessment:

- seminarska naloga	70,00 %	- seminar paper
- predstavitev seminarske naloge	30,00 %	- presentation of seminar paper

Ocenjevalna lestvica:

Grading system:

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Reference nosilca/Lecturer's references:

- DEMŠAR, Andrej, ANEJA, Arun P. The future of education. V: Textiles at the crossroads : proceedings. 19th World Textile Conference AUTEX 2019. Ghent: (MaTCh), Ghent University, 2019. ISBN 978-9079-8920-6-8. [COBISS.SI-ID 3629168]
- DEMŠAR, Andrej, ANEJA, Arun P. Čas sprememb = Time of changes. Tekstilec : glasilo slovenskih tekstilcev. [Tiskana izd.]. 2017, vol. 60, priloga 3, str. 131-136, ilustr. ISSN 0351-3386. [COBISS.SI-ID 303776768], [SNIP]
- DEMŠAR, Andrej, ANEJA, Arun P. Education in 21st century. V: ITMC 2017. 6th edition of the International Conference on Intelligent Textiles and Mass Customisation, Ghent, Belgium. Ghent: Ghent University, Centre for Textile Science and Engineering, 2017. Str. [1-6], ilustr. [COBISS.SI-ID 3435120]
- DEMŠAR, Andrej, ANEJA, Arun P. Resume, eulogy, education and future. V: Shaping the future of textiles. 17th World Textile Conference AUTEX 2017, Corfu, Greece. Bristol: IOP Publishing, 2017. Vol. 254, 222003, str. 1-6. IOP conference series, Materials science and engineering, vol. 254. ISSN 1757-899X. <http://iopscience.iop.org/article/10.1088/1757-899X/254/22/222003>. [COBISS.SI-ID 3439984], [SNIP, WoS, Scopus]
- DEMŠAR, Andrej, ANEJA, Arun P. Bending the curve: a holistic approach to technology education. V: Proceedings. 16th World Textile Conference AUTEX 2016, Ljubljana, Slovenia. Ljubljana: Faculty of Natural Sciences and Engineering, Department of Textiles, Graphic Arts and Design, 2016. 6 str. ISBN 978-961-6900-17-1. [COBISS.SI-ID 3267696]
- DEMŠAR, Andrej, ANEJA, Arun P. Value of values : a new pedagogical paradigm. V: Proceedings 15th Autex Conference, 2015, Bucharest, Romania. Iasi: "Gheorghe Asachi" Technical University, Faculty of Textiles, Leather and Industrial Management, 2015. 6 f. ISBN 978-606-685-276-0. [COBISS.SI-ID 3152240]
- ZUPANČIČ, Maja, SVETINA, Matija. Socialni razvoj v zgodnji odraslosti. V: MARJANOVIČ UMEK, Ljubica (ur.), ZUPANČIČ, Maja (ur.). Razvojna psihologija. 2., dopolnjena in razširjena izd. Ljubljana: Znanstvena založba Filozofske fakultete, 2020. Zv. 3, str. 930-965, ilustr. ISBN 978-961-06-0285-9, ISBN 978-961-06-0296-5, ISBN 978-961-06-0379-5.
- SVETINA, Matija, ISTENIČ, Andreja, JUVANČIČ, Matevž, NOVLJAN, Tomaž, ŠUBIC KOVAČ, Maruška, VEROVŠEK, Špela, ZUPANČIČ, Tadeja. Beliefs about the environment : moving from the egocentric towards the ecocentric perspective. The international journal of sustainable development and world ecology. [Print ed.]. 2014, letn. 21, št. 6, str. 540-545, ilustr. ISSN 1350-4509.
- SVETINA, Matija. The microgenetic approach in the digitalised era. V: LEMAIRE, Patrick (ur.). Cognitive development from a strategy perspective : a festschrift for Robert S. Siegler. Abingdon; New York: Routledge, 2018. Str. 81-99, ilustr. ISBN 978-1-138-71137-2, ISBN 978-1-138-71136-5.
- SVETINA, Matija, ZUPANČIČ, Maja. Strategija upravljanja z življenjem v odraslosti : prečna študija v Sloveniji. Psihološka obzorja. [Tiskana izd.]. 2007, letn. 16, št. 4, str. 43-63, preglednice, graf. prikazi. ISSN 1318-1874.
- SVETINA, Matija. Intraindividualna variabilnost kot dejavnik učenja. Psihološka obzorja. [Tiskana izd.]. 2004, letn. 13, št. 1, str. 29-41, ilustr. ISSN 1318-1874.
- HERMAN, Bogdana; PAVLIHA, Marko: Mala šola retorike II, Lexpera, GV Založba, 2020 (ISBN: 978-961-247-447-8)

- PAVLIHA, Marko: Onkraj materialističnega prepričanja: duhovna dramila, Lexpera, GV Založba, 2021, (ISBN: 978-961-247-457-7)
- PAVLIHA, Marko: Dvanajst pred dvanajsto ali Za norost je zdravilo le modrost: eseji o iskanju svetlobe, UMco, 2014, (ISBN: 978-961-6954-07-5)

DIPLOMA

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Diploma
Course title:	Diploma work
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	3. letnik	2. semester	obvezni

Univerzitetna koda predmeta/University course code:	0070322
Koda učne enote na članici/UL Member course code:	10208

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
				90	90	6

Nosilec predmeta/Lecturer:

Vrsta predmeta/Course type:

Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v 3. letnik študija. Opravljene vse ostale študijske obveznosti. Opravljeno praktično usposabljanje. Odobrena tema diplomske naloge.	Enrolment into the 3rd study year. Completed all others study prerequisites. Completed practical work. Confirmation of the thesis theme.

Vsebina:	Content (Syllabus outline):
Diplomsko delo je lahko interdisciplinarno naravnano ali ožje specializirano na poljubno področje znotraj strokovnih vsebin s področja, ki ga pokriva prvostopenjski študij Grafične in medijske tehnike. Diplomsko delo vsebuje: – predstavitev problema oz. razlog za raziskavo ter namen in cilje dela, – pregled literature in dosedanjih raziskav oz. tuje in domače izkušnje, – nakazane rešitve problema, – sklepe in priporočila. Diplomsko delo študent izdela pod mentorstvom izbranega učitelja, ga javno predstavi in zagovarja.	Thesis may be interdisciplinary or specialized in any area within the professional course from the area covered by the first-stage studies of Graphic and media technology. Thesis includes: – the presentation of the problem or reason for a survey and the purpose and goal of the work, – review of literature and previous research and/or foreign and domestic experiences, – implicit solution of the problem, – conclusions and recommendations. Student completes the diploma thesis under the supervision of a teacher and finishes the study with the public presentation and defend.

Temeljna literatura in viri/Readings:

Izbrana literatura glede na nalogo, ki jo opravlja. / Selected readings, depending on the thesis he/she is working on.

Cilji in kompetence:

CILJI: Študent osvoji delo v praksi. Izdelava diplomskega dela študenta usposobi za reševanje strokovnih ali preprostejših znanstveno-raziskovalnih problemov na področjih, ki jih pokriva prvostopenjski študijski program Grafične in medijske tehnike.
KOMPETENCE: Praktično uporabi med študijem pridobljeno znanje.

Objectives and competences:

OBJECTIVES: Student gets familiar with work in practice. Through the work for diploma thesis student gets able to deal with professional or simpler scientific research problems in the areas covered by the first level study program in Graphic and media technology.
COMPETENCES: Practical application of the knowledge gained during their studies.

Predvideni študijski rezultati:

Študent razume stroko v širšem kontekstu kot interdisciplinarno panogo, dokaže samostojno reševanje konkretnih problemov s povezovanjem temeljnih znanj, ki jih uporabi pri izdelavi diplomskega dela. Pridobi nove informacije, jih kritično analizira in uporabi pri določitvi problemov in njihovem reševanju. Pridobljeno znanje in rešitve konkretnega problema v diplomskem delu je sposoben podati in zagovarjati pred širšim krogom zainteresirano publiko.

Intended learning outcomes:

The student will understand the profession in a broader context as an interdisciplinary branch. The student demonstrates his/her ability to solve concrete problems by integrating basic skills and uses them to prepare consistent diploma thesis. The student will synthesize and analyze new information and use it to identify and solve problems. The student is able to present and defend acquired knowledge and solutions to a specific problem in the thesis to a wider range of interested audience.

Metode poučevanja in učenja:

Praktično delo, branje literature, konzultacije z mentorjem, pisanje naloge.

Learning and teaching methods:

Practical work, literature reading, consultations with advisor, diploma thesis writing.

Načini ocenjevanja:**Delež/Weight****Assessment:**

Ocena pisnega dela diplomskega dela	70,00 %	Assessment of the written thesis
Ocena javne predstavitve in zagovora diplome	30,00 %	Assessment of public presentation and defending of the thesis

Ocenjevalna lestvica:**Grading system:****Reference nosilca/Lecturer's references:**

Reference nosilcev razvidne iz učnih načrtov pri posameznih predmetih v okviru prvostopenjskega študija Grafična in medijska tehnika. / References of lecturers listed in the curricula of individual courses in the undergraduate program of Graphic and media technology.

DODELAVA GRAFIČNIH IZDELKOV

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Dodelava grafičnih izdelkov
Course title:	Finishing graphic products
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	2. letnik	2. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068077
Koda učne enote na članici/UL Member course code:	10209

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	15	0	0	60	4

Nosilec predmeta/Lecturer:	Urška Vrabič Brodnjak
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v 2. letnik študija. Za pristop k končnemu izpitu je pogoj opravljen seminar, opravljena predstavitev projektnega dela in pozitivno ocenjen (z oceno 6 ali več) izpit iz laboratorijskih vaj.	Enrollment in the 2nd year of studies. For the approach to the final exam is a prerequisite completed seminar, conducted project presentation and positively graded (6 or more) exam of laboratory exercises.

Vsebina:	Content (Syllabus outline):
Spoznavanje značilnosti knjigoveške, kartonažerske in ostale dodelave in temeljne skupine tehnoloških operacij. Tehnologija knjigoveške dodelave s tehnološkimi operacijami: rezanje, zgibanje, znašanje, rezkanje, lepljenje (vezava rezkano-lepljeno, kaširanje, plastificiranje), šivanje (žica, nit, taljiva nit), tehnološke linije za spiralno vezavo, vezavo z žičnim glavnikom, mehko vezavo, trdo vezavo knjig. Tehnologija dodelave časopisa na rotaciji. Tehnologija kartonažerske dodelave z izdelavo orodja in protiorodja za izsekovanje in žlebljenje, izsekovanje, zgibanje in lepljenje zloženek, tehnologija izdelave transportnih škatel iz valovitega kartona, tehnologija izdelave papirnih in samolepilnih etiket,	Getting to know the characteristics of bookbinding, packaging and other finishing and basic groups of technological operations. Technology bookbinding finishing with technological operations: cutting, folding, assembling, milling, bonding (binding, cutting, gluing, coating, laminating), sewing (wire, thread, fusible thread), technological lines for spiral binding, binding with wire comb, soft binding, hard bookbinding. Technology completion newspaper in rotation. Cardboard and packaging technology completion of the manufacture of tools and dieboards for cutting and creasing, cutting, folding and gluing leaflets, manufacturing technology transport boxes made of corrugated cardboard, paper

tehnologija izdelave neskončnih računalniških obrazcev in obrazcev z integriranimi elementi. Projektno delo: predstavitev tehnologije dodelave določenega grafičnega izdelka od surovin, izdelave, lastnosti in uporabe. Praktična izvedba in izdelava mehke vezave kot je brošura. Seminar: poglobljena predstavitev dela snovi in izdelava grafičnega izdelka, v povezavi s trenutno temo, ki jo določi nosilec seminarja. Vaje: spoznavanje temeljnih tehnoloških operacij v knjigoveški in kartonažerski dodelavi, določanje jakosti lepljene vezave (martini tester), lastnoročna izvedba trde vezave (letvična vezava z vročim tiskom - seminarska naloga) konstruiranje kartonske zloženke, analiza lastnosti kartonažerskega izdelka.	manufacturing technology and self-adhesive labels, manufacturing technology of continuous computer forms and forms with integrated elements. Practical implementation and production of a booklet procedure such as a brochure. Project work: technology demonstration completion of a specific graphic product from raw materials, processing, properties and use. Seminar: an in-depth presentation of substance and making a graphic product, in conjunction with the current theme set by the lecturer of the seminar. Exercises: comprehension of basic technological operations in binding and printing finishing, determine the strength of glued binding (Martini tester), hard binding (binding, hot press - seminar), carton design construction, analysis features of printing finishing product.
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Temeljna literatura in viri/Readings:

KIPPAN, H. Handbook of Print Media. Berlin [etc.] : Springer, 2001. – NOVAK, G. Grafični materiali. Ljubljana : Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, 2004. – LIEBAU, D., in HEINZE, I. Industrielle Buchbinderei. Itzehoe : Verlag Beruf+Schule, 1997. – POTISK, V. Grafička dorada. Zagreb : Školska knjiga, 1997. – GREENFIELD, J. ABC of Bookbinding. New Castle : Oak Knoll Press; New York : The Lyons Press, 1998. – WIESER, F. Der Bucheinband. Hannover : Schlütersche Verlaganstalt und Druckerei, 1983. – SCHEICHER, L. Tehnologija knjigoveške dodelave. Ljubljana : Tehniška založba Slovenije, 1997. – REP, J. Krajšnica o knjigoveštvu. Ljubljana : TLP, 1997. – Standardi ISO, sprejeti na TC 130, TC 42 in SIST-ISO, sprejeti na odboru USM/GRT. – Internet, strani ISO, Fogra, Ugra, GATF, SWOP, ... Literatura je dosegljiva v knjižnici Oddelka za tekstilstvo, NTF.

Cilji in kompetence:

Študenti spoznajo osnovne tehnološke operacije za ločevanje, preoblikovanje in združevanje materialov v knjigoveški, kartonažerski in ostali dodelavi. Seznanijo se s tehnološkimi procesi za dodelavo različnih grafičnih izdelkov (mehko in trdo vezana knjiga, brošura, časopis, kartonske škatle oz. zloženke, transportne škatle, etikete, neskončni računalniški obrazci), seznanijo se s tehnološkimi linijami v dodelavi in z dodelavnimi tehnološkimi operacijami na tiskarskih in drugih strojih in napravah. Predmetno specifične kompetence: – poznavanje in razumevanje temeljev in razvoja grafične dodelave, – poznavanje in razumevanje razvoja tehnoloških operacij v knjigoveški kot je broširanje, kartonažerski in ostali dodelavi, – sposobnost za reševanje konkretnih problemov na podlagi poznavanja tehnoloških operacij za ločevanje, preoblikovanje in združevanje materialov v dodelavi, – sposobnost povezovanja znanja z različnih področij in aplikacij na podlagi poznavanja grafičnih izdelkov, materialov in dodelavnih tehnoloških operacij, – sposobnost umeščanja novih informacij in interpretacij v kontekst temeljne grafične stroke z obvladovanjem novih grafičnih izdelkov v procesu dodelave, – razumevanje in uporaba metod kritične analize in razvoja teorij ter njihova uporaba v reševanju konkretnih delovnih problemov v grafični dodelavi pri posodabljanju

Objectives and competences:

Students learn the basic technological operations for the separation, transformation and aggregation of materials in book binding, print finishing and other finishing. Get acquainted with the technological processes for processing a variety of graphic products (soft and hardcover books, brochures, newspaper, cardboard boxes or. leaflets, transport boxes, labels, continuous computer forms) to get acquainted with technological lines in the finishing and finishing technology operations at printing and other industrial machinery. Subject-specific competencies: - knowledge and understanding of the foundations and the development of graphic finishing, - knowledge and understanding of the development of technological operations in bookbinding, booklet production, printing finishing and other processing, - the ability to solve practical problems based on the knowledge of technological operations for the separation, transformation and combine materials in the finishing, - the ability to integrate knowledge from different fields and applications based on knowledge of graphic products, materials and finishing technology operations, - the ability to place new information and interpretation in the context of the basic graphic profession by mastering new graphic products in the process of completion, - understanding and use of critical analysis and development theories and their application in solving

obstojećih in nastanku novih grafičnih izdelkov, – razvoj veščin in spretnosti pri razvoju kakovostnih grafičnih izdelkov.	specific working problems in the graphic finishing the modernization of existing and creation of new graphic products, - the development of skills and expertise in the development of quality graphic products.
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Predvideni študijski rezultati:

Znanje in razumevanje: Pozna tehnologijo oz. tehnološke operacije za ločevanje, preoblikovanje in združevanje materialov v knjigoveški, kartonažerski in ostali dodelavi, pozna načrtovanje knjigoveških in kartonažerskih grafičnih izdelkov, postopke za določanje njihove ustreznosti oz. funkcionalnosti, zna voditi proces grafične dodelave. Razume pojme povezane s knjigoveškimi, kartonažerskimi in ostalimi grafičnimi izdelki, pomen njihovih lastnosti pri načrtovanju in v procesu grafične dodelave, razume delovanje strojev in naprav v knjigoveški, kartonažerski in ostali dodelavi ter delovanje tehnoloških linij v dodelavi glede kakovosti izvedbe dodelave, optimizacije procesov in pravilnosti zaporedja izvedbe operacij. Pri laboratorijskih vajah študent spozna in uporablja najnovejše naprave za izdelavo brošure. Seznani se s postopki optimizacije broširanja ter vključitvi zelenih tehnologij, materialov povezanih s temi procesi. Zna uporabiti literaturo, zna zbrati podatke in jih interpretirati, zna se vključiti v skupinsko delo, razvije komunikacijske in pisne sposobnosti. Zna izbrati in uporabiti najprimernejšo tehnologijo grafične dodelave za načrtovani grafični izdelek, zna na podlagi rezultatov preskušanj podati oceno izdelka. Razumevanja teorije in izkušenj v praksi.

Intended learning outcomes:

Knowledge and understanding: Student's knowledge: technological operations for the separation, transformation and aggregation of materials in book binding, graphic finishing and other processing, familiar with the design bookbinding and graphic products, procedures for determining their suitability or. functionality, guiding the process of graphic finishing. Understands the concepts related to bookbinding, packaging and other graphic products, the importance of their properties in the planning and in the process of graphic finishing, understands the operation of machines and devices in bookbinding, packaging and other finishing and operation of technological lines in the process of completion in terms of quality of performance completion, process optimization and regularity the sequence of the execution. At the laboratory work, the students use the latest devices for producing a booklet. They get familiar with booklet optimization processes and the inclusion of green technologies and materials related to these processes. Knows how to use literature, collect data and interpret and able to engage in teamwork, develop communication and writing skills. Knows how to select the best technology for the graphic finishing product, designed graphics and able to on the basis of test results provides an assessment of the product. Understanding of theory and practical experience.

Metode poučevanja in učenja:

Predavanja, seminar, laboratorijske vaje, projektno delo. Predavanja se izvajajo v živo v predavalnici in/ali prek spleta (online) s pomočjo specifičnih orodij. Seminarska dela se izvajajo individualno in/ali v skupini (3–4 študenti). Tematika seminarских nalog oz. izdelka se vedno nanaša na vsebine in področja grafične dodelave. Vaje se izvajajo v laboratorijih in/ali prek spleta (online) s pomočjo primerne in ustrezne programske opreme, ki omogoča ustrezno podajanje snovi in izvedbe.

Learning and teaching methods:

Lectures, seminars, laboratory work, project work. Lectures are performed live in the classroom and/or online with the help of specific tools. Seminar assignments are performed individually and/or in a group (3–4 students). Topics of seminar assignments or the product always refers to the contents that cover of the graphic finishing. Tutorials are performed in a laboratory and/or online with the help of appropriate and suitable software that enables suitable preparation and performance of the practicum.

Načini ocenjevanja:

Delež/Weight

Assessment:

Ustni/pisni izpit, izpit iz laboratorijskih vaj, seminarska naloga, poročilo o projektnem delu, poročilo o opravljenih laboratorijskih vajah.		Oral / written exam, exam of laboratory exercises (practicum), essay, report on project work, a report on the lab.
Predavanja in seminar	50,00 %	Lectures and seminar

izpit iz vaj	50,00 %	exam of laboratory exercises (practicum)
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Ocenjevalna lestvica:
Grading system:

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Reference nosilca/Lecturer's references:

VRABIČ BRODNJAK, Urška. Influence of ultrasonic treatment on properties of bio-based coated paper. Progress in organic coatings, ISSN 0300-9440. [Print ed.], Feb. 2017, vol. 103, str. 93-100, ilustr. VRABIČ BRODNJAK, Urška. Microorganism based biopolymer materials for packaging applications : a review. Journal of composites and biodegradable polymers, ISSN 2311-8717, Dec., June 2016, vol. 4, no. 1, str. 32-40, ilustr. GREGOR-SVETEC, Diana, MOŽINA, Klemen, BLAZNIK, Barbara, URBAS, Raša, VRABIČ BRODNJAK, Urška, GOLOB, Gorazd. Efficient paper recycling. V: Conference proceedings, 11th Symposium on Graphic Arts, 17th to 18th June 2013, Pardubice, Czech Republic. Pardubice: Faculty of Chemical technology, department of Graphic Arts and Photophysics, 2013, f. 44-51. VRABIČ BRODNJAK, Urška, MUCK, Deja. Printing quality of chitosan and rice starch coated packaging paper. V: Book of abstracts, 9th National Conference on Chemistry, Sofia, Bulgaria, 29 September - 1 October 2016. Sofia: Faculty of Chemistry and Pharmacy, St. Kliment Ohridski University of Sofia: Union of Chemists in Bulgaria, 2016, str. 87. VRABIČ BRODNJAK, Urška. The effect of ultrasound on soy protein and chitosan coating solution for packaging paper. V: Book of abstracts, 9th National Conference on Chemistry, Sofia, Bulgaria, 29 September - 1 October 2016. Sofia: Faculty of Chemistry and Pharmacy, St. Kliment Ohridski University of Sofia: Union of Chemists in Bulgaria, 2016, str. 88. VRABIČ BRODNJAK, Urška. Z znanostjo iz bioloških adhezivov do sintetičnih veziv. Embalaža, okolje, logistika, ISSN 1855-4849, dec. 2016, 114/115, str. 14. VRABIČ BRODNJAK, Urška. Biološka lepila v embalažni in papirni industriji : začetek EU - mreže bioloških adhezivov. Grafičar, ISSN 1318-4377, 2016, [Št.] 6, str. 13, ilustr. VRABIČ BRODNJAK, Urška. UV-drogen van biobased coatings : oppervlakteafwerking voor papier en karton. V: Papier-gerelateerd onderzoek in Nederland en daarbuiten, (Innovatieboekjes, 7). Arnhem: Kenniscentrum Papier & Karton (KCPK), Aug. 2016, str. 15, ilustr. VRABIČ BRODNJAK, Urška. Obtaining of paper samples, containing of bio-based components and investigation on its influence over the properties of paper : lecture at the ActInPak Conference and Second MC/WG meeting, Bled, Slovenia, November 21 - 23, 2016. VRABIČ BRODNJAK, Urška. Effect of UV-treatment on properties of coated paper with biopolymers : [invited lecture on the European Paper Week 2015, 17th - 19th November 2015, Brussels, Belgium]. 2015: Confederation of European Paper Industries; Brussels. VRABIČ BRODNJAK, Urška. UV drying for bio-based coatings : [invited lecture on "Industry meets science" / "science meets industry", International paper and board value chain innovation event 2 february 2016, Arnhem, Netherlands]. 2016: KCPK - Kenniscentrum Papier en Karton; Arnhem.

EKOLOGIJA V GRAFIKI

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Ekologija v grafiki
Course title:	Environmental protection in graphic arts
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	2. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068078
Koda učne enote na članici/UL Member course code:	10944

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
45	15	30	0	0	90	6

Nosilec predmeta/Lecturer:	Maja Klančnik
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik študija. Pogoji za opravljanje študijskih obveznosti je prisotnost pri predavanjih, seminarju in vajah. Zahtevana prisotnost na vajah je 100 %. Za pristop k izpitu je pogoj opravljen seminar in kolokvij iz laboratorijskih vaj.	Enrolment into the study year. Prerequisite to complete study obligations is participation at lectures, seminar and tutorials. Requested presence at tutorials is 100 %. Student can attend the exam after passing tutorials and seminar.

Vsebina:	Content (Syllabus outline):
Osnovne definicije pojmov: ekologija, onesnaževanje, obremenjevanje okolja, trajnostni razvoj, varstvo okolja. Okoljska zakonodaja in ukrepi EU za zmanjševanje onesnaževanja okolja. Okolju prijaznejši produkti in ekološko označevanje. Okolju prijazna embalaža. Sistemi okoljevarstvenega vodenja. Onesnaževanje zraka in tehnike čiščenja prašnih delcev in škodljivih plinov iz zraka. Onesnaževanje vod in tehnike čiščenja odpadnih vod s poudarkom na čiščenju vod papirne in grafične industrije. Okoljska analitika vod: splošni, anorganski, organski in ekotoksikološki parametri ocenjevanja onesnaženosti vod. Kemikalije: nevarne kemikalije in	Basic definitions of notions: ecology, pollution, environmental burden, sustainable development, environmental protection. Environmental legislation and actions of EU for reducing of environmental pollution. Environmentally friendly products and eco-labelling. Environmentally friendly packing. Environmental management systems. Air pollution and purification techniques for elimination of dust particles and harmful gases from air. Water pollution and treatments of wastewater, with emphasis on water treatments of the paper and the graphic industry. Environmental water analysis: general, inorganic, organic and eco-toxic parameters for

označevanje. Varstvo pri delu. Sistem vodenje poklicnega zdravja in varstva pri delu. Tiskarske barve: ekološko nezaželene in okolju prijaznejše. Ekološka problematika in okoljevarstvene rešitve v pripravi in v posameznih tehnikah tiska: ofsetni, flekso, knjigo, globoki, tampo, sito in digitalni tisk ter v dodelavi. Ustrezno ravnanje z odpadnimi snovmi.	assessment of water pollution. Chemicals: dangerous and labelling. Safety at work. Occupational health and safety management system. Printing inks: ecological unfavourable and eco-friendly. Environmental problems and environmental protective solutions in the prepress and in the printing processes: offset, flexo, letterpress, gravure, tampo, screen and digital printing and in the finishing. Appropriate waste management.
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Temeljna literatura in viri/Readings:

- KLANČNIK, Maja. Ekologija in okoljevarstvo : študijsko gradivo. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, grafiko in oblikovanje, 2021. 1 zv. (loč. pag.), ilustr. [COBISS.SI-ID [75498755](#)]. - Kipphan, H. Handbook of Print Media, Technologies and Production Methods. Verlag; Berlin; Heidelberg; New York : Springer, 2001. - Eldred, N. R. Chemistry for the Graphic Arts. 3rd edition. Pittsburg : GattfPress, 2001. - Leach, R. H., in Pierce, R. J. The Printing Ink Manual. 5th edition. Dordrecht; Boston; London : Kluwer Academic Publishers, 1993. - Roš, M. Biološko čiščenje odpadne vode. Ljubljana : GV Založba, 2001. - Vuk, D. Uvod v ekološki management. Ljubljana : Založba moderna organizacija, 2000. - Kurnik Donlagić, J. Tehnološke vode in odplake. Maribor : Univerza v Mariboru, Fakulteta za strojništvo, 2001. - Klančnik, M. Ekologija v grafiki : vaje. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, grafiko in oblikovanje, 2016.

Cilji in kompetence:

Študent se pri predmetu seznani z negativnim vplivom procesov in materialov grafične industrije na okolje. Spozna okoljevarstvene rešitve, okolju prijaznejše grafične materiale in postopke kot tudi ustrezno ravnanje z odpadnimi snovmi. Seznani se z osnovami okoljske analitike in tehnologije čiščenja tehnoloških odpadnih vod in zraka. Spozna okoljsko zakonodajo in ekološke standarde. Kompetence: - ekološko osveščeno ravnanje na delovnem mestu, - sposobnost uporabe teoretičnega znanja pri ocenitvi in reševanju konkretnih ekoloških problemov v grafični industriji, - sposobnost načrtovanja in uvajanja sodobnih, okoljsko čistejših tehnologij v podjetjih, - sposobnost povezovanja okoljevarstvene zakonodaje z različnimi področji grafične stroke, - sposobnost razvijanja ekoloških proizvodov, - sposobnost pridobivanja okoljskih priznanj in dovoljenj, - sposobnost raziskovalnega dela in predstavljanja rezultatov, - sposobnost umeščanja novih znanj in podatkov o grafičnih materialih, tehnikah tiska in dodelave v kontekst grafične stroke in okoljevarstva.

Objectives and competences:

The students are introduced to the negative influences of processes and materials of graphic technology on the environment. They get knowledge about environmental protective solutions, environmentally friendly materials and procedures, as well as about appropriate waste management. They are introduced with basics of environmental analysis and technologies of wastewater treatment and air purification as well as with environmental legislation and standards. Competences: - environmental consciousness management at work, - ability to use the theoretical knowledge at evaluation and solving the ecological problems in the graphic industry, - ability to plan and introduce the modern and more environmentally friendly technologies in companies, - ability to connect the environmental legislation with different areas of graphic professions, - ability to develop the eco-products, - ability to gain environmental recognitions and permissions, - ability of research work and presentation of results, - ability to apply newly gained knowledge and information of graphic materials, techniques of printing and finishing into the graphic professional field and the environmental protection.

Predvideni študijski rezultati:

Poznavanje in razumevanje vpliva grafične industrije (priprave za tisk, tiskanja in dodelave) na okolje. Poznavanje okolju prijaznejših grafičnih materialov, tehnoloških postopkov in grafičnih izdelkov. Poznavanje kriterijev za pridobitev ekološke oznake tiskanih papirnih proizvodov. Poznavanje in razumevanje ekoloških problemov odlaganja grafičnih

Intended learning outcomes:

Knowing and understanding the impact of graphic industry (prepress, printing and finishing) on the environment. Knowing environmentally friendly graphic materials, technologies and graphic products. Knowing the criteria for acquisition of ecolabel for printing paper products. Knowing and understanding the environmental problems of disposal of graphic

odpadkov in izdelkov. Poznavanje in razumevanje pravilnikov (zakonodaje) in standardov s področja varovanja okolja. Poznavanje in razumevanje spremljanja parametrov onesnaževanja. Poznavanje in razumevanje osnov tehnologije čiščenja odpadnih tehnoloških vod in zraka. Študent pri laboratorijskih vajah spozna sodobno opremo za analizo in čiščenje odpadnih voda.	wastes and products. Knowing and understanding the environmental regulations (legislation) and standards. Knowing and understanding the monitoring of pollution parameters. Knowing and understanding the basics of technologies of wastewater treatment and air purification. At laboratory tutorials, the student learns about modern equipment for the analysis and treatment of wastewaters.
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Metode poučevanja in učenja:

Predavanja, seminar, laboratorijske vaje, ki potekajo v predavalnici oziroma v laboratoriju in/ali preko spleta s pomočjo ustrezne računalniške opreme.

Learning and teaching methods:

Lectures, seminar, tutorials, that take place in a classroom or in a laboratory and/or online using appropriate computer equipment.

Načini ocenjevanja:
Delež/Weight
Assessment:

pisni/ustni izpit. Ocena: pozitivno: 6-10, negativno: 5.	70,00 %	Written/oral exam Positive: 6–10; Negative: 5.
seminarska naloga,	10,00 %	Seminar
laboratorijske vaje	20,00 %	Tutorial

Ocenjevalna lestvica:
Grading system:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10
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Reference nosilca/Lecturer's references:

1. **KLANČNIK, Maja.** Printing with natural dye extracted from *Impatiens glandulifera* Royle. *Coatings*. 13 April 2021, vol. 11, iss. 4, str. 1-12, ilustr. ISSN 2079-6412.
2. **KLANČNIK, Maja.** Screen printing with natural dye extract from Japanese knotweed rhizome. *Fibers and polymers*. 19 May 2021, vol. , no. , 9 str. ISSN 1229-9197.
3. **KLANČNIK, Maja, BATISTA, Meta.** Čiščenje odpadne vode, onesnažene s sitotiskarsko barvo = Treatment of wastewater contaminated with screen printing ink. *Tekstilac*, ISSN 0351-3386, 2015, vol. 58, no. 3, str. 209-220.
4. **KLANČNIK, Maja.** Coagulation and adsorption treatment of printing ink wastewater. *Acta graphica*, ISSN 0353-4707. [Print ed.], 2014, vol. 25, no. 3/4, str. 73-82.
5. **KLANČNIK, Maja, KOTNIK, Kaja.** Biološko razgradljivi adsorbenti pri čiščenju obarvane odpadne vode = Biologically degradable adsorbents in treatment of coloured wastewater. *Tekstilac*, ISSN 0351-3386, 2016, vol. 61, no. 1, str. 54-64.

EMBALAŽA 1

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Embalaža 1
Course title:	Packaging 1
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	2. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068043
Koda učne enote na članici/UL Member course code:	10213

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	15	0	0	60	4

Nosilec predmeta/Lecturer:	Diana Gregor Svetec
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik študija. Pogoj za opravljanje študijskih obveznosti je prisotnost pri predavanjih, seminarju in vajah. Zahtevana prisotnost na vajah je 100 %.	Enrolment into the study year. Prerequisites for performing study obligations is presence at lectures, seminar and tutorials. Requested presence at tutorials is 100 %.

Vsebina:	Content (Syllabus outline):
Predavanja: • predstavitev embalaže in njenih funkcij; • trajnost in okoljska funkcija embalaže; • pregled embalažnih materialov; • obravnavanje lastnosti, prednosti in pomanjkljivosti posameznih embalažnih materialov in vrst embalaže; • pregled postopkov izdelave posameznih vrst embalaže; • vpeljava krožnega gospodarjenja v procese izdelave embalaže in prehod v ogliščno nevtralno družbo; • pregled najpogostejših oznak na embalaži in njihov pomen. Seminar: predstavitev embalaže posameznih izdelkov, izdelava in predstavitev seminarske naloge. V seminarske naloge so vključene zelene in trajnostne vsebine. Vaje: načrtovanje embalaže in izdelava kartonske	Lectures: • introduction of packaging and its functions; • sustainability and environmental function of packaging; • overview of packaging materials; • overview of characteristics, advantages and disadvantages of various types of packaging materials and packaging; • review of manufacturing processes of certain types of packaging; • introduction of circular economy into manufacturing processes and transition to carbon neutral society • an overview of the most common symbols on the packaging and their significance. Seminar: presentation of packaging of individual products, preparation and presentation of seminar work. Green and sustainable topics are included in the seminar assignments.

embalaže z računalniškim programom za načrtovanje embalaže.

Tutorial: design and production of cardboard packaging with a computer program for the design of packaging.

Temeljna literatura in viri/Readings:

- Vrabčič Brodnjak, U. Načrtovanje in oblikovanje embalaže, Ljubljana, UL NTF, 2022
 - Auras, R.A., Selke, S.E.M. Life cycle of sustainable packaging: From design to end-of-life. Wiley, 2022
 - Bastioli, C. Handbook of biodegradable polymers. Boston, De Gruyter, 2020 (e-knjiga)
 - Kwan, C., Ho, E. Packaging materials. Honkong, SendPoint Publishing, 2014
 - Hanlon, J.F., Kelsey, R.J., Forcinio, H.E. Handbook of package engineering. London, CRC Press, 1998
 - Brody, A.L. The Wiley Encyclopedia of packaging technology. New York, J Wiley & Sons, 1997 2009
 - E-revije in e-knjige iz podatkovnih zbirk univerze / e-journals and e-books from university databases
- Literatura je dostopna v knjižnici NTF-Oddelka za tekstilstvo, grafiko in oblikovanje, Centralni tehniški knjižnici in preko medknjižnične izposoje.

Literature is available in library NTF-Department of Textiles, Graphic Arts and Design, Central technical library and through library exchange.

Cilji in kompetence:

Študenti spoznajo različne vrste embalaže in funkcije embalaže, vključno z okoljsko funkcijo. Seznanijo se z različnimi embalažnimi materiali, kot so papir, karton, valoviti karton, polimerni materiali, steklo, kovina, les, tekstilije in z njihovimi lastnostmi, prednostmi in pomankljivostmi. Spoznajo procese pri načrtovanju in postopke izdelave različnih vrst embalaže ter tehnologije, ki so del krožnega gospodarstva in manj ogljično intenzivne. Naučijo se uporabljati računalniški program, ki omogoča načrtovanje kartonske embalaže.

Predmetnospecifične kompetence:

- poznavanje pomena lastnosti embalažnih materialov za izdelavo različnih vrst embalaže,
- obvladovanje postopka načrtovanja in izdelave embalaže,
- razvoj spretnosti pri uporabi ustreznih računalniških programov,
- uporaba informacijsko-komunikacijske tehnologije pri načrtovanju embalaže, posredovanju in obdelavi podatkov ter zasledovanju novosti,
- sposobnost umeščanja novih informacij in spoznanj v kontekstu razvoja novih izdelkov.

Objectives and competences:

Students get know various types of packaging and functions of packaging, including environmental function. They learn about different packaging materials such as paper, cardboard, corrugated cardboard, polymeric materials, glass, metal, wood, textiles and their characteristics, advantages and disadvantages. They learn about the processes in the design and manufacturing of various types of packaging, technologies which are part of circular economy and less carbon intensive. They learn how to use a computer program for design of packaging. Competences:

- knowledge of the importance of packaging materials characteristics for the manufacturing of various types of packaging,
- managing of planning process and design of packaging,
- develop skills in using appropriate computer programs,
- use of information-communication technology at packaging development, data evaluation and following innovations,
- ability to include new information and knowledge in the context of the development of new product.

Predvideni študijski rezultati:

Znanje in razumevanje:

študent pozna različne vrste embalažnih materialov in iz njih izdelano embalažo, njihove lastnosti, postopke izdelave in dodelave. Razume postopek načrtovanja in oblikovanja embalažnih enot in zna uprabit računalniške programe za načrtovanje embalaže. Razume pomembnost embalažnih materialov in posameznih faz pri postopkih izdelave v relaciji z lastnostmi embalaže in optimiranjem le-te. Razume pomen vpeljave krožnega gospodarjenja v procese izdelave embalaže in trajnostni razvoj na področju

Intended learning outcomes:

Knowledge and understanding:

student knows various types of packaging materials and packaging made from them, their properties, manufacturing processes and finishing. Understand the design process of packaging units and is able to use computer programmes for packaging design. Understands the importance of packaging materials and the various stages in manufacturing processes in relation to the properties of packaging in order to optimize it. Understands the importance of introducing circular economy into packaging production processes and sustainable development in

embalaže. Teoretična podlaga mu pomaga prenesti znanje v delovni proces.	the field of packaging. Theoretical basis helps him/her to implement the knowledge into the working process.
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Metode poučevanja in učenja:

- klasična in interaktivna predavanja, poučevanje z uporabo IKT tehnologije
- projektno delo, diskusije, interpretacije, skupinsko delo,
- samostojno analitično pisno delo s predstavitvijo in individualno delo pri vajah.
Vse oblike (predavanja/seminar/vaje) se lahko izvajajo v živo v učilnicah ali preko spleta (online) v spletnih učilnicah, z uporabo specifičnih orodij ter ustrezne programske opreme.

Learning and teaching methods:

- classic and interactive lectures, teaching using IKT technology
- project work in groups, discussions, interpretation, group work,
- independent analytical written work with presentation and individual work at tutorials.
All forms (lectures/seminar/tutorials) can be conducted live in classrooms or online in online classrooms, using specific tools and suitable software.

Načini ocenjevanja:

Delež/Weight

Assessment:

Ustni/pisni izpit/izpitna naloga ter sprotno preverjanje (domače naloge, projektno delo) Poteka lahko v predavalnici ali na daljavo.	50,00 %	Oral/written exam/exam assignment, and ongoing assessment (homework, project work) Performed in classroom or on-line.
seminarska naloga	25,00 %	seminar work
vaje	25,00 %	tutorial

Ocenjevalna lestvica:

Grading system:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10
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Reference nosilca/Lecturer's references:

- ŠARČEVIĆ, Iva, GREGOR-SVETEC, Diana, BANIĆ, Dubravko. Influence of perforations on the reduction of the compressive strength of corrugated cardboard. *Journal of physics. Conference series*. [Online ed.]. 2022, vol. 2321, 6 str., ilustr. ISSN 1742-6596
- PÁL, Magdolna, DEDIJER, Sandra, KOLTAI, László, GREGOR-SVETEC, Diana, CIGULA, Tomislav, PAVLOVIĆ, Živko, MILIĆ-KERESTES, Neda. Fold cracking of coated papers: investigation on automated computer-aided visual assessment method. *Nordic pulp & paper research journal*. [Print ed.]. 28. sep. 2021, vol. , no. , str. 1-17. ISSN 0283-2631.
- TIŠLER KORLIJAN, Barbara, GREGOR-SVETEC, Diana. Properties and printability of compression moulded recycled polyethylene. *Materials & design*, ISSN 0264-1275. [Print ed.], Mar. 2014, vol. 55, str. 583-590.
- GREGOR-SVETEC, Diana. Influence of layer composition on properties of recycled boards. *Cellulose chemistry and technology*, ISSN 0576-9787, 2010, vol. 44, no. 10, str. 505-512.
- JOHANSSON, Caisa, BRAS, Julien, MONDRAGON, Inaki, NECHITA, Petronela, PLACKETT, David, ŠIMON, Peter, GREGOR-SVETEC, Diana, VIRTANEN, Sanna, GIACINTI BASCHETTI, Marco, BREEN, Chris, CLEGG, Francis, AUCEJO, Susana. Renewable fibers and bio-based materials for packaging applications - a review of recent developments. *Bioresources*, ISSN 1930-2126, 2012, vol. 7, no. 2, str. 2506-2552.
- GREGOR-SVETEC, Diana. Načrtovanje plastične embalaže za boljšo reciklabilnost. V: VOLFAND, Jože (ur.), AMBROŽ, Goran. *Razvoj embalaže v krožnem gospodarstvu : priročnik*. Celje: Fit media, 2019. Str. 133-141, ilustr. Zbirka Zelena Slovenija. ISBN 978-961-6283-59-5.

EMBALAŽA 2

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Embalaža 2
Course title:	Packaging 2
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068053
Koda učne enote na članici/UL Member course code:	10214

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	15	0	0	60	4

Nosilec predmeta/Lecturer:	Diana Gregor Svetec
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik študija. Pogoj za opravljanje študijskih obveznosti je prisotnost pri predavanjih, seminarju in vajah. Zahtevana prisotnost na vajah je 100 %.	Enrolment into the year of study. Prerequisites for performing study obligations is presence at lectures, seminar and tutorials. Requested presence at tutorials is 100 %.

Vsebina:	Content (Syllabus outline):
Predavanja: • predstavitev embalaže z dodano vrednostjo, kot so: jedilna, samogrelna, samoohlajevalna, embalaža posebnih oblik, z zaščito pred ponarejanjem, večfunkcionalna, aktivna, inteligentna, interaktivna in druge vrste pametne embalaže; • pregled zahtev živilske, kozmetične, farmacevtske in drugih industrij glede embalaže; • zakonodaja, predpisi in sistemi ravnanja z embalažo; • vpliv embalaže na okolje, recikliranje, biorazgradnja, ekološko oblikovanje embalaže in krožno gospodarjenje. Seminar: raziskovalna naloga, pregled literature in predstavitev novosti. Vaje: načrtovanje in izdelava embalaže z dodano vrednostjo.	Lectures: • packaging with added value, such as edible, self-heating, self-cooling, packaging with special shapes and functions, with anti-counterfeit function, active, intelligent, interactive and other kind of smart packaging; • overview of regulations for packaging of food, beauty and personal care, pharmaceutical and in other sectors, legislation and systems for packaging management. Seminar: research work, literature overview and presentation of novelties. Tutorial: design and manufacturing of packaging with added value.

Temeljna literatura in viri/Readings:

• Debeaufort, F., Galić, K., Kurek, M., Benbettaieb, N., Ščetar, M. Packaging Materials and Processing for Foods, Pharmaceuticals and Cosmetics, London, Hoboken, ISTE and Wiley, 2021
• Muthu, S. S. Sustainable packaging. Singapore, Springer Nature, 2021
• Kerry, J., Butler, P. Smart packaging technologies for fast moving consumer goods. Chichester, Wiley, 2008
• Han, H. J. Innovations in food packaging. London, Academic Press, 2014
• E-Revije in e-knjige iz podatkovnih zbirk univerze / e-journals and e-books from university databases
Literatura je dostopna v knjižnici NTF-Oddelka za tekstilstvo, grafiko in oblikovanje, Centralni tehniški knjižnici in preko medknjižnične izposoje.
Literature is available in library NTF-Department of Textiles, Graphic Arts and Design, Central technical library and through library exchange.

Cilji in kompetence:

Študenti spoznajo embalažo z dodano vrednostjo, napredno embalažo in trende pri razvoju embalaže ter nove smernice kot so trajnostni razvoj, krožno gospodarjenje in ekološko oblikovanje. Seznanijo se s posebnimi zahtevami za določeno vrsto embalaže, kot je embalaža za pakiranje živil, zdravil, kozmetike, elektronike itd. Dobijo pregled zakonodaje, predpisov, specifikacij, testnih metod za določene vrste embalaž.

Predmetnospecifične kompetence:

- poznavanje in razumevanje dejavnikov, ki podajo embalaži dodano vrednost,
- poznavanje in razumevanje posebnih zahtev za določene vrste embalaže,
- obvladovanje postopka načrtovanja pametne embalaže,
- obvladovanje postopka načrtovanja trajnostne embalaže,
- uporaba informacijsko-komunikacijske tehnologije pri načrtovanju napredne embalaže, posredovanju in obdelavi podatkov ter zasledovanju novosti,
- sposobnost umeščanja novih informacij in spoznanj v kontekstu razvoja novih izdelkov.

Objectives and competences:

Students get to know packaging with added value, advanced packaging and trends in packaging development, new directions such as sustainability, circular economy and eco-design. They become familiar with the specific requirements for a particular type of packaging, such as packaging for food, drugs, cosmetics, electronics, etc. They get overview of the legislation, regulations, specifications, test methods for certain types of packaging.

Competences:

- knowledge and understanding of factors, which give packaging added value,
- knowledge and understanding of the specific requirements for certain types of packaging,
- managing of design process of smart packaging,
- managing of eco-design process of sustainable packaging,
- use of information-communication technology at packaging development, data evaluation and following innovations,
- ability to include new information and knowledge in the context of the development of new products.

Predvideni študijski rezultati:

Znanje in razumevanje:

študent pozna različne vrste napredne embalaže in trende pri razvoju embalaže z dodano vrednostjo. Pozna in razume postopek načrtovanja pametne embalaže. Pozna pomen trajnostnega razvoja na področju embalaže in razume postopek ekološkega oblikovanja embalaže. Pozna predpise in zahteve za določene vrste embalaže. Teoretična podlaga mu pomaga prenesti znanje v delovni proces pri izdelavi napredne embalaže in izdelavi trajnostne embalaže.

Intended learning outcomes:

Knowledge and understanding:

student knows various types of advanced packaging and trends at developing packaging with added value. Knows and understands the design process of smart packaging. Knows the meaning of sustainability in the field of packaging and understands the process of eco-design of packaging. Knows the regulations and requirements for a particular type of packaging. Theoretical basis helps him to implement the knowledge into the working process at advance packaging manufacturing and manufacturing of sustainable packaging.

Metode poučevanja in učenja:

- Klasična in interaktivna predavanja, poučevanje z uporabo IKT tehnologije,
- projektno delo, diskusije, interpretacije, skupinsko

Learning and teaching methods:

- Classic and interactive lectures, teaching using IKT technology,
- project work in groups, discussions, interpretation,

delo, - samostojno analitično pisno delo s predstavitvijo in individualno delo pri vajah. Vse oblike (predavanja/seminar/vaje) se lahko izvajajo v živo v učilnicah ali preko spleta (online) v spletnih učilnicah, z uporabo specifičnih orodij ter ustrezne programske opreme.	group work, - independent analytical written work with presentation and individual work at tutorials. All forms (lectures/seminar/tutorials) can be conducted live in classrooms or online in online classrooms, using specific tools and suitable software.
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Načini ocenjevanja:	Delež/Weight	Assessment:
Ustni/pisni izpit/izpitna naloga ter sprotno preverjanje (domače naloge, projektno delo) Poteka lahko v predavalnici ali na daljavo.	50,00 %	Oral/written exam/exam assignment, and ongoing assessment (homework, project work) Performed in classroom or on-line.
Seminar	25,00 %	Seminar
Vaje	25,00 %	Practical exercises

Ocenjevalna lestvica:	Grading system:
5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- GREGOR-SVETEC, Diana. Intelligent packaging. V: CERQUEIRA, Miguel Ângelo Parente Ribeiro (ur.), et al. *Nanomaterials for food packaging : materials, processing technologies and safety issues*. Amsterdam: Elsevier, 2018. Str. 203-247. Micro & nano technologies series. ISBN 978-0-323-51271-8.

- GREGOR-SVETEC, Diana, RAVNJAK, David. Različni sistemi aktivne in pametne embalaže za živila. V: VOLFAND, Jože (ur.), AMBROŽ, Goran. *Razvoj embalaže v krožnem gospodarstvu : priročnik*. Celje: Fit media, 2019. Str. 87-93, ilustr. Zbirka Zelena Slovenija. ISBN 978-961-6283-59-5.

- GREGOR-SVETEC, Diana, PIVAR, Matej, MUCK, Deja. Properties of recycled papers important for printable antennas. *Cellulose chemistry and technology*. 2015, vol. 49, no. 7/8, str. 701-708, ilustr. ISSN 0576-9787.

- JOHANSSON, Caisa, BRAS, Julien, MONDRAGON, Inaki, NECHITA, Petronela, PLACKETT, David, ŠIMON, Peter, GREGOR-SVETEC, Diana, VIRTANEN, Sanna, GIACINTI BASCHETTI, Marco, BREEN, Chris, CLEGG, Francis, AUCEJO, Susana. Renewable fibers and bio-based materials for packaging applications - a review of recent developments. *Bioresourves*, ISSN 1930-2126, 2012, vol. 7, no. 2, str. 2506-2552.

- KAVČIČ, Urška, PIVAR, Matej, ĐOKIĆ, Miloje, GREGOR-SVETEC, Diana, PAVLOVIČ, Leon, MUCK, Tadeja. UHF RFID tags with printed antennas on recycled papers and cardboards. *Materiali in tehnologije*, ISSN 1580-2949. [Tiskana izd.], mar.-apr. 2014, letn. 48, št. 2, str. 261-267.

- GREGOR-SVETEC, Diana, ZULE, Janja, ELEGIR, Graziano. Recyclability of graphic products and paper based packaging. V: *Wood, pulp & paper 2014 : [proceedings of joint conference = zbornik vedeckých konferencií] : [proceedings of joint conference = zbornik vedeckých konferencií]*. Wood, Pulp and paper 2014 in Polygrafia academica 2014, proceedings of joint conference, Bratislava 12. a 13. marca 2014. Bratislava: Slovenská technická univerzita v Bratislave, 2014. Str. 14-19, ilustr. ISBN 978-80-89597-16-1

EMBALAŽNI MATERIALI IN TEHNOLOGIJA

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Embalažni materiali in tehnologija
Course title:	Packaging materials and technology
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	2. semester	izbirni
Grafične in interaktivne komunikacije, prva stopnja, univerzitetni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code: 0644018

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	45	0	0	90	6

Nosilec predmeta/Lecturer: Diana Gregor Svetec

Vrsta predmeta/Course type: Izbirni/Elective

Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Vpis v letnik študija.
Pogoj za opravljanje študijskih obveznosti je prisotnost pri predavanjih, seminarju in vajah. Zahtevana prisotnost na vajah je 100 %, pri seminarjih 80 % in predavanjih 50 %.

Prerequisites:

Enrolment into the study year.
Prerequisites for performing study obligations is presence at lectures, seminar and tutorials. Requested presence at tutorials is 100 %, at seminar 80 % and lectures 50 %.

Vsebina:

Predavanja: Pregled postopkov, embalažnih materialov in tehnologij, ki se uporabljajo za izdelavo embalažnih rešitev za različne izdelke. Pregled zahtev živilske, kozmetične, farmacevtske in drugih industrij glede embalaže.
• predstavitev funkcij embalaže; • trajnost in okoljska funkcija embalaže; • embalažni materiali; lastnosti, prednosti in pomanjkljivosti posameznih embalažnih materialov in vrst embalaže; • trajnostni embalažni materiali; • postopki izdelave posameznih vrst embalaže; • vpeljava krožnega gospodarjenja v

Content (Syllabus outline):

Lectures: An overview of the processes, packaging materials and technologies used to create packaging solutions for various products. An overview of regulations for packaging of food, beauty and personal care, pharmaceutical and in other sectors.
• introduction of packaging and its functions; • sustainability and environmental function of packaging; • packaging materials; characteristics, advantages and disadvantages of various types of packaging materials and packaging; • sustainable packaging materials; • manufacturing processes of

processe izdelave embalaže in prehod v ogljično nevtrarno družbo. Seminar: izdelava in predstavitev seminarske naloge. V seminarske naloge so vključene zelene in trajnostne vsebine. Vaje: načrtovanje embalaže in izdelava kartonske embalaže z računalniškim programom za načrtovanje embalaže.	certain types of packaging; • introduction of circular economy into manufacturing processes and transition to carbon neutral society. Seminar: preparation and presentation of seminar work. Green and sustainable topics are included in the seminar assignments. Tutorial: design and production of cardboard packaging with a computer program for the design of packaging.
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Temeljna literatura in viri/Readings:

• Vrabčič Brodnjak, U. Načrtovanje in oblikovanje embalaže, Ljubljana, UL NTF, 2022

• Auras, R.A., Selke, S.E.M. Life cycle of sustainable packaging: From design to end-of-life. Wiley, 2023

• Bastioli, C. Handbook of biodegradable polymers. Boston, De Gruyter, 2020

• Kwan, C., Ho, E. Packaging materials. Honkong, SendPoint Publishing, 2014

• Hanlon, J.F., Kelsey, R.J., Forcinio, H.E. Handbook of package engineering. London, CRC Press, 1998

• Brody, A.L. Encyclopedia of packaging technology. New York, J Wiley & Sons, 2009

Literatura je dostopna v knjižnici NTF-Oddelka za tekstilstvo, grafiko in oblikovanje. Literature is available in the library NTF-Department of Textiles, Graphic Arts and Design.

DODATNA LITERATURA

E-revije in e-knjige iz podatkovnih zbirk univerze / e-journals and e-books from university databases

Cilji in kompetence:

Študenti spoznajo različne vrste embalaže, njihove funkcije, vključno z okoljsko funkcijo. Seznanijo se z različnimi embalažnimi materiali, z njihovimi lastnostmi, prednostmi in pomankljivostmi. Seznanijo se s trajnostnimi embalažnimi materiali. Spoznajo procese pri načrtovanju embalaže in postopke izdelave različnih vrst embalaže ter tehnologije, ki so del krožnega gospodarstva in manj ogljično intenzivne. Seznanijo se s posebnimi zahtevami za določeno vrsto embalaže, kot je embalaža za pakiranje živil, zdravil, kozmetike, elektronike itd. Naučijo se uporabljati računalniški program, ki omogoča načrtovanje kartonske embalaže.

Predmetnospecifične kompetence:

- poznavanje pomena lastnosti embalažnih materialov za izdelavo različnih vrst embalaže,
- obvladovanje postopka načrtovanja in izdelave embalaže,
- razvoj spretnosti pri uporabi ustreznih računalniških programov,
- uporaba informacijsko-komunikacijske tehnologije pri načrtovanju embalaže, posredovanju in obdelavi podatkov ter zasledovanju novosti,
- sposobnost umeščanja novih informacij in spoznanj v kontekstu razvoja novih izdelkov.

Objectives and competences:

Students get know various types of packaging and the functions of packaging, including environmental function. They learn about different packaging materials and their characteristics, advantages and disadvantages. They get to know sustainable packaging materials. They learn about the processes in the design and manufacturing of various types of packaging, technologies which are part of circular economy and less carbon intensive. They become familiar with the specific requirements for a particular type of packaging, such as packaging for food, drugs, cosmetics, electronics, etc. They learn how to use a computer program for design of packaging.

Competences:

- knowledge of the importance of packaging materials characteristics for the manufacturing of various types of packaging,
- managing of planning process and design of packaging,
- develop skills in using appropriate computer programs,
- use of information-communication technology at packaging development, data evaluation and following innovations,
- ability to include new information and knowledge in the context of the development of new product.

Predvideni študijski rezultati:

Znanje in razumevanje:

študent pozna različne vrste embalažnih materialov in iz njih izdelano embalažo, njihove lastnosti, postopke izdelave in dodelave. Razume postopek načrtovanja in oblikovanja embalažnih enot in zna uporabiti

Intended learning outcomes:

Knowledge and understanding:

student knows various types of packaging materials and packaging made from them, their properties, manufacturing processes and finishing. Understand the design process of packaging units and is able to

računalniške programe za načrtovanje embalaže. Razume pomembnost embalažnih materialov in posameznih faz pri postopkih izdelave v relaciji z lastnostmi embalaže in optimiranjem le-te. Razume pomen vpeljave krožnega gospodarjenja v procese izdelave embalaže in trajnostni razvoj na področju embalaže. Teoretična podlaga mu pomaga prenesti znanje v delovni proces.	use computer programmes for packaging design. Understands the importance of packaging materials and the various stages in manufacturing processes in relation to the properties of packaging in order to optimize it. Understands the importance of introducing circular economy into packaging production processes and sustainable development in the field of packaging. Theoretical basis helps to implement the knowledge into the working process.
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Metode poučevanja in učenja:

- klasična in interaktivna predavanja, poučevanje z uporabo IKT tehnologije
- projektno delo, diskusije, interpretacije, skupinsko delo,
- samostojno analitično pisno delo s predstavitvijo in individualno delo pri vajah.
Vse oblike (predavanja/seminar/vaje) se lahko izvajajo v živo v učilnicah ali preko spleta (online) v spletnih učilnicah, z uporabo specifičnih orodij ter ustrezne programske opreme.

Learning and teaching methods:

- classic and interactive lectures, teaching using IKT technology
- project work in groups, discussions, interpretation, group work,
- independent analytical written work with presentation and individual work at tutorials.
All forms (lectures/seminar/tutorials) can be conducted live in classrooms or online in online classrooms, using specific tools and suitable software.

Načini ocenjevanja:

Delež/Weight

Assessment:

Ustni ali pisni izpit ali izpitna naloga. Poteka lahko v predavalnici ali na daljavo.	40,00 %	Oral or written exam or exam assignment. Performed in classroom or on-line.
Seminarska naloga	20,00 %	Seminar work
Vaje	40,00 %	Tutorial

Ocenjevalna lestvica:

Grading system:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10
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Reference nosilca/Lecturer's references:

- DERMOL, Špela, BORIN, Bojan, GREGOR-SVETEC, Diana, SLEMENIK PERŠE, Lidija, LAVRIČ, Gregor. The development of a bacterial nanocellulose/cationic starch hydrogel for the production of sustainable 3D-printed packaging foils. *Polymers*. 2024, vol. 16, iss. 11, [article no.] 1527, str. 1-23
- GREGOR-SVETEC, Diana, VODNIK, Žan, GALE, Tea, KAVČIČ, Urška. Tomato plant residues, a sustainable fiber source for cardboard packaging. *Sustainability*. 2024, vol. 16, iss. 17, str. 1-21
- ŠARČEVIČ, Iva, GREGOR-SVETEC, Diana, BANIČ, Dubravko. Influence of perforations on the reduction of the compressive strength of corrugated cardboard. *Journal of physics. Conference series*. [Online ed.]. 2022, vol. 2321, 6 str.
- PÁL, Magdolna, DEDIJER, Sandra, KOLTAI, László, GREGOR-SVETEC, Diana, CIGULA, Tomislav, PAVLOVIČ, Živko, MILIĆ-KERESTES, Neda. Fold cracking of coated papers: investigation on automated computer-aided visual assessment method. *Nordic pulp & paper research journal*. [Print ed.]. 28. sep. 2021, vol. , no. , str. 1-17.
- TIŠLER KORLIJAN, Barbara, GREGOR-SVETEC, Diana. Properties and printability of compression moulded recycled polyethylene. *Materials & design*, ISSN 0264-1275. [Print ed.], Mar. 2014, vol. 55, str. 583-590.
- JOHANSSON, Caisa, BRAS, Julien, MONDRAGON, Inaki, NECHITA, Petronela, PLACKETT, David, ŠIMON, Peter, GREGOR-SVETEC, Diana, VIRTANEN, Sanna, GIACINTI BASCHETTI, Marco, BREEN, Chris, CLEGG, Francis, AUCEJO, Susana. Renewable fibers and bio-based materials for packaging applications - a review of recent developments. *Bioresources*, 2012, vol. 7, no. 2, str. 2506-2552.

FOTOGRAFIJA IN VIDEO

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Fotografija in video
Course title:	Photography and video
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	1. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0148191
Koda učne enote na članici/UL Member course code:	10972

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	0	30	0	0	60	4

Nosilec predmeta/Lecturer:	Marica Starešinič
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
/Pogoj za vključitev v delo je vpis v letnik študija. Pogoj za pristop h končnemu izpitu so opravljene vaje.	Enrolment in the study year. For the final exam, guided tutorial has to be completed successfully.

Vsebina:	Content (Syllabus outline):
/Zgodovina fotografije s poudarkom na starih fotografskih tehnikah, fotografski opremi, postopkih izdelave klasičnih črnobelih fotografij. Analogni fotoaparati, objektiv, optični zakoni, osvetlitvene naprave, leče, napake leč, ČB in barvni materiali, urejanje in arhiviranje posnetega materiala, snemalne tehnike, razvijalni postopki za klasično ČB fotografijo, reproduksijska fotografija, digitalna fotografija, digitalni fotoaparati, formati zapisa, korekcija fotografij. Osnovne razlike med digitalno in klasično fotografijo, HDR fotografija, različne teme v fotografiji: portret, panorama, kolaži, abstraktna fotografija. Likovna analiza fotografij, odnos med fotografijo in tipografijo. Vzorci v naravi in na fotografiji, osnovni likovni parametri ter likovno -	The history of photography, classical analogue photographic techniques, equipment , and manufacturing processes of classical black-and-white photos. Cameras, lenses, optical laws, and lighting systems, lens defects , black-and-white and colour materials, editing and archiving of photography, procedures for the classic black & white photo reproduction photography, digital photography, digital cameras, image formats , correction of photos. Basic differences between digital and conventional photography, HDR photography, a variety of topics in photography: portrait, panorama, collages, abstract photo. Art analysis of the photos, the relationship between photography and typography, patterns in nature and photography. Basic parameters and Fine

estetska načela v fotografiji, združena z likovno analizo fotografije. Vaje: fotografija, izvedba vaj na različnih lokacijah, računalniške korekcije fotografij, (spoznavanje tehničnih parametrov, estetskih in izraznih rešitev). Spoznavanje z video opremo, pogoji za video smemanje ter spoznavanje z programsko opremo za video produkcijo.	Arts - aesthetic principles of photography, combined with the visual analysis of the photographs. Tutorial: photography on locations and computer postproduction of photos (to determine technical parameters of photography, aesthetic and expressive requirements and solutions). the basic knowledge of video production, the filming parameters as well as video production software.
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Temeljna literatura in viri/Readings:

/1. PAPOTNIK, A. Fotografija : zbrano gradivo o fotografiji. Radovljica : Didakta, 1994 2. PARR, Martin; ANG, T., Digitalna fotografija, Ljubljana: Tehniška založba, 2000.
SLAVEC, D., Fotografija, Ljubljana: Much, 2000.
LONG, B., Complete Digital Photography, Massachusetts, 2001. 7.
INTIHAR, M., E-fotografija (prenovljena in razširjena izdaja), Ljubljana: Samozaložba, 2003

Dodatna literatura:

BADGER, Gerry. The photobook: a history. Phaidon Press, 2006
HIRSCH, Robert. Seizing the light. A history of photography, 2008. 8.
Članki v revijalnem tisku o fotografiji. 9. Elektronske publikacije digitalnih knjižnic na svetovnem spletu. 10. Tiskane publikacije ter strokovna poročila. Literatura je dosegljiva v knjižnici Oddelka za tekstilstvo , ter on-line preko programa Moodle.

Cilji in kompetence:

/Spoznavanje fotografije kot enega najpomembnejših vizualno komunikacijskih medijev, in videa, ki fotografijo nadgrajuje, katera skupaj s tipografijo omogoča oblikovanje grafičnih izdelkov in multimedijских predstavitev. Predmetno specifične kompetence: - Sposobnost vpogleda v celotno vlogo fotografije kot enega najpomembnejših vizualnih komunikacijskih medijev. - Sposobnost za uporabo in poznavanje tehnoloških, postopkov za izdelavo reprodukcij za vse vrste tiska in računalniško oblikovanje slike z različno programsko opremo. - Poznavanje zgodovine fotografije in videa. - Poznavanje vseh specifičnih značilnosti in področij uporabe fotografije skozi zgodovino in danes. - Sposobnost izvedbe in predstavitev samostojne kolekcije ČB in barvnih fotografij v kombinaciji s tipografijo. - Znanje s področja zaznave prostora s pomočjo zakona o perspektivi in perspektivi v fotografiji kot prostorski, estetski in izpovedni parameter. Znanje s področja likovne analize fotografij in videa. Poznavanje osnov video produkcije, opreme ter osnov snemanja. Sposobnost montaže in osnovnih korekcij v video produkciji. Sposobnost tehnične priprave (izvoza) videa za različne medije.

Objectives and competences:

Learning about photography as one of the most important visual communication media, and video that upgrades photography, that together with typography allows the creation of graphic products and multimedia presentations. Subject-specific competencies: - A complex knowledge of photography as one of the most important visual communication media. - Knowledge of the history of photography and video - The use of knowledge and technology for making reproductions for all types of printing and computer images using different software - Knowledge of the specific characteristics and application areas of photography and video through history and today. - Ability to present separate collection of black & white and colour photographs, combined with typography. - Knowledge of the perception of space by means of the Law on the perspective and the perspective of the photo as a spatial, aesthetic and narrative parameter. - Art analysis of the photos and video. Knowledge of the basics of video production, equipment and the basics of recording video. Ability to edit and make basic corrections in video production. Ability to technically export video for different media formats.

Predvideni študijski rezultati:

/Znanje s področja analogne in digitalne fotografije, poznavanje nekaterih najpomembnejših svetovnih in slovenskih fotografov in njihovih del. Uporaba znanja s področja digitalne fotografije v grafični proizvodnji, oglaševanju ter samostojno delovanje na področju fotografije ter osnove priprave fotografskih razstav

Intended learning outcomes:

The knowledge of analogue and digital photography, and some of the most important photographers and their works. The use of knowledge from the field of digital photography in graphic production, advertising, graphic products and to set their

ter razstav grafičnih izdelkov. Poznavanje osnov video produkcije ter izdelava avtorskega videa.	photography exhibitions. Knowing the basics of video production and making of original video.
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Metode poučevanja in učenja:

/Predavanja, vodene individualne naloge.
Predavanja v predavalnici ali on-line preko programa Moodle, ter vodene individualne naloge.

Learning and teaching methods:

Lectures and guided individual work.
Lectures and guided individual work in lecture room or on-line using Moodle..

Načini ocenjevanja:
Delež/Weight
Assessment:

a) izpit teoretskih znanj in	50,00 %	a) exam of theoretical knowledge and
b) ocena iz vaj	50,00 %	b) completed tutorials

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

1. STAREŠINIČ, Marica, SIMONČIČ, Barbara, BRACKO, Sabina. Using a digital camera to identify colors in urban environments. *Journal of imaging science and technology*, ISSN 1062-3701, 2011, vol. 55, no. 6, str. 060201/1-060201/4, ilustr., doi: [10.2352/J.ImagingSci.Technol.2011.55.6.060201](https://doi.org/10.2352/J.ImagingSci.Technol.2011.55.6.060201). [COBISS.SI-ID [2684272](#)]
2. AHTIK, Jure, MUCK, Deja, STAREŠINIČ, Marica. Detail diversity analysis of novel visual database for digital image evaluation. *Acta polytechnica Hungarica*, ISSN 1785-8860, 2017, vol. 14, no. 6, str. 115-132. <http://www.uni-obuda.hu/journal/Issue77.htm>. [COBISS.SI-ID [3458416](#)]
3. AHTIK, Jure, STAREŠINIČ, Marica. Eye movement analysis of image quality parameters compared to subjective image quality assessment = Analiza pokreta očiju u određivanju parametara kvalitete slike u usporedbi sa subjektivnom procenom kvalitete slike. *Tehnički vjesnik : znanstveno-stručni časopis tehničkih fakulteta Sveučilišta u Osijeku*, ISSN 1330-3651, 2017, vol. 24, no. 6, str. 1833-1839. http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=280290. [COBISS.SI-ID [3452784](#)]
4. JAVORŠEK, Dejana, MOČNIK, Janja, STAREŠINIČ, Marica. Analyses of colour appearances on different display devices = Analiza interpretacije barv na različnih prikazovalnih napravah. *Tekstilec : glasilo slovenskih tekstilcev*, ISSN 0351-3386. [Tiskana izd.], 2015, letn. 58, št. 2, str. 100-107, ilustr. [COBISS.SI-ID [3139440](#)]
5. OPAKA, Uroš, JAVORŠEK, Andrej, STAREŠINIČ, Marica, JAVORŠEK, Dejana. Analiza kakovosti barvnega profila za digitalno kamero Nikon D50 = Analysis of colour profile quality for digital camera Nikon D50. *Tekstilec : glasilo slovenskih tekstilcev*, ISSN 0351-3386. [Tiskana izd.], 2013, letn. 56, št. 2, str. 123-128, ilustr. [COBISS.SI-ID [2905712](#)]
Razstave
6. GODLER, Marjeta, STAREŠINIČ, Marica. *Space illusions dance : [razstava] : Galéria Umelka, Slovak Union of Visual Arts, 5th - 24th August, 2014, Bratislava, Slovakia*. 2014. [COBISS.SI-ID [3049072](#)]
7. GODLER, Marjeta, STAREŠINIČ, Marica. *Vesolje - veselje v nas : [samostojna razstava] : 33. festival idrijske čipke, 20. - 22. junij 2014, Idrija = "Space - the joy in us" exhibition : 33. idrija lace festival, 20. - 22. June 2014*. 2014. [COBISS.SI-ID [3023728](#)]
8. AHTIK, Jure (avtor razstave, mentor), KOČEVAR, Tanja Nuša (avtor razstave, mentor), STAREŠINIČ, Marica (avtor razstave, mentor). *Muvit/6x60 in NTF : razstava študentov 2. letnika, Naravoslovnotehniške fakultete, Univerze v Ljubljani : Maraton filmskega ustvarjanja Muvit/6x60, Celje, 16. - 19. avgust 2017*. 2017. [COBISS.SI-ID [3396976](#)]

GRAFIČNA PRIPRAVA

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Grafična priprava
Course title:	Graphic prepress
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	1. letnik	2. semester	obvezni

Univerzitetna koda predmeta/University course code:	0148198
Koda učne enote na članici/UL Member course code:	10219

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Raša Urbas
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Pogoj za vključitev v delo je vpis v letnik študija in izbira predmeta ter aktivna udeležba na vseh segmentih predmeta.
Izdelana seminarska naloga z zagovorom ter pozitivno opravljene vaje so pogoj za pristop k končnemu izpitu.
Pogojena prisotnost pri posameznih učnih enotah:

- predavanja: 70 %
- vaje 100 % in
- seminar: 80 %.

Prerequisites:

The prerequisite for inclusion present enrollment in the study year and selection of the subject as well as active participation in all segments of the course.
Finished seminar work with presentation and positively performed tutorials are a condition for the final exam.
Conditional attendance for individual course units:

- lectures: 70%,
- practicum (tutorials) 100 % and
- seminar: 80%.

Vsebina:

Pri predmetu bodo študentje seznanjeni s sledečimi vsebinami: - lastnosti slikovnih in tekstovnih predlog, ki definirajo načine upodobitve tiskovin in spletnih objav; - metode in načini uporabe orodij za digitalizacijo; - analogno-digitalna pretvorba grafičnih predlog; - uporaba načinov kompresiranja in postopkov interpolacijskih metod; - določila in specifikacije, ki narekujejo postopke barvnih pretvorb

Content (Syllabus outline):

Lectures will enable students to become acquainted with the following content: - properties of image and text designs, which define methods of prints and web publishing; - methods and manners of usage of digitalization tools; - analogue-digital conversion of graphic designs; - use of compression and procedures of interpolation methods; - terms and specifications, which define procedures of color conversion and the

in uporabe barvnih profilov; - vrste in načini zapisa datotečnih formatov; - klasična, frekvenčna in hibridna modulacija rastrov; - uporaba programske rasterizacijske opreme; - lastnosti in izdelava barvnih separacij procesnih in dodatnih barv; - tehnike in načini izvedbe impozicije; - spoznavanje klasičnega delokroga grafične priprave; - lastnosti in značilnosti različnih vrst zapisa .pdf datotek in njihov pomen in namen v praksi; - uporaba osnovnih .pdf oblik zapisa datotek za pripravo tiskovin in spletnih objav.	use of color profiles; - types and methods of defining file formats; - classic, frequent and hybrid raster modulation; - use of rasterization software tools; - properties and use of color separation of process and spot colors; - imposition techniques and methods; - basic properties of graphic prepress workflow; - properties and characteristics of different .pdf file formats and their meaning and aim of use in practice; - use of basic .pdf file formats for print and web publishing.
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Temeljna literatura in viri/Readings:

Kipphan H. Handbook of Print Media. Berlin, Springer, 2001.
Novak G. A. Grafični materiali, 2004
Kumar M. Tehnologija Grafičnih procesov. Srednja medijska in grafična šola, 2009
Možina K. Tipografska kunšt: upodobitev informacij. Ljubljana: Naravoslovnotehniška fakulteta, 2023

Cilji in kompetence:

Študentje se seznajajo z osnovnimi znanji s področja digitalne in grafične priprave za tiskane in spletne medije. Seznanijo se s pripadajočimi osnovnimi tehnološkimi procesi, orodji in elementi delokroga za izdelavo tiskovin in spletnih objav. Predmetno specifični cilji in kompetence so naslednje:

- pregled osnovnih značilnosti komuniciranja;
- obvladovanje analogno-digitalne pretvorbe različnih grafičnih predlog (besedila in slik);
- pregled osnovnih tehnoloških značilnosti procesov izdelave različnih vrst tiskovin;
- pregled namena in uporabe najpomembnejših formatov zapisa datotek grafičnih predlog;
- obvladovanje sestave in tehnoloških parametrov delokroga digitalne priprave tiskovin;
- nameni in cilji uporabe barvnega upravljanja pri pripravi grafičnih predlog;
- uporaba rastriranja in pripadajočih tehnoloških procesov;
- priprava rastriranih predlog na RIPu in izdelava posameznih separacij;
- spoznavanje pomembnosti in namembnosti različnih oblik pdf zapisa.

Cilj rabe IKT opreme in sodobnega pristopa poučevanja je doseganje boljšega razumevanja in znanja vsebine teoretičnega in praktičnega dela predmeta ter hkrati zagotavljanje trajnostnega znanja rabe in pomena IKT tehnologij v učnem procesu in praktični rabi v postopkih grafične priprave. Študent bo s pridobljenim znanjem znal interdisciplinarno povezovati osvojene vsebine z drugimi predmeti.

Objectives and competences:

Students are acquainted with the basic knowledge from the field of digital and graphic prepress for printed and web media. They are acquainted with associated basic technology processes, tools and elements of workflow for the production of printed and web material. Subject-specific objectives and competencies are as follows:

- review of the basic communication characteristics;
- controlling of analogue-digital conversion of different graphic designs (text and images);
- review of basic technology characteristics in the production process of different printing material;
- review of the aim and the use of most important file formats of graphic designs;
- managing of composition and technological parameters of digital prepress workflow of printing material;
- aims and objectives of the use of color management in graphic designs;
- use of raster and related technological processes;
- preparation of raster designs on RIP and production of individual separations;
- understanding the importance and the purpose of different .pdf file formats.

The aim of the use of ICT devices and a modern teaching approach is to achieve a better understanding and knowledge of the contents of the theoretical and practical part of the studies, while ensuring sustainable knowledge of the use and importance of ICT technologies in the learning process and practical use in graphic prepress. With the knowledge acquired, the student will be able to combine the acquired content with other subjects in an interdisciplinary manner.

Predvideni študijski rezultati:

Študent razume in zna pravilno uporabljati:

Intended learning outcomes:

Student understands and knows how to properly use:

• osnovna programska orodja za izvedbo grafične priprave za tisk in splet; • osnove tehnoloških procesov grafičnega delokroga v digitalni pripravi za tisk in splet; • izbrati in urediti ustrezne podatke in informacije, ki so osnova v digitalni grafični pripravi; • povezave med posameznimi procesi pretvorbe grafičnih predlog v digitalni pripravi za tisk; • načine dela in kontrole kakovosti pripravljenih datotek za tisk in objavo na spletu.	• basic software tools for graphic prepress of printing and web publishing; • basics of technological properties of graphic workflow in digital prepress for print and web publishing; • selecting and editing proper data and information, which are the bases in graphic digital prepress; • links between individual processes of conversion graphic designs in digital graphic prepress; • methods and quality control of prepared files for printing and web publishing.
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Metode poučevanja in učenja:

Predmet je sestavljen iz predavanj, seminarja, vaj in drugih oblik dela.

Predavanja (multimedijske prezentacije) se izvaja v živo v predavalnici in/ali prek spleta (online) s pomočjo specifičnih orodij. Vsa gradiva predmeta so dostopna v Moodle spletni učilnici.

Seminarske naloge (v obliki grafičnega izdelka) se izvajajo individualno in/ali v skupini (3–4 študenti). Tematika seminarских nalog oz. izdelka se vedno nanaša na vsebine, ki zaobjemajo področje priprave predlog.

Vaje se izvajajo v računalniški učilnici in/ali prek spleta (online) s pomočjo primerne in ustrezne programske opreme, ki omogoča ustrezno grafično pripravo izdelkov.

Pri predmetu se uporabljajo spletne učilnice (gradivo, kvizi, preverja je znanja, igre, druge aktivnosti) in IKT metode poučevanja (multimedijsko gradivo, praktične demonstracije itd.). Komunikacija in oddaja seminarских nalog poteka prek spletne učilnice, kjer študentje tudi medsebojno vrednotijo projektno delo. Uporabljajo se inovativne metode poučevanja v smislu obogatitve predavanj z relevantnimi vabljenimi predavanji, povezovanjem z industrijo, seminarским delom na realnih izzivih iz industrije in gospodarstva zagotavljajo trajnostno znanje.

Izvedba predavanj, vaj, seminarja in drugih oblik dela poteka v slovenskem jeziku in/ali angleškem.

Learning and teaching methods:

The course consists of lectures, a seminar, exercises and other forms of work.

The lectures (multimedia presentations) are given live in the lecture hall and/or online using specific tools. All course materials are available in the online classroom Moodle.

Seminar papers (in the form of a graphic product) are done individually and/or in a group (3–4 students). The topics of the seminar papers or the product always relate to content that covers the field of design (graphic product).

The exercises are carried out in a computer classroom and/or online with the help of suitable and appropriate software that allows for adequate graphic preparation of the products.

The course uses online classroom (materials, quizzes, knowledge tests, games, other activities) and ICT teaching methods (multimedia materials, practical demonstrations, etc.). Communication and submission of seminar assignments is done through the online classroom, where students also assess each other's project work.

Innovative teaching methods are used in terms of enriching lectures with relevant invited lectures, communication with industry, seminar work on real challenges from industry and business ensure sustainable knowledge.

Lectures, practicum, seminars and other forms of work are held in Slovenian and/or English.

Načini ocenjevanja:

Delež/Weight

Assessment:

Praktično znanje, osvojeno na vajah, in teoretično znanje vsebine predavanj ter drugih literarnih virov se oceni s pomočjo pisnega in/ali ustnega preverjanja, ki se izvede v živo, v predavalnici, ali prek spleta (online) s pomočjo ustreznih programskih rešitev/orodij. Seminarська naloga oz. izdelek je ocenjen na podlagi vsebinske, oblikovne in kontekstualne kakovosti ter predstavitve. Skupna ocena seminarja, vaj in teoretičnega znanja predavanj se oceni z negativno oceno (5) oz. s pozitivnimi ocenami od 6 do 10. Za

The practical knowledge acquired in the tutorials and the theoretical knowledge from the lectures and other literature sources will be tested by a written and/or oral examination, which will be conducted in the lecture hall or online using appropriate software solutions/tools. The seminar assignment i.e. product will be graded on content, design and contextual quality and presentation. The overall grade of the seminar, tutorials and theoretical knowledge of the lectures will be assessed with a

pozitivno oceno je treba doseči vsaj 55 % ali več.		negative grade (5) or with positive grades from sufficient 6 to excellent 10. For a positive grade, at least 55 % or more must be achieved.
Vaje	30,00 %	Practicum (tutorials)
Seminarska naloga oz. izdelek	20,00 %	Seminar assignment i.e. product
Izpit teoretičnega znanja	50,00 %	Exam of theoretical knowledge

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- 1.URBAS, Raša, STANKOVIČ ELESINI, Urška, CIGULA, Tomislav, MAHOVIČ POLJAČEK, Sanja. Pad printing. V: IZDEBSKA, Joanna (ur.), THOMAS, Sabu (ur.). Printing on polymers : fundamentals and applications. Amsterdam [etc.]: Elsevier, 2016, str. 263-278.
- 2.STANKOVIČ ELESINI, Urška, URBAS, Raša. Microcapsules in printing. V: IZDEBSKA, Joanna (ur.), THOMAS, Sabu (ur.). Printing on polymers : fundamentals and applications. Amsterdam [etc.]: Elsevier, 2016, str. 389-396.
- 3.STANKOVIČ ELESINI, Urška, LESKOVŠEK, Mirjam, BERNIK, Slavko, ŠUMIGA, Boštjan, URBAS, Raša. Influence of co-current spray drying conditions on agglomeration of melamine-formaldehyde microcapsules. Drying technology, ISSN 0737-3937, [in press] 2016, 36 str., doi: 10.1080/07373937.2015.1131713.
- 4.URBAS, Raša, STANKOVIČ ELESINI, Urška. Color differences and perceptive properties of prints made with microcapsules. JGED, ISSN 2217-379X, Jun 2015, vol. 6, no. 1, str. 15-21, ilustr.
5. ROTAR, Bojan, STANKOVIČ ELESINI, Urška, HAJDU, Peter, LESKOVAR, Blaž, URBAS, Raša. Morphological and dimensional properties of unmodified and modified braille dots produced with UV inkjet printing = Morfološke in dimenzijske lastnosti nemodificirane in modificirane brajice izdelane z UV kapljičnim tiskom. *Materiali in tehnologije*, ISSN 1580-2949. [Tiskana izd.], 2020, vol. 54, iss. 6, str. 879-887, ilustr. <http://mit.imt.si/mit206.html>, doi: 10.17222/mit.2020.016.

GRAFIČNE PREISKAVE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Grafične preiskave
Course title:	Testing of graphic materials
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik, 3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068045
Koda učne enote na članici/UL Member course code:	10221

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Diana Gregor Svetec
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures: Angleščina, Slovenščina
	Vaje/Tutorial: Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik študija. Pogoj za opravljanje študijskih obveznosti je prisotnost pri predavanjih, seminarju, drugih oblikah študija in vajah. Zahtevana prisotnost na vajah je 100 %.	Enrolment into the study year. Prerequisites for performing study obligations is presence at lectures, seminar, other forms of study and tutorials. Requested presence at tutorials is 100 %.

Vsebina:	Content (Syllabus outline):
Predavanja: • temeljne preiskave papirjev in kartonov – določanje vpojnosti, mehanskih, površinskih, optičnih, prepustnih, tiskarskih in tiskovnih lastnosti; • temeljne preiskave polimernih tiskovnih materialov; • temeljne preiskave tiskarskih barv, lakov in lepil; • zahteve za trajnost pri preskušanju in merilnih naprav; • digitalizacija laboratorijev pri preskušanju in vrednotenju. Vaje: individualno delo na posamezni laboratorijski opremi, izvedba meritev določenih osnovnih, mehanskih, površinskih, optičnih in tiskarskih lastnosti grafičnih materialov. Seminar: ocena kakovosti določenega grafičnega izdelka na podlagi določitve lastnosti grafičnih materialov z	Lectures: • basic testing of papers and cardboards – determination of mechanical, surface and optical properties, permeability and adsorption, runnability and printability; • basic properties of polymeric printing materials; • basic properties of printing inks, varnishes and adhesives • sustainable testing requirements and measuring devices; • digitalization in laboratory at testing and evaluation. Tutorial: individual work on laboratory equipment, perform measuring some of basic, mechanical, surface, optical and printing properties of graphic materials. Seminar: quality evaluation of graphic product on the basis of printing materials' characteristics determined with

uporabo ustreznih metod preskušanja. Druge oblike študija: pregled literature, vrednotenje in prikaz meritev, interpretacija rezultatov meritev, izračuni.	suitable testing methods. Other forms of study: literature review, evaluation and presentation of measurements, interpretation of results of measurement, calculations.
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Temeljna literatura in viri/Readings:

- Levlin, J.-E., Soderbjelm, L. *Pulp and Paper Testing*. Helsinki : Fapet Oy, 1999.
 - *Handbook of physical testing of paper*. Ed. by R. E. Mark. New York ; Basel : M. Dekker, cop. 2002.
 - *Handbook of polymer testing : physical methods*. Ed. by R. Brown. New York ; Basel : M. Dekker, cop. 1999.
 - *The Printing Ink Manual*. 5th ed. Ed. by R. H. Leach. Dordrecht : Kluwer Academic Publishers, 2008.
- Literatura je dostopna v knjižnici NTF-Oddelka za tekstilstvo, grafiko in oblikovanje. / Literature is available in the library NTF-Department of Textiles, Graphic Arts and Design.
- DODATNA LITERATURA:
- SIST, ISO, TAPPI – standardi
 - E-revije in e-knjige iz podatkovnih zbirk univerze / e-journals and e-books from university databases

Cilji in kompetence:

Študenti se seznanijo s temeljnimi fizikalnimi metodami preskušanja grafičnih materialov ter spoznajo njihove lastnosti. Seznanijo se s preskuševalnimi standardi in njihovo uporabo. Predmetno specifične kompetence:

- sposobnost za reševanje konkretnih problemov na podlagi poznavanja heterogenosti materialov in njihovih lastnosti z obvladovanjem metod preskušanja,
- sposobnost razumevanja in uporabe standardiziranih preskuševalnih metod pri karakterizaciji grafičnih materialov in končnih izdelkov,
- razumevanje uporabe statističnega vrednotenja meritev in rezultatov preiskav ter sposobnost interpretacije rezultatov analize,
- razumevanje digitalizacije pri preskušanju in obdelavi podatkov,
- sposobnost razumevanja uporabe trajnostnih načel pri preskušanju;
- razvoj veščin in spretnosti pri kontroli in analiziranju zahtev pri izdelavi grafičnih izdelkov.

Objectives and competences:

Students get to know the basic physical methods for testing graphic materials and obtain knowledge about their properties. They get acquainted with the standards and their use. Specific competences of the subject:

- the ability to solve specific problems on the basis of knowledge about the heterogeneity of materials and their properties by applying proper testing methods,
- the ability to understand and use of standardized testing methods for the characterization of graphic materials and finished products,
- the ability to understand the use of statistical evaluation of measurements and obtained results and the ability to interpret the results of analyzes,
- the ability to understand digitalization at testing and evaluation of data,
- the ability to understand the application of sustainable principles at testing;
- development of skills and expertise in the control and analysis of requirements in the manufacturing of graphic products.

Predvideni študijski rezultati:

Znanje in razumevanje: študent spozna pomen in uporabnost preiskav grafičnih materialov, seznanen se z delom na sodobni laboratorijski opremljenosti. Zna razložiti in uporabiti standarde, izvesti meritev po danih postopkih, vrednotiti rezultate meritev ter jih podati. Spozna posamezne metode, prednosti in pomanjkljivosti posameznih metod preskušanja. Razume zakonitosti posameznih metod preskušanja, delovanje merilnih naprav ter relacije med metodami preskušanja, pomen digitalizacije in trajnosti na področju preskušanja.

Intended learning outcomes:

Knowledge and understanding: student knows the role and meaning of graphic materials testing, gets familiar with working on modern laboratory equipment. Student understands and can apply standards, can make measurements according to given procedure, evaluate the results of measurements and present them. Student gets to know different testing methods, their strengths and weaknesses. Understands the principals of individual testing methods, performance of measuring devices, relationships between different testing methods and the importance of digitalization and sustainability in the field of testing.

Metode poučevanja in učenja:

- Klasična in interaktivna predavanja, poučevanje z uporabo IKT tehnologije,
- projektno delo, diskusije, interpretacije, skupinsko

Learning and teaching methods:

- Classic and interactive lectures, teaching using IKT technology,
- project work in groups, discussions, interpretation,

delo, - samostojno analitično pisno delo s predstavitvijo in individualno delo pri vajah. Vse oblike (predavanja/seminar/vaje) se lahko izvajajo v živo v učilnicah ali preko spleta (online) v spletnih učilnicah, z uporabo specifičnih orodij ter ustrezne programske opreme.	group work, - independent analytical written work with presentation and individual work at tutorials. All forms (lectures/seminar/tutorials) can be conducted live in classrooms or online in online classrooms, using specific tools and suitable software.
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Načini ocenjevanja:	Delež/Weight	Assessment:
Ustni/pisni izpit/izpitna naloga ter sprotno preverjanje (domače naloge, projektno delo) Poteka lahko v predavalnici ali na daljavo.	40,00 %	Oral/written exam/exam assignment, and ongoing assessment (homework, project work). Performed in classroom or on-line.
Seminar	15,00 %	Seminar
Druge oblike študija	15,00 %	Other forms of study
Vaje	30,00 %	Tutorial

Ocenjevalna lestvica:	Grading system:
5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- ŠARČEVIĆ, Iva, GREGOR-SVETEC, Diana, BANIĆ, Dubravko. Validation of Elmendorf method for testing perforated corrugated cardboard. *Tehnički vjesnik : znanstveno-stručni časopis tehničkih fakulteta Sveučilišta u Osijeku*. 2022, vol. 29, no. 6, str. 1883-1888, ilustr. ISSN 1330-3651.
- DRAGOJEVIĆ, Andreja, GREGOR-SVETEC, Diana, VODOPIVEC, Jedert, LOZO, Branka. Characterization of seventeenth century papers from Valvasor's collection of the Zagreb Archdiocese. *Heritage science*. 19 Mar. 2021, vol. 9, str. 1-20, ilustr. ISSN 2050-7445
- GREGOR-SVETEC, Diana, LESKOVŠEK, Mirjam, VRABIĆ BRODNJAK, Urška, STANKOVIĆ ELESINI, Urška, MUCK, Deja, URBAS, Raša. Characteristics of HDPE/cardboard dust 3D printable composite filaments. *Journal of materials processing technology*. February 2020, vol. 276, 9 str. ISSN 0924-0136.
- BLAZNIK, Barbara, GREGOR-SVETEC, Diana, BRAČKO, Sabina. Influence of light and temperature on optical properties of papers. *Cellulose chemistry and technology*. 2017, vol. 51, no. 7/8, str. 755-764, ilustr. ISSN 0576-9787.
- KARLOVITS, Mirica, GREGOR-SVETEC, Diana. Durability of cellulose and synthetic papers exposed to various methods of accelerated ageing. *Acta polytechnica Hungarica*, ISSN 1785-8860, 2012, vol. 9, no. 6, str. 81-100.

GRAFIČNI MATERIALI

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Grafični materiali
Course title:	Graphic materials
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	1. letnik	2. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068069
Koda učne enote na članici/UL Member course code:	10222

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Diana Gregor Svetec, Sabina Bračko
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik študija. Pogoj za opravljanje študijskih obveznosti je prisotnost pri predavanjih, seminarju in vajah. Zahtevana prisotnost na vajah je 100 %. Za pristop k izpitu je pogoj opravljen seminar in kolokvij iz laboratorijskih vaj.	Enrolment into the study year. Prerequisite for performing study obligations is presence at lectures, seminar and tutorials. Requested presence at tutorials is 100 %. Student can attend the exam after passing Tutorial and Seminar.

Vsebina:	Content (Syllabus outline):
Predavanja: • predstavitev različnih grafičnih materialov; • predstavitev postopka izdelave in dodelave papirja ter vpliva surovin in proizvodnih faz na lastnosti papirja; • pregled različnih vrst papirjev; • formati; • sestava, lastnosti in mehanizmi sušenja tiskarskih barv za klasične in digitalne tehnike tiska; • zgradba in lastnosti lakov in lepil; • krožno gospodarjenje in trajnostni razvoj na področju grafičnih materialov. Seminar: poglobljena predstavitev določene teme. V seminarske naloge so vključene zelene in trajnostne vsebine.	Lectures: • overview of different graphic materials; • introduction to manufacturing process of paper and its finishing; • influence of raw materials and processing steps on characteristics of papers; • overview of various types of papers; • paper sizes; • composition, properties and drying mechanisms of printing inks for different printing techniques; • structure and properties of adhesives and varnishes; • circular economy and sustainable development in the field of graphic materials. Seminar: presentation of a specific topic. Green and sustainable topics are included in the seminar assignments.

Vaje: identifikacija papirnih vlaken, določanje lastnosti grafičnih materialov, delo na laboratorijski opremi. Druge oblike študija: samostojno in/ali projektno delo na določeni temi temelječ na pregledu literature.	Tutorial: identification of paper fibres, determination of properties of graphic materials, working on laboratory equipment. Other forms of study: individual and/or project work on defined subject based on literature overview.
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Temeljna literatura in viri/Readings:

- C. J. Biermann: Handbook of pulping and papermaking, Academic Press, 1996
- G. A. Smook: Handbook for pulp and paper technologists, Angus Wilde Publications Inc., 2002
- H. Kipphan: Handbook of Print Media. Springer-Verlag, 2001
- B. Thompson: Printing Materials: Science and Technology. Pira International, 2002
- G. Novak: Grafični materiali. NTF-Oddelka za tekstilstvo, 2004
- N. Eldred: What the Printer Should Know about Ink. Pittsburgh:GATFPRESS, 2001.
Literatura je dostopna v knjižnici NTF-Oddelka za tekstilstvo, grafiko in oblikovanje. Literature is available in the library NTF-Department of Textiles, Graphic Arts and Design.

Cilji in kompetence:

Študenti spoznajo osnovne materiale, ki se uporabljajo v tisku in dodelavi grafičnih izdelkov, kot so papir, karton in lepenka, polimerne folije, tiskarske barve, laki, lepila in drugi pomožni materiali. Seznanijo se z njihovim pridobivanjem, sestavo, strukturo in uporabnostjo. Spoznajo lastnosti grafičnih materialov ter medsebojni vpliv tiskovnega materiala, tiskarske barve in drugih materialov, ki se uporabljajo pri proizvodnji grafičnih izdelkov. Predmetnospecifične kompetence: • poznavanje in razumevanje pomena strukture in lastnosti grafičnih materialov v povezavi z njihovo uporabnostjo, • poznavanje in razumevanje pomena interakcij med različnimi grafičnimi materiali za doseg kakovostnih grafičnih izdelkov, • sposobnost povezovanja znanja z različnih področij in aplikacij z namenom optimiranja postopkov izdelave in doseganje večje kakovosti končnih izdelkov, • sposobnost umeščanja novih informacij in interpretacij pri razvoju grafičnih materialov in njihove uporabnosti.

Objectives and competences:

Students get to know basic materials, which are used in printing and finishing of graphic products, such as paper, cardboard, polymeric foils, binding materials, printing inks, varnishes, adhesives and other materials. They get acquainted with their composition, structure and usability. They learn about the properties of graphic materials and the link between the properties of printing material, printing ink and other materials used in the manufacturing of graphic products. Competences: • knowledge and understanding the importance of the structure and properties of graphic materials in relation to their usefulness, • knowledge and understanding the importance of knowing interactions between various graphic materials for achieving high quality graphic products, • ability to integrate knowledge from different fields and applications in order to optimize the manufacturing processes and to achieve higher quality of finished products • ability to include new information and interpretations at the development of graphic materials and their usability.

Predvideni študijski rezultati:

Znanje in razumevanje: Pozna surovine za proizvodnjo papirja in njihov vpliv na lastnosti tiskovnega materiala; pozna postopek izdelave papirja; pozna vrste papirjev, njihove lastnosti ter uporabo; pozna formate papirja; pozna zgradbo tiskarskih barv za različne tehnike tiska; pozna in razume vpliv sestavin tiskarskih barv na tehnološki postopek in kvaliteto odtisa; pozna zgradbo in lastnosti lakov in lepil, seznanjen je z delom na sodobni laboratorijski opremi. Razume pojme, povezane z lastnostmi grafičnih materialov in relacije med posameznimi lastnostmi grafičnih materialov, razume vpliv strukture grafičnih materialov na kakovost končnega izdelka. Razume pomen vpeljave krožnega gospodarjenja v procese izdelave grafičnih

Intended learning outcomes:

Knowledge and understanding: Knows raw materials for production of paper and their influence on properties of printed material; knows paper manufacturing process; knows types of paper, their characteristics and use; knows paper sizes; knows the structure of printing inks for different printing techniques; knows and understands the influence of printing ink composition on technological process and print quality; knows composition and properties of varnishes and glues, gets familiar with working on modern laboratory equipment. Understands the concepts related to the properties of graphic materials and relations between the characteristics of graphical materials, understands the influence of the structure of graphic materials on the quality of the finished product. Understands the importance of introducing

materialov in trajnostnega razvoja na področju materialov.	circular economy into production of graphic materials and sustainable development in the field of materials.
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Metode poučevanja in učenja:

Predavanja, seminar, laboratorijske vaje, projektno delo. Delo poteka pretežno v predavalnici oziroma v laboratoriju in/ali preko spleta s pomočjo ustrezne programske opreme.

Learning and teaching methods:

Lectures, seminar, laboratory work, project work. The activities are predominantly located in the classroom and laboratory or/and on-line using suitable equipment.

Načini ocenjevanja:
Delež/Weight
Assessment:

Ustni/pisni izpit	40,00 %	Oral/written exam
seminarska naloga	20,00 %	Seminar work
kolokvij iz laboratorijskih vaj	30,00 %	Tutorial
druge oblike študija	10,00 %	other forms of study

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

BLAZNIK, Barbara, KOVAČ, Franci, BIZJAK, Grega, BRAČKO, Sabina. Fastness of dye-based ink-jet printing inks in aqueous solution in the presence and absence of oxygen. *Color research and application*. [Print ed.]. 25. mar. 2022, vol. 47, no. 5, str. 1193-1199, ilustr. ISSN 0361-2317.

MOŽINA, Klementina, BRAČKO, Sabina, KOVAČEVIĆ, Dorotea, BLAZNIK, Barbara, MOŽINA, Klemen. Legibility of prints on paper made from Japanese knotweed. *Bioresources*. 2020, vol. 15, no. 2, str. 3999-4015. ISSN 1930-2126

MOŽINA, Klementina, PODLESEK, Anja, BRAČKO, Sabina. Preserving typographic cultural heritage using contemporary digital technology. *Journal of cultural heritage*. 2019, vol. 36, [no.] mar.-apr., str. 166-173, ilustr. ISSN 1296-2074.

SARJANOVIĆ, Anja, MOŽINA, Klemen, GREGOR-SVETEC, Diana. Print quality of coated paper from invasive alien plant Goldenrod. *Coatings*. 2023, vol. 13, iss. 10, str. 1-11.

GREGOR-SVETEC, Diana, ROŽIĆ, Mirela, MUCK, Tadeja, LOZO, Branka. Natural zeolite as filler in base ink jet paper sheet. *Nordic pulp & paper research journal*, ISSN 0283-2631. [Print ed.], 2012, vol. 27, no. 4, str. 721-728.

DRAGOJEVIĆ, Andreja, GREGOR-SVETEC, Diana, VODOPIVEC, Jedert, LOZO, Branka. Characterization of seventeenth century papers from Valvasor's collection of the Zagreb Archdiocese. *Heritage science*. 19 Mar. 2021, vol. 9, str. 1-20, ilustr. ISSN 2050-7445.

KÖNIG, Silva, MUCK, Tadeja, HLADNIK, Aleš, GREGOR-SVETEC, Diana. Recycled papers in everyday office use. *Nordic pulp & paper research journal*, ISSN 0283-2631. [Print ed.], 2011, vol. 26, no. 3, str. 349-355.

INFORMACIJSKE KOMPETENCE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Informacijske kompetence
Course title:	Information competences
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Geotehnologija in rudarstvo, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)		2. semester	izbirni
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni
Metallurške tehnologije, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	1. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code: 0643981

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	15	0	0	60	4

Nosilec predmeta/Lecturer: Danica Dolničar

Vrsta predmeta/Course type: Izbirni/Elective

Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Prisotnost študentov pri pouku: predavanja 70 %, vaje 100 %, seminar 90 %, druge oblike dela 90 %.
Pogoji za pristop k izpitu so opravljene vaje in seminarski izdelek.

Prerequisites:

Recommended attendance: lectures 70%, lab 100%, seminar 90%, other forms of work 90%.
Conditions for the exam are completed practical work and the seminar product.

Vsebina:

Strokovni pojmi s področja virov informacij. Digitalni informacijski viri za strokovno/študijsko področje. Informacijska pismenost in elementi vizualne, podatkovne in digitalne pismenosti. Priprava referenc po uveljavljenih bibliografskih standardih, citiranje, programska oprema. Pridobivanje podatkov. Iskalni profili za osnovno in napredno iskanje v specializiranih podatkovnih zbirkah in na spletu. Združevalni iskalniki, bibliografske, faktografske in

Content (Syllabus outline):

Professional concepts in the field of information sources. Digital information resources for professional/study areas. Information literacy and elements of visual, data and digital literacy. Preparation of references according to established bibliographic standards, citation, software. Data acquisition. Search profiles for basic and advanced searches in specialised databases and on the web. Federated search engines, bibliographic, factual and

multimedijske zbirke za področje študija: struktura, lastnosti, primeri uporabe. Intelktualna lastnina: avtorske pravice, tržne znamke, modeli in vzorci, geografske označbe, patenti. Informacijska varnost. Interpretacija vizualizacij podatkov. Metode in tehnike analize podatkov, orodja. Informacijske metode in tehnike za strukturiranje in vizualizacijo podatkov. Sinteza informacij v znanje. Priprava strokovnih člankov, diplomskega dela in vizualnih predstavitev: metodologija in programska orodja.	multimedia databases for the field of study: structure, properties, applications. Intellectual property: copyright, trademarks, designs, geographical indications, patents. Information security. Interpretation of data visualisations. Data analysis methods and techniques, tools. Information methods and techniques for data structuring and visualisation. Synthesis of information into knowledge. Preparation of professional journal articles, diploma thesis and visual presentations: methodology and software tools.
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Temeljna literatura in viri/Readings:

- Informacijske kompetence - študijska gradiva v spletni učilnici (study materials in the online Moodle classroom)
- Merila in kazalci informacijske pismenosti v visokem šolstvu. 2010, Ljubljana: Zveza bibliotekarskih društev Slovenije. (prevedeno iz Information literacy competency standards for higher education. 2000, ACRL) Dostopno: https://www.ala.org/acrl/sites/ala.org/acrl/files/content/standards/infolit_slovenian.pdf
- Visual Literacy Competency Standards for Higher Education. 2011, ACRL. Dostopno: <https://www.ala.org/acrl/standards/visualliteracy>
- Ridsdale, C., Rothwell, J., Smit, M., Ali-Hassan, H., Bliemel, M., Irvine, D., ... & Wuetherick, B. Strategies and best practices for data literacy education: Knowledge synthesis report. 2015, Dalhousie University, NS, Canada. Dostopno: <https://dalspace.library.dal.ca/bitstream/handle/10222/64578/Strategies%20and%20Best%20Practices%20for%20Data%20Literacy%20Education.pdf>
- DigComp 2.2: The Digital Competence Framework for Citizens - With new examples of knowledge, skills and attitudes. Dostopno: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC128415/JRC128415_01.pdf
- Chowdhury, G.G. Introduction to modern information retrieval. Third edition, London: Facet Publishing, 2010.

Cilji in kompetence:

Cilji: Študent razume pomen informacijske, vizualne, podatkovne in digitalne pismenosti; zna pridobivati, urejati in obdelovati strokovne informacije za svoje študijsko področje; zna poiskati kvalitetne informacijske vire v splošnih in profesionalnih podatkovnih zbirkah; obvlada pravilno citiranje virov; pozna osnove pravic osebne in industrijske intelektualne lastnine ter vrste licenc za dostop do digitalnih informacijskih virov; pozna in upošteva vidike informacijske varnosti; raziskovalne in literaturne podatke zna urediti v logične strukture in iz njih pripraviti vsebinsko sintezo; zna razbrati sporočilo vizualnih prikazov za strokovno področje; zna izbrati ustrezne metode za obdelavo/analizo podatkov; zna izbrati ustrezne načine vizualizacije podatkov/rezultatov; usposobi se za pisanje strokovnih besedil in pripravo vizualnih predstavitev; pozna osnovne pravne in etične vidike pridobivanja in uporabe informacij in podatkov.

Predmetno specifične kompetence:

- obvladovanje informacijskih strategij in podatkovnih zbirk za samostojno iskanje, zajemanje in obdelavo znanstvenih in tehničnih informacij,

Objectives and competences:

Objectives: The student understands the importance of information, visual, data and digital literacies; is able to acquire, structure and process professional information in the field of study; is able to find quality information sources in general and professional databases; masters the correct citation of literature sources; knows the basics of personal and industrial intellectual property rights and types of licences for access to digital information sources; knows and considers the aspects of information safety; is able to structure research and literature data into logical structures and prepare a synthesis of content; is able to decipher the message from visual representations in the professional field; is able to select appropriate methods for data processing/analysis; is able to select appropriate ways of visualising data/results; is capable of writing professional texts and preparing visual presentations; knows the basic legal and ethical aspects of acquisition and use of information and data.

Subject-specific competencies:

- mastering information strategies and databases to independently search, acquire and process scientific and technical information,

• poznavanje, razumevanje in pravilna uporaba kategorij intelektualne lastnine, • upoštevanje vidikov informacijske varnosti, • uporaba standardov in slogov za citiranje literature, • sposobnost interpretacije grafičnih predstavitev podatkov, • uporaba osnovnih orodij za analizo podatkov, • sposobnost izdelave učinkovitih grafičnih predstavitev podatkov, • uporaba informacijskih metod za urejanje in sintezo informacij v znanje, • sposobnost priprave strokovnih in tehničnih besedil ter predstavitev. • ustrezna raven informacijske, vizualne, podatkovne in digitalne pismenosti.	• knowledge, understanding and appropriate use of intellectual property categories, • considering the aspects of information security • using standards and styles for citing literature, • ability to interpret graphical representations of data, • using basic data analysis tools, • ability to produce effective graphical representations of data, • using information methods for structuring and synthesis of information into knowledge, • ability to prepare professional and technical texts and presentations. • appropriate level of information, visual, data and digital literacies.
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Predvideni študijski rezultati:

Znanje, razumevanje in uporaba:

- meril in kazalcev informacijske pismenosti ter izbranih elementov vizualne, podatkovne in digitalne pismenosti,
- citiranja različnih tipov primarnih dokumentov po bibliografskih standardih v različnih bibliografskih slogih,
- bibliografskih, faktografskih in multimedijskih zbirk za področje študija,
- profilov za enostavno in napredno iskanje informacij v podatkovnih zbirkah in/ali s pomočjo spletnih iskalnikov,
- pravnih in etičnih vidikov intelektualne lastnine,
- značilne zgradbe znanstvenega in strokovnega članka, patenta, diplomskega dela,
- vidikov informacijske varnosti,
- orodij za osnovno analizo podatkov,
- interpretacije, načrtovanja in izdelave grafičnih predstavitev podatkov,
- metod za združevanje podatkov v znanje,
- metodoloških pristopov za izdelavo strokovnih besedil in vizualiziranih predstavitev za področje študija,
- osnovnih orodij za predstavljanje znanstvenih in strokovnih informacij v digitalnih okoljih.

Intended learning outcomes:

Knowledge, understanding and use of:

- standards and outcomes of information literacy and selected elements of visual, data and digital literacies,
- citing different types of primary documents according to bibliographic standards in a variety of bibliographic styles,
- bibliographic, factual and multimedia databases in the field of study,
- profiles for simple and advanced information searches in databases and/or web search engines,
- legal and ethical aspects of intellectual property,
- characteristic structure of the scientific and technical articles, patent, diploma thesis,
- aspects of information safety,
- tools for basic data analysis,
- interpretation, planning and production of graphic representations of data,
- methods for synthesizing data into knowledge,
- methodological approaches for the production of professional texts and visual presentations in the field of study,
- basic tools for presenting scientific and professional information in digital environments.

Metode poučevanja in učenja:

Predavanja z demonstracijami primerov, vaje v računalniški učilnici oz. na daljavo, seminarsko projektno delo s predstavitvami izdelkov in razpravo. Pri delu se uporablja spletna učilnica Moodle na NTF platformi za nalaganje statičnih in interaktivnih študijskih gradiv, navodil za vaje in seminar, oddajo delovnih listov študentov, izdelkov vaj in seminarjev, ter za komunikacijo s študenti. Aktivnosti poučevanja in učenja potekajo na fakulteti in/ali prek spleta (online).

Learning and teaching methods:

Lectures with demonstrations of examples, practical work in a computer room or online, seminar project work with presentations and discussions. The Moodle online classroom on the NTF platform is used for uploading of static and interactive study materials, computer lab and seminar instructions, submission of student worksheets, computer lab assignments, seminar products, and for communication with students. Teaching and learning activities take place at the faculty and/or online.

Načini ocenjevanja:	Delež/Weight	Assessment:
• Pisni ali ustni izpit	50,00 %	• Written or oral exam
• Ocena vaj	25,00 %	• Practical exercises
• Ocena seminarskega projektnega izdelka. Vse delne ocene morajo biti pozitivne. Aktivnosti ocenjevanja potekajo na fakulteti in/ali prek spleta (online).	25,00 %	• Assessment of a seminar project work All partial grades must be positive. Assessment activities take place at the faculty and/or online.

Ocenjevalna lestvica:	Grading system:
5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- DOLNIČAR, Danica, BOH PODGORNİK, Bojana, BARTOL, Tomaž, ŠORGO, Andrej. Added value of secondary school education toward development of information literacy of adolescents. *Library & Information Science Research : an international journal*. [Print ed.]. 2020, vol. 42, no. 2, str. 1-18. ISSN 0740-8188. DOI: 10.1016/j.lisr.2020.101016. [COBISS.SI-ID 16455171]
- DOLNIČAR, Danica, BOH PODGORNİK, Bojana, BARTOL, Tomaž, ŠPERNJAK, Andreja, ŠORGO, Andrej. Predlog meril in kazalcev informacijske pismenosti za srednje šole = Proposed information literacy standards and performance indicators for secondary education. *Knjižnica : revija za področje bibliotekarstva in informacijske znanosti*. [Tiskana izd.]. 2018, 62, [št.] 1/2, str. 69-91. ISSN 0023-2424. [COBISS.SI-ID 1412446]
- BARTOL, Tomaž, DOLNIČAR, Danica, BOH PODGORNİK, Bojana, RODIČ, Blaž, ZORANOVIĆ, Tihomir. A comparative study of information literacy skill performance of students in agricultural sciences. *Journal of academic librarianship*. [Print ed.]. 2018, iss. 3, vol. 44, str. 374-382. ISSN 0099-1333. DOI: 10.1016/j.acalib.2018.03.004. [COBISS.SI-ID 1397854]
- BOH PODGORNİK, Bojana, DOLNIČAR, Danica, GLAŽAR, Saša A. Does the information literacy of university students depend on their scientific literacy?. *Eurasia journal of mathematics, science and technology education*. 2017, vol. 13, iss. 7, str. 3869-3891. [COBISS.SI-ID 1340510]
- DOLNIČAR, Danica, BOH PODGORNİK, Bojana, BARTOL, Tomaž. A comparative study of three teaching methods on student information literacy in stand-alone credit-bearing university courses. *Journal of information science*. [Online ed.]. 2017, vol. 43, iss. 5, str. 601-614. ISSN 1741-6485. DOI: 10.1177/0165551516655084. [COBISS.SI-ID 127062]
- BOH PODGORNİK, Bojana, BARTOL, Tomaž, ŠORGO, Andrej, RODIČ, Blaž, DOLNIČAR, Danica. STIP - slovenski test informacijske pismenosti študentov = SILT - students' information literacy test in the Slovenian language. *Knjižnica : revija za področje bibliotekarstva in informacijske znanosti*. 2017, 61, [št.] 3, str. 87-111. [COBISS.SI-ID 1378910]

INFORMACIJSKE TEHNOLOGIJE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Informacijske tehnologije
Course title:	Information technologies
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	1. letnik	2. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068070
Koda učne enote na članici/UL Member course code:	10223

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Aleš Hladnik
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Pogoj za vključitev v delo je vpis v letnik študija in izbira predmeta. Pogoja za pristop k izpitu sta oddano poročilo seminarja in njegova predstavitev ter opravljene vaje.	- For a student to start working: enrollment in the study year and selection of the course. - For writing the final exam: handing in the seminar report and its presentation as well as completion of the lab work.

Vsebina:	Content (Syllabus outline):
- Delovanje računalnika, koda in računalniški program - Strojna oprema - Zapis in shranjevanje podatkov: biti in bajti - Programska oprema - Tabele in podatkovne baze - Računalniška omrežja, internet in internetne storitve - Računalniška varnost in zasebnost - Analogni in digitalni mediji: slika, zvok, video.	- How computer works, computer code and programme - Hardware - Recording and saving data: bits and bytes - Software - Data tables and databases - Computer networks, internet and internet services - Computer security and privacy - Analogue and digital media: image, sound, video.

Temeljna literatura in viri/Readings:
- Spletni tečaj (MOOC) Computer Science 101: https://www.coursera.org/course/cs101 - E-učbenik za informatiko: http://lusy.fri.uni-lj.si/ucbenik/RIN1/index.html

Cilji in kompetence:

Objectives and competences:

- Poznavanje in razumevanje temeljnih pojmov s področja informacijsko-komunikacijskih tehnologij - Sposobnost opredelitve primerov uporabe in osnovnih značilnosti sodobnih informacijsko-komunikacijskih tehnologij - Razvijanje samoiniciativnosti, ustvarjalnosti in metodičnega razmišljanja	- Familiarity with and understanding of fundamental information-communication terms - Ability to define examples and basic characteristics of modern information-communication technologies - Development of self-initiative, creativity and methodical thinking
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Predvideni študijski rezultati:

Znanje in razumevanje: - Poznavanje osnovnih principov delovanja osebnega računalnika in razumevanje povezanosti njegove strojne in programske opreme - Poznavanje delovanja sistemov za delo s podatkovnimi tabelami in bazami - Poznavanje značilnosti sodobnega interneta in njegovih aplikacij - Razumevanje pomena programiranja in delov enostavne programske kode - Razumevanje možnosti praktične uporabe računalniških sistemov na področju digitalnih medijev

Intended learning outcomes:

Knowledge and understanding: - Knowledge of a personal computer basic operation principles and understanding of computer hardware and software - Knowledge of systems used to work with data tables and databases - Knowledge of characteristics of modern internet and its applications - Understanding of the science and art of programming and decoding of simple programme code snippets - Understanding of various possibilities how computer systems can be implemented in the field of digital media

Metode poučevanja in učenja:

Predavanja, seminarske vaje, delo v računalniški učilnici.

Learning and teaching methods:

Lectures, seminar projects, work in a computer lab.

Načini ocenjevanja:

Pisni izpit (50%), seminarska naloga (25%), vaje (25%).

Delež/Weight

0,00 %

Assessment:

Written exam (50%), seminar project (25%), lab work (25%).

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- LAZAR, Mihael, HLADNIK, Aleš. Comparison of artificial neural network and polynomial approximation models for reflectance spectra reconstruction. *Sensors*, 2023, vol. 23, no. 2, DOI: <https://doi.org/10.3390/s23021000>, ISSN 1424-8220
- KODŽOMAN, Duje, HLADNIK, Aleš, PAVKO-ČUDEN, Alenka, ČOK, Vanja. Assessment and semantic categorization of fabric visual texture preferences. *AUTEX research journal*, 2022, DOI: <https://doi.org/10.2478/aut-2022-0006>, ISSN 1470-9589
- HLADNIK, Aleš, POLJIČAK, Ante. Improving performance of content based image retrieval system with color features. *Acta graphica*, 2016, vol. 27, no. 4, p. 7-12, <https://actagraphica.hr/index.php/actagraphica/article/view/107/94>, ISSN 0353-4707

INFORMACIJSKI VIRI

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Informacijski viri
Course title:	Information sources
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068056
Koda učne enote na članici/UL Member course code:	10224

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	15	0	0	60	4

Nosilec predmeta/Lecturer:	Danica Dolničar
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Priporočena prisotnost študentov pri pouku: predavanja 70 %, vaje 100 %, seminar 90 %, druge oblike dela 90 %. Pogoji za pristop k izpitu so opravljene vaje in seminarski izdelek.	Recommended attendance: lectures 70%, lab 100%, seminar 90%, other forms of work 90%. Conditions for the exam are completed practical work and the seminar product.

Vsebina:	Content (Syllabus outline):
Strokovni pojmi s področja virov informacij. Digitalni informacijski viri in IKT v informacijski dobi. Informacijska pismenost. Primarni viri informacij v tiskani in elektronski obliki. Priprava referenc po standardu SIST ISO 690, citiranje, bibliografski slogi, programska oprema. Pridobivanje podatkov. Iskalni profili za osnovno in napredno iskanje v specializiranih podatkovnih zbirkah in na spletu. Združevalni iskalniki, bibliografske, faktografske in multimedijske zbirke za področje študija: struktura, lastnosti, primeri uporabe. Intelektualna lastnina: avtorske pravice, blagovne znamke, modeli in vzorci, geografske označbe, patenti. Licence in dostop do informacijskih virov v digitalni družbi. Osnovne	Professional concepts in the field of information sources. Digital information sources and ICT in the information age. Information literacy. Primary sources of information in printed and electronic form. Preparation of references in accordance with SIST ISO 690 standard, citation, bibliographic styles, software. Data acquisition. Search profiles for basic and advanced searches in specialised databases and on the web. Federated search engines, bibliographic, factual and multimedia databases: structure, properties, applications. Intellectual property: copyright, trademarks, designs and models, geographical indications, patents. Licences and access to information sources in a digital society. Basic

informacijske metode in tehnike za urejanje in vizualizacijo podatkov. Sinteza informacij v znanje. Priprava strokovnih člankov, diplomskega dela in vizualnih predstavitev: metodologija in programska orodja.	information methods and techniques for data structuring and visualisation. Synthesis of information into knowledge. Preparation of professional journal articles, diploma thesis and visual presentations: methodology and software tools.
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Temeljna literatura in viri/Readings:

Informacijski viri - študijska gradiva v spletni učilnici (study materials in the online Moodle classroom)
 Merila in kazalci informacijske pismenosti v visokem šolstvu. 2010, Ljubljana: Zveza bibliotekarskih društev Slovenije. Dostopno <http://www.old.zbds-zveza.si/dokumenti/merila-in-kazalci-informacijske-pismenosti-v-visokem-solstvu.pdf>= Information literacy competency standards for higher education, 2000, ACRL
<http://www.ala.org/ala/mgrps/divs/acrl/standards/informationliteracycompetency.cfm>
 Chowdhury, G.G. Introduction to modern information retrieval. Third edition, London: Facet Publishing, 2010

Cilji in kompetence:

Cilji: Študent razume pomen informacijske pismenosti v digitalni dobi; zna pridobivati in obdelavovati strokovne informacije za svoje študijsko področje; samostojno zna poiskati kvalitetne informacijske vire v splošnih in profesionalnih podatkovnih zbirkah; obvlada pravilno citiranje virov; pozna osnove pravic osebne in industrijske intelektualne lastnine ter tipe licenc za dostop do digitalnih informacijskih virov; raziskovalne in literaturne podatke zna urediti v logične strukture in iz njih pripraviti vsebinsko sintezo; usposobi se za pisanje strokovnih besedil in pripravo vizualnih predstavitev; pozna osnovne pravne in etične vidike pridobivanja in uporabe informacij. Predmetno specifične kompetence: - obvladovanje informacijskih strategij in podatkovnih zbirk za samostojno iskanje, zajemanje in obdelavo znanstvenih in tehničnih informacij, - poznavanje, razumevanje in pravilna uporaba kategorij intelektualne lastnine, - uporaba standardov in slogov za citiranje literature, - uporaba informacijskih metod za urejanje in sintezo informacij v znanje, - sposobnost priprave strokovnih in tehničnih besedil ter predstavitev s pomočjo digitalnih medijev in IKT, - ustrezna raven informacijske pismenosti v skladu s standardi v visokem šolstvu.

Objectives and competences:

Objectives: The student understands the importance of information literacy in the digital age; is able to acquire and process professional data in the field of study; is able to find quality information sources in general and professional databases; masters the correct citation of literature sources; knows the basics of personal and industrial intellectual property rights and types of licences for access to digital information resources; is able to structure research and literature data into logical structures and prepare a synthesis; is capable of writing professional texts and prepare visual presentations; knows the basic legal and ethical aspects of acquisition and use of information. Subject-specific competencies: - knowing the strategies and databases for searching, acquisition and processing of scientific and technical information, - knowing, understanding and appropriate use of intellectual property categories, - using standards and styles of literature citation, - using of information methods for structuring and synthesis of information into knowledge, - ability to prepare professional and technical texts and presentations using digital media and ICT, - appropriate level of information literacy according to higher education the standards.

Predvideni študijski rezultati:

Znanje, razumevanje in uporaba: - meril in kazalcev informacijske pismenosti, - citiranja različnih tipov primarnih dokumentov po standardu SIST ISO690 v različnih bibliografskih slogih, - bibliografskih, faktografskih in multimedijjskih zbirk za področje študija, - profilov za enostavno in napredno iskanje informacij v podatkovnih zbirkah in/ali s pomočjo spletnih iskalnikov, - pravnih in etičnih vidikov intelektualne lastnine, - značilne zgradbe znanstvenega in strokovnega članka, patenta, diplomskega dela, - metod za urejanje podatkov v znanje, - metodoloških osnov za izdelavo strokovnih

Intended learning outcomes:

Knowledge, understanding and use of: - standards and outcomes of information literacy, - citing different types of primary documents according to standard SIST ISO690 in a variety of bibliographic styles, - bibliographic, factual and multimedia databases in fields of study, - profiles for simple and advanced information searches in databases and / or web search engines, - legal and ethical aspects of intellectual property, - characteristic structure of the scientific and technical articles, patent, diploma thesis - methods for synthesizing data into knowledge, - methodological approaches for producing

besedil in vizualiziranih predstavitev za področje študija, - osnovnih orodij za predstavljanje znanstvenih in strokovnih informacij v digitalnih okoljih.	professional texts and visual presentations in the field of study, - basic tools for presenting scientific and professional information in digital environments.
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Metode poučevanja in učenja:

Predavanja z demonstracijami primerov, vaje v računalniški učilnici, seminarsko projektno delo s predstavitvami izdelkov in razpravo. Pri delu se uporablja spletna učilnica Moodle na NTF platformi za nalaganje študijskih gradiv, navodil za vaje in seminar, oddajo delovnih listov študentov, izdelkov vaj in seminarjev, ter za komunikacijo s študenti. Aktivnosti poučevanja in učenja potekajo na fakulteti in/ali prek spleta (online).

Learning and teaching methods:

Lectures with demonstrations of examples, practical work in a computer room, seminar project work with presentations and discussions. The Moodle online classroom on the NTF platform is used for uploading of study materials, computer lab and seminar instructions, submission of student worksheets, computer lab assignments, seminar products, and for communication with students. Teaching and learning activities take place at the faculty and/or online.

Načini ocenjevanja:

Delež/Weight

Assessment:

• Pisni ali ustni izpit	50,00 %	• Written or oral exam
• Ocena vaj	25,00 %	• Practical exercises
• Ocena seminarskega projektnega izdelka .	25,00 %	• Assessment of a seminar project work
Vse delne ocene morajo biti pozitivne. Aktivnosti ocenjevanja potekajo na fakulteti in/ali prek spleta (online).		All partial grades must be positive. Assessment activities take place at the faculty and/or online.

Ocenjevalna lestvica:

Grading system:

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Reference nosilca/Lecturer's references:

- DOLNIČAR, Danica, BOH PODGORNİK, Bojana. Factors influencing information literacy of university students. V: WALLER, Lee (ur.). *Higher Education - Reflections From the Field [Working Title]* : [Vol. 2]. 1st ed. London: IntechOpen, cop. 2023. Str. 1-16, ilustr. DOI: 10.5772/intechopen.109436. [COBISS.SI-ID 156185859]
- DOLNIČAR, Danica, BOH PODGORNİK, Bojana, BARTOL, Tomaž, ŠORGO, Andrej. Added value of secondary school education toward development of information literacy of adolescents. *Library & Information Science Research : an international journal*. [Print ed.]. 2020, vol. 42, no. 2, str. 1-18. ISSN 0740-8188. DOI: 10.1016/j.lisr.2020.101016. [COBISS.SI-ID 16455171]
- DOLNIČAR, Danica, BOH PODGORNİK, Bojana. Undergraduate students' information literacy : challenges and opportunities. V: NATA, Roberta V. (ur.). *Progress in education*. New York: Nova Science Publishers, 2020. Str. 153-185. *Progress in education*, 63. ISBN 978-1-53617-845-6. ISSN 1535-4806. [COBISS.SI-ID 17201667]
- DOLNIČAR, Danica, BOH PODGORNİK, Bojana, BARTOL, Tomaž, ŠPERNJAK, Andreja, ŠORGO, Andrej. Predlog meril in kazalcev informacijske pismenosti za srednje šole = Proposed information literacy standards and performance indicators for secondary education. *Knjižnica : revija za področje bibliotekarstva in informacijske znanosti*. [Tiskana izd.]. 2018, 62, [št.] 1/2, str. 69-91. ISSN 0023-2424. [COBISS.SI-ID 1412446]
- DOLNIČAR, Danica, BOH PODGORNİK, Bojana, BARTOL, Tomaž. A comparative study of three teaching methods on student information literacy in stand-alone credit-bearing university courses. *Journal of information science*. [Online ed.]. 2017, vol. 43, iss. 5, str. 601-614. ISSN 1741-6485. DOI: 10.1177/0165551516655084. [COBISS.SI-ID 127062]
- ŠORGO, Andrej, BARTOL, Tomaž, DOLNIČAR, Danica, BOH PODGORNİK, Bojana. Attributes of digital natives as predictors of information literacy in higher education. *British journal of educational technology*. [Print ed.]. 2017, vol. 48, no. 3, str. 749-767. [COBISS.SI-ID 1261406]
- BOH PODGORNİK, Bojana, DOLNIČAR, Danica, ŠORGO, Andrej, BARTOL, Tomaž. Development, testing, and validation of an information literacy test (ILT) for higher education. *Journal of the Association for Information Science and Technology*. 2016, vol. 67, iss. 10, str. 2420-2436. [COBISS.SI-ID 1585756]

INTERAKTIVNI MEDIJI 1

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Interaktivni mediji 1
Course title:	Interactive media 1
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068046
Koda učne enote na članici/UL Member course code:	10292

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Aleš Hladnik
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Pogoj za vključitev v delo je vpis v letnik študija in izbira predmeta. Pogoja za pristop k izpitu sta oddano poročilo seminarja in njegova predstavitev ter opravljene vaje.	- For a student to start working: enrollment in the study year and selection of the course. - For writing the final exam: handing in the seminar report and its presentation as well as completion of the lab work.

Vsebina:	Content (Syllabus outline):
- Interakcija človek-računalnik - Uporabniški vmesnik, spletna uporabnost in uporabniška izkušnja - Oblikovanje in razvoj spletnih mest - Mobilne tehnologije in komunikacije - Osnove programskega jezika Python in njegova uporaba (spletno luščenje, vizualizacija in analiza masovnih podatkov, generativna umetnost, računalniške igre)	- Human-computer interaction - User interface, web usability and user experience - Web site design and development - Mobile technologies and communications - Fundamentals of Python programming language and its use (web scraping, big data vizualization and analysis, generative art, computer games)

Temeljna literatura in viri/Readings:
- Rogers, Y.; Preece, J.; Sharp, H.: Interaction Design - Beyond Human-Computer Interaction. 2nd edn. John Wiley & Sons, 2007. Dodatna literatura: - Domača stran Jakoba Nielsena: http://www.useit.com/ https://www.nngroup.com/ - Domača stran Dona Normana: http://www.jnd.org/

- E-učbenik za informatiko: <https://lusy.fri.uni-lj.si/ucbenik/book/index.html>

Cilji in kompetence:

Cilj predmeta je seznaniti študente z osnovnimi znanji in koncepti s področja interaktivnih medijev, njihove interdisciplinarnosti in povezanosti s sorodnimi področji sodobnih informacijsko-komunikacijskih tehnologij. Študenti bodo spoznali uporabnost programskega jezika Python za različne namene povezane z interaktivnostjo medijev.

Objectives and competences:

The objective of this course is to present to the students the basic knowledge and concepts of the field of interactive media, its interdisciplinarity and relationships with related fields of modern information-communication technologies. Students will learn applicability of Python programming language related to media interactivity.

Predvideni študijski rezultati:

Znanje in razumevanje: - Poznavanje zvrsti interaktivnih medijev in njihove povezanosti s sodobnimi digitalnimi mediji - Poznavanje različnih načinov interakcije med človekom in računalnikom ter oblik uporabniških vmesnikov - Razumevanje trenutnega stanja in smeri razvoja interneta in njegovih storitev - Sposobnost oblikovanja in razvoja spletnih mest ter njihovega vrednotenja - Poznavanje najnovejših tehnologij mobilnega komuniciranja

Intended learning outcomes:

Knowledge and understanding: - Knowledge of interactive media forms and their connection with contemporary digital media - Knowledge of various human-computer interaction modes and user interface types - Understanding of current internet services and its future trends - Ability to design and develop web sites and to perform their evaluation - Knowledge of the state-of-the-art mobile communication technologies

Metode poučevanja in učenja:

Predavanja, seminarske vaje, delo v računalniški učilnici.

Learning and teaching methods:

Lectures, seminar projects, work in a computer lab.

Načini ocenjevanja:

Pisni izpit (50%), seminarska naloga (25%), vaje (25%).

Delež/Weight

0,00 %

Assessment:

Written exam (50%), seminar project (25%), lab work (25%).

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- KAVČIČ, Alenka, PODLESEK, Anja, KOMIDAR, Luka, HLADNIK, Aleš, BOH PODGORNIK, Bojana, BOHAK, Ciril, DEPOLLI STEINER, Katja, GRIL, Alenka, LESAR, Žiga, MAROLT, Matija, PEČJAK, Sonja, PESEK, Matevž, PIRC, Tina, PUKLEK LEVPUŠČEK, Melita, PEKLAJ, Cirila. What can off- and online measures tell about students' self-regulation and their achievement while learning science expository hypertext. Sustainability, 2022, vol. 14, no. 9, p. 1-19, DOI: <https://doi.org/10.3390/su14095686>, ISSN 2071-1050
- SEDOVŠEK, Robert, POGAČNIK, Matevž, HLADNIK, Aleš. Rich media mobile advertising: comparison of gestures used for navigation through a photo gallery. Tehnički vjesnik, 2016, vol. 23, no. 4, p. 1095-1102, DOI: <https://doi.org/10.17559/TV-20150727122900>, ISSN 1330-3651
- HLADNIK, Aleš, POLJIČAK, Ante. Improving performance of content based image retrieval system with color features. Acta graphica, 2016, vol. 27, no. 4, p. 7-12, <https://actagraphica.hr/index.php/actagraphica/article/view/107/94>, ISSN 0353-4707

INTERAKTIVNI SISTEMI 1

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Interaktivni sistemi 1
Course title:	Interactive systems
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068057
Koda učne enote na članici/UL Member course code:	10225

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Aleš Hladnik
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Vpis v študij letnika. Osnovno znanje uporabe računalnika.
Pristop k izpitu:
Pristopijo lahko študenti, ki imajo opravljen seminar in vaje ter izpolnjeno predpisano prisotnost pri vseh sklopih predmeta.
Zahteve za prisotnost:
predavanja 70 %, seminar in druge oblike dela 70 %, vaje 100 %.

Prerequisites:

Enrollment in the study year. Basic knowledge of computer use.
Approach to the exam:
Students who have completed the seminar and tutorials and have met the attendance requirements for all units of the course may take the examination.
Attendance requirements:
lectures 70%, seminar and other forms of work 70%, computer tutorial and practical exercises 100%.

Vsebina:

- pregled zgodovine razvoja komunikacije človek-stroj in posledično pojava interaktivnosti - presek trenutnega obsega razvoja interaktivnih sistemov (računalniki, mobilne naprave, telefoni, hišne naprave, roboti...) - razlike in stične točke med človekom in računalnikom - analiza PACT (ljudje-"People", Aktivnosti, konteksti-"Contexts", Tehnologije) načrtovanega interaktivnega sistema - uporabniško-

Content (Syllabus outline):

- overview of the history of the development of human-machine interaction and the consequent emergence of interactivity - overview of the current stage of development of interactive systems (computers, mobile phones, household appliances, robots ...) - differences and similarities between human and computer - PACT analysis ("People", "Activities", "Contexts", "Technologies") of the

centrično načrtovanje interaktivnega sistema na podlagi oseb in scenarijev - dostopnost, uporabnost, sprejemljivost - HTML (namen, struktura, sintaksa, osnovni gradniki - s primeri) - CSS (namen, sintaksa, oblikovanje videza spletne strani - s primeri) - JavaScript (namen, značilnosti, osnovan sintaksa in osnovne ključne besede - s primeri) - pogled v bodočnost interaktivnosti (branje z ustnic, sistemi za daljinsko prisotnost, 3D hologramski vmesnik in razpoznavanje kretenj, povezava možgani-stroj, možgani-možgani, potop v navidezno resničnost, umetna inteligenca in napredna robotika)	planned interactive system - human-centered interactive system design based on personas and scenarios - accessibility, usability, acceptability - HTML (purpose, structure, syntax, basic building blocks - with examples) - CSS (purpose, syntax, designing the appearance of web pages - with examples) - JavaScript (purpose, characteristics, basic syntax and basic keywords - with examples) - peek into the future of interactivity (lip-reading, systems for remote presence, 3D hologram interface and gesture recognition, brain-machine connection, brain-brain connection, immersion into virtual reality, artificial intelligence and advanced robotics)
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Temeljna literatura in viri/Readings:

Benyon, D., Designing Interactive Systems, *A comprehensive guide to HCI and interaction design*

Dodatna literatura:

1. <http://www.w3schools.com/html>
2. <http://www.w3schools.com/css>
3. <http://www.w3schools.com/js>

Cilji in kompetence:

Spoznavanje raznolikosti interaktivnih sistemov ter analitičnega in uporabniško-centričnega pristopa k načrtovanju interaktivnega sistema.

Objectives and competences:

Getting to know the diversity of interactive systems, and analytical and user-centric approach to the design of an interactive system.

Predvideni študijski rezultati:

Znanje in razumevanje: - raznolikost interaktivnih sistemov - pomembni vidiki načrtovanja interaktivnih sistemov - pomembnost uporabniško-centričnega pristopa - razumevanje pomena analize interaktivnega sistema z vidika človeka, namena oz. aktivnosti, okolja uporabe oz. konteksta in uporabljenih tehnologij - razumevanje procesa uporabniško-centričnega načrtovanja s pomočjo analize oseb – različnih uporabnikov in načinov uporabe – scenarijev - razumevanje ključnih vprašanj, konceptov in načel dostopnosti, uporabnosti in sprejemljivosti

Intended learning outcomes:

Knowledge and understanding: - The variety of interactive systems - The concerns of interactive systems design - Why being human-centered is important - interactive system PACT analysis - Understanding the importance of the analysis of the interactive system in terms of people, activities, contexts and technologies - understanding of human-centered design through planning for different personas and usage scenarios - Understand the key issues, concepts and underlying principles of accessibility, usability and acceptability

Metode poučevanja in učenja:

predavanja
seminar/projekt in pogovor (samostojno projektno delo)
računalniške vaje
Pri izvedbi vaj se uporablja napredna programska in strojna oprema.

Learning and teaching methods:

lectures
seminar/project and discussion (individual project work)
computer tutorials and exercises
Advanced software and hardware are used to carry out the practical exercises.

Načini ocenjevanja:

Delež/Weight

Assessment:

a) pisni izpit teoretskih znanj	40,00 %	a) exam of theoretical knowledge
b) ocena seminarja/projekta	30,00 %	b) evaluation of project work
c) ocena iz računalniških vaj	30,00 %	c) tutorial

Ocenjevalna lestvica:

Grading system:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- Bachelor's degree at the Faculty of Electrical Engineering at the University of Ljubljana, Study programme of System Automation and Process Informatics
- Nine years of practical work at an Automation and Manufacturing IT company; participating in more than 30 projects by programming and designing automation, control and information applications in Building Automation, Energy Management, Industrial processes and Traffic control
- Ph.D. at the Faculty of Natural Sciences and Engineering at the University of Ljubljana, Study programme of Textile Engineering, Graphic Communication and Textile Design
- LAZAR, Mihael, JAVORŠEK, Dejana, HLADNIK, Aleš. Study of camera spectral reflectance reconstruction performance using CPU and GPU artificial neural network modelling. *Tehnički vjesnik*, 2020, vol. 27, no. 4, str. 1204-1212.
- LAZAR, Mihael, HLADNIK, Aleš. Exploiting nonlinearity between parallel channels of multiple cameras for accurate ANN reconstruction of reflectance spectra. *Tehnički vjesnik*, 2022, vol 29, no. 3, str. 765-774.
- LAZAR, Mihael, HLADNIK, Aleš. Comparison of artificial neural network and polynomial approximation models for reflectance spectra reconstruction. *Sensors*, 2023, vol. 23, no. 2, str. 1000.

IZBIRNI

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Izbirni
Course title:	
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	2. letnik	2. semester	obvezni

Univerzitetna koda predmeta/University course code:	0111856
Koda učne enote na članici/UL Member course code:	11140

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
120	60	90	0	30	300	20

Nosilec predmeta/Lecturer:

Vrsta predmeta/Course type:

Jeziki/Languages:	Predavanja/Lectures:	
	Vaje/Tutorial:	

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:

Vsebina:	Content (Syllabus outline):

Temeljna literatura in viri/Readings:

Cilji in kompetence:	Objectives and competences:

Predvideni študijski rezultati:	Intended learning outcomes:

Metode poučevanja in učenja:	Learning and teaching methods:

Načini ocenjevanja: **Delež/Weight** **Assessment:**

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Ocenjevalna lestvica:

Grading system:

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Reference nosilca/Lecturer's references:

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IZBIRNI

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Izbirni
Course title:	
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	3. letnik	2. semester	obvezni

Univerzitetna koda predmeta/University course code:	0111857
Koda učne enote na članici/UL Member course code:	11304

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
157	110	76	0	17	360	24

Nosilec predmeta/Lecturer:

Vrsta predmeta/Course type:

Jeziki/Languages:	Predavanja/Lectures:	
	Vaje/Tutorial:	

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:

Vsebina:	Content (Syllabus outline):

Temeljna literatura in viri/Readings:

Cilji in kompetence:	Objectives and competences:

Predvideni študijski rezultati:	Intended learning outcomes:

Metode poučevanja in učenja:	Learning and teaching methods:

Načini ocenjevanja: **Delež/Weight** **Assessment:**

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Ocenjevalna lestvica:

Grading system:

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Reference nosilca/Lecturer's references:

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LIKOVNE ANALIZE GRAFIČNIH IZDELKOV 1

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Likovne analize grafičnih izdelkov 1
Course title:	Artistic analysis of graphic products
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	2. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068080
Koda učne enote na članici/UL Member course code:	10229

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	0	0	15	60	4

Nosilec predmeta/Lecturer:	Marica Starešinič
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
/Pogoj za vključitev v delo je vpis v letnik študija. Pogoja za pristop k izpitu sta predstavitev ter oddano poročilo seminarja.	Enrolment in the study year. For the final exam guided seminar on selected theme has to be completed successfully.

Vsebina:	Content (Syllabus outline):
/Spoznavanje in razumevanje vidnih in nevidnih strukturnih, konstrukcijskih, kompozicijskih, estetskih in psiholoških značilnosti grafičnega izdelka; vrste grafičnih izdelkov, njihovo oblikovanje; načini razporejanja sestavin vzorčnih enot; vrste vzorcev; kompozicija; zgodovinski pregled slogovnih obdobij in njihov vpliv na oblikovanje; likovna analiza Uvod v estetsko problematiko oblikovanja grafičnih izdelkov, neposredna povezava med likovno teorijo in oblikovanjem ter izvedbo grafičnih izdelkov. Predstavitev kompozicijskih silnic in strukturalnih grafov, ki so pomembni pri ustvarjanju grafičnih izdelkov, neposredna likovna analiza posameznih primerov s primerjalnimi variacijami in komentarji, priprava seminarjskih nalog z zagovori in dokazovanjem dobrih in slabih strani oblikovanja,	Learning about and understanding hidden and visible construction, composition, aesthetic and communication characteristics of a graphic product; linking artistic theory, design and production of a graphic product; compositional vectors in structural graphics; artistic analysis. Introduction to the aesthetic problem of designing graphic products , direct connection between art theory and design and implementation of graphic products . Presentation of compositional forces and structural graphs , important in the creation of graphic products. Artistic analysis of individual designs with the comparative variations and comments , preparation of seminars with presentations of the strengths and weaknesses of design, visual impact and messaging values of graphic

vizualnega učinka in sporočilne izraznosti grafičnega izdelka. Predstavitev velikega števila dobrih in slabih rešitev s komentarjem in dokazovanjem.	product. Introduction of a large number of good and bad graphic design solutions with commentary.
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Temeljna literatura in viri/Readings:

- FIELL, C., in FIELL, P. Graphic Design for the 21st Century : 100 of the World's Best Graphic Designers. Köln : Taschen, 2002.
- MUHOVIČ JOŽEF: Vidno in nevidno, Inštitut Nove revije, 2019.
- The Best of Newspaper Design. Providence : Society of Newspaper Design, 1997.
- JUTE, A. Grids : the Structure of Graphic Design. Crans- Pres-Celigny : RotoVision, 1996.
- REPOVŠ, J. Kako nastaja in deluje učinkovita, tržno usmerjena celostna grafična podoba kot del simbolnega identitetnega sistema organizacij. Ljubljana : Studio Marketing, 1995.
- MEGGS, P. B. A History of Graphic Design. New York : John Wiley & Sons, 1998. - DABNER, D. Graphic Design School : the Principles and Practices of Graphic Design. London : Thames and Hudson, 2004. - Članki v revijalnem tisku.
- Elektronske publikacije digitalnih knjižnic na svetovnem spletu.
- Tiskane publikacije ter strokovna poročila. Literatura je dosegljiva v knjižnici Oddelka za tekstilstvo, NTF, ter preko programa Moodle.

Cilji in kompetence:

/Opaziti, spoznati, razumeti, razložiti skrivne (nevidne) in vidne konstitucijske, kompozicijske, estetske in sporočilne značilnosti grafičnega izdelka, izhajajoč iz likovne analize, ki se posredno veže na razumevanje, sinteze ali samostojnega ustvarjanja in oblikovanja novih grafičnih izdelkov.

Objectives and competences:

Observed recognize , understand , explain the secret (invisible) and visible constitutive, compositional , aesthetic and messaging features graphic product, starting from the visual analysis , which is indirectly bound to understand the synthesis or self- creation and the creation of new graphic products

Predvideni študijski rezultati:

/Znanje in razumevanje: - Vpliv na splošno in specifično občutljivost posameznika v opazovanju, analiziranju in vrednotenju, naravnih, civilizacijskih, oblikovalskih in umetniških vizualnih sistemov, - funkcionalna uporabnost zlatega reza in drugih proporcijskih odnosov pri načrtovanju grafičnih izdelkov , - analiziranje povezave med ploskovnimi in prostorskimi (plastično iluzivnimi) efekti in poudarjanje razlik med njimi, - analiziranje morfološko – likovno strukturalne zgradbe grafičnega izdelka s pomočjo likovnih prvin in odnosov med likovnimi sistemi, - analiziranje velikega števila grafičnih izdelkov z variacijami ter primerjava med posameznimi oblikovalskimi rešitvami glede na njihov namen, - zgodovinska primerjava grafičnih izdelkov med nekoč in danes.

Intended learning outcomes:

Knowledge and understanding: - Effects on the general and specific sensitivity of the individual in the observation, analysis and evaluation, natural, cultural, artistic design and visual systems, - Functional usefulness of the golden ratio and proportions in the planning of graphic products - Analyzing the links between surface and volumen (plastic iluzivnimi) Effects and highlight the differences between them, - Analyzing the fine structural building product with the help of graphic art elements and relationships between art systems, - Analyzing a large number of graphic products with variations and comparison between different design solutions for different purpose, - Historical comparison of graphic products in the past and today.

Metode poučevanja in učenja:

/Predavanja, izdelava vodenega seminarja na izbrano temo.
Predavanja potekajo v učilnici ali on-line .

Learning and teaching methods:

Lectures, and implemetation of guided seminar on seleceted theme.
Lectures are in classroom or on-line.

Načini ocenjevanja:

Delež/Weight

Assessment:

- pisni/ustni izpit	50,00 %	- examination written/oral
- seminarska naloga	50,00 %	- seminar project

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

1. STAREŠINIČ, Marica, SIMONČIČ, Barbara, BRAČKO, Sabina. Using a digital camera to identify colors in urban environments. *Journal of imaging science and technology*, ISSN 1062-3701, 2011, vol. 55, no. 6, str. 060201/1-060201/4, ilustr., doi: [10.2352/J.ImagingSci.Technol.2011.55.6.060201](https://doi.org/10.2352/J.ImagingSci.Technol.2011.55.6.060201). [COBISS.SI-ID [2684272](#)]
 2. AHTIK, Jure, MUCK, Deja, STAREŠINIČ, Marica. Detail diversity analysis of novel visual database for digital image evaluation. *Acta polytechnica Hungarica*, ISSN 1785-8860, 2017, vol. 14, no. 6, str. 115-132. <http://www.uni-obuda.hu/journal/Issue77.htm>. [COBISS.SI-ID [3458416](#)]
 3. AHTIK, Jure, STAREŠINIČ, Marica. Eye movement analysis of image quality parameters compared to subjective image quality assessment = Analiza pokreta očiju u određivanju parametara kvalitete slike u usporedbi sa subjektivnom procjenom kvalitete slike. *Tehnički vjesnik : znanstveno-stručni časopis tehničkih fakulteta Sveučilišta u Osijeku*, ISSN 1330-3651, 2017, vol. 24, no. 6, str. 1833-1839. http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=280290. [COBISS.SI-ID [3452784](#)]
 4. JAVORŠEK, Dejana, MOČNIK, Janja, STAREŠINIČ, Marica. Analyses of colour appearances on different display devices = Analiza interpretacije barv na različnih prikazovalnih napravah. *Tekstilec : glasilo slovenskih tekstilcev*, ISSN 0351-3386. [Tiskana izd.], 2015, letn. 58, št. 2, str. 100-107, ilustr. [COBISS.SI-ID [3139440](#)]
 5. OPAKA, Uroš, JAVORŠEK, Andrej, STAREŠINIČ, Marica, JAVORŠEK, Dejana. Analiza kakovosti barvnega profila za digitalno kamero Nikon D50 = Analysis of colour profile quality for digital camera Nikon D50. *Tekstilec : glasilo slovenskih tekstilcev*, ISSN 0351-3386. [Tiskana izd.], 2013, letn. 56, št. 2, str. 123-128, ilustr. [COBISS.SI-ID [2905712](#)]
- Razstave
6. GODLER, Marjeta, STAREŠINIČ, Marica. *Space illusions dance : [razstava] : Galéria Umelka, Slovak Union of Visual Arts, 5th - 24th August, 2014, Bratislava, Slovakia*. 2014. [COBISS.SI-ID [3049072](#)]
 7. GODLER, Marjeta, STAREŠINIČ, Marica. *Vesolje - veselje v nas : [samostojna razstava] : 33. festival idrijske čipke, 20. - 22. junij 2014, Idrija = "Space - the joy in us" exhibition : 33. idrija lace festival, 20. - 22. June 2014*. 2014. [COBISS.SI-ID [3023728](#)]
 8. AHTIK, Jure (avtor razstave, mentor), KOČEVAR, Tanja Nuša (avtor razstave, mentor), STAREŠINIČ, Marica (avtor razstave, mentor). *Muvit/6x60 in NTF : razstava študentov 2. letnika, Naravoslovnotehniške fakultete, Univerze v Ljubljani : Maraton filmskega ustvarjanja Muvit/6x60, Celje, 16. - 19. avgust 2017*. 2017. [COBISS.SI-ID [3396976](#)]

MEDIJSKE VIZUALIZACIJE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Medijske vizualizacije
Course title:	Media visualisation
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068047
Koda učne enote na članici/UL Member course code:	10230

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
15	30	15	0	0	60	4

Nosilec predmeta/Lecturer:	Jure Ahtik
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Pogoj za vključitev v delo je vpis v letnik študija in pozitivno ocenjena sprejemna naloga. Omejitev je 20 vpisanih študentov. Pogoj za pristop k ustnemu izpitu predmeta so 70 % prisotnost pri predavanjih in seminarju ter 100 % prisotnost pri vajah.	Enrolment in the study year and positively assessed admission task. The limit is 25 enrolled students. The condition for taking the oral exam of the course is 70% attendance at lectures and seminars and 100% attendance at tutorials.

Vsebina:	Content (Syllabus outline):
/Zahtevne vsebine s področja oblikovanja vizualnih komunikacij ter obravnave specifične problematike vsakega področja posebej na podlagi številnih primerov. Spremljanje in analiza celotnega postopka od začetne ideje do končne realizacije izdelka v obliki tiskovine, knjižne opreme, plakata, embalaže, vabila, postavitve internetne strani, izdelave logotipa itd. Praktične izvedbene naloge s posameznega področja s poudarkom na kvalitetni rešitvi odnosa med idejo, namenom in končnim rezultatom ter likovni analizi doseženih rezultatov. Poseben poudarek je na trajnostnih in okolju prijaznih rešitvah, kot npr.	Advanced topics in the field of visual communications design and treatment of specific issues of each area, based on numerous examples. Monitoring and analysis of the entire process from the initial idea to the final realization of the product in the form of printed matter, book design, posters, packaging, invitations, website layouts, creation of a logo, etc. Practical implementation of tasks in a particular area, with an emphasis on high-quality solution to the relationship between the idea, the purpose and the end result and visual analysis of the results achieved. Special emphasis is placed on sustainable and environmentally friendly solutions,

uporaba okolju prijaznih grafičnih materialov in snovanje dolgoročnih komunikacijskih rešitev.	such as the use of environmentally friendly graphic materials and the creation of long-term communication solutions.
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Temeljna literatura in viri/Readings:

1. FIELLE, C. in P., Graphic Design for the 21 Century 100 of the World s Best Grafic Designers, Taschen, 2002.
2. The Best of Newspaper Design Society of Newspaper Design, 1997.
3. JUTE. A., Grids the Structure of Graphic Design, Mac and Windows, 1996.
4. REPOUŠ. J., Celostna grafična podoba, Edicija Studio marketing, Ljubljana: 1995.
5. MEGGS, P. B., A History of Graphic Design, Canada, 1998.
6. DABUER, D., Graphic Design School, The principles and practices of graphic design, Thames and Hudson, 2004.
7. BUTINA, M., Prvine likovne prakse, Debora, Ljubljana:1997

Cilji in kompetence:

/Seznanjanje in spoznavanje tehničnih, oblikovalskih in vizualno – estetskih parametrov pri ustvarjanju različnih izdelkov s področja vizualnih komunikacij, oglaševanja in predstavitev v javnem prostoru ter sposobnost praktične izvedbe tovrstnih projektov s pomočjo ustreznega estetskega prilagajanja zahtevanim potrebam.

Predmetno specifične kompetence:

- Razvijanje sposobnosti za samostojno, skupinsko, projektno, raziskovalno delo.
- Razvijanje ustvarjalne imaginacije in kreativne vizualne interpretacije.
- Seznanjanje z metodičnimi procesi oblikovanja širših in bolj poglobljenih zasnov.
- Vzpostavljane kritičnih razmerij do lastnih del s pomočjo prečiščevanja svojih miselnih konceptov ter tehničnih pristopov in procesov izgradnje produktov.
- Razvoj veščin in spretnosti v uporabi različnih računalniških
- programov na področju oblikovanja medijskih vizualizacij.
- Sposobnost izvedbe zastavljenih nalog s poudarkom na
- jedrnatosti, urejenosti, razumljivosti, berljivosti in logični
- zaporednosti v kombinaciji s slikovnim gradivom.
- Sposobnost zasnove celotne grafične podobe s področja
- medijskih vizualizacij.
- Sposobnost snovanja dolgotrajnih in okolju prijaznih komunikacijskih rešitev.

Poznavanje sistematične metodologije oblikovanja od idejnega projekta, analize, definicije ciljev, sinteze, glavnega projekta do zaključka izvedbe in uporabe.

Objectives and competences:

Getting to know technical, design and visual– aesthetic parameters to create different products in the field of visual communications, advertising and presentation in the public space and the ability of the practical implementation of such projects by means of an appropriate aesthetic adjustments.

Subject-specific competencies:

- Developing the ability for independent, group, project, research work.
- Developing creative imagination and creative visual interpretations.
- Getting to know a methodical process of creating a broader deeper designs.
- Establishing critical relations to their own works through refining their mental concepts and technical approaches and processes of product construction.
- Computer skills development.
- Skills to carry out set tasks with a focus on brevity, orderliness, understandability, readability and logical sequence in combination with the visual materials.
- The ability to design the entire graphic image of the media visualizations.
- Ability to design long-term and environmentally friendly communication solutions.

Knowing systematic methodology of conceptual design, analysis and definition of objectives of the main project until the completion

Predvideni študijski rezultati:

/Znanje s področja medijske vizualizacije, ki zajema teoretično, praktično (tehnično) kot tudi estetsko podlago, slonečo na individualni kreativnosti in

Intended learning outcomes:

Knowledge of media visualization, which includes theoretical, practical (technical) as well as the aesthetic basis leaning on individual creativity and

izvirnosti posameznika. Razumevanje tehničnih, tehnoloških, okolju prijaznih, estetskih in izraznih zakonitosti oblikovanja in predstavitev svojih idej v obliki multimedijских vizualizacij s težnjo po kvaliteti doseženih rezultatov. Praktična uporaba temeljnih oz. splošnih principov oblikovanja na posameznih primerih s sposobnostjo utemeljevanja in evalvacije doseženih rezultatov. Refleksija razumevanja teorije in izkušenj pri delu na konkretnih nalogah ustvarjajo podlago za nadaljnje delo v industriji oz. samostojno ter omogoča istočasno kritično vrednotenje rezultatov dela med izhodiščno idejo in zaključnim izdelkom, njegovo sporočilno estetsko in psihološko uporabnostjo ter sinhronizacijo z zahtevami tržišča. Spretnosti uporabe različnih postopkov oz. načinov interpretacije medijskih vizualizacij, spretnost prilagajanja različnim zahtevnim stopnjam ter oblikam vsebin, velikosti, strukturi, stilnim posebnostim, kompleksnosti vzorcev in povezavi tipografije, fotografije in vizualnih poudarkom oz. akcentom.	originality of the individual. Understanding of the technical, technological, environmentally friendly, aesthetical and expressive view on the creation and presentation of their ideas in the form of multimedia visualization with a tendency for the quality results. The practical application of fundamental or. general design principles in individual cases, the ability of reasoning and evaluation of the achieved results. Understanding of the theory and experience when working on tasks of creating the basis for further work in the industry or. independently and simultaneously providing a critical evaluation of the results of the work between the initial idea and the final product, its communication value, psychological usability and synchronisation with the demands of the market. Skills of using different procedures or. ways of media visualization interpretation, ability to adopt to different challenging levels and forms of content, size, structure, style, the complexity of the patterns and relationships between typography, photography and other elements.
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Metode poučevanja in učenja:

Predavanja, projektno delo, individualne naloge, vaje in izdelki. Pedagoški proces je lahko deloma izveden na daljavo. Za izvedbo predmeta je predvidena uporaba spletne učilnice. Pri predavanjih je predvidena udeležba strokovnjaka s področja vidnega sporočanja in oglaševanja.

Learning and teaching methods:

Lectures, project work, individual assignments, tutorials, products. The pedagogical process can be partly carried out remotely. The use of an online classroom is planned for the implementation of the course. The participation of an expert in the field of visual communication and advertising is planned for the lectures.

Načini ocenjevanja:

Delež/Weight

Assessment:

/a) ustni izpit in	20,00 %	a) oral exam and
b) dokončane naloge	80,00 %	b) completed assignments

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

1. AHTIK, Jure, MUCK, Deja, STAREŠINIČ, Marica. Detail diversity analysis of novel visual database for digital image evaluation. *Acta polytechnica Hungarica*, ISSN 1785-8860, 2017, vol. 14, no. 6, str. 115-132.
2. AHTIK, Jure. Comparison of ICC and DNG colour profile workflows based on colorimetric accuracy. *Journal of print and media technology research*, ISSN 2223-8905, 2017, vol. 6, no. 3, str. 115-121.
3. AHTIK, Jure, STAREŠINIČ, Marica. Eye movement analysis of image quality parameters compared to subjective image quality assessment = Analiza pokreta očiju u određivanju parametara kvalitete slike u usporedbi sa subjektivnom procenom kvalitete slike. *Tehnički vjesnik : znanstveno-stručni časopis tehničkih fakulteta Sveučilišta u Osijeku*, ISSN 1330-3651, 2017, vol. 24, no. 6, str. 1833-1839.
4. STAREŠINIČ, Marica, AHTIK, Jure, SIMONČIČ, Barbara, BRAČKO, Sabina. Določanje barve objektov v urbanem okolju s spektoradiometrom = Determination of object colours in urban environments using spectroradiometry. *Tekstilec : glasilo slovenskih tekstilcev*, ISSN 0351-3386. [Tiskana izd.], 2012, letn. 55, št. 2, str. 87-91, ilustr.
5. AHTIK, Jure. Introducing a new anaglyph method : compromise anaglyph. V: ENLUND, Nils (ur.), LOVREČEK, Mladen (ur.). *Advances in printing and media technology : [proceedings of the 39th International*

- Research Conference iarigai, Ljubljana, Slovenia, September 2012*]. Vol. 39. Darmstadt: International Association of Research Organizations for the Information, Media and Graphic Arts Industries. 2012, str. 91-95.
6. STAREŠINIČ, Marica, AHTIK, Jure, UČAKAR, Andrej, JAVORŠEK, Dejana. Evaluation of changes in urban environments using orthophoto maps. V: COHEN, Alexis (ur.). *Urban and built environments : sustainable development, health implications and challenges*, (Urban development and infrastructure). New York: Nova Science Publishers. 2015, str. [41]-53, ilustr.
 7. AHTIK, Jure. *Tehnike upodabljanja anaglifnih slik za uporabo v umetnosti*. Ljubljana: [J. Ahtik], 2011. XIII, 96 f., ilustr.
 8. AHTIK, Jure (avtor razstave, mentor), KOČEVAR, Tanja Nuša (avtor razstave, mentor), STAREŠINIČ, Marica (avtor razstave, mentor), KOS, Primož (avtor razstave, mentor). *Končna.pdf : razstava študentov 2. letnika Grafične in medijske tehnike ter Grafičnih in interaktivnih komunikacij, Oddelka za tekstilstvo, grafiko in oblikovanje, Naravoslovnotehniške fakultete, Univerze v Ljubljani : Klub ZOO, Tržaška cesta 2, Ljubljana, 6. - 20. 6. 2017*. 2017.
 9. AHTIK, Jure (avtor razstave, mentor), KOČEVAR, Tanja Nuša (avtor razstave, mentor), STAREŠINIČ, Marica (avtor razstave, mentor). *Muvit/6x60 in NTF : razstava študentov 2. letnika, Naravoslovnotehniške fakultete, Univerze v Ljubljani : Maraton filmskega ustvarjanja Muvit/6x60, Celje, 16. - 19. avgust 2017*. 2017.

NAČRTOVANJE GRAFIČNE PROIZVODNJE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Načrtovanje grafične proizvodnje
Course title:	Planning graphic production
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068058
Koda učne enote na članici/UL Member course code:	10235

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
45	30	15	0	0	90	6

Nosilec predmeta/Lecturer:	Andrej Demšar, Urška Stanković Elesini
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
/Vpis v letnik študija in izbira predmeta. Pogoj za opravljanje izpita sta pozitivno opravljena seminar in predstavitev seminarja o poljubno izbrani temi s področja	Enrolment into study year and selecting the course. A prerequisite for access to the exam are positively evaluated seminar paper and its presentation on a topic from the field.

Vsebina:	Content (Syllabus outline):
VODENJE - Vodenje podjetja in oddelka, organizacija podjetja, kontrola proizvodnje, določanje rokov, zajemanje podatkov, nadzor in analiza dosežkov, optimalizacija zalog, ABC analiza, nabava, študij in analiza časa, krmiljenje delovnega procesa, projektni management, alternativne metode planiranja in vodenja, vodenje in odločanje, stili in modeli vodenja. ČLOVEK V PROIZVODNEM PROCESU - Delavčeva funkcija, humanizacija dela, strukturiranje dela, zahtevnost dela, metode ugotavljanja zahtevnosti opravil. PROIZVODNJA - Industrijska struktura, pojmovanje proizvodnje ter organizacija, značilnosti in delitev proizvodnje. PLANIRANJE - Proces	PRODUCTION - Industry structure, conception and organization of production, characteristics and division of production. PLANNING - The process of planning, preparation of the process, the selection of technology, determining equipment, manufacturing interval, technological preparation of production, work time norm, operational preparation of production, planning of the production process, capacity planning, material management, purchasing department, production and launching of operational documentation. MANAGEMENT - Management of companies and department, company organization, production control, scheduling, data collection, monitoring and

planiranja, priprava procesa, izbor tehnologije, določanje opreme, proizvodni interval, tehnološka priprava dela, časovna norma, operativna priprava proizvodnje, planiranje proizvodnega procesa, planiranje kapacitet, naloge materialnega poslovanja, naloge nabavnega oddelka, izdelava in lansiranje delovne dokumentacije. V okviru seminarja se izdelajo skupinske seminarske naloge, ki se razlikujejo po tematikah in področjih in so v vseh vsebinah vezane na trajnostnost v poslovnem procesu, s čimer nadgradijo osnove, pridobljene tekom predavanj. Z vključitvijo trajnostnosti seznanijo ostale študente, pri čemer se s pomočjo izvajalcev predmeta razvije ustrezna razprava na temo.	analysis of performance, optimization of stock, ABC analysis, acquisition, study and analysis of time, control of the working process, project management, alternative methods of planning and management, leadership and decision-making styles and models of leadership. MAN IN THE PRODUCTION PROCESS - Workers function, humanization of work, structuring work, the complexity of the work, the method of assessment of work. As part of the seminar work, group seminar assignments will be created that vary in terms of topics and themes, all related to sustainability in the business and production process, thus building on the foundations acquired in the lectures. The other students will be introduced to the inclusion of sustainability, and with the help of the course instructors, an appropriate discussion on the topic will be developed.
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Temeljna literatura in viri/Readings:

- POLAJNAR, A. Oblikovanje dela in delovnih mest. Maribor: Fakulteta za strojništvo, 2002
- MOŽINA, S. Management : nova znanja za uspeh. Radovljica: Didakta, 2002
- ANDREJČIČ, R. Operativni management. Kranj: Moderna organizacija, 1995
- KALTNEKAR, Z. Organizacija delovnih procesov. Moderna organizacija, Kranj 1996
- KLOPČIČ, S. Voditeljstvo : vodenje in sodelovanje, moč in odgovornost. Zagorje ob Savi : samozal., 2015
- STARE, A. Projektni management. Teorija in praksa. Ljubljana: Agencija POTI d.o.o., 2011
- STANKOVIČ ELESINI, Urška. Študij dela in časa. Ljubljana, Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, 2002. 213 str.

Dodatna literatura:

- HILL, T. Operations Management. Strategic context and managerial analysis. MacMillan Business, 2000

Cilji in kompetence:

/Temeljni cilj: Cilji predmeta so spoznati študenta z osnovami vodenja poslovnih procesov ter spoznavanje novih trendov v proizvodnem sistemu. Kompetence: – razumevanje stanja in trendov proizvodne in storitvene dejavnosti; – sposobnost nadzorovanja, analiziranja, vodenja, načrtovanja, planiranja in vrednotenja delovnih procesov; – razumevanje in sposobnost reševanje konkretnih delovnih problemov z uporabo strokovnih metod kot so npr. SWOT analiza, vrednostna analiza, sistemizacija in vrednotenje zahtevnosti dela itd.; – sposobnost uporabe temeljnega znanja pri vodenju delovnega procesa; – vodenje projektnega tima; - uporaba trajnostnih načel v postopku planiranja in vodenja poslovnih procesov.

Objectives and competences:

The basic aim: aim of the subject is to get to know the student with the basics of business process management, and learning about new trends in the production system. Competencies: - Understanding of the status and trends of production and service activities; - The ability to monitor, analyze, management, design, planning and evaluation of work processes; - Understanding of and ability to solve real business problems using scientific methods like eg. SWOT analysis, value analysis, systematization and evaluation of the complexity of work, etc .; - The ability to use basic knowledge in managing workflow; - Management of the project team; - the application of sustainable principles in the planning and management of business processes.

Predvideni študijski rezultati:

/Znanje in razumevanje: Pozna vrste in načine organiziranja proizvodnih sistemov; pridobi znanje s področja vodenja in planiranja proizvodnih sistemov; pozna metode za spremljanje proizvodnega procesa; pozna pomen posameznih proizvodnih podfunkcij ter njih vpliv na lastno ceno izdelka; zna organizirati

Intended learning outcomes:

Knowledge and understanding: Student knows the types and ways of organizing production systems; acquires knowledge of the management and planning of production systems; knows the methods for monitoring the manufacturing process; knows the importance of individual production objective

skupinsko delo. Razume pomen in vlogo posameznih podfunkcij proizvodne funkcije; razume pomen vodenja in sledljivosti proizvodnega procesa; razume pomen ustrezno vodene dokumentacije; razume pomen skupinskega dela; razume pomen standardizacije, tipizacije ter sistematizacije v proizvodnem procesu; razume pomen vpeljave trajnostnosti v proces vodenja in planiranja procesov ter pomen humanizacije del.	functions and their impact on the cost price of the product; knows how to organize team; understands the importance and role of production function and it's sub functions; understands the importance of managing and traceability of the manufacturing process; understands the importance of properly controlled documentation; understands the importance of teamwork; understands the importance of standardization, typing and systematization in manufacturing process; understands the importance of bringing sustainability into the management and planning of processes and the importance of humanizing work.
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Metode poučevanja in učenja:

Predavanja in seminarsko delo. V okviru predmeta se občasno lahko izvajajo strokovni obiski in/ali vabljen predavanja.

Predavanja se večinoma izvajajo v predavalnici, kjer je zagotovljena lažja komunikacija ter delo z uporabo inovativnih metod. Pri delu se uporablja spletna učilnica Moodle na NTF platformi (nalaganje gradiva, videov, povezav, kvizov, domačih nalog, ki so podlaga in uvod v naslednje predavanje; s strani študentov oddaja domačih nalog).

V primeru seminarjev se prve ure, ko se določajo vsebine seminarjev izvedejo v predavalnici, kasneje pa se 25% ur izvede na daljavo z uporabo IKT. V spletni učilnici se študenti prijavljajo v skupine, tedensko oddajajo seminarske naloge). Tedensko potekajo razgovori, s pomočjo katerih študenti pri seminarski nalogi napredujejo hitreje, končni izdelki pa so kakovostnejši.

Learning and teaching methods:

Lectures and seminar work. Within the course students visit some graphic companies and/or invited lectures are implemented. Lectures are usually held in a classroom, where easier communication and work with innovative methods are ensured. During work, the online classroom Moodle on the NTF platform is used (uploading materials, videos, links, quizzes, homework assignments that serve as a basis and introduction for the next lecture; students use online classroom to submit homework, register in seminar groups, etc.).

In seminars, the first lessons, when the content of the seminars is determined, are held in the classroom; later, 25% of the hours are held remotely via ICT. In the online classroom, students register in groups and submit seminar assignments weekly). Constructive discussions are held weekly, with the help of which students make faster progress in seminar work and the final products are of higher quality.

Načini ocenjevanja:

Delež/Weight

Assessment:

- pisni izpit (v predavalnici ali na daljavo)	60,00 %	- written exam (classroom or distance learning)
- seminarska naloga (oddaja delnih poročil z uporabo spletne učilnice in končna predstavitev v predavalnici tekom predavanj (vključitev teme v predavanja, s čimer se sproži dodatna razprava na temo) ali na daljavo). - Ocena od 6 - 10 je pozitivna	40,00 %	- seminar paper (submit partial reports via the online classroom and final classroom presentation during lectures (incorporating the topic into the lectures, triggering additional discussion on the topic) or remotely). Rating: positive – marks 6-10

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

KAVKLER, Katja, DEMŠAR, Andrej. Application of FTIR and Raman spectroscopy to qualitative analysis of structural changes in cellulosic fibres = Uporaba FTIR in ramanske spektroskopije pri kvalitativni analizi strukturnih sprememb celuloznih vlaken. Tekstilec, ISSN 0351-3386, 2012, letn. 55, št. 1, str. 19-44, ilustr. [COBISS.SI-ID 2727792]

URBAS, Raša, STANKOVIČ ELESINI, Urška, CIGULA, Tomislav, MAHOVIČ POLJAČEK, Sanja. Pad printing. V: IZDEBSKA, Joanna (ur.), THOMAS, Sabu (ur.). *Printing on polymers : fundamentals and applications*. Amsterdam [etc.]: Elsevier. cop. 2016, str. 263-278. [COBISS.SI-ID [3193712](#)]

POLJANŠEK, Adrijana, STANKOVIČ ELESINI, Urška. Razvoj in umeščanje kolektivne znamke Izdelek slovenske obrti = Development and positioning of the collective product of Slovenian craft trademark.

Tekstilec : glasilo slovenskih tekstilcev, ISSN 0351-3386. [Tiskana izd.], 2017, vol. 60, no. 3, str. 222-234, ilustr.

http://www.tekstilec.si/?page_id=1970. [COBISS.SI-ID [3418224](#)]

URBAS, Raša, ŠVARC, Jernej, STANKOVIČ ELESINI, Urška. *Odišavljenje modnih metuljev z uporabo vonj sproščujočih mikrokapsul : SI 25157 (A)*, 29. 09. 2017. Ljubljana: Urad RS za intelektualno lastnino, 2017. 6 str. [COBISS.SI-ID [3419248](#)]

STANKOVIČ ELESINI, Urška. Analiza in projektiranje procesov v konfekciji : zapiski predavanj. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, 2005. 128 str.

STANKOVIČ ELESINI, Urška, ZAKRAJŠEK, Špela, CERAR, Estera, MAROLT, Matija, GODEC, Primož, URBAS, Raša. Informatizacija slovenskih tekstilnih, oblačilnih in usnjarskopredelovalnih podjetij. *Tekstilec*, 2015, let. 58, št. 4, str. 281–300.

NAČRTOVANJE UPORABNIŠKIH VMESNIKOV

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Načrtovanje uporabniških vmesnikov
Course title:	User interface planning
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0075638
Koda učne enote na članici/UL Member course code:	123

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	15	0	0	60	4

Nosilec predmeta/Lecturer:	Jože Guna
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Vrsta predmeta/Course type:	izbirni/optional
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Pogoji za pristop k izpitu so pozitivno opravljene vaje in seminarski projekt.. Priporočena prisotnost na predavanjih je 70%, na vajah 100% ter seminarju 90%.	Conditions for the exam are successfully completed practical work and the seminar project. The recommended attendance at lectures is 70%, at laboratory work 100% and at the seminar project 90%.

Vsebina:	Content (Syllabus outline):
• Metode načrtovanja uporabniške izkušnje po metodi - Uporabniško usmerjeno načrtovanje • Na uporabnika/človeka osredotočen razvoj uporabniških vmesnikov • Načrtovanje interakcij • Uporabnost • Identifikacija uporabniških skupin, person • Analiza uporabniških potreb • Informacijska arhitektura • Prototipiranje uporabniškega vmesnika in interakcij (skica, žični model, interaktivni prototip) • Vizualna podoba	• User experience design method - User-centred design • User/human centred user interface development • Interactions design • Usability • Identification of user groups, personas • Analysis of user needs and requirements • Information architecture • User interface and interaction prototyping (sketch, wireframe, interactive prototype) • Design • User experience evaluation, presentation and application of typical evaluation methods

• Vrednotenje uporabniške izkušnje, predstavitev in uporaba tipičnih metod za vrednotenje • Metode za pripravo in izvedbo postopka vrednotenja uporabniške izkušnje in uporabnosti ter analizo rezultatov • tehnologije in uporaba naprav za sledenje pogleda pri načrtovanju in vrednotenju uporabniške izkušnje	• Methods for preparation and implementation of user experience and usability evaluation experiment and analysis of results • technology and use of eye-tracking devices in user experience design and evaluation
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Temeljna literatura in viri/Readings:

Temeljna literatura

- Krug, S. »Don't Make Me Think: A Common Sense Approach to Web Usability, 3rd Edition«, New riders, 2014, ISBN-13: 978-0321965516,

Dodatna literatura

- William, A. and Tullis, T.»Measuring the user experience: collecting, analyzing, and presenting usability metrics«. Newnes, 2013, ISBN-13: 978-0124157811
- Norman, D, A.»The design of everyday things: Revised and expanded edition«. Basic books, 2013, ISBN 978-0-465-05065,
- Hartson, Rex, and Pardha S. Pyla. The UX Book: Process and guidelines for ensuring a quality user experience. Elsevier, 2012.

Cilji in kompetence:

Študentje pridobijo in praktično aplicirajo znanja iz interdisciplinarnega področja načrtovanja uporabniške izkušnje, interakcij ter uporabniških vmesnikov po metodi na človeka/uporabnika osredotočenega načrtovanja. Poseben poudarek je na praktični uporabi uveljavljenih metodologij za analizo, načrtovanje, implementacijo ter vrednotenje uporabniške izkušnje in uporabnosti.

Predmetno specifične kompetence:

- razumevanje in praktična aplikacija metode na uporabnika osredotočenega razvoja rešitev
- identifikacija ciljnih uporabnikov in njihovih dejanskih potreb
- izdelava informacijske arhitekture
- uporaba metod in orodij za prototipiranje uporabniških vmesnikov in interakcij
- razumevanje in aplikacija metod za vrednotenje uporabniške izkušnje
- načrtovanje in izvedba postopka vrednotenja uporabniške izkušnje, izdelava ustreznih scenarijev in nalog za testne uporabnike ter določanje časovnih okvirjev in faz razvoja
- poznavanje in sposobnost kreativnega vključevanja interaktivnosti v sodobne produkte in storitve, vključujoč mobilne aplikacije, razširjeno resničnost
- poznavanje načinov modeliranja uporabnikov v interaktivnih medijih in sistemih
- vloga rešitev za sledenje pogleda pri vrednotenju uporabniške izkušnje

Objectives and competences:

Students acquire and practically apply knowledge from the interdisciplinary field of planning user experience, interactions and user interfaces according to the User Centred Design method. Special emphasis is on the practical application of established methodologies for analysis, planning, implementation and evaluation of user experience and usability.

Subject-specific competences:

- understanding and practical application of the user-centred design development method
- identification of target users and their actual needs
- information architecture
- the use of methods and tools for prototyping user interfaces and interactions
- understanding and application of user experience evaluation methods
- planning and implementation of the user experience evaluation process, creation of appropriate scenarios and tasks for test users, and determination of time frames and phases of development
- knowledge and ability to creatively integrate interactivity into modern products and services, including mobile applications, extended reality
- knowledge of user modeling methods in interactive media and systems
- the role of eye-tracking solutions in the user experience evaluation process

Predvideni študijski rezultati:

Znanje in razumevanje:

Intended learning outcomes:

Knowledge and understanding of:

• poglobljeno poznavanje načinov načrtovanja uporabniških vmesnikov in interakcij • poglobljeno poznavanje načinov vrednotenja uporabniških vmesnikov in interakcij • razumevanje vloge uporabniških vmesnikov v povezavi s sodobnimi interaktivnimi storitvami • praktična aplikacija znanja na v obliki seminarskega projekta	• in-depth knowledge of how to design user interfaces and interactions • in-depth knowledge of user interfaces and interactions evaluation process • understanding the role of user interfaces in connection with modern interactive services • practical application of knowledge in the form of a seminar project
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Metode poučevanja in učenja:

Predavanja z demonstracijami primerov, vaje v računalniški učilnici, seminarsko projektno delo s predstavitvami izdelkov in razpravo. Aktivnosti poučevanja in učenja potekajo na fakulteti in/ali prek spleta (online). Uporaba spletne učilnice in IKT metod poučevanja (multimedijsko gradivo, praktične demonstracije). Uporaba inovativnih metod poučevanja v smislu obogatitve predavanj z relevantnimi vabljenimi predavanji, povezovanje z industrijo, seminarsko delo na realnih izzivih iz industrije, uporaba sodobnih metod poučevanja s primeri iz prakse. Uporaba skupinskih metod dela.

Learning and teaching methods:

Lectures with demonstrations of examples, practical work in a computer room, seminar project work with presentations and discussions. Teaching and learning activities take place at the faculty and/or online. Use of the online classroom and ICT teaching methods (multimedia content, practical demonstrations). Use of innovative teaching methods in terms of enriching lectures with relevant invited lectures, connecting with the industry, seminar work on real challenges from industry, use of modern teaching methods with examples from practice. Use of team work methods.

Načini ocenjevanja:

Delež/Weight

Assessment:

Ustni/Pisni izpit Vse delne ocene morajo biti pozitivne.	50,00 %	Oral/Written exam All partial grades must be positive.
Ocena vaj	25,00 %	Practical exercises
Ocena seminarskega projektne izdelka	25,00 %	Assessment of a seminar project work

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

1. GUNA, Jože, POLAJNAR HORVAT, Katarina, PODJED, Dan. People-centred development of a smart waste bin. *Sensors*. Feb.-1 2022, iss. 3, 1288, str. 1-14, ilustr. ISSN 1424-8220. <https://www.mdpi.com/1424-8220/22/3/1288>, DOI: [10.3390/s22031288](https://doi.org/10.3390/s22031288). [COBISS.SI-ID [96699651](https://cobiss.si/96699651)]
2. SOMRAK, Andrej, POGAČNIK, Matevž, GUNA, Jože. Impact of different types of head-centric rest-frames on VRUSE and user experience in virtual environments. *Applied sciences*. Feb.-2 2021, no. 4, 1593, str. 1-31, ilustr. ISSN 2076-3417. <https://www.mdpi.com/2076-3417/11/4/1593>, DOI: [10.3390/app11041593](https://doi.org/10.3390/app11041593).
3. SOMRAK, Andrej, HUMAR, Iztok, HOSSAIN, M. Shamim, ALHAMID, Mohammed F., HOSSAIN, M. Anwar, GUNA, Jože. Estimating VR sickness and user experience using different HMD technologies : an evaluation study. *Future generation computer systems*. [Print ed.]. 2019, vol. 94, str. 302-316, ilustr. ISSN 0167-739X. <https://www.sciencedirect.com/science/article/pii/S0167739X18325044>, DOI: [10.1016/j.future.2018.11.041](https://doi.org/10.1016/j.future.2018.11.041). [COBISS.SI-ID [12274772](https://cobiss.si/12274772)]
4. BURGER, Gregor, GUNA, Jože, POGAČNIK, Matevž. Suitability of inexpensive eye-tracking device for user experience evaluations. *Sensors*. Jun. 2018, no. 6, 1822, str. 1-17, ilustr. ISSN 1424-8220. <http://www.mdpi.com/1424-8220/18/6/1822>, DOI: [10.3390/s18061822](https://doi.org/10.3390/s18061822). [COBISS.SI-ID [12045396](https://cobiss.si/12045396)]
5. GUNA, Jože, JAKUS, Grega, POGAČNIK, Matevž, TOMAŽIČ, Sašo, SODNIK, Jaka. An analysis of the precision and reliability of the leap motion sensor and its suitability for static and dynamic tracking. *Sensors*. Feb. 2014, vol. 14, no. 2, str. 3702-3720, ilustr. ISSN 1424-8220. <http://www.mdpi.com/1424-8220/14/2/3702>, DOI: [10.3390/s140203702](https://doi.org/10.3390/s140203702). [COBISS.SI-ID [10430036](https://cobiss.si/10430036)]

OBLIKOVANJE MEDIJEV

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Oblikovanje medijev
Course title:	Media design
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068059
Koda učne enote na članici/UL Member course code:	10240

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
15	15	30	0	0	60	4

Nosilec predmeta/Lecturer:	Primož Fijavž
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v 3. letnik, izbira predmeta, za pristop h končnemu izpitu so pogoji: opravljeno vodeno individualno delo, opravljena predstavitev individualnega dela, zahtevana prisotnost pri predavanjih (70%), seminarjih (90%) in vajah (100%)	Enrollment in the 3rd year, choosing a course, for taking the final exam the conditions are: completed guided individual work, completed presentation of individual work, required attendance at lectures (70%), seminars (90%) and exercises (100%).

Vsebina:	Content (Syllabus outline):
Predavanja: Teoretične definicije grafičnega oblikovanja. Predstavitev osnovnih oblikovalskih parametrov in pristopov. Študije različnih primerov s področja založniškega oblikovanja, informacijskega oblikovanja, oblikovanja celostnih podob, vizualnih komunikacij v javnem prostoru. Seminar: oblikovanje za različne medije. Vaje: uporaba grafičnih programov za grafično oblikovanje; izdelava nalog.	Lectures: Theoretical definitions of graphic design. Introduction to basic design parameters and approaches. Case studies in the field of editorial design, information design, corporate design, visual communication in public space. Seminar: designing a graphic design product or different media. Exercises: use of graphic programs for graphic design; creation of assignments.

Temeljna literatura in viri/Readings:
- Meggs, P. 8., A History of Graphic Design. New York: John Wiley & Sons, 1998. - Hendel, R., On Book Design. New Haven: Yale University Press, 1998. - Wilson, A., The Design of Books. San Francisco:

Chronicle Books, 1993. - Lupton, E., Miller, A. J., Design Writing Research: Writing and Graphic Design. London : Phaidon, 1996. - Fishel, C. M., The Perfect Package: How to Add Value Through Graphic Design. Gloucester : Rockport Publishers, 2000.

Dodatna literatura:

- Stewart, 8 ., Packaging Design Strategies. Leatherhead : Pira, 2004.
- Whittaker, J. , Producing for the Web. London : Routledge, 2000.
- White, J. V., Editing by design: A guide to effective word-and-picture communication for editors and designers. New York: R. R. Bowker Company, 1982.
- Pathak, H ., Structural Package Designs. Amsterdam : The Pepin Press, 1999.

Cilji in kompetence:

Študent spozna elemente grafičnega oblikovanja in njihovo vlogo v prezentaciji informacij za različne grafične izdelke in za različne medije (tiskane in digitalne). Spozna različne načine posredovanja informacij (slikovno in besedilno). Razlikuje vlogo vidnosti in čitljivosti vizualiziranih informacij na različnih izdelkih in različnih medijih; zna ju preveriti z napravo za sledenje očesnim premikom. Zna izbrati in pripraviti primerno vizualizacijo glede na vrsto informacije, vrsto uporabljenega materiala in tehnološke zahteve.

Predmetno specifične kompetence:

- poznavanje in razumevanje pomena in uporabnosti različnih grafičnih materialov in različnih medijev (tiskanega in digitalnih) za grafično oblikovanje,
- poznavanje in razumevanje pomena in uporabnosti posameznih vsebinskih elementov v različnih grafičnih izdelkih ali različnih medijih posredovanja informacij,
- poznavanje in razumevanje pomena in uporabnosti posameznih grafičnih elementov (tipografije, fotografije, ilustracije) za različne grafične izdelke,
- sposobnost reševanja konkretnih delovnih problemov v pripravi besedila in slikovnega materiala za različne izdelke,
- koherentno obvladovanje temeljnega tipografskega in fotografskega znanja ter sposobnost njunega povezovanja, združevanja in dopolnjevanja za različne grafične izdelke,
- razumevanje in uporaba metod kritične analize in razvoja teorij ter njihova uporaba v reševanju vidnosti, čitljivosti in sporočilnosti elementov grafičnega oblikovanja,
- razumevanje in uporaba metod kritične analize v načrtovanju konkretne tehnološke izdelave posameznih oblikovanih izdelkov,
- sposobnost generiranja novih idej (kreativnosti) v grafičnem oblikovanju za različne izdelke in v različnih medijih,
- razvoj kritične in samokritične presoje v oblikovanju različnih grafičnih izdelkov,
- avtonomnost pri izboru in uporabi grafičnih programov za oblikovanje in načrtovanje grafičnih izdelkov,

Objectives and competences:

The student gets to know the elements of graphic design and their role in the presentation of information for various graphic products and for various media (printed and digital). Gets to know different ways of transmitting information (visual and textual). Differentiates the role of visibility and legibility of visualized information on different products and different media; he/she can check them with an eye tracking device. He/she knows how to choose and prepare a suitable visualization according to the type of information, the type of material used and technological requirements.

Subject-specific competences:

- knowledge and understanding of the importance and usefulness of different graphic materials and different media (printed and digital) for graphic design,
- knowledge and understanding of the meaning and usefulness of individual content elements in various graphic products or various media of information transmission,
- knowledge and understanding of the meaning and usefulness of individual graphic elements (typography, photographs, illustrations) for various graphic products,
- the ability to solve concrete work problems in the preparation of text and pictorial material for various products,
- coherent mastery of basic typographic and photographic knowledge and the ability to connect, combine and complement them for various graphic products,
- understanding and application of methods of critical analysis and development of theories and their use in solving the visibility, legibility and communication of elements of graphic design,
- understanding and application of critical analysis methods in the planning of concrete technological production of individual designed products,
- the ability to generate new ideas (creativity) in graphic design for various products and in various media,
- the development of critical and self-critical judgment in the design of various graphic products,

• uporaba informacijsko-komunikacijske tehnologije v prevzemu in nadaljnjem posredovanju podatkov in osnovnega gradiva pri obdelavi podatkov za grafične izdelke	• autonomy in the selection and use of graphic programs for the design and planning of graphic products, • the use of information and communication technology in the acquisition and further forwarding of data and basic material in the processing of data for graphic products.
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Predvideni študijski rezultati:

Znanje in razumevanje: Pozna posamezne elemente grafičnega oblikovanja in njihovo vlogo v tiskanem mediju in v digitalnih medijih; pozna pomen vizualizacije informacije za različne medije; pozna značilnosti posameznih materialov ter posamezne tehnološke zahteve za različne vrste grafičnih izdelkov. Razume pomen izbora različnih kombinacij grafičnih elementov in njihovega vpliva na sporočilnost, vidnost in čitljivost informacije (vključno s tehnologijo za sledenje očesnim premikom); razume odnosa dopolnjevanja in nadgrajevanja v vizualizaciji informacij; razume pomen dopolnjevanja oblikovnih idej in tehnoloških zahtev. Zna uporabiti primerne grafične elemente v oblikovanju različnih izdelkov; zna uporabiti primerne materiale za različne grafične izdelke in za različne tehnološke zahteve; zna uporabiti računalniške programe za grafično oblikovanje.

Intended learning outcomes:

Knowledge and understanding: Knows individual elements of graphic design and their role in print and digital media; knows the importance of visualizing information for different media; knows the characteristics of individual materials and individual technological requirements for different types of graphic products. Understands the importance of selecting different combinations of graphic elements and their impact on the message, visibility and legibility of information (including eye tracking technology); understands the relationships of complementing and upgrading in information visualization; understands the importance of complementing design ideas and technological requirements. He/she knows how to use suitable graphic elements in the design of various products; knows how to use suitable materials for different graphic products and for different technological requirements; knows how to use computer programs for graphic design.

Metode poučevanja in učenja:

Predavanja, skupinsko seminarsko delo, računalniške vaje, vođeno individualno delo.
Predavanja, seminarji in vaje se lahko izvajajo v živo (predavalnica, računalniška učilnica) in/ali na daljavo z uporabo primerne programske opreme.

Learning and teaching methods:

Lectures, group seminar work, computer exercises, guided individual work.
Lectures, seminars and exercises can be conducted live (lecture room, computer classroom) and/or online using appropriate software.

Načini ocenjevanja:

Delež/Weight

Assessment:

individualne naloge	80,00 %	individual assignments
ustni zagovor (v predavalnici ali na daljavo)	20,00 %	oral defense (in the lecture room or online)
Pozitivno: 6–10 (60–100 %) Negativno: 5 (0–59 %)		Positive: 6–10 (60–100%) Negative: 5 (0–59%)

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

Projekt

FIJAVŽ, Primož, KENDA, Boštjan Botas; Regionalni center za ravnanje z odpadki – RCERO Ljubljana. Podoba arhitekture, označevalni sistem, celostna podoba. Snaga d. o. o., Ljubljana, 2017.

Razstava

KUČAN, Ana, JAVORNIK, Luka, BREZAR, Zs, KENDA, Boštjan Botas, FIJAVŽ, Primož, RAUCH, Peter, KOŠTRUN, Peter, KALAN, Sašo, SOBOČAN, Urb; *Vsi odtenki zelene / All Shades of Green*. Slovenska

predstavitev na 12. mednarodni razstavi arhitekture - Bienale v Benetkah, Muzej in galerije mesta Ljubljane, Galerija A+A, Benetke, 2010

Objavljena raziskava

BERK, Ksenija, FIJAVŽ, Primož, KENDA, Boštjan Botas; Clear the Land of Mine. V *Out of Balance - Kritik der Gegenwart / Reader Information Design*, Edited by S. Kraft, P. Oswalt, J. Krausse, C. Weiss, U. Kleefisch-Jobst. Aachen: ARCH+ Verlag, 2013, 108–109.

Objavljeni znanstveni prispevek na konferenci

FIJAVŽ Primož; *Self-Reflection and Awareness*, Design × Nachhaltigkeit, DGTF Tagung, Kiel, Nemčija, 2022.

OSNOVE 3D ANIMACIJ IN SIMULACIJ

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Osnove 3D animacij in simulacij
Course title:	Basics of 3D animation and simulation
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code: 0642806

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
15	15	30			60	4

Nosilec predmeta/Lecturer: Helena Gabrijelčič Tomc

Vrsta predmeta/Course type: Izbirni/Facultative

Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Pristop k predmetu:
Vpis v študij letnika. Osnovno znanje uporabe računalnika. Pogoj za pristop k predmetu je izbran in vpisan predmet Osnove 3D modeliranja.
Pristop k izpitu:
K izpitu lahko pristopijo študenti/ke, ki imajo opravljen izpitni projekt, seminar in vaje ter izpolnjeno predpisano prisotnost pri vseh sklopih predmeta.
Prisotnost:
Pri predmetu se zahteva naslednja prisotnost: predavanja 80 %, seminar in druge oblike dela 90 %, vaje 100 %.

Prerequisites:

Course:
Enrolment in the study year. Basic knowledge of computer use. The prerequisite for joining the course is to select and enroll in the course Basics of 3D Modelling.
Exam/Assessment:
Students who have completed the exam project, seminar and practical course and who have met the attendance requirements for all sections of the course can take the exam.
Presence:
Parts of the subject require the presence of: Lectures 80%, seminar and other forms of work 90 %, Practical Course 100 %.

Vsebina:

- 3D računalniška animacija: razvoj, zgodovina, pregled
- Animacijski cevovod, produkcijske faze

Content (Syllabus outline):

- 3D computer animation: development, history, overview
- Animation pipeline, production stages

• Priprava in načrtovanje referenc za animiranje z uporabo risarsko ilustratorske opreme (digitalna tablica), oblikovanje gibanja • Osnovne animacijske tehnike • Ključne sličice in določanje ključnih stanj objektov in ključnih poz likov • Osnovne operacije sprememb (premik, rotacija, skaliranje) • Animiranje s preoblikovalci • Gibanje po poti, nadzor in omejitve gibanja • Morfiranje in 3D interpolacije oblik • Animiranje tekstur, luči in kamere • Osnovno animiranje likov (hierarhija, kontrole, kosti, koža) • Osnovno animiranje tehničnih objektov • Sistemi delcev, gruče in avtonomni agenti. • Simuliranje dinamičnih objektov (vlaknine, tekstil, trki, trda in elastična telesa). • Simuliranje tekočin, plinov in drugih naravnih pojavov. • Zajem iz slik, videa in 3D rekonstrukcija gibanja. • Proceduralni in algoritemski pristopi animiranja. • Hibridne tehnike in proceduralno animiranje. • Pregled področij uporabe 3D animacij in simulacij, ki temeljijo na sodobnih pristopih digitizacije objektov in okolij (video produkcija in stabilizirane glave), na človeka in planet usmerjene uporabe 3D digitalnih okolij z animiranimi elementi in elementi simulacij ter okoljih razširjenih resničnosti.	• Preparation and planning of references for animation using drawing and illustration equipment (digital tablet), motion design • Basic animation techniques • Key frames, defining key states of objects and key poses of characters, interpolation • Basic change operations (shift, rotation, scaling) • Animating with modifiers • Animation along the path, constraints and motion control • Morphing and 3D shape interpolation • Animating textures, lights and cameras • Basic character animation (hierarchy, controls, bones, skin) • Basic animation of technical objects • Particle systems, flocks and autonomous agents. • Dynamic objects simulations (collision, hair and fur, cloth, rigid and soft bodies). • Simulating liquids, gases, plants and other natural phenomena • Capture from images, video and 3D motion reconstruction. • Hybrid techniques and procedural animation. • Overview of areas of application of 3D animations and simulations based on modern approaches of digitization of objects and environments (video production and stabilised head), human and planet-oriented use of 3D digital environments with animated and simulation elements, and augmented reality environments.
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Temeljna literatura in viri/Readings:

1. GABRIJELČIČ TOMC, Helena, KOČEVAR, Tanja Nuša, ISKRA, Andrej. 3D animacije ustvarjanje od giba do simulacije. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, grafiko in oblikovanje, 2021.
2. ERZETIČ Blaž, GABRIJELČIČ Helena. 3D od točke do upodobitve, 2. izdaja, Pasadena, 2010.
3. CHOPINE, AMI. 3D art essentials : the fundamentals of 3D modeling, texturing, and animation, Amsterdam [etc.] : Elsevier : Focal Press, 2011.

Dodatna literatura:

1. [BEANE Andy](#), 3D Animation Essentials 1st Edition, Sybex, 2012.
2. RATNER Peter, 3-D human modeling and animation, 3rd ed. Wiley, 2010.
3. HUGHES, John et all. Computer Graphics: Principles and Practice. 3rd ed. Addison-Wesley Professional, 2013.

Cilji in kompetence:

Cilj je seznaniti študenta o pomenu 3D računalniške animacije v grafičnih in interaktivnih komunikacijah in avdio-vizualnih medijih.

Predmetno-specifične kompetence:

- Spoznavanje osnovnih tehnik in orodij 3D animacij.
- Kritična presoja določanja osnovnih pristopov 3D animiranja enostavnih in kompleksnejših objektov.
- Obvladovanje kompozicijskih pravil in kadriranja pri postavitvi scene in načrtovanju animacije.

Objectives and competences:

Aim of the course is understanding the importance of 3D computer animation in graphic and interactive communication, audio-visual media.

Subject-specific competences:

- Knowledge of basic 3D animation techniques and tools.
- Critical assessment of defining basic 3D animation approaches for simple and complex objects.
- Mastering compositional rules and framing in scene setting and animation planning.

- Razumevanje cevovoda animacij od načrtovanja do končnega izrisa ter poznavanje osnovnih postopkov optimizacije modelov, tekstur in drugih nastavitev za končno produkcijo. - Razumevanje sodobne merilne in predstavitvene opreme za produkcijo animacij in vizualizacijo končnih upodobitev. - Praktične spretnosti prenosa znanj po principih na človeka in planet usmerjenih pristopov 3D animiranja in simuliranja na uporabna področja vizualnih komunikacij v izobraževanju, naravoslovju, tehniki, naravni in kulturni dediščini, spletnih tehnologijah, računalniških igrah in razširjenih resničnosti.	- Understanding the animation pipeline from design to final rendering and knowledge of basic optimization processes for models, textures and other settings for final production. - Understanding of modern measurement and presentation equipment for animation production and visualization of final renderings. - Practical knowledge transfer skills based on the principles of human- and planet-oriented approaches of 3D animation and simulation to useful areas of visual communication in education, natural science, technology, natural and cultural heritage, online technologies, computer games and extended reality.
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Predvideni študijski rezultati:

Razumevanje teoretičnih in praktičnih osnov 3D animacij in simulacij, načrtovanja in produkcije ter vpeljave v delokrog izdelave avdio-vizualnih medijev. Sposobnost prenosa znanj produkcije 3D animacij in simulacij na interdisciplinarna področja. Razumevanje uporabne vrednosti 3D animacij in simulacij na področjih vizualnih komunikacij v izobraževanju, naravoslovju, tehniki, naravni in kulturni dediščini, spletnih tehnologijah, računalniških igrah in razširjenih resničnosti.

Intended learning outcomes:

Understanding of the theoretical and practical basics of 3D animations and simulations, planning and production and their introduction to the field of audio-visual media production. Ability to transfer knowledge of 3D animation production and simulations to interdisciplinary fields. Understanding the usability of 3D animations and simulations in the fields of visual communication in education, science, technology, natural and cultural heritage, web technologies, computer games and augmented reality.

Metode poučevanja in učenja:

Predavanja, seminar (samostojno projektno delo), računalniške vaje in vodeno individualno delo. IKT podprto učenje in poučevanje, uporaba spletne učilnice. Sklopi predmeta se izvajajo v računalniških in drugih fakultetnih učilnicah/predavalnicah in/ali preko spleta (online) s pomočjo primerne in ustrezne programske opreme, ki omogoča delo. Pri poučevanju se uporablja napredna programska in strojna oprema.

Learning and teaching methods:

Lectures, seminar (individual project work), computer exercises and guided individual work. ICT-supported learning and teaching, use of the online classroom. Course assemblies are conducted in computer and other faculty classrooms/lecture rooms and/or online with the help of suitable and appropriate software that enables work. Classes are taught using advanced software and hardware.

Načini ocenjevanja:

Delež/Weight

Assessment:

a.) izpit teoretskih znanj in postopkov dela in ocena projektnega dela. Pogoji za pristop k zagovoru projektnega dela so opravljene računalniške vaje in pozitivno ocenjeno teoretično znanje postopkov dela.	70,00 %	a) exam of theoretical knowledge and work procedures and evaluation of project work Prerequisites to the final presentation of project are completed computer tutorials and positive grade of theoretical knowledge of work procedure.
b) ocena iz računalniških vaj	30,00 %	b) completed computer tutorials
Ocena od 6 - 10 je pozitivna		Rating: positive – marks 6-10

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- GABRIJELČIČ TOMC, Helena, KOČEVAR, Tanja Nuša, ISKRA, Andrej. 3D animacije - ustvarjanje od giba do simulacije. 1. natis. Ljubljana – Oddelek za tekstilstvo, grafiko in oblikovanje. ISBN 978-961-6900-28-7
- UČAKAR, Andrej, STERLE, Ana, VUGA, Martina, TRČEK PEČAK, Tamara, TRČEK, Denis, AHTIK, Jure, KOŠAK, Karin, MUCK, Deja, GABRIJELČIČ TOMC, Helena, KOČEVAR, Tanja Nuša. 3D digital preservation, presentation, and interpretation of wooden cultural heritage on the example of sculptures of the FormaViva Kostanjevica na Krki collection. Applied sciences. 2022, vol. 12, iss. 17, str. 1-17
- KNIFIC KOŠIR, Aja, GABRIJELČIČ TOMC, Helena. Visual effects and their importance in the field of visual media creation. JGED : Journal of Graphic Engineering and Design. 2022, vol. 13, no. 2, str. 5-13
- REBERŠEK-GAVRIČ, Žan, AHTIK, Jure, GABRIJELČIČ TOMC, Helena. The influence of 3D visualizations on attractiveness perspicuity and stimulation using the website interface of a marketing agency as an example. V: BOLANČA MIRKOVIĆ, Ivana (ur.). Zbornik radova = Proceedings. 27. međunarodna konferencija tiskarstva, dizajna i grafičkih komunikacija Blaž Baromić 2023, Zagreb, Hrvatska, 28. - 29. rujna 2023. Zagreb: Sveučilište u Zagrebu, Grafički Fakultet: = University of Zagreb, Faculty of Graphic Arts, 2023. Str. 145-155
- SMAREGLIA, Celeste Sanja, SULIČ, Jure, STANKOVIĆ ELESINI, Urška, HRKAČ, Tanja, GABRIJELČIČ TOMC, Helena. 3D animacija in AR aplikacija kot didaktično orodje za razumevanje delovanja kože pri predmetu biologije = 3D animation and AR application as a didactic tool for understanding the function of the skin in the subject of biology. V: OREL, Mojca (ur.), BRALA-MUDROVČIČ, Jasminka (ur.), MILETIĆ, Josip (ur.). EDUvision 2023 : 13th international conference : "New Contemporary Challenges - Opportunities for Integrating Innovative Solutions into 21st Century Education" : 22-24 November 2023 : [the book of papers]. Electronic ed. Polhov Gradec: EDUvision, 2023. Str. 1274-1291

OSNOVE 3D MODELIRANJA

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Osnove 3D modeliranja
Course title:	Basics of 3D modelling
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068060
Koda učne enote na članici/UL Member course code:	10241

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	45	0	0	90	6

Nosilec predmeta/Lecturer:	Helena Gabrijelčič Tomc
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Pristop k predmetu:
Vpis v študij letnika. Osnovno znanje uporabe računalnika.
Pristop k izpitu:
K izpitu lahko pristopijo študenti/ke, ki imajo opravljen izpitni projekt, seminar in vaje ter izpolnjeno predpisano prisotnost pri vseh sklopih predmeta.
Prisotnost:
Pri predmetu se zahteva naslednja prisotnost: predavanja 80 %, seminar in druge oblike dela 90 %, vaje 100 %.

Prerequisites:

Course:
Enrolment in the study year. Basic knowledge of computer use.
Exam/Assessment:
Students who have completed the exam project, seminar and practical course and who have met the attendance requirements for all sections of the course can take the exam.
Presence:
Parts of the subject require the presence of: Lectures 80%, Seminar and other forms of work 90 %, Practical Course 100 %.

Vsebina:

- 3D računalniška grafika: razvoj, zgodovina, pomen.
- Geometrično ozadje 3D računalniške grafike.
- Priprava in načrtovanje referenc za modeliranje z uporabo risarsko ilustratorske opreme (digitalna tablica)

Content (Syllabus outline):

- 3D computer graphic: development, history, trends.
- Geometrical background of 3D computer graphic.
- Preparation and planning of references for modelling using drawing and illustration equipment (digital tablet)
- Fundamentals of 3d modelling (basic

• Enostavni in kompleksnejši postopki 3D modeliranja (osnovne transformacije, modeliranje s primitivi, poligonsko modeliranje, modeliranje k krivuljami in NURBS-i, preoblikovalci). • Pomen topologije za produkcijo. • Subdivizija. • Digitalno kiparjenje. • 3D modeliranje iz slik in videa in retopologija. • Proceduralni in algoritemski pristopi modeliranja. • Postavitev na sceno: objekt, osvetlitev, kamera. • Teksture in materiali. • Mape in teksturiranje (projekcijsko in enostavno UV mapiranje). • Teoretične osnove simulacije svetlobnih interakcij v 3D prostoru. • Luči in generiranje senc v 3D prostoru. • Teoretično ozadje 3D osvetljevanja. • Virtualna kamera in pomen kompozicije. • Tehnike in algoritmi osnovnih in naprednih upodobljevalnikov. • Pregled uporabljenih področij 3D modeliranja, teksturiranja, osvetljevanja in upodabljanja z namenom na človeka in planet usmerjene uporabe računalniške grafike (računalniške vizualizacije, animacije, računalniške igre, razširjene resničnosti s poudarkom na navidezni resničnosti)	transformations, primitives modelling, polygonal modelling, modelling with NURBS, modifiers and deformers) •Topology and production. •Subdivision surface modelling. •Digital sculpturing. •3D modelling from images and video and retopology. • Procedural and algorithmic modelling approaches. •Scene setting: object, lightning, camera. •Textures and materials. •Maps and texturing (projection and simple UV mapping). •Theoretical basis of light interactions in 3D space. •Light and shadow generation in 3D space. •Theoretical background of 3D lightning. •Virtual camera and the composition. •Techniques and algorithms of simple and advanced rendering engines. • Overview of areas of application of 3D modelling, texturing, lighting and rendering with the aim of human and planet-oriented use of computer graphics (computer visualization, animation, computer games, extended reality with an emphasis on virtual reality)
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Temeljna literatura in viri/Readings:

- ERZETIČ Blaž, GABRIJELČIČ Helena. 3D od točke do upodobitve, 2. izdaja, Pasadena, 2010.
- GABRIJELČIČ TOMC, Helena, KOČEVAR, Tanja Nuša, ISKRA, Andrej. 3D animacije ustvarjanje od giba do simulacije. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, grafiko in oblikovanje, 2021.
- CHOPINE, AML. 3D art essentials : the fundamentals of 3D modeling, texturing, and animation, Amsterdam [etc.] : Elsevier : Focal Press, 2011.

Dodatna literatura:

- VAUGHAN. William. Digital Modeling. 1st ed. New Riders, Pearson Education, 2012.
 - BIRN Jeremy. Digital Lighting & Rendering, 3rd ed. New Riders, 2013.
- HUGHES, John et all. Computer Graphics: Principles and Practice. 3rd ed. Addison-Wesley Professional, 2013

Cilji in kompetence:

Cilj je seznaniti študenta o pomenu 3D računalniške grafike v grafičnih in interaktivnih komunikacijah in avdio-vizualnih medijih.

Predmetno-specifične kompetence:

- Spoznavanje osnovnih in naprednih tehnik in orodij 3D modeliranja s poudarkom na topologiji.
- Spoznavanje osnovnih in naprednih tehnik ustvarjanja 3D grafičnih digitalnih vsebin z na učeečega usmerjenimi pristopi, vključujoč umetniške izkušnje in inovativnega učenja (gibanje, oblikovanje z objekti,...)
- Kritična presoja določanja osnovnih in kompleksnih tekstur in materialov s zahtevnimi postopki mapiranja.
- Obvladovanje kompozicijskih pravil pri postavitvi

Objectives and competences:

Aim of the course is understanding the importance of 3D computer graphic in graphic and interactive communication, audio-visual media.

Subject-specific competences:

- Knowledge of basic and advanced 3d modelling techniques and tools with the emphasis on topology.
- Knowledge the basic and advanced techniques of creating 3D graphic digital content with learner-oriented approaches, including artistic experiences and innovative learning (movement, design with objects,...)
- Critical evaluation and design of simple and advanced textures and materials with advanced mapping procedures.
- Management of compositional rules in scene setting

scene ter kompleksnih postopkov 3D osvetljevanja s poudarkom na razumevanju simulacij svetlobnih interakcij s 3D materialom. • Razumevanje metod in delovanja algoritmov za enostavno in napredno upodabljanje. • Praktične spretnosti prenosa znanj po principih na človeka in planet usmerjenih pristopov 3D modeliranja, teksturiranja, osvetljevanja in upodabljanja na uporabna področja vizualizacij, animacij, računalniških iger in razširjenih resničnosti.	and complex procedures of 3D illumination with the emphasis on understanding the interactions between light and 3D material. • Understanding rendering methods and working of rendering algorithms for simple and advanced rendering. • Practical skills of transferring knowledge according to the principles of human and planet-oriented approaches of 3D modelling, texturing, lighting and rendering to the useful fields of visualizations, animations, computer games and augmented realities.
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Predvideni študijski rezultati:

Razumevanje teoretičnih osnov in obvladovanje prenosa v prakso osnovnih in zahtevnejših tehnik 3D modeliranja (s poudarkom na topologiji), osvetljevalnih sistemov, teksturiranja, postavitve scene, upodabljanja.

Sposobnost uporabe znanj 3D računalniške grafike, s poudarkom na modeliranju in statičnih vizualizacijah na interdisciplinarnih področjih.

Razumevanje uporabne vrednosti 3D računalniške grafike na področjih zajema topologije objektov, vizualizacij, animacij, iger in razširjenih resničnosti.

Intended learning outcomes:

Understanding of theoretical basis and practical use of 3D simple and advanced modelling, textures, mapping, virtual illumination, scene setting and rendering.

Ability to apply 3D computer graphics skills, with an emphasis on modelling and static visualizations in interdisciplinary areas.

Understanding the usability of 3D computer graphics in the fields of acquisition of the objects' topology, visualizations, animations, games, and augmented reality.

Metode poučevanja in učenja:

Predavanja, seminar (samostojno projektno delo), računalniške vaje in vodeno individualno delo.

IKT podprto učenje in poučevanje, uporaba spletne učilnice.

Sklopi predmeta se izvajajo v računalniških in drugih fakultetnih učilnicah/predavalnicah in/ali preko spleta (online) s pomočjo primerne in ustrezne programske opreme, ki omogoča delo.

Learning and teaching methods:

Lectures, seminar (individual project work), computer exercises and guided individual work.

ICT-supported learning and teaching, use of the online classroom.

Course assemblies are conducted in computer and other faculty classrooms/lecture rooms and/or online with the help of suitable and appropriate software that enables work.

Načini ocenjevanja:

Delež/Weight

Assessment:

a.) izpit teoretskih znanj in postopkov dela in ocena projektnega dela. Pogoji za pristop k zagovoru projektnega dela so opravljene računalniške vaje in pozitivno ocenjeno teoretično znanje.	70,00 %	a) exam of theoretical knowledge and work procedures and evaluation of project work Prerequisites to the final presentation of project are completed computer tutorials and positive grade of theoretical knowledge of work procedure.
b) ocena iz računalniških vaj	30,00 %	b) completed computer tutorials
Ocena od 6 - 10 je pozitivna		Rating: positive – marks 6-10

Ocenjevalna lestvica:

Grading system:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10
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Reference nosilca/Lecturer's references:

- ERZETIČ, Blaž, GABRIJELČIČ, Helena. 3D od točke do upodobitve. 1. natis. Ljubljana: Pasadena, 2009. 201 str., ilustr. ISBN 978-961-6361-99-6.
- GABRIJELČIČ TOMC, Helena, KOČEVAR, Tanja Nuša, ISKRA, Andrej. 3D animacije ustvarjanje od giba do simulacije. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, grafiko in oblikovanje, 2021. 211 str., ilustr. ISBN 978-961-6900-28-7.

- SMAREGLIA, Celeste Sanja, SULIČ, Jure, STANKOVIĆ ELESINI, Urška, HRKAČ, Tanja, GABRIJELČIĆ TOMC, Helena. 3D animacija in AR aplikacija kot didaktično orodje za razumevanje delovanja kože pri predmetu biologije = 3D animation and AR application as a didactic tool for understanding the function of the skin in the subject of biology. V: OREL, Mojca (ur.), BRALA-MUDROVČIĆ, Jasminka (ur.), MILETIĆ, Josip (ur.). EDUvision 2023 : 13th international conference : "New Contemporary Challenges - Opportunities for Integrating Innovative Solutions into 21st Century Education" : 22-24 November 2023 : [the book of papers]. Electronic ed. Polhov Gradec: EDUvision, 2023. Str. 1274-1291
- GABRIJELČIĆ TOMC, Helena, CULJKAR, Petra, ZUPIN, Živa, MOŽINA, Klementina. Legibility of 3D printed typography at smaller sizes. *Ergonomics*. [Print ed.]. 2023, vol. 66, no. 12, str. 2091–2105
- REBERŠEK-GAVRIČ, Žan, AHTIK, Jure, GABRIJELČIĆ TOMC, Helena. The influence of 3D visualizations on attractiveness perspicuity and stimulation using the website interface of a marketing agency as an example. V: BOLANČA MIRKOVIĆ, Ivana (ur.). *Zbornik radova = Proceedings*. 27. međunarodna konferencija tiskarstva, dizajna i grafičkih komunikacija Blaž Baromić 2023, Zagreb, Hrvatska, 28. - 29. rujna 2023. Zagreb: Sveučilište u Zagrebu, Grafički Fakultet: = University of Zagreb, Faculty of Graphic Arts, 2023. Str. 145-155

OSNOVE INTERAKTIVNOSTI IN ANIMACIJ

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Osnove interaktivnosti in animacij
Course title:	Basics of interactivity and animation
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068081
Koda učne enote na članici/UL Member course code:	10249

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	45	0	0	90	6

Nosilec predmeta/Lecturer:	Helena Gabrijelčič Tomc
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures: Angleščina, Slovenščina
	Vaje/Tutorial: Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Pristop k predmetu:
Vpis v študij letnika. Osnovno znanje uporabe računalnika.
Pristop k izpitu:
K izpitu lahko pristopijo študenti/ke, ki imajo opravljen izpitni projekt, seminar in vaje ter izpolnjeno predpisano prisotnost pri vseh sklopih predmeta.
Prisotnost:
Pri predmetu se zahteva naslednja prisotnost: predavanja 80 %, seminar in druge oblike dela 90 %, vaje 100 %.

Prerequisites:

Course:
Enrolment in the study year. Basic knowledge of computer use.
Exam/Assessment:
Students who have completed the exam project, seminar and practical course and who have met the attendance requirements for all sections of the course can take the exam.
Presence:
Parts of the subject require the presence of: Lectures 80%, seminar and other forms of work 90 %, Practical Course 100 %.

Vsebina:

- Osnove interaktivnosti in interaktivne komunikacije.
- Načrtovanje interaktivnih rešitev računalniške grafike od idejne zasnove, preko možnih scenarijev in informacijske arhitekture do testnih rešitev.

Content (Syllabus outline):

- Basis of Interactivity and interactive communication.
- Planning of interactive solutions from basic idea, through information architecture to test solutions.

• Priprava in načrtovanje referenc grafičnih elementov z uporabo risarsko ilustratorske opreme (digitalna tablica). • Osnove glavnih interaktivnih funkcionalnosti v računalniški grafiki. • Principi interaktivnega oblikovanja in produkcije. • Načrtovanje in izdelava različnih vsebin za interaktivno računalniško grafiko in animacije. • Načrtovanje in izdelava vsebin za 360 okolja in okolja razširjenih resničnosti. • Testiranje vsebinskih elementov v interaktivni računalniški grafiki. • Osnove delovanja platform za izdelavo interaktivnih rešitev računalniške grafike. • Uporabniška izkušnja, analiza uporabnosti in načrtovanje odzivnosti interaktivne računalniške grafike in animacij. • Interdisciplinarna področja razvoja interaktivnih komunikacijskih rešitev in animacij s poudarkom na trajnostnem načrtovanju in oblikovanju vsebin, gibanja, večpredstavnosti in interaktivnih medijev.	• Preparation and planning of references of graphic elements using drawing and illustration equipment (digital tablet). • Basic interactive functionalities in computer graphic. • Principles of interactive design and production. • Planning and production of content element for interactive media. • Planning and creating content for 360 and augmented reality environments. • Testing of content elements in interactive computer graphic and animation. • Basic principles of platforms for production of interactive computer graphic. • User experience, usability analysis and user response in interactive computer graphic and animation. • Interdisciplinary fields of development of interactive communication solutions and animation with an emphasis on sustainable planning and design of multimedia, motion, and interactive media content.
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Temeljna literatura in viri/Readings:

- Isabel Meirelles: Design for Information: An Introduction to the Histories, Theories, and Best Practices Behind Effective Information Visualizations, Rockport Publishers, 2013.
- Tullis, Thomas ; Albert, William: Measuring the user experience : collecting, analyzing, and presenting usability metrics, Elsevier/Morgan Kaufmann, 2008
- Parush, Avi: Conceptual design for interactive systems : designing for performance and user experience, Morgan Kaufmann Publishers, 2015

Dodatna literatura:

- Don Norman: The Design of Everyday Things, Basic Books, 2013.
- Jesse James Garrett: The Elements of User Experience: User-Centered Design for the Web and Beyond, Peachpit Pr, 2002
- Mark A. Simon: Producing Independent 2D Character Animation: Making & Selling A Short Film, 2012
- Steve Roberts: Character Animation Fundamentals: Developing Skills for 2D and 3D Character Animation, 2012

Cilji in kompetence:

Cilj je seznaniti študenta o pomenu interaktivnosti in interaktivne komunikacije skozi orodja in tehnike izdelave interaktivne računalniške grafike.

Predmetno-specifične kompetence:

- Poznavanje in razumevanje interaktivnosti in interaktivne komunikacije skozi prostor in čas.
- Obvladovanje načrtovanja interaktivne računalniške grafike in animacij s poudarkom na uporabniški izkušnji.
- Spoznavanje postopkov načrtovanja interakcij med uporabnikom in interaktivno računalniško grafiko.
- Kritična presoja pri izboru in oblikovanju ključnih elementov interaktivne računalniške grafike in animacij od teksta, slike in animacij do kompleksnih funkcionalnosti ter rešitev.
- Spoznavanje osnovnih razvojnih okolij za interaktivno računalniško grafiko.

Objectives and competences:

Basic goals of a course are the introduction of interactivity, interactive communication through tools and techniques of production of interactive computer graphic.

Subject-specific competences:

- Knowledge and understanding of interaction and interactive communication through space and time.
- Understanding the importance of planning of interactive computer graphic and animation with a stress on user experience.
- Knowledge of principles of planning interactions between users and interactive media.
- Critical estimation by selection and design of key elements of interactive computer graphic and animation from text, images and animations to complex functionalities and solutions.

- Razumevanje pomena uporabniške izkušnje in uporabnosti v interaktivni računalniški grafiki in animacijah analiza slednje. - Razumevanje sodobne merilne in predstavitvene opreme za produkcijo večpredstavnosti in vizualizacijo končnih upodobitev. - Pridobivanje praktičnih spretnosti IKT usmerjenega prenosa znanj načrtovanja interaktivnih medijev, animacij in vsebin večpredstavnosti na interdisciplinarna področja.	- Knowledge of basic development environments for interactive computer graphic. - Understanding the importance and analysis of user experience and usability in interactive computer graphic and animations. - Understanding of modern measurement and presentation equipment for multimedia production and visualization of final renderings. - Acquisition of practical skills of ICT-oriented transfer of knowledge of planning interactive media, animation, and multimedia content to interdisciplinary fields.
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Predvideni študijski rezultati:

Študent bo razumel osnove interaktivnih medijev in spoznal ključne faze praktičnega načrtovanja, izdelave in analize interaktivnih medijev. Razumevanje teoretičnih osnov interaktivnih medijev in faz načrtovanja, produkcije in testiranja rešitev animacij. Spretnost prenosa znanj s področja načrtovanja interaktivnih medijev, animacij in večpredstavnostnih vsebin z uporabo IKT na različna interdisciplinarna področja. Zmožnost uporabe pridobljenih veščin načrtovanja interaktivnih medijev in animacij na različnih interdisciplinarnih področjih.

Intended learning outcomes:

The student will understand the basics of interactive media and become familiar with the key stages of practical planning, creation, and analysis of interactive media. They will gain an understanding of the theoretical foundations of interactive media, as well as the stages of planning, production, and testing of animation solutions. Skill in transferring knowledge in the design of interactive media, animations, and multimedia content using ICT to various interdisciplinary fields. The ability to apply acquired skills in designing interactive media and animations across diverse interdisciplinary domains.

Metode poučevanja in učenja:

Predavanja, seminar (samostojno ali skupinsko projektno delo), računalniške vaje in vodeno individualno delo.
IKT podprto učenje in poučevanje, uporaba spletne učilnice.
Sklopi predmeta se izvajajo v računalniških in drugih fakultetnih učilnicah/predavalnicah in/ali preko spleta (online) s pomočjo primerne in ustrezne programske opreme, ki omogoča delo.
Pri poučevanju se uporablja napredna programska in strojna oprema.

Learning and teaching methods:

Lectures, seminar (individual or group project work), computer exercises and guided individual work. ICT-supported learning and teaching, use of the online classroom.
Course assemblies are conducted in computer and other faculty classrooms/lecture rooms and/or online with the help of suitable and appropriate software that enables work.
Classes are taught using advanced software and hardware.

Načini ocenjevanja:

Delež/Weight

Assessment:

a.)izpit teoretskih znanj in postopkov dela in ocena projektnega dela. Pogoji za pristop k zagovoru projektnega dela so opravljene računalniške vaje in pozitivno ocenjeno teoretično znanje postopkov dela.	60,00 %	a) exam of theoretical knowledge and work procedures and evaluation of project work Prerequisites to the final presentation of project are completed computer tutorials and positive grade of theoretical knowledge of work procedure.
b) ocena iz računalniških vaj	40,00 %	b) completed computer tutorials
Ocena od 6 - 10 je pozitivna		Rating: positive – marks 6-10

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- KARO, Nuša, GABRIJELČIČ TOMC, Helena. The use of animation as a teaching tool to learn about the meaning and function of ozone. V: BLAZNIK, Barbara (ur.). 9th Conference on Information and Graphic Arts Technology : proceedings : 11.-12. April 2024, Ljubljana, Slovenija. Ljubljana: Faculty of Natural Sciences and Engineering, Department of Textiles, Graphic Arts and Design, Chair of Information and Graphic Arts Technology, 2024. str. 211-216
- KRAJNČIČ, Naja, WEINGERL, Primož, GABRIJELČIČ TOMC, Helena. Character design as a means of expression for successful animation. V: BLAZNIK, Barbara (ur.). 9th Conference on Information and Graphic Arts Technology : proceedings : 11.-12. April 2024, Ljubljana, Slovenija. Ljubljana: Faculty of Natural Sciences and Engineering, Department of Textiles, Graphic Arts and Design, Chair of Information and Graphic Arts Technology, 2024. str. 204-210
- STANKOVIĆ ELESINI, Urška, KOGELNIK, Mojca, KRAJNC, Gaja, HRKAČ, Tanja, GABRIJELČIČ TOMC, Helena. Oblikovanje animacije za 4. razred osnovne šole: o koži pri predmetu Naravoslovje in tehnika = Designing an animation for the 4th grade of elementary school: about the skin in the subject Science and Technology. V: ČIRGIĆ, Adnan (ur.). EDUvision 2021 : 11. mednarodna konferenca : "Novi izzivi današnjega časa - priložnosti za vključevanje inovativnih rešitev v izobraževanje 21. stoletja" : 25.-27. november 2021 : [zbornik prispevkov]. Elektronska izd. Ljubljana [i. e. Polhov Gradec]: EDUvision, 2021. Str. 306-321
- MUŠIČ, Jaka, GABRIJELČIČ TOMC, Helena. A comparison of current solutions for creating web animations on Apple hardware. Journal of print and media technology research. 2022, vol. 11, no. 2, str. 129–140.
- SMOLE, Vera, GABRIJELČIČ TOMC, Helena, KAVČIČ, Alenka. Uporaba novih medijev v narečnem slovaropisju na primeru Slovarja starega orodja v govoru Loškega Potoka. Rasprave Instituta za hrvatski jezik i jezikoslovje. 2020, vol. 46, no. 2, str. 1039-1057

OSNOVE LIKOVNEGA IZRAŽANJA

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Osnove likovnega izražanja
Course title:	Basics of artistic expression
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	1. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068071
Koda učne enote na članici/UL Member course code:	11281

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	30	0	0	0	60	4

Nosilec predmeta/Lecturer:	Marica Starešinič
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures: Angleščina, Slovenščina
	Vaje/Tutorial: Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v prvi letnik študija	Enrolment into the first study year.

Vsebina:	Content (Syllabus outline):
Vizualne zaznave in zakonitosti gestalta. Likovni jezik, semiologija, sintaksa Razlikovanje figure in ozadja, vloga kontrasta in asimilacije zakoni organizacije vidnega polja. Svetlo-temno, valeur in sence Barva Barva percepcija Barva fizikalno Barvni modeli Barvni kontrasti Estetika barve Morfološke likovne prvine. Točka, linija, oblika, 2D, 3D, Prostor, čutne in psihične prvine prostora. Iluzija prostora prostorski ključ. Likovna sintaksa Likovna materializacija v različnih risarskih medijih Seminar: Grafično oblikovanje in vizualne komunikacije Strategije oblikovanja z uporabo vizualnih, likovnih in tipografskih elementov Študent se seznani s postopki vizualizacije ideje v grafičnih medijih Simbolna identiteta blagovne znamke	Visual perception and the gestalt legality. Art language, semiology, sintaxis Differentiating figures and background, the role of contrast and assimilation organization Light-dark valeur and shadow Color Colour perception Colour physical Colour models Color contrasts Aesthetics of color Morphological art elements. Point, line, shape, 2D, 3D, Space, sensory and psychological space, an illusion of depth, spatial keys. Art syntax Artistic materialization in various drawing media seminar: Graphic design and visual communication Design strategies using visual, artistic and typographic elements Students are acquainted with the procedures of visualization ideas in graphic media Symbolic brand identity

Temeljna literatura in viri/Readings:

BUTINA, M. Elementi likovne prakse. Ljubljana : Mladinska knjiga, 1982. – BUTINA, M. Mala likovna teorija. Ljubljana : Debora, 2000. – ITTEN, J. Design and Form. London : Thames and Hudson, 1975.
 – KLEIN, Naomi, Designing New Brand Identity
 – ITTEN, Johannes, Umetnost barve

Dodatna literatura:

– KUEPPERS, H. Harmonielehre der Farben. Köln : DuMont, 1989

Cilji in kompetence:

- sposobnost razvijanja vizualne senzibilnosti, - sposobnost selekcioniranja vidnega v povezavi s cilji, - sposobnost likovnega produktivnega mišljenja, - sposobnost posploševanja in abstrahiranja, - sposobnost mimetičnega organiziranja slikovnega polja, - sposobnost vizualiziranja in ustvarjanja - iluzije tretje dimenzije na dvodimenzionalni ploskvi, - sposobnost uporabe barve - sposobnost uporabe risarskih in slikarskih tehnik in postopkov, - obvlada osnove perspektive in aksonometrije - sposobnost gradnje kompozicije

Objectives and competences:

The course presents students with knowledge on the links and interdependencies basic artistic elements and procedures. Students get acquainted with the basics of visual language, techniques of artistic expression and understanding of visual communication and graphic design - Ability to develop visual sensibility, - The ability to filter visible in relation to the objectives, - The ability of artistic productive thinking, - The ability of generalization and abstraction, - The ability to organize the mimetic image field, - The ability to visualize and create - The illusion of a third dimension to the two-dimensional surface, - The ability to use color - The ability to use drawing and painting techniques and procedures, - The basics of perspective and axonometry - The ability of composition building

Predvideni študijski rezultati:

Znanje in razumevanje: Predmet predstavi študentu znanja o povezavah in soodvisnostih temeljnih likovnih prvin in postopkov. Študent se seznani z osnovami likovnega jezika, tehnikami likovnega izražanja in razumevanja vizualnih komunikacij in grafičnega oblikovanja

Intended learning outcomes:

Knowledge and understanding: The course presents students with knowledge on the links and interdependencies basic artistic elements and procedures. Students get acquainted with the basics of visual language, techniques of artistic expression and understanding of visual communication and graphic design

Metode poučevanja in učenja:

Predavanja, seminarji, raziskovalni seminarji, projektno delo, delo poteka v predavalnici in drugje.

Learning and teaching methods:

Lectures, seminars, research seminars, project work, is done in the lecture room and elsewhere.

Načini ocenjevanja:

Delež/Weight

Assessment:

Način pisni / ustni izpit
projekt

70,00 %
30,00 %

written / oral exam
project

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

Razstave

1. GODLER, Marjeta, STAREŠINIČ, Marica. *Space illusions dance : [razstava] : Galéria Umelka, Slovak Union of Visual Arts, 5th - 24th August, 2014, Bratislava, Slovakia.* 2014. [COBISS.SI-ID [3049072](#)]

2. GODLER, Marjeta, STAREŠINIČ, Marica. *Vesolje - veselje v nas : [samostojna razstava] : 33. festival idrijske čipke, 20. - 22. junij 2014, Idrija = "Space - the joy in us" exhibition : 33. idrija lace festival, 20. - 22. June 2014.* 2014. [COBISS.SI-ID [3023728](#)]
3. AHTIK, Jure (avtor razstave, mentor), KOČEVAR, Tanja Nuša (avtor razstave, mentor), STAREŠINIČ, Marica (avtor razstave, mentor). *Muvit/6x60 in NTF : razstava študentov 2. letnika, Naravoslovnotehniške fakultete, Univerze v Ljubljani : Maraton filmskega ustvarjanja Muvit/6x60, Celje, 16. - 19. avgust 2017.* 2017. [COBISS.SI-ID [3396976](#)]
4. STAREŠINIČ, Marica, SIMONČIČ, Barbara, BRAČKO, Sabina. Using a digital camera to identify colors in urban environments. *Journal of imaging science and technology*, ISSN 1062-3701, 2011, vol. 55, no. 6, str. 060201/1-060201/4, ilustr., doi: [10.2352/J.ImagingSci.Technol.2011.55.6.060201](#). [COBISS.SI-ID [2684272](#)]
5. AHTIK, Jure, STAREŠINIČ, Marica. Eye movement analysis of image quality parameters compared to subjective image quality assessment = Analiza pokreta očiju u određivanju parametara kvalitete slike u usporedbi sa subjektivnom procjenom kvalitete slike. *Tehnički vjesnik : znanstveno-stručni časopis tehničkih fakulteta Sveučilišta u Osijeku*, ISSN 1330-3651, 2017, vol. 24, no. 6, str. 1833-1839. http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=280290. [COBISS.SI-ID [3452784](#)]
6. JAVORŠEK, Dejana, MOČNIK, Janja, STAREŠINIČ, Marica. Analyses of colour appearances on different display devices = Analiza interpretacije barv na različnih prikazovalnih napravah. *Tekstilec : glasilo slovenskih tekstilcev*, ISSN 0351-3386. [Tiskana izd.], 2015, letn. 58, št. 2, str. 100-107, ilustr. [COBISS.SI-ID [3139440](#)]

Razstave

1. GODLER, Marjeta, STAREŠINIČ, Marica. *Space illusions dance : [razstava] : Galéria Umelka, Slovak Union of Visual Arts, 5th - 24th August, 2014, Bratislava, Slovakia.* 2014. [COBISS.SI-ID [3049072](#)]
 2. GODLER, Marjeta, STAREŠINIČ, Marica. *Vesolje - veselje v nas : [samostojna razstava] : 33. festival idrijske čipke, 20. - 22. junij 2014, Idrija = "Space - the joy in us" exhibition : 33. idrija lace festival, 20. - 22. June 2014.* 2014. [COBISS.SI-ID [3023728](#)]
- Članki:
3. AHTIK, Jure (avtor razstave, mentor), KOČEVAR, Tanja Nuša (avtor razstave, mentor), STAREŠINIČ, Marica (avtor razstave, mentor). *Muvit/6x60 in NTF : razstava študentov 2. letnika, Naravoslovnotehniške fakultete, Univerze v Ljubljani : Maraton filmskega ustvarjanja Muvit/6x60, Celje, 16. - 19. avgust 2017.* 2017. [COBISS.SI-ID [3396976](#)]
 4. STAREŠINIČ, Marica, SIMONČIČ, Barbara, BRAČKO, Sabina. Using a digital camera to identify colors in urban environments. *Journal of imaging science and technology*, ISSN 1062-3701, 2011, vol. 55, no. 6, str. 060201/1-060201/4, ilustr., doi: [10.2352/J.ImagingSci.Technol.2011.55.6.060201](#). [COBISS.SI-ID [2684272](#)]
 5. AHTIK, Jure, STAREŠINIČ, Marica. Eye movement analysis of image quality parameters compared to subjective image quality assessment = Analiza pokreta očiju u određivanju parametara kvalitete slike u usporedbi sa subjektivnom procjenom kvalitete slike. *Tehnički vjesnik : znanstveno-stručni časopis tehničkih fakulteta Sveučilišta u Osijeku*, ISSN 1330-3651, 2017, vol. 24, no. 6, str. 1833-1839. http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=280290. [COBISS.SI-ID [3452784](#)]
 6. JAVORŠEK, Dejana, MOČNIK, Janja, STAREŠINIČ, Marica. Analyses of colour appearances on different display devices = Analiza interpretacije barv na različnih prikazovalnih napravah. *Tekstilec : glasilo slovenskih tekstilcev*, ISSN 0351-3386. [Tiskana izd.], 2015, letn. 58, št. 2, str. 100-107, ilustr. [COBISS.SI-ID [3139440](#)]

PODJETNIŠTVO

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Podjetništvo
Course title:	Entrepreneurship
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni
Tekstilno in oblačilno inženirstvo, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068061
Koda učne enote na članici/UL Member course code:	10246

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	0	30	0	0	60	4

Nosilec predmeta/Lecturer:	Blaž Zupan
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Študent oz. kandidat mora imeti predmet opredeljen kot študijsko obveznost.
Pogoj za pristop k pisnemu in/ali ustnemu izpitu predmeta so 70 % prisotnost pri predavanjih, 100 % prisotnost pri vajah in 90 % prisotnost pri seminarjih in drugih oblikah dela. K pisnemu in/ali ustnemu izpitu predmeta lahko pristopijo študentje šele ko imajo pozitivno ocenjene vaje in seminar in izpolnjeno predpisano prisotnost pri vseh sklopih predmeta.

Prerequisites:

The course must be assigned to the student.
The condition for taking the written and/or oral exam of the course is 70% attendance at lectures, 100% attendance at exercises and 90% attendance at seminars and other forms of work. Students can take the written and/or oral exam of the course only after they have received a positive assessment of the exercises and the seminar and have met the required attendance for all sections of the course.

Vsebina:

Študenti bodo v okviru predmeta spoznali: Pomen podjetništva v gospodarstvu in temeljne pojme podjetništva; Prepoznavanje poslovnih priložnosti; Pet korakov razvoja novih izdelkov in storitev – opazovanje, brainstorming, hitro prototipiranje,

Content (Syllabus outline):

Students will learn: - entrepreneurship and its role in socio-economic development; - recognition of business opportunities; - five steps of the product/service development process: observation, brainstorming, rapid prototyping, testing and

izboljšanje prototipov in implementacija rešitve; Dizajnerski način razmišljanja – tehnični, poslovni, človeški vidik; Praktična aplikacija metode razvoja novih izdelkov in dizajnerskega procesa; Osnove računovodstva in financiranja; Poslovno načrtovanje; - pomen in vsebino marketinške/prodajne funkcije v podjetju - metode raziskovanja trga, porabnikov, konkurence - poslovno komunikacijo	refinement and implementation; - design thinking: desirability, feasibility and viability of new solutions; - practical application of new product development methodologies and design thinking; - basics of accounting and financing; - business planning, governmental policies to promote entrepreneurship; - importance and definition of the marketing/ sales at a company; - market, customer and competition research methods; - business communication.
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Temeljna literatura in viri/Readings:

Maurya, Ash (2014): Delaj vitko – Od načrta A do načrta, ki deluje. Pasadena.

Dostopno na: <https://www.leanslovenia.com/delajvitko>

Dodatna neobvezna gradiva (Additional optional readings):

Antončič in ostali (2022): Podjetništvo – glavi dejavnik razvoja. Ekonomska fakulteta.

Dostopno na: <http://www.ef.uni-lj.si/zaloznistvoslike/499/Podjetni%C5%A1tvo.pdf>

Dodatna aktualna gradiva, objavljena na spletni strani predmeta./Additional current materials are published on the course website.

Cilji in kompetence:

Cilj predmeta je študentom razviti sposobnost timskega dela, prevzemanja odgovornosti in samoiniciativnega delovanja pri reševanju človeških, tehničnih in ekonomskih problemov povezanih z razvojem novih produktov in storitev. Študentje z uporabo dizajnerskega pristopa in hitrega prototipiranja izdelajo delujoč prototip rešitve podj. problema; Študentje si pri predmetu pridobijo naslednje specifične kompetence: Prepoznati in oceniti priložnosti; uravnavati tveganje; učinkovito komunicirati; vztrajati; ustvarjalno rešiti problem; učinkovito rabiti vire; delovati gverilsko; ustvarjati vrednost; ohranjati fokus; prilagajati se; biti samoučinkovit; se mrežiti; sprejemati odločitve; sklepati posle in se pogajati.

Objectives and competences:

The objective of the course is to develop skills such as teamwork, responsibility, self-initiative, and the ability to solve any societal, technical or business problem associated with the development of new products and services. Student will use design thinking and rapid prototyping to produce a working prototype as a solution to a given entrepreneurial problem. Student acquires the following specific competencies: Opportunity recognition and assessment; risk management; effective communication; perseverance; innovative thinking, creative problem solving; efficient use of resources; guerrilla skills; creating value; maintaining focus; resilience; self-efficacy; networking; decision making; deal making and negotiation.

Predvideni študijski rezultati:

Znanje in razumevanje: Študent bo spoznal in razumel: Pojme s področja podjetništva in gospodarstva, organizacije dela, vodenja projektov, marketinga; Osnovne zakonitosti kreativnega razvoja novih izdelkov in storitev ter podjetniške dejavnosti s poudarkom na primerih iz prakse kakor tudi iz študentskih življenjskih potreb ter izkušenj; Skozi dizajnerski način razmišljanja in s pomočjo d.school metodologije študent reši konkreten poslovni ali življenjski problem in osvoji znanje, ki ga lahko replicira v profesionalnem in osebnem življenju; Pepoznavanje podjetniških priložnosti, analiza podatkov in informacij za sprejemanje poslovnih odločitev, izdelava prototipov, antropološke in etnografske metode spremljanja potrošnikov, izpeljava rešitve problema. Dokumentacija procesa z

Intended learning outcomes:

Knowledge and comprehension Student will recognise and understand: - concepts in the field of entrepreneurship and the economy as a whole, management, project management, marketing; and - the basic principles of the creative development of new products and services, and entrepreneurial activities, with an emphasis on cases from practical experience, and from the student's needs and life experiences. Through a design thinking methodology, student solves a specific business or social problem, and acquires knowledge that can be replicated in their professional and personal life. Identification of business opportunities, analysis of data and information for business decision-making, prototyping, anthropological and ethnographic methods of customer analysis, and the implementation of a solution to a specific problem.

multimedijskimi metodami, samostojna priprava finančnih in poslovnih analiz	Documentation of the process using multimedia and the independent preparation of financial and business analyses (marketing, sales, etc.).
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Metode poučevanja in učenja:

Predavanja s pomočjo različnih AV sredstev; Delo na konkretnem projektu, aktualnem problemu; Predstavitve sprotne dela, poročilo in komentarji s strani mentorjev in študentov; Uporaba multimedijske tehnologije za spremljanje napredka, Internet, video; Aktivno mentorstvo s strani pedagogov, asistentov, praktikov - podjetnikov; Terensko delo – analiza trga, testiranje prototipov, uporaba rešitve problema, praktične vaje d.school metodologije. Vaje se izvajajo v učilnici ali preko spleta s pomočjo ustrezne programske opreme (ZOOM; Teams, ipd).

Learning and teaching methods:

Lectures using audio-visual technology. Work on a specific project in the form of a real business or social problem. Ongoing work will be presented regularly, with feedback given by mentors and students. The use of multimedia (Internet, video, etc.) to monitor progress. Active mentoring will be provided by teachers, assistants, practitioners-entrepreneurs. Fieldwork: market analysis, prototype testing, application of a solution to a problem, and practical exercises using the design thinking methodology.

Tutorials are conducted in classroom or via ZOOM, Teams, etc.

Načini ocenjevanja:

Delež/Weight

Assessment:

Projektna naloga in vmesna poročila, končna predstavitev	60,00 %	Project work, interim reports and final presentation
Domače naloge, sodelovanje	20,00 %	Homework and active participation
Izpit pisni in/ali ustni	20,00 %	Written and/or oral examination

Ocenjevalna lestvica:

Grading system:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10
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Reference nosilca/Lecturer's references:

1. DEBARILEV, Stojan, JANESKA-ILIEV, Aleksandra, STRIPEIKIS, Osvaldas, ZUPAN, Blaž. What can education bring to entrepreneurship? : formal versus non-formal education. Journal of small business management. 2022, vol. 60, iss. 1, str. 219-252.
2. PUSTOVRH, Aleš, JAKLIČ, Marko, BOLE, Domen, ZUPAN, Blaž. How to create a successful regional startup ecosystem : a policy-making analysis. Lex localis : revija za lokalno samoupravo. [Tiskana izd.]. Jul. 2019, vol. 17, iss. 3, str. 749-770, ilustr.
3. ZUPAN, Blaž, CANKAR, Franc, SETNIKAR-CANKAR, Stanka. The development of an entrepreneurial mindset in primary education. European journal of education. [Print ed.]. Sep. 2018, vol. 53, iss. 3, str. 427-439.
4. ZUPAN, Blaž, STRITAR, Rok, SLAVEC GOMEZEL, Alenka. Unlocking latent creativity with rapid prototyping = Spodbujanje latentne ustvarjalnosti s hitrim prototipiranjem. Traditiones : zbornik Inštituta za slovensko narodopisje, ISSN 0352-0447, 2017, vol. 46, no. 1/2, str. 183-187, doi: 10.3986/Traditio201746020
5. LIKAR, Borut, CANKAR, Franc, ZUPAN, Blaž. Educational model for promoting creativity and innovation in primary schools. Systems research and behavioral science : the official journal of the International Federation for Systems Research, ISSN 1092-7026, Mar./Apr. 2015, vol. 32, iss. 2, str. 205-213, doi: 10.1002/sres.2261.
6. ZUPAN, Blaž, SVETINA NABERGOJ, Anja. Razvoj podjetniških kompetenc s pomočjo dizajnerskega pristopa. Economic and business review, ISSN 1580-046 [Tiskana izd.], 2014, vol. 16, posebna št., str. 49-74, ilustr.

7. CANKAR, Franc, DEUTSCH, Tomi, ZUPAN, Blaž, SETNIKAR-CANKAR, Stanka. Schools and promotion of innovation = Škole i promicanje inovacije. Hrvatski časopis za odgoj i obrazovanje : [CJE], ISSN 1848-5189. [Tiskana izd.], 2013, vol. 15, sp. ed. no. 2, str. 179-211. [COBISS.SI-ID 4164782],
8. VADNJAL, Jaka, ZUPAN, Blaž. Family business as a career opportunity for women. South East European journal of economics and business, ISSN 1840-118X, Nov. 2011, vol. 6, no. 2, str. 27-36, tabele. [COBISS.SI-ID 513010818],
9. VADNJAL, Jaka, ZUPAN, Blaž. The role of women in family businesses. Economic and business review, ISSN 1580-0466. [Tiskana izd.], June 2009, vol. 11, no. 2, str. 159-177, tabele. [COBISS.SI-ID 18637798]

POSLOVNI INFORMACIJSKI SISTEMI

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Poslovni informacijski sistemi
Course title:	Business information systems
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068062
Koda učne enote na članici/UL Member course code:	10247

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
45	45	0	0	0	90	6

Nosilec predmeta/Lecturer:	Raša Urbas, Urška Stanković Elesini
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Pogoj za vključitev v delo je vpis v letnik študija in izbira predmeta ter aktivna udeležba na vseh segmentih predmeta.
Izdelana seminarska naloga z zagovorom ter pozitivno opravljene vaje so pogoj za pristop k končnemu izpitu.
Pogojena prisotnost pri posameznih učnih enotah:

- predavanja: 70 % in
- seminar: 80 %.

Prerequisites:

The prerequisite for inclusion present enrollment in the study year and selection of the subject as well as active participation in all segments of the course.
Finished seminar work with presentation and positively performed tutorials are a condition for the final exam.
Conditional attendance for individual course units:
- lectures: 70% and
- seminar: 80%.

Vsebina:

Vsebina predmeta sloni na študentovem predhodno pridobljenem znanju, tako iz strokovnih predmetov kot tudi iz predmetov, ki podajajo znanje o računalniško podprtih delovnih sistemih. Predavanja pri predmetu vključujejo naslednja področja: - informatizacija in informacijska kultura; - informacijska preobrazba podjetja in nujnost preobrazbe; - mesto in vloga IS v podjetju ter zagotavljanje konkurenčne prednosti podjetja; -

Content (Syllabus outline):

The course is based on the student's previously acquired knowledge, both technical subjects as well as courses that provide knowledge of computerized working systems. Lectures on the subject include the following areas: - computerization of information and culture; - information transformation of the company and its necessity for transformation; - place and role of IS in the company as well as providing competitive advantages; - identification of the basic IS concepts; -

opredelitev osnovnih pojmov IS; - izhodišče sodobnega načrtovanja IS; - strateško načrtovanje IS (tj. ocena trenutnega stanja, pristopi in značilnosti sodobne metodologije uvajanja IS, faze pri graditvi IS, pregled osnovnih aplikativnih področij IS); - organizacijska in upravljalna problematika načrtovanja IS; - varnost in zaščita IS; - opredeljevanje in vrednotenje učinkov IS; - ljudje in IS; etičnost IS; - spoznavanje različnih IS, ki so na voljo na slovenskem tržišču in so primerni za manjša in srednje velika grafična podjetja. Seminarske naloge se izvajajo v sklopu predavanj in vključujejo primere iz analiziranja, uvajanja in nadziranja IS. Seminarske naloge se izdelujejo skupinsko (do max 4 študenti/skupino). Tema seminarskih nalog je povezovanje realnih računalniških aplikacij v grafičnem proizvodnem procesu z izbranim IS.	basics of modern IS planning; - IS strategic planning (e.g. assessment of current situation, approaches, and modern methodology features of introducing IS, phases in building IS, overview of the basic IS application domains); - organizational and management problems of planning IS; - safety and security of IS; - identification and evaluation the effects of the IS; - people and IS; ethnicity IS; - learning about the various IS, which are available on the Slovenian market and are suitable for small and medium-sized graphics companies. Seminar works are carried out within the lectures and include examples from the analysis, implementation and monitoring of IS. Seminar papers are made in groups (up to max 4 students/group). The topic of seminar papers is realistic integration of computer applications in graphic production process with the chosen IS.
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Temeljna literatura in viri/Readings:

Gradišar M., Resinovič G.: *Informatika v organizaciji* (2000)
Kovač T.: *Informatika v poslovanju* (2008)
Pearlson K. E., Saunders C. S.: *Managing and using information systems* (2010)
Gradišar M. *Uvod v informatiko* (2003)
Beynon-Davies P. *Business information systems* (2019)

Dodatna literatura:

McKinney E. Jr., Kroenke D. *Processes, Systems, and Information: An Introduction to MIS* (2018)

Cilji in kompetence:

Cilj predmeta je usposobiti študenta za sodelovanja pri izdelovanju, uvajanju in vzdrževanju delov ali celote informacijskega sistema (v nadaljevanju IS) v grafičnem podjetju. Glede na omenjeno, so predmetno specifične kompetence naslednje: - razumevanje nujnosti preobrazbe podjetij v skladu z razvijajočo se informacijsko kulturo in s tem pridobitve konkurenčne prednosti podjetja; - vzporedno povezovanje temeljnega in strokovnega znanja z uvajanjem IS v podjetje; - sposobnost analiziranja delovnih procesov v proizvodnji (tudi CIM sistemov) in na podlagi tega sposobnost nudenja pomoči pri strateškem uvajanju in organiziranju IS; - prepoznavanje in razreševanje problemov, nastalih pri uvajanju IS; - opredeljevanje in vrednotenje učinkov IS; - upoštevanje in zagovarjanje humanizacije dela pri uvajanju IS s poudarkom na etičnosti IS; - prepoznavanje ustreznega IS za grafično podjetje glede na njeno velikost, vrsto in zahtevnost procesov itd. - vodenje projektnega tima pri uvajanju IS. Cilj rabe IKT opreme in sodobnega pristopa poučevanja je doseganje boljšega razumevanja in znanja vsebine teoretičnega in praktičnega dela predmeta ter hkrati zagotavljanje trajnostnega znanja rabe in pomena IKT tehnologij v učnem procesu in praktični rabi v postopkih uporabe IS. Študent bo s pridobljenim znanjem znal interdisciplinarno povezovati osvojene vsebine z drugimi predmeti.

Objectives and competences:

The aim of this course is to train students for participation in the production, deployment and maintenance of parts or the whole information system (hereinafter IS) in the graphics business. In view of the above, the object-specific competences are following: - understanding the necessity of transformation of enterprises in accordance with the evolving culture of information and thus the acquisition of competitive advantage; - parallel integration of basic and expertise by introducing the IS in the company; - ability to analyze business processes in production (including CIM systems) and on the basis of the ability to provide assistance in strategic deployment and organization of IS; - identifying and solving problems arising from the implementation of the IS; - identifying and evaluating the effects of the IS; - respecting and defending the humanization of work in the implementation of IS with an emphasis on ethics IS; - identification of the appropriate IS graphics company regardless of its size, nature and complexity of the processes, etc. - management of the project team in the implementation of IS. The aim of the use of ICT devices and a modern teaching approach is to achieve a better understanding and knowledge of the contents of the theoretical and practical part of the studies, while ensuring sustainable knowledge of the use and

	importance of ICT technologies in the learning process and practical use in procedures of IS. With the knowledge acquired, the student will be able to combine the acquired content with other subjects in an interdisciplinary manner.
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Predvideni študijski rezultati:

- Študent pozna vrste IS in njih uporabnost glede na vrsto proizvodnje;
- prepozna probleme pri uvajanju IS;
- pozna odgovore in rešitve na omenjene probleme;
- zna analizirati procese in jih usmerjati ter vgraditi v tok IS;
- zna zbrati ustrezne podatke in nudi pomoč pri izgradnji baze podatkov;
- pridobi znanja iz upravljanja z množico podatkov, strojnega učenja in več-dimenzijske vizualizacije podatkov in informacij,
- zna opredeliti in razgraditi stroške, povezane z uvedbo IS;
- razume pomen in vlogo IS v proizvodnem podjetju, razsežnosti IS, probleme, ki nastajajo pri uvajanju IS s stališča komunikacije ali uvajanja ljudi, strategijo in metode uvajanja IS.

Intended learning outcomes:

- Student knows the type of IS and their applicability depending on the type of production;
- identifies the problems in the implementation of the IS;
- knows the answers and solutions to these problems;
- has the ability to analyze processes and to guide and integrate the current IS;
- be able to collect relevant data and assist in building the database;
- acquires skills in data management, machine learning and multidimensional visualisation of data and information,
- knows how to identify and break down costs, linked to the introduction of the IS;
- understands the importance and the role of IS in a manufacturing company, the dimensions of IS, the problems arising from the introduction of the IS from the standpoint of communication or introducing people, the strategy and implementation methods IS.

Metode poučevanja in učenja:

Predmet je sestavljen iz predavanj in seminarja.

- Predavanja (multimedijske prezentacije) nudijo teoretične osnove za seminarje;
- seminarske naloge se izvajajo individualno ter vključujejo delo z ustrezno programsko opremo v računalniški učilnici;
- v okviru predmeta se izvajajo strokovni obiski grafičnih podjetij;
- namen obiskov je spoznavanje različnih vrst delnih ali celovitih IS v grafičnih podjetjih.

Aktivnosti poučevanja in učenja potekajo na fakulteti in/ali prek spleta (online).

Pri predmetu se uporabljajo spletne učilnice in IKT metode poučevanja (multimedijsko gradivo, praktične demonstracije itd.).

Uporabljajo se inovativne metode poučevanja v smislu obogatitve predavanj z relevantnimi vabljenimi predavanji, povezovanjem z industrijo, seminarškim delom na realnih izzivih iz industrije in gospodarstva. Izvedba predavanj, vaj, seminarja in drugih oblik dela poteka v slovenskem jeziku in/ali angleškem.

Learning and teaching methods:

The course consists of lectures and seminars.

- Lectures (multimedia presentation) offer theoretical basis for the seminars;
- seminar work is carried out individually, and includes work with the appropriate software in the computer room;
- the course will be carried out technical visits graphic companies;
- purpose of the visits is to recognize the different types of partial or complete IS in graphic companies.

Teaching and learning activities take place at the faculty and/or online.

The course uses online classrooms and ICT teaching methods (multimedia materials, practical demonstrations, etc.).

Innovative teaching methods are used in terms of enriching lectures with relevant invited lectures, communication with industry, seminar work on real challenges from industry and business.

Lectures, practicum, seminars and other forms of work are held in Slovenian and/or English.

Načini ocenjevanja:

Delež/Weight Assessment:

Praktično znanje, osvojeno pri izdelavi seminarske naloge in teoretično znanje pridobljeno na predavanjih ter iz drugih literaturnih virov se oceni s pomočjo pisnega in/ali ustnega preverjanja, ki se izvede v živo, v predavalnici, ali prek spleta (online) s pomočjo ustreznih programskih rešitev/orodij. Seminarska naloga oz. izdelek je ocenjen na podlagi vsebinske, oblikovne in kontekstualne zasnove ter predstavitve. Skupna ocena seminarske naloge in teoretičnega znanja predavanj se oceni z negativno oceno 5 ali s pozitivnimi ocenami od 6 do 10. Za pozitivno oceno je treba doseči vsaj 55 % ali več.		The practical knowledge acquired with seminars and the theoretical knowledge from the lectures and other literature sources is graded by a written and/or oral examination, which is conducted in the classroom or online using suitable software solutions/tools. The seminar, i.e. the product, is graded according to content, design, context quality as well as presentation. The overall grade of the seminar and the theoretical knowledge of the lectures is graded with a negative grade 5 or with positive grades from 6 to 10. For a positive grade, at least 55 % or more must be achieved.
seminar oz. izdelek	50,00 %	seminar i.e. product
izpit teoretičnega znanja	50,00 %	exam of theoretical knowledge

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- 1.STANKOVIČ ELESINI U., ZAKRAJŠEK Š., CERAR E., MAROLT M., GODEC P., URBAS R. Informatizacija slovenskih tekstilnih, oblačilnih in usnjarskopredelovalnih podjetij. Tekstilec, 2015, let. 58, št. 4, str. 281-300.
- 2.CERAR E., URBAS R., STANKOVIČ ELESINI U. Razvoj informacijske infrastrukture v letih 1960–1991 s primeri iz slovenske tekstilne industrije. Annales Series Historia et Sociologia, 2017, 1.
- 3.STANKOVIČ ELESINI U. Analiza in projektiranje procesov v konfekciji : zapiski predavanj. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, 2005. 128 str.
- 4.URBAS R., STANKOVIČ ELESINI U., CIGULA T., MAHOVIČ POLJAČEK S. Pad printing. V: IZDEBSKA J. (ur.), THOMAS S. (ur.). Printing on polymers: fundamentals and applications. Amsterdam [etc.]: Elsevier, 2016, str. 263-278.
- 5.STANKOVIČ ELESINI U., URBAS R. Microcapsules in printing. V: IZDEBSKA J. (ur.), THOMAS S. (ur.). Printing on polymers: fundamentals and applications. Amsterdam [etc.]: Elsevier, 2016, str. 389-396.
- 6.STANKOVIČ ELESINI U., LESKOVŠEK M., BERNIK S., ŠUMIGA B., URBAS R. Influence of co-current spray drying conditions on agglomeration of melamine-formaldehyde microcapsules. Drying technology, ISSN 0737-3937, [in press] 2016, 36 str., doi: 10.1080/07373937.2015.1131713.

POSLOVNO KOMUNICIRANJE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Poslovno komuniciranje
Course title:	Business communication
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code: 0643470

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	30				60	4

Nosilec predmeta/Lecturer: Andreja Jaklič

Vrsta predmeta/Course type: Izbirni/Elective

Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Ni posebnih pogojev.
Zaželeno osnovno predznanje (predmeti kot npr. Temelji ekonomije, Osnove ekonomike poslovanja).

Prerequisites:

There are no special conditions. Basic prior knowledge is desirable (subjects such as The principles of economics, or Elementary business economics).

Vsebina:

Pomen poslovnega komuniciranja
Poslovno komuniciranje in uspešnost poslovanja
Proces komuniciranja in vpliv tehnologije Prepričljivo komuniciranje
Načini komuniciranja (ustno in pisno komuniciranje, sestanki, komuniciranje v skupini, komuniciranje s sodelavci, učinkovite predstavitve)
Poslovni bonton
Medkulturno komuniciranje
Poslovna pogajanja

Content (Syllabus outline):

The importance of business communication
Business communication and business performance
The process of communication
Persuasive communication
Communication methods
(written communication, meetings, communication in a group, communication with colleagues, effective presentations)
Business etiquette
Intercultural communication
Business negotiations

Temeljna literatura in viri/Readings:

Zbirka gradiv in Odprti viri (Open Education Resources), ki jih posreduje učitelj
MNCwhispering. Zbirka video študijskih primerov (2021) <https://www.mncwhispering.com>

Thill, V. Jonh & Courtland L. Bovee (2023) Excellence in Business Communication, 14th edition. Pearson education. (izbrana poglavja)

Cilji in kompetence:

- Podati temeljna znanja in ugotovitve s področja poslovnih odnosov in komuniciranja,
- Razvijati komunikacijske spretnosti za različne načine komuniciranja (sestanki, predstavitve, pogajanja).
- Razviti spretnosti poslovnega komuniciranja s sodelavci pri reševanju problemov in v različnih težkih situacijah
- Podati razumevanje povezanosti poslovnega komuniciranja z reševanjem poslovnih problemov in uspešnostjo poslovanja.

Objectives and competences:

- Providing basic knowledge and understanding in the field of business relations and communication, - Developing communication skills for different types of communication (meetings, presentations, negotiations).
- Develop business communication skills with colleagues in solving problems and in various difficult situations
- Providing an understanding of the relationship between business communication and solving business problems and business success.

Predvideni študijski rezultati:

- Poznavanje pomena učinkovitega komuniciranja in osnov poslovnega komuniciranja
- Navajati študente na uporabo spoznanj o komuniciranju pri reševanju poslovnih problemov
- razumevanje povezanosti poslovnega komuniciranja in uspešnosti poslovanja

Intended learning outcomes:

- Understanding the role of effective communicator and the basics of business communication skills
- Stimulate students to use the business communication skills when solving business problems
- Understanding the role of business communication for business performance

Metode poučevanja in učenja:

Predavanja, seminarji, študijski primeri, delo v skupini, individualno delo.

Learning and teaching methods:

Lectures, seminars, case studies, group work, individual work.

Načini ocenjevanja:

pisni izpit, Individualne naloge, študijski primeri, skupinski projekt ali drugo

Delež/Weight

Assessment:

written exam, Individual assignments, case studies, group project or other assignments

Ocenjevalna lestvica:

Grading system:

Reference nosilca/Lecturer's references:

DE BEULE, Filip, JAKLIČ, Andreja, et al. Proximity at a distance : the relationship between foreign subsidiary co-location and MNC headquarters board interlock formation. *International business review*. [Print ed.]. Aug. 2022, vol. 31, no. 4, str. 1-13, ilustr. ISSN 0969-5931. DOI: 10.1016/j.ibusrev.2021.101971.

STARE, Metka, JAKLIČ, Andreja. Sources of value creation in service global value chains. *Amfiteatru economic*. Aug. 2020, vol. 22, no. 55, str. 846-866, ilustr. ISSN 1582-9146. DOI: 10.24818/EA/2020/55/846.

JAKLIČ, Andreja, OBLÓJ, Krzysztof, SVETLIČIČ, Marjan, KRONEGGER, Luka. Evolution of Central and Eastern Europe related international business research. *Journal of business research*. [Print ed.]. Jan. 2020, vol. 108, str. 421-434, ilustr. ISSN 0148-2963. DOI: 10.1016/j.jbusres.2019.06.046.

JAKLIČ, Andreja, BURGER, Anže. Complex internationalisation strategies during crises : the case of Slovenian exporters during the Great Recession and Covid-19 pandemic. *Teorija in praksa : revija za družbeno vprašanja*. okt.-dec. 2020, letn. 57, št. 4, str. 1018-1041.

JAKLIČ, Andreja, SVETLIČIČ, Marjan. *Enhanced transition through outward internationalization : outward FDI by Slovenian firms*. Abingdon; New York: Routledge, 2018. Routledge revivals. ISBN 978-1-315-19095-2, ISBN 978-1-138-72720-5. <https://www.taylorfrancis.com/books/9781351750653>.

Raziskovalna delo:

Razvoj zbirke video študijskih primerov MNCwhispering (2021) <https://www.mncwhispering.com>

Periodično anketno raziskovanje med podjetij s tujim kapitalom (2008-2023).

Sodelovanje v CRP »*Strateška razvojno inovacijska partnerstva kot orodje krepite inovacijske sposobnosti slovenskega gospodarstva*«.

PRAKTIČNO USPOSABLJANJE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Praktično usposabljanje
Course title:	Practical training
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	3. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068086
Koda učne enote na članici/UL Member course code:	10309

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
0	0	0	0	0	900	30

Nosilec predmeta/Lecturer:	Habilitiran učitelj
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Vrsta predmeta/Course type:	Obvezni/Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik študija.	Enrolment into study year.

Vsebina:

Izvajanje v gospodarskih družbah s področja grafične, medijske, papirno predelovalne, založniške, oblikovalske in oglaševalske dejavnosti.

- konkretna vsebina se prilagodi proizvodnemu procesu gospodarske družbe
- usposabljanje diplomantov za samostojno vodenje proizvodnih procesov in predvsem za načrtovanje novih izdelkov ter storitev

Osnovno vsebino programa sestavljajo 3 segmenti:

Segment 1: Informativno spoznavanje delovanja gospodarske družbe vključuje seznanitev z: organizacijo družbe, tokom informacij, organizacijo proizvodnega procesa, načinom zbiranja in obdelave podatkov, povezanostjo med oddelki in službami, organizacijo zagotavljanja kakovosti in podobno.

Segment 2: Delno aktivno spoznavanje delovanja proizvodnega procesa ob sprejemanju manjših delovnih zadolžitvev na relaciji: razvoj - planiranje in

Content (Syllabus outline):

Implementation in companies in the field of graphic, media, paper-processing, publishing, design and advertising activities.

- the concrete programme of the practical training is based on the working proces of the companies
- it should train the graduates students for independent control of production processes, planning new products and services

The basic programme of the practical training is divided into 3 parts:

Part 1: Get the basic information and knowledge about the companies: society organization of the company, the flow of the information, organization of the manufacturing process, method of collecting and processing data, relationship between departments and services, organization of quality assurance etc.

načrtovanje proizvodnje - proizvodni proces – obvladovanje kakovosti. Segment 3: Aktivno vključevanje v delovni proces: razvoj, planiranje in načrtovanje izdelkov in proizvodnih procesov ter storitev, vodenje zaključenih proizvodnih procesov, obvladovanje kakovosti. Stopnja aktivnega vključevanja je odvisna od velikosti in vrste proizvodnega programa družbe in je rezultat sodelovanja med organizatorjem in mentorjem praktičnega usposabljanja na šoli in mentorjem, ki je v gospodarski družbi zadolžen za izvajanje praktičnega usposabljanja.	Part 2: Get to know the working process and be partially active in the production process, performing smaller working tasks in the field of: development - production planning - production process - quality control. Part 3: The student should get the active participation in the working process. This is the most important stage, and a student should be actively involved in one of the following fields: development, planning and product planning and production processes and services, leadership of the completed production, quality management. The activation rate of the student's integration is dependent on the size and the nature of the production of the company and is the result of the cooperation between the coordinator and the mentor of the practical training at school and mentor from the company.
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Temeljna literatura in viri/Readings:

Glede na izbrano temo praktičnega usposabljanja se nahaja v obliki monografij, člankov, prispevkov v zbornikih konferenc, posvetovanj in seminarjev, raziskovalnih nalog (seminarske, diplomske, magistrske, doktorske), standardov, zakonov, kot tudi komercialnih predstavitev dejavnosti podjetij itd. Lahko je internega značaja in predstavlja dokumentacijo v podjetjih ali ustanovah ali/in pa je dostopna preko knjižnic Oddelka za tekstilstvo, NTF, in ostalih knjižnic ter spleta. / Depending on the chosen topic of practical training the literature sources exists in the form of monographs, articles, papers in conference proceedings, consultations and seminars, research papers (seminar , bachelor, master , doctoral), standards, laws , as well as the commercial presentation of the activities of businesses etc. It can be internal and represents the documentation of enterprises or institutions and/or can be accessible through libraries of the Department of Textiles , NTF , and other libraries and online.

Cilji in kompetence:

Cilji:

Osnovni cilj praktičnega usposabljanja je omogočiti študentom preverjanje posredovanih teoretičnih znanj v okolju v katerem bodo delovali po zaključenim izobraževanju in jih nadgraditi z znanji, ki so značilni za proizvodno delovno okolje in jih ni mogoče pridobiti pri teoretičnem delu v šoli. Praksa poteka v povezavi študent, mentor v podjetju in mentor na šoli.

Predmetno specifične kompetence:

Študenti naj bi se pri praktičnem usposabljanju seznanili s funkcijami načrtovanja in izvajanja poslovne politike gospodarske družbe, vodenja, planiranja proizvodnje, načrtovanja novih izdelkov, strojno opremo, tehnološkimi postopki in zagotavljanjem kakovosti. Načrtovano je, da bi se študent pri praktičnem usposabljanju čimbolj aktivno vključeval v izvajanje primernih delovnih nalog.

Objectives and competences:

Objectives:

The basic aim of practical training is to enable students to verify the given theoretical knowledge in the environment in which they operate after completion of education and upgrade them with the skills that are characteristic for the production working environment and can not be obtained in the theoretical studies at school. The practice takes place in conjunction with student, company mentor and school mentor.

Subject-specific competencies :

Students should be acquainted with the functions of planning and implementation of the business policy of the company, management, production planning, design of new products, hardware, technological processes and quality assurance. It is planned that the student should be actively involved in the implementation of appropriate working tasks.

Predvideni študijski rezultati:

Znanje in razumevanje:

Poznavanje funkcije načrtovanja in izvajanja poslovne politike gospodarske družbe, poznavanje vodenja proizvodnje, poznavanje planiranja proizvodnje,

Intended learning outcomes:

Knowledge and understanding:

Knowing the functions of planning and implementation of the business policy, knowledge of production management, knowledge of production

poznavanje načrtovanja novih izdelkov/storitev, poznavanje strojne opreme, poznavanje tehnoloških postopkov, poznavanje obdelave in prenosa podatkov, poznavanje zagotavljanje kakovosti, poznavanje logistike, poznavanje ekonomike in poslovanja. Študent razume kako teoretična spoznanja prenesti, preveriti in nadgraditi na praktičnih primerih, pri čemer v celoti razume delovanje procesov, ki se odvijajo v gospodarski družbi.	planning, knowledge of the planning of new products / services, knowledge of hardware, knowledge of technological processes, knowledge of processing and transmission of data, knowledge of quality assurance, knowledge of logistics, knowledge of economics and business. The student understands the implementation and can transfer, check and upgrade of the theoretical knowledge practical situations, while fully understands the operation of the processes, taking place in the company.
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Metode poučevanja in učenja:

Delovna praksa. Možno je tudi delo na terenu in projektno delo v okviru delovne prakse.

Learning and teaching methods:

Practical training. Also possible as work at fieldwork and project work within practical training.

Načini ocenjevanja:

Metoda ocenjevanja: seminarska naloga.
Ocenjevalna lestvica: opravljen / ni opravljen.

Delež/Weight

100,00 %

Assessment:

The method of assessment : seminar.
Grading scale : passed / not passed .

Ocenjevalna lestvica:
Grading system:
Reference nosilca/Lecturer's references:

- ADOMAVIČIUTE, Erika, MILAŠIUS, Rimvydas, ŽEMAITAITIS, Algirdas, BENDORAITIENE, Joana, LESKOVŠEK, Mirjam, DEMŠAR, Andrej. Methods of forming nanofibres from bicomponent PVA/cationic starch solution. *Fibres & textiles in Eastern Europe*, ISSN 1230-3666, 2009, vol. 17, no. 3 (74), str. 29-33, ilustr. [COBISS.SI-ID [2247792](#)]
- GREGOR-SVETEC, Diana, TIŠLER KORLJAN, Barbara, LESKOVŠEK, Mirjam, SLUGA, Franci. Monofilaments produced by blending virgin with recycled polypropylene = Ham ve geri dönüşüm polipropilen polimerlerinin karışımından elde edilen monofilamentler. *Tekstil ve konfeksiyon dergisi*, ISSN 1300-3356, 2009, vol. 19, no. 3, str. 181-188. [COBISS.SI-ID [2250096](#)]
- LESKOVŠEK, Mirjam, JEDRINOVIĆ, Gordana, STANKOVIĆ ELESINI, Urška. Properties of polypropylene fibres with incorporated microcapsules. *Acta chimica slovenica*, ISSN 1318-0207. [Tiskana izd.], december 2004, letn. 51, št. 4, str. 699-715, graf. prikazi. <http://acta.chem-soc.si/51/51-4-699.pdf>. [COBISS.SI-ID [26426373](#)]
- STANKOVIĆ ELESINI, Urška, JEDRINOVIĆ, Gordana, LESKOVŠEK, Mirjam. Razdioba i oštećenja mikrokapsula ugrađenih u polipropilenska vlakna = Distribution and damages of microcapsules incorporated into polypropylene fibres = Verteilung und Beschädigung von in Polypropylen fasern eingearbeiteten Mikrokapseln. *Tekstil*, ISSN 0492-5882. [Print ed.], 2004, vol. 53, no. 6, str. 285-291. [COBISS.SI-ID [1405296](#)]

STANDARDIZACIJA GRAFIČNIH PROCESOV

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Standardizacija grafičnih procesov
Course title:	Standardisation of graphic processes
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068082
Koda učne enote na članici/UL Member course code:	10258

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Deja Muck, Klemen Možina
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v program. Pogoj za opravljanje obveznosti je prisotnost na predavanjih, seminarjih in vajah. Zahtevana prisotnost na vajah je 100 %.	Enrolment in the program. Attendance at lectures, seminars and tutorials is a condition for fulfilling obligations. Required attendance at tutorials is 100%.

Vsebina:	Content (Syllabus outline):
Pregled razvoja standardizacije grafičnega procesa. Spoznavanje postopkov priprave, sprejemanja in uveljavljanja standardov. Pregled vrste standardov in specifikacij, vključno z zelenimi tehnologijami prihodnosti in smernicami trajnostnega razvoja. Spoznavanje osnov barvnega upravljanja v grafičnem delokrogu. Izdelava in uporaba profilov vhodnih, vhodno/izhodnih in izhodnih naprav. Ovrednotenje kakovosti profilov (avtomatizirano branje standardnih barvnih kart). Standardni pogoji za delo z zaslonom (grafična priprava, splet). Standardni pogoji za primerjave odtisov s poskusnimi odtisi. Standardni pogoji za merjenje barv v tisku s pomočjo profesionalne spektrofotometralne metode.	Review of the standardization development in the field of graphic process. Understanding of the preparation, adoption and implementation of standards. Review of standards and specifications, including green technologies of the future and guidelines for sustainable development. Getting to know the basics of colour management in the graphic workflow. Creating and using profiles of input, input / output and output devices. Evaluation of profiles quality (automated reading of standard colour charts). Standard conditions for work with display (prepress, web). Standard conditions for the comparison of prints with proof-prints. Standard conditions for colour measurement in the press using professional spectrophotometric method.

Temeljna literatura in viri/Readings:

JAVORŠEK D., KARLOVIČ I., MUCK T.: Reproduciranje barv in barvno upravljanje, UL, NTF, 2013.
 KIPPAN, H.: Handbook of Print Media, Springer-Verlag, Berlin, Heidelberg, NewYork, 2001
 GIORGIANNI, E., MADDEN, T.: Digital Color Management, Encoding Solutions. Addison-Wesley, 1998
 MUCK, Tadeja, JAVORŠEK, Dejana, JAVORŠEK, Andrej. Priročnik za barvno upravljanje. 1. izd. Ljubljana: Oddelek za tekstilstvo, Naravoslovnotehniška fakulteta, 2010. 58 str.
 ADAMS, R. M., REINERTSON, R. N. The GATF Guide to Digital Color Reproduction in Newspapers. GATF Press, 1999.
 BRÜES, S., MAY, L., FUCHS, D. Postscriptum on color management. GretagMacbeth, 1999.
 FIELD, G. G. Color and its reproduction. 1999.

Cilji in kompetence:

Spoznavanje pomena standardizacije v sodobnem grafičnem procesu. Spoznavanje priporočil, specifikacij in standardov v grafičnem komuniciranju in zelenemu gospodarstvu. Spoznavanje in razumevanje postopkov priprave, sprejemanja in uvajanja standardov. Spoznavanje pomena barvnega upravljanja.

Objectives and competences:

Recognizing the importance of standardization in the modern graphic process. Recognizing the recommended specifications and standards in graphic communication and green economy. Knowledge and understanding of the methods for standards preparation, adoption and their deployment. Recognizing the importance of color management.

Predvideni študijski rezultati:

Znanje in razumevanje: Študentje bodo spoznali najnoveše standarde v celotnem delokrogu grafičnega procesa, vplivu grafičnih postopkov na okolje, vpeljava zelenih tehnologij in ozaveščenosti o digitalnih smeteh. Osvojili bodo pomembna znanja s področja barvnega upravljanja. Osvojena tako teoretična kot praktična znanja jim bodo omogočila suvereno delo na različnih področjih grafičnih in medijskih tehnologij.

Intended learning outcomes:

Knowledge and understanding: Students will know the latest standards throughout graphic workflow., impact of graphic processes on the environment, introduction into the green technologies and awareness of digital waste. Students will gain important knowledge in the field of colour management. With the theoretical and practical knowledge. Students will confidently work in different fields of graphics and media technologies.

Metode poučevanja in učenja:

Predavanja, seminarji in vaje potekajo v predavalnici, v računalniški učilnici in /ali preko spleta s pomočjo ustrezne opreme.

Learning and teaching methods:

Lectures, seminars and tutorials take place in lecture and computer room and / or online with an appropriate hardware.

Načini ocenjevanja:**Delež/Weight****Assessment:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt).		Type (examination, oral, coursework, project).
izpit	50,00 %	exame
seminar	20,00 %	seminar
vaje	30,00 %	tutorials

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

SARJANOVIĆ, A., MOŽINA, K., GREGOR-SVETEC, D. Print quality of coated paper from invasive alien plant Goldenrod. *Coatings*. 2023, vol. 13, iss. 10, str. 1–11, ilustr. ISSN 2079-6412, [COBISS.SI-ID [167947267](#)].

BRESKVAR, K., AHTIK, J., MOŽINA, K. Cracking phenomena of coatings on label papers. *Cellulose chemistry and technology*. 2021, vol. 55, no. 3–4, str. 289–297, [COBISS.SI-ID [59536643](#)].

MOŽINA, K., RUTAR, V. Modifikacija GCC za kakovostnejši izpis kapljičnega tiskalnika = GCC modification for better performance of ink-jet prints. *Papir: revija Društva inženirjev in tehnikov papirništva*. [Tiskana izd.]. nov. 2012, letn. 41 [i. e. 40], št. 8, str. 34–37, [COBISS.SI-ID [2798704](#)].

JAVORŠEK, D., KARLOVIĆ, I., MUCK, T. *Reproduciranje barv in barvno upravljanje*. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, 2013. 275 str., ilustr.

MUCK, T., JAVORŠEK, D., JAVORŠEK, A. *Priročnik za barvno upravljanje*. 1. izd. Ljubljana: Oddelek za tekstilstvo, Naravoslovnotehniška fakulteta, 2010. 58 str., ilustr.

KÖNIG, S., GREGOR-SVETEC, D., HLADNIK, A., MUCK, T. Assessing the lightfastness of prints by image chrominance histogram quantification. *Journal of imaging science and technology*, ISSN 1062-3701, Nov./Dec. 2012, vol. 56, no. 6, str. 060507/1-060507/7, ilustr.

STATISTIKA

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Statistika
Course title:	Statistics
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068083
Koda učne enote na članici/UL Member course code:	10259

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	0	30	0	0	60	4

Nosilec predmeta/Lecturer:	Stanislav Praček
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Pristop k predmetu:
vpis v letnik študija in izbira predmeta.
Pristop k izpitu:
K izpitu lahko pristopijo študenti/ke, ki imajo opravljene vaje ter izpolnjeno predpisano prisotnost pri predmetu.
Prisotnost:
Pri predmetu se zahteva naslednja prisotnost:
predavanja 80 %, vaje 90 %.

Prerequisites:

Course:
Student has applied in the year and elected the course.
Exam/Assesment:
Students who have completed the practical course and who have met the attendance requirements of the course can take the exam.
Presence:
Parts of the subject require the presence of: Lectures 80%, Practical Course 90%.

Vsebina:

/I.1 Uvod, osnovni pojmi I.2 Statistične funkcije (povprečje, mediana, modus,...) I.3 Statistične funkcije za vzorčenje (varianca, kovarianca, standardni odklon,...) II. Obdelava podatkov II.1 Uvod v obdelavo podatkov II.2 Tabeliranje in urejanje podatkov II.3 Statistična obdelava podatkov III. Teoretične porazdelitve III.1 Normalna porazdelitev III.2 Binomska porazdelitev III.3 Poissonova

Content (Syllabus outline):

I.1 Introduction, basic concepts I.2 statistical features (mean, median, mode, ...) I.3 Statistical Functions sampling (variance, covariance, standard deviation, ...) II. Data processing II.1 Introduction II.2 tabulation of data processing and data management II.3 Statistical data processing III. Theoretical distributions III.1 Normal distribution III.2 Binomial distribution III.3 Poisson distribution III. IV.

porazdelitev IV. Vzorčenje IV.1 Statistično zaupanje IV.2 Statistične količine (korelacija, korelacijski koeficient,...)	Sampling IV.1 statistical confidence IV.2 statistical quantities (correlation coefficient of correlation, ...)
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Temeljna literatura in viri/Readings:

/-Graf, U., Henning, H.J., Wilrich P.T.: Statistische Methoden, Heidelberg, Springer Verlag 1974. -Freund, R.J., Wilson, W.J.: Statistical Methods, Academic Press, 1996. -Sachs, L.: Angewandte Statistik, Anwendung statistischer Methoden, (7.izd.) Berlin, Springer Verlag 1999. -Weiss, N.A.: Elementary statistics (4. izd.) Addison Wesley Longman, 1999. - Linearna regresija > http://sl.wikipedia.org/wiki/Linearna_regresija. - Praček S.: Vaje iz statistike z rešitvami za VS program [Elektronski vir], študijsko gradivo, 2011 - Praček Stanislav, Statistika NTF-Oddelek za Tekstilstvo, Učbenik, 2015.

Cilji in kompetence:

/Cilj in namen predmeta je naučiti študente osnove statistike. Predmetno specifične kompetence:
 –Študent pozna in zna uporabljati metode zbiranja, urejevanja, prikazovanja ter vrednotenja rezultatov meritev na objektivni in deduktiven način. –Pozna strokovno izrazoslovje statistike in statistične računske metode vrednotenja ene, dveh ali več temeljnih skupnosti. Prav tako pozna osnovne teoretičnih modelnih porazdelitev, ki predstavljajo splošno temeljno znanje za deduktivno statistično analizo. –Predmet navaja študente na kritično presojo rezultatov s preverjanjem veljavnosti ničelne in alternativne hipoteze ter omogoča sprejemanje razumnih odločitev v praksi na osnovi deduktivne statistične analize in s tem reševanja tehnoloških problemov ali sposobnosti ohranjanja in skrbi za kakovost izdelkov.

Objectives and competences:

The aim and purpose of the course is to teach students the fundamentals of statistics. Subject-specific competencies: - The student knows and is able to use the methods of collecting, editing, presenting and evaluating the results of measurements in an objective and deductive manner. - The student knows the terminology and statistical calculation method of valuation of one, two or more population. It is also aware of the underlying theoretical model distribution representing the general basic knowledge of deductive statistical analysis. - The subject stating students to critically assess the different results of the verification of the null and alternative hypotheses, and allows for make sound decisions in practice based on deductive statistical analysis, and thereby solving technological problems or the keeping and care for the quality of the products.

Predvideni študijski rezultati:

/Znanje in razumevanje: Osnovno znanje in razumevanje statistike in statistične deduktivne analize. Poznavanje različnih metod statističnega vrednotenja meritev ene, dveh ali več temeljnih skupnosti. Sposobnost matematično rešiti naloge razlik dveh srednjih vrednosti, izračunati linearne korelacije dveh ali večih spremenljivk. Pridobljeno znanje, elementarne matematične metode in vrednotenje rezultatov omogočajo sklepno analizo in nedvoumen odgovor na zastavljena vprašanja o veljavnosti ničelne (H0) ali alternativne hipoteze (H1).

Intended learning outcomes:

Knowledge and understanding: Basic knowledge and understanding of statistics and statistical deductive analysis. Knowing the different methods of statistical evaluation of measurements of one, two or more population. Ability to solve mathematical exams, the difference of two averages to calculate the linear correlation of two or more variables. The acquired knowledge, elementary mathematical methods and evaluation of results allows for concluding analysis and unequivocal answer to the questions about the validity of the null (H0) and alternative hypothesis (H1)

Metode poučevanja in učenja:

Predavanja so neposredno povezana z vajami, pri katerih študentje praktično spoznajo in razumejo temeljne osnove statistične teorije in matematično-statistične metode. Vaje obsegajo reševanje računskih nalog z neposrednimi problemi povezanimi s grafično stroko ter od vsakega udeleženca zahtevajo aktivno in neposredno reševanje nalog pred avditorijem ostalih udeležencev. Dodatno pojasnjevanje nekaterih vsebin

Learning and teaching methods:

Lectures are directly related to the exercises in which the students learn practical and understand about basic fundamentals of statistical theory and mathematical-statistical methods. Exercises comprise a solving problems with direct problems associated with the graphic profession and from each participant require an active and direct solving exams in front of the auditorium of the other participants. Additional clarifying of certain content of the course

predmeta je na željo posameznih študentov v času govorilnih ur. Sklopi predmeta se izvajajo v računalniških in drugih fakultetnih učilnicah/predavalnicah in/ali preko spleta (online) s pomočjo primerne in ustrezne programske opreme za delo.	is at the request of individual students during consultation hours. Course assemblies are conducted in computer and other faculty classrooms/lecture rooms and/or online with the help of suitable and appropriate software that enables work.
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Načini ocenjevanja:	Delež/Weight	Assessment:
Pisni izpit	100,00 %	Written examination

Ocenjevalna lestvica:	Grading system:
5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

PRAČEK, Stanislav. Statistika. V Ljubljani: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, 2015. 1 optični disk (CD-ROM). ISBN 978-961-6900-14-0. PRAČEK, Stanislav. Vaje iz statistike z rešitvami : Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, 2011. 1 el. optični disk (CD-ROM). MOŽINA, Klemen, PRAČEK, Stanislav, BUKOŠEK, Vili. Linear behaviour of one-side coated paper: anisotropy. Cellul. Chem. Technol., 2013, vol. 47, no. 5/6, str. 461-468, ilustr. . PRAČEK, Stanislav. Theory of string.. International journal of nonlinear sciences and numerical simulation, 2007, let. 8, št. 3, str. 451-460. PRAČEK, Stanislav, PUŠNIK, Nace. Fictitious forces.TRJ, ISSN 0040-5175, 2016, vol. , no. , 10 str., ilustr. <http://trj.sagepub.com> PRAČEK, Stanislav, PUŠNIK, Nace, FRANKEN, Gregor, SIMONČIČ, Barbara. Balloon theory.TRJ, ISSN 0040-5175, 2016, vol. 86, no. 14, str. 1522-1532

STROKOVNA ANGLEŠČINA

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Strokovna angleščina
Course title:	English for specific purposes
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	1. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068072
Koda učne enote na članici/UL Member course code:	10260

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
0	60	0	0	0	60	4

Nosilec predmeta/Lecturer:	Barbara Luštek Preskar, prof. angl. in nem.
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik. Pogoj za pristop k izpitu: 90 % prisotnost na srečanjih.	Enrolment into study year. Requirement to sit the exam: 90% presence at seminar

Vsebina:	Content (Syllabus outline):
- Branje in strategije branja, uvajanje v diskurz strokovnih in tehničnih besedil s področja grafike (tiskanje, barve, fotografija, tipografija, embalaža, trajnostnost itd.), - določanje ključnih besed, pisanje povzetkov, - uporaba slovarjev, glosarjev in drugih informacijskih virov, - pisanje sestavkov in poročil, - opisovanje grafov, - poslovna komunikacija (pisanje pisem, prošenj, življenjepisa, javno nastopanje), - sodelovanje v razpravah.	- Reading and reading strategies, introduction into discussing technical and professional texts from the field of graphic arts (printing, colour, photography, typography, packaging, sustainability etc.), - defining and understanding keywords, writing abstracts, - using dictionaries, glossaries and other information sources, - writing reports, - describing graphs, - business communication (business correspondence, writing letters of application and CVs, giving public presentations), - taking active part in discussions.

Temeljna literatura in viri/Readings:

- Luštek Preskar, B. (2020) *English for Specific Purposes – Graphic Arts*. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, grafiko in oblikovanje.
- Didaktizirani material, ki ga pripravi predavatelj sam.
- Materiali dostopni na spletnih straneh na temo stroke.
- Spletni slovarji in glosarji, splošni ter terminološki.

Literatura je dosegljiva v knjižnici Oddelka za tekstilstvo, grafiko in oblikovanje, NTF.

Literature is available in the library at the Faculty of Natural Sciences and Engineering, Department of Textiles, Graphic Arts and Design.

Cilji in kompetence:

Dograjevanje splošnega znanja angleščine na višjo stopnjo z uvajanjem strokovnih tekstov.

Predmetno specifične kompetence:

- izpopolnjevanje kompetenc v ustnem in pisnem izražanju,
- širjenje besednega zaklada in gradnja strokovnega besedišča,
- ozaveščanje o aktualnih perečih temah s področja stroke (trajnostnost, recikliranje itd.),
- razvijanje bralnih spretnosti.

Objectives and competences:

Upgrading general knowledge of English to a higher level by introducing technical and professional texts.

Course-specific competences:

- meeting competences in oral and written communication,
- enriching the existing vocabulary and building technical vocabulary,
- raising awareness of current hot topics from the field of graphic arts (sustainability, recycling etc.),
- getting familiar with reading strategies to improve reading skills.

Predvideni študijski rezultati:

Znanje in razumevanje:

- seznanitev s osnovnim strokovnim besediščem z določenih področij grafike,
- poglobljeno znanje posameznih slovničnih struktur,
- povzemanje/parafraziranje,
- pisanje povzetkov, sestavkov in projektnih poročil,
- pisne in ustne komunikacijske spretnosti,
- predstavitve v angleščini,
- poslovna komunikacija.

Intended learning outcomes:

Knowledge and understanding:

- acquiring basic terminology from certain fields of graphic arts,
- in-depth knowledge of specific grammatical structures,
- summarising/paraphrasing,
- writing abstracts, paragraphs and project reports,
- oral and written communication skills,
- giving presentations in English,
- business communication.

Metode poučevanja in učenja:

- Predavanje,
- vaje,
- samostojno delo,
- delo v parih/skupinah.

Uporaba spletne učilnice in IKT metod poučevanja. Medpredmetno povezovanje z drugim predmetom pri izdelavi seminarske naloge in predstavitvi le-te. Delo poteka na fakulteti ali preko spletne platforme.

Learning and teaching methods:

- Lectures,
- practical work,
- individual work,
- work in pairs/groups.

Using online classroom and ICT teaching methods. Cross-curricular cooperation with another course at preparation and presentation of the seminar paper. Work takes place live or online via an online platform.

Načini ocenjevanja:**Delež/Weight****Assessment:**

Način (pisni izpit, ustno preverjanje, zadolžitve): Končna ocena je sestavljena iz:		Type (written and oral examination, assignments): The final grade consist of:
zadolžitev tekom semestra (50 %)	50,00 %	various assignments during the semester (50%)
ter izpita (50 %).	50,00 %	and the exam (50%).

Ocenjevalna lestvica: 6–10 pozitivno, 5 negativno.		Grading scale: 6–10 pass, 5 fail.
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Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- LUŠTEK PRESKAR, Barbara. English for specific purposes. [Graphic arts]. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, grafiko in oblikovanje, 2020. 160 str., ilustr. ISBN 978-961-6900-27-0. [COBISS.SI-ID 28249603]
- LUŠTEK PRESKAR, Barbara. English for specific purposes. Textile engineering. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, 2011. 128 str., ilustr. ISBN 978-961-6045-95-7. [COBISS.SI-ID 257973760]
- LUŠTEK PRESKAR, Barbara, VRBINC, Marjeta. Patient information leaflet as genre in English and Slovenian : contrastive analysis. V: CIGAN, Vesna (ur.), KRAKIĆ, Ana-Marija (ur.), OMRČEN, Darija (ur.). Od teorije do prakse u jeziku struke : zbornik radova = From theory to practice in language for specific purposes : conference proceedings = Von der Theorie zur Praxis in der Fachsprache : Sammelband. Zagreb: Udruga nastavnika jezika na visokošolskim ustanovama: = Association of LSP Teachers at Higher Education Institutions. 2019, str. 144-157, ilustr. Od teorije do prakse u jeziku struke (Zbornik radova). ISSN 1849-9279. [COBISS.SI-ID 17231107]
- STANKOVIĆ ELESINI, Urška, QUALIZZA, Nataša Pavla, HRKAČ, Tanja, ABSEC, Andreja, LUŠTEK PRESKAR, Barbara, JEDRINOVIĆ, Sanja, URBAS, Raša. Analiza uporabnosti in namembnosti večpredmetnega zvezka pri pouku v prvem razredu osnovne šole. Sodobna pedagogika. okt. 2021, letn. 72(138), št. 3, str. 46-64, ilustr. ISSN 0038-0474. https://www.sodobna-pedagogika.net/clanki/03-2021_analiza-uporabnosti-in-namembnosti-vecpredmetnega-zvezka-pri-pouku-v-prvem-razredu-osnovne-sole/. [COBISS.SI-ID 83967747]
- STANKOVIĆ ELESINI, Urška, LUŠTEK PRESKAR, Barbara. Posodobitev visokošolskega predmeta Inovacijski management = Higher education course Innovation management update. V: LIPOVEC, Alenka (ur.). Vloga predmetnih didaktik za kompetence prihodnosti : zbornik povzetkov. 1. izd. Maribor: Univerzitetna založba Univerze, 2019. Str. 283-284. ISBN 978-961-286-298-5. <http://press.um.si/index.php/ump/catalog/view/433/436/706-2>. [COBISS.SI-ID 3654000]

STUDIJSKA FOTOGRAFIJA

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Studijska fotografija
Course title:	Studio Photography
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0148202
Koda učne enote na članici/UL Member course code:	10980

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
15	15	30	0	0	60	4

Nosilec predmeta/Lecturer:	Jure Ahtik
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Pogoj za vključitev v delo je vpis v letnik študija. Pogoj za oddajo izpitne naloge je 70 % prisotnost pri seminarju ter 100 % prisotnost pri vajah.	Enrolment in the study year. The condition for submitting the exam paper is 70% attendance at the seminar and 100% attendance at the tutorials.

Vsebina:	Content (Syllabus outline):
Digitalni fotoaparati, profesionalni objektiv, njihova oprema in uporaba, skenerji, tiskalniki, tehnični parametri in načini uporabe. Računalniška uporaba fotografij z ustrezno programsko opremo, načini uporabe v tehničnem in likovnem smislu. Osnovne razlike med digitalno in klasično fotografijo, upravljanje barv, uglaševanje ekrana in tiskalnika, osnovna pravila fotografiranja, slog in stil v fotografiji, oblikovanje in oprema fotografij in fotografskih razstav. Medsebojno kombiniranje in dopolnjevanje fotografije in tipografije, kolažna fotografija, razrezi in preliv ozadja. Uporaba fotografije pri vizualnih komunikacijah, estetika in likovna analiza oblikovalskih in fotografskih del, dokazovanje kvalitete in slabosti. Naravni in	Digital cameras, professional lenses, equipment and the use of scanners, printers, technical parameters and modes of operation. Computer use of photos with adequate software applications in technical and artistic terms. Basic differences between digital and conventional photography, colour management, tuning screens and printers, basic rules of photography, style in photography, design of photographic exhibitions. Mutual combining and complementing photography and typography, photo collage, and background. Using photography in visual arts artistic analysis of design and photographic works, demonstrating the qualities and weaknesses. Natural and cultural patterns, their influence on photography, various themes in photography.

civilizacijski vzorci, njihov vpliv na fotografijo, različne tematike v fotografiji. Vaje: študijska fotografija in računalniška obdelava fotografij, (spoznavanje tehničnih parametrov, pristopov k delu, estetskih in izraznih zahtev in rešitev). Vodne individualne naloge: Računalniška korekcija, oblikovanje in preoblikovanje fotografije glede na kompozicijske, splošno estetske in specifično izrazne zahteve, vključevanje kreativnih načinov osvetljevanja. Poseben poudarek je na trajnostnih in okolju prijaznih pristopih in tehnologijah.	Tutorial: studio photography and computer postproduction of photos (learn technical parameters, approaches to work, aesthetic and expressive requirements and solutions). Individual assignments: computer correction, transforming photos according to the compositional and other requirements, including creative lightning. Special emphasis is placed on sustainable and environmentally friendly approaches and technologies.
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Temeljna literatura in viri/Readings:

1. INTIHAR, M., E-fotografija (prenovljena in razširjena □ izdaja), Ljubljana: Samozaložba, 2003. □
 2. ANG, T., Digitalna fotografija, Ljubljana: Tehniška založba, □ 2000. □
 3. SLAVEC, D., Fotografija, Ljubljana: Much, 2000.
 4. HEDGECOE, J., The new manual of photography, 2003.
 5. LONG, B., Complete Digital Photography, Massachusetts, □ 2001.
- Literatura je dosegljiva v knjižnici Oddelka za tekstilstvo, grafiko in oblikovanje.

Cilji in kompetence:

Uporaba digitalne fotografije kot sodobnega, hitrega, učinkovitega in fleksibilnega medija pri prenosu in uporabi vizualnih podatkov v sporočilno in estetsko funkcijo. Predmetno specifične kompetence: – kompleksno znanje s področja digitalne fotografije in računalniške obdelave slike z ustrezno programsko opremo in načini uporabe v tehničnem in likovnem smislu, – sposobnost uporabe profesionalne fotografske in računalniške opreme, – znanje s področja medsebojne splošne uporabe fotografije in tipografije, – znanja s področja slogov in stilov v fotografiji, – znanja s področja oblikovanja, opreme fotografij in priprave fotografskih razstav, – sposobnost študijskega osvetljevanja, – sposobnost za individualno in projektno delo na področju fotografije (izdelava seminarske naloge in fotografskih izdelkov). – sposobnost izbora ustrezne fotografske opreme s posebnim poudarkom na trajnosti, – razumevanje okoljskega vpliva različnih fotografskih procesov.

Objectives and competences:

The use of digital photography as a modern, developing, efficient and flexible medium for the transfer and use of visual data messages and aesthetic functions. Subject-specific competencies: - complex knowledge of digital photography and computer image processing with appropriate software and applications in the technical and artistic sense, – ability to use professional photographic and computer equipment, - knowledge of a general use of photography and typography - knowledge of photography styles, - knowledge of design and setting of photographic exhibitions, – ability to use studio lightning, - the ability for individual and project work in the field of photography (making seminar work and photographic products). – the ability to select appropriate photographic equipment with special emphasis on sustainability, – understanding the environmental impact of different photographic processes.

Predvideni študijski rezultati:

Znanje s področja sodobne digitalne fotografije, poznavanje nekaterih najpomembnejših svetovnih in slovenskih fotografov in njihovih del. Poseben poudarek je na študijski fotografiji s poudarkom na produktnem in kreativnem osvetljevanju. Uporaba znanja s področja digitalne fotografije v grafični proizvodnji, samostojno delovanje na področju fotografije (tudi grafično oblikovanje in oglaševanje) ter priprave fotografskih razstav ter razstav grafičnih izdelkov, s poudarkom na okolju prijaznih rešitvah.

Intended learning outcomes:

Contemporary digital photography knowledge, recognising some of Slovenian and world wide photographers and their work. Special emphasis is on studio photography with a focus on product and creative lighting. Students will also be able to use digital photography in a professional graphic production, individually work as photographers, (also in graphic design and in advertising) and set their photography exhibitions, with an emphasis on environmentally friendly solutions.

Metode poučevanja in učenja:

Learning and teaching methods:

/Predavanja, vodene individualne naloge. Pedagoški proces je lahko deloma izveden na daljavo. Za izvedbo predmeta je predvidena uporaba spletne učilnice. Pri predavanjih je predvidena udeležba strokovnjaka s področja vidnega sporočanja in oglaševanja. Končna naloga pri seminarju je v medpredmetni povezavi s Tipografskim načrtovanjem.	Lectures and guided individual work. The pedagogical process can be partly carried out remotely. The use of an online classroom is planned for the implementation of the course. The participation of an expert in the field of visual communication and advertising is planned for the lectures. The final assignment in the tutorials is in the cross-curricular connection with Typographic design.
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Načini ocenjevanja:		Delež/Weight	Assessment:
a) oddaja izpitne naloge	60 %	60,00 %	a) submitting exam tasks 60 %
b) ocena iz vaj	40 %	40,00 %	b) completed tutorials 40 %

Ocenjevalna lestvica:	Grading system:
5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

1. AHTIK, Jure. Comparison of ICC and DNG colour profile workflows based on colorimetric accuracy. *Journal of print and media technology research*, ISSN 2223-8905, 2017, vol. 6, no. 3, str. 115-121.
2. AHTIK, Jure, MUCK, Deja, STAREŠINIČ, Marica. Detail diversity analysis of novel visual database for digital image evaluation. *Acta polytechnica Hungarica*, ISSN 1785-8860, 2017, vol. 14, no. 6, str. 115-132.
3. AHTIK, Jure. Introducing a new anaglyph method : compromise anaglyph. V: ENLUND, Nils (ur.), LOVREČEK, Mladen (ur.). *Advances in printing and media technology : [proceedings of the 39th International Research Conference iarigai, Ljubljana, Slovenia, September 2012]. Vol. 39*. Darmstadt: International Association of Research Organizations for the Information, Media and Graphic Arts Industries. 2012, str. 91-95.
4. AHTIK, Jure, MUCK, Deja, STAREŠINIČ, Marica. A novel database for evaluation of digital images. V: URBAS, Raša (ur.). *Abstracts*, 7th Symposium of Information and Graphic Arts Technology, Ljubljana, 5-6 June 2014. Ljubljana: Faculty of Natural Sciences and Engineering, Department of Textiles, Chair of Information and Graphic Art Technology. 2014, str. 49.
5. BIDOVEC, Katja, AHTIK, Jure, PUŠNIK, Maruša. Kulturni in družbeni vidiki razvoja modne fotografije v slovenskem prostoru. V: PUŠNIK, Maruša (ur.), FAJT, Elena (ur.). *Moda in kultura oblačenja*. 1. izd. Maribor: Aristej. 2014, str. 185-204, fotogr.
6. AHTIK, Jure. *Tehnike upodabljanja anaglifnih slik za uporabo v umetnosti*. Ljubljana: [J. Ahtik], 2011. XIII, 96 f., ilustr.

Avtor in soavtor več razstav in objavljenih fotografij.

TEHNOLOGIJE UPORABNIŠKIH VMESNIKOV

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Tehnologije uporabniških vmesnikov
Course title:	User interface Technologies
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code: 0642807

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	30	0			60	4

Nosilec predmeta/Lecturer: Jože Guna

Vrsta predmeta/Course type: Izbirni/Facultative

Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Pogoj za vključitev v delo je vpis v letnik študija in izbira predmeta. K izpitu lahko pristopijo študenti/ke, ki imajo opravljen izpitni projekt in seminar .
Pri predmetu se zahteva naslednja prisotnost: predavanja 80 %, seminar 100 %.

Prerequisites:

Prerequisite is enrollment in the year of study and choosing the course.
Students who have completed the exam project and seminar are eligible to take the exam.
The attendance requirements for the course are as follows: lectures 80%, seminar 100%.

Vsebina:

- dizajn sistemi in stilski priročniki uporabniških vmesnikov:** lastnosti učinkovitih načel oblikovanja, funkcionalni vzorci, percepcijski vzorci
- tipografija uporabniških vmesnikov:** odzivna spletna tipografija, ritem pri spletni tipografiji, formati spletnih pisav, učinkovitost in optimizacija tipografije
- barve uporabniških vmesnikov:** dosegljive, uporabniku prijazne in estetske barvne teme
- uporaba slik pri uporabniških vmesnikih:** kakovost slik, slikovni formati, barvno upravljanje, optimizacija slik, učinkovitost

Content (Syllabus outline):

- design systems and style guides:** qualities of effective design principles, functional patterns, perceptual patterns
- interface typography:** responsive web typography, rhythm in web typography, web font formats, fonts performance and optimization
- interface colors:** accessible, user-friendly and astetic colors themes
- interface images:** image quality, image formats, color management, image optimization, image decoding performance, measuring image performance, prograssive rendering techniques, responsive images;

dekodiranja slik, merjenje učinkovitosti slik, progresivno upodabljanje slik, odzivne slike • mobilni vmesniki in oblikovanje za zaslone na dotik: lastnosti mobilnih vmesnikov, specifikacije, norme in principi za vmesnike na dotik • dostopni uporabniški vmesniki: dostopni gumbi, navigacije in meniji, dostopne barvne kombinacije, pravila WAI-ARIA • odzivni in adaptivni uporabniški vmesniki: optimizacija glede na karakteristike naprave/zaslona • struktura in organizacija uporabniških vmesnikov • vzorci komponent uporabniškega vmesnika: splošna navigacija, karte, zavijki, stranske navigacije, zgibni meni, vrtljive slike, elementi obrazcev (vnosna polja, potrditvena polja, izbirni gumbi, spustni meniji), zaslonski namigi in pojavna sporočila, gumbi, povezave, hierarhična navigacija, preklopni gumbi, modalni elementi • oblikovanje interakcij: nakazovanje napredka in povratnih informacij, sporočanje sistema, pokazatelji napredka, vzorci iskalnih elementov, samodokončanje, prikaz zadetkov, filtriranje • stili in konvencije pri kodiranju uporabniških vmesnikov, • moderne arhitekture uporabniških vmesnikov, ogrodja in knjižnice • učinkovitost uporabniških vmesnikov: metrike in tehnike optimizacije • optimizacija za iskalnike (SEO) • tehnologije in uporaba naprav za sledenje pogleda	• mobile interfaces and touch design: attributes of mobile interfaces, specifications, norms and principles for touch interfaces • accessible interfaces: accessible buttons and toggle buttons, navigation menus and dropdowns, keyboard-friendly tooltips, accessible color combinations, WAI-ARIA roles • responsive and adaptive interfaces: optimization according to device/display characteristics • interface structure and organization • interface component patterns: global navigation, cards, tabs, side navigation, accordions, carousel, slider, form elements (input fields, checkboxes, radio buttons, dropdowns), tooltips and popovers, buttons, links, breadcrumbs, toggle switches, modals • interaction design: indicating progress and feedback, system messaging, progress indicators, progress meters, search patterns, autocomplete, search results, filtering ... • styles and conventions for coding interfaces • modern interface architectures, frameworks and libraries • interface performance: metrics and optimization technique • search-engine optimization (SEO) • technology and use of eye-tracking devices
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Temeljna literatura in viri/Readings:

Temeljna literatura

- Duckett, Jon. JavaScript & jQuery: interactive front-end web development. Wiley, 2014, str. 622, 14.

Dodatna literatura

- GRIGSBY, J. *Progressive web apps*. A Book Apart, 2018.
- KALBAG, L. *Accessibility for Everyone*. A Book Apart, 2018.
- Hoober, S. *Touch Design for Mobile Interfaces*. Smashing Magazine, 2022
- Kholmatova, A. *Design Systems*. Smashing Magazine, 2017
- Osmani, A. *Image Optimization*. Smashing Magazine, 2022
- Tidwell, J., Brewer C., Valencia A. *Designing Interfaces: Patterns for Effective Interaction Design*. O'Reilly Media, 2019

Cilji in kompetence:

Študent se poglobljeno seznani s tehnologijami uporabniških vmesnikov. Teoretično znanje o ključnih tehnologijah in gradnikih uporabniških vmesnikov nadgradi s praktičnimi znanji in veščinami, ki so potrebna za izgradnjo uporabniku prijaznih, dostopnih in učinkovitih vmesnikov.

Predmetno specifične kompetence:

Objectives and competences:

In this course, students learn about technologies behinds user interfaces. Theoretical knowledge about key technologies and essential building blocks of user interfaces, is extended with practical knowledge and skills, which are necessary to build user-friendly, accessible and efficient interfaces.

Subject-specific competencies:

• poglobljeno znanje o tehnologijah uporabniških vmesnikov, • dobro poznavanje modelov in vzorcev elementov oz. komponent uporabniških vmesnikov, • dobro poznavanje orodji in metod ter seznanitev s konvencijami in primeri dobre prakse pri izdelavi oz. oblikovanju uporabniških vmesnikov.	• comprehensive knowledge about user interface technologies, • extended knowledge about user interface patterns, • in-depth knowledge about tools, frameworks, and libraries, • comprehensive knowledge about conventions and methods for creating/designing user interfaces
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Predvideni študijski rezultati:

Študent pridobi poglobljeno teoretično znanje o tehnologijah uporabniških vmesnikov ter osvoji tehnična znanja potrebna za razvoj uporabniku prijaznih, dostopnih in učinkovitih uporabniških vmesnikov.

Intended learning outcomes:

The student acquires in-depth theoretical knowledge of user interface technologies and gains the technical skills to develop user-friendly, accessible, and efficient user interfaces.

Metode poučevanja in učenja:

Predavanja, seminar, konzultacije
Aktivnosti poučevanja in učenja potekajo na fakulteti in/ali prek spleta (online).
Uporaba spletne učilnice in IKT metod poučevanja (multimedijsko gradivo, praktične demonstracije).

Learning and teaching methods:

Lectures, seminar, consultations
Teaching and learning activities take place at the faculty and/or online.
Use of the online classroom and ICT teaching methods (multimedia content, practical demonstrations).

Načini ocenjevanja:

Delež/Weight

Assessment:

Dokumentacija sprotnega dela in aktivna udeležba in sodelovanje pri predmetu (predavanja, seminar)	25,00 %	Maintaining documentation of ongoing work and actively participating in course activities, including lectures and seminars.
Zaključni projekt	50,00 %	Final project
Predstavitev zaključnega projekta in ustni izpit	25,00 %	Presentation of the final project and oral exam

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

1. GUNA, Jože, POLAJNAR HORVAT, Katarina, PODJED, Dan. People-centred development of a smart waste bin. *Sensors*. Feb.-1 2022, iss. 3, 1288, str. 1-14, ilustr. ISSN 1424-8220. <https://www.mdpi.com/1424-8220/22/3/1288>, DOI: [10.3390/s22031288](https://doi.org/10.3390/s22031288). [COBISS.SI-ID [96699651](#)]
2. SOMRAK, Andrej, POGAČNIK, Matevž, GUNA, Jože. Impact of different types of head-centric rest-frames on VR use and user experience in virtual environments. *Applied sciences*. Feb.-2 2021, no. 4, 1593, str. 1-31, ilustr. ISSN 2076-3417. <https://www.mdpi.com/2076-3417/11/4/1593>, DOI: [10.3390/app11041593](https://doi.org/10.3390/app11041593).
3. SOMRAK, Andrej, HUMAR, Iztok, HOSSAIN, M. Shamim, ALHAMID, Mohammed F., HOSSAIN, M. Anwar, GUNA, Jože. Estimating VR sickness and user experience using different HMD technologies : an evaluation study. *Future generation computer systems*. [Print ed.]. 2019, vol. 94, str. 302-316, ilustr. ISSN 0167-739X. <https://www.sciencedirect.com/science/article/pii/S0167739X18325044>, DOI: [10.1016/j.future.2018.11.041](https://doi.org/10.1016/j.future.2018.11.041). [COBISS.SI-ID [12274772](#)]
4. BURGER, Gregor, GUNA, Jože, POGAČNIK, Matevž. Suitability of inexpensive eye-tracking device for user experience evaluations. *Sensors*. Jun. 2018, no. 6, 1822, str. 1-17, ilustr. ISSN 1424-8220. <http://www.mdpi.com/1424-8220/18/6/1822>, DOI: [10.3390/s18061822](https://doi.org/10.3390/s18061822). [COBISS.SI-ID [12045396](#)]

5. GUNA, Jože, JAKUS, Grega, POGAČNIK, Matevž, TOMAŽIČ, Sašo, SODNIK, Jaka. An analysis of the precision and reliability of the leap motion sensor and its suitability for static and dynamic tracking. *Sensors*.

TEORETIČNE OSNOVE TISKARSKIH PROCESOV

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Teoretične osnove tiskarskih procesov
Course title:	Teoretical basics of printing processes
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	1. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068073
Koda učne enote na članici/UL Member course code:	10266

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
90	0	0	0	0	90	6

Nosilec predmeta/Lecturer:	Andreja Drobnič Vidic, Daniel Svenšek, Gregor Skačej, Janez Cerkovnik, Pavle Saksida
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v program	Enrolment in the programme

Vsebina:	Content (Syllabus outline):
1. Čiste snovi in zmesi - Elementi in spojine - Zmesi (različne vrste in ločevanje) - Fizikalne in kemijske lastnosti snovi - Fazne spremembe 2. Atomi in molekule - Osnovni kemijski zakoni - Struktura atoma in periodni sistem elementov - Kemijske vezi in struktura molekul - Medmolekulske vezi 3. Element, spojina in formule spojina (oksidacijsko število, poimenovanje spojina) 4. Kisline, baze, soli in raztopine (nevtralizacija, redoks reakcija) 5. Struktura, vezi in reaktivnost organskih molekul 6. Zapis formel organskih spojin in poimenovanje (osnovni tipi organskih spojin in njihove značilnosti; alkani, alkeni, alkini, aromatske spojine) 7. Funkcionalne skupine in poimenovanje 8. Izomerija organskih spojin 9. Reaktivnost organskih spojin - Prekinitev kemijske vezi - Pregled osnovnih reakcij (substitucija,	1. Pure substances and mixtures - Elements and compounds - Mixtures (different types and separation) - Physical and chemical properties of substances - Phase changes 2. Atoms and molecules - Basic chemical laws - Structure of atoms and the periodic system of elements - Chemical bonds and molecular structure - Intermolecular bonds 3. The element, compound and molecular formula (Oxidation number, nomenclature) 4. Acids, bases, salts and solutions (Neutralization, redox reactions) 5. The structure and reactivity of organic molecules 6. Formulae of organic compounds and nomenclature (Basic types of organic compounds and their features; alkanes, alkenes, alkynes, aromatic compounds) 7. Functional

adacija, eliminacija) - Ogljikovodiki - Organske kisikove spojine 10. Uporaba organskih spojin - Površinsko aktivne snovi (mila, detergenti) - Polimeri (osnovni tipi, nastanek in uporaba) - Barvila Realna števila: predstavitev, lastnosti, računanje s približki, kompleksna števila. Vektorji v dvo-in tri-razsežnem prostoru, premice v prostoru. Funkcija ene spremenljivke. Reševanje sistemov linearnih enačb. Pregled elementarnih funkcij in njihovih lastnosti. Zveznost in limita. Reševanje enačb (iskanje ničel predvsem potenčnih, eksponentnih in logaritmskih funkcij). Grafična upodobitev funkcij in primeri uporabe v naravoslovju. Odvod, geometrični in fizikalni pomen. Primeri uporabe (ekstremi, risanje grafov, regresija). Nedoločeni integral, določeni integral s primeri uporabe. Fizikalne količine in enote. Enakomerno gibanje, enakomerno pospešeno gibanje. Poševni met. Kroženje. Sila, Newtonovi zakoni. Delo in energijski zakon, moč. Kinetična, potencialna, prožnostna energija. Elastičnost. Prožnostni in strižni modul, stisljivost. Mehanika tekočin. Hidrostatični tlak, vzgon, Bernoullijeva enačba. Viskoznost. Linearni in kvadratni zakon upora. Toplota, notranja energija, temperatura. Specifična in utajena toplota. Električno polje in naboj, Coulombov zakon, električna napetost. Gravitacijska sila. Električni tok, Kirchhoffova zakona, Ohmov zakon. Valovanje. Amplituda, valovna dolžina, frekvenca. Odboj in lom. Uklon in interferenca. Geometrijska optika. Zrcala, leče, optične naprave	groups and naming 8. Isomerism of organic compounds 9. Reactivity of organic compounds - Cleavage of chemical bonds - An overview of basic reactions (Substitution, addition, elimination) - Hydrocarbons - Organic oxygen compounds 10. The use of organic compounds - Surfactants (soaps, detergents) - Polymers (basic types, formation and use) - Dyes Real numbers: representation, properties, computation with approximate numbers, complex numbers. Vectors in the plane and in three-dimensional space, line in three-dimensional space. Functions of one real variable. Solving systems of linear equations. Overview of elementary functions. Continuity and limits. Solving equations. Graphs of functions and practical cases from science. Derivative: definition, properties and applications. Indefinite integral, definite integral and applications. Physical quantities and units. Motion with constant velocity/constant acceleration. Projectile motion. Circular motion. Force, Newton's laws. Work. Energy conservation. Power. Kinetic, potential, elastic energy. Elasticity. Young and shear modulus, compressibility. Fluid mechanics. Hydrostatic pressure, buoyancy, Bernoulli equation. Viscosity. Linear and quadratic drag. Heat, internal energy, temperature. Specific and latent heat. Electric field and charge, Coulomb's law, voltage. Gravitational force. Electric current, Kirchhoff's laws, Ohm's law. Waves. Amplitude, wavelength, frequency. Reflection and refraction. Diffraction and interference. Geometrical optics. Mirrors, lenses, optical instruments
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Temeljna literatura in viri/Readings:

- A. Godec, I. Leban, Atomi in molekule: Učbenik za kemijo v gimnaziji, Modrijan, Ljubljana, 2008. - A. Godec, I. Leban, Kemijske reakcije: Učbenik za kemijo v gimnaziji, Modrijan, Ljubljana, 2009. - Š. Tršek, J. Cerkovnik, Verige in obroči – Učbenik za kemijo v gimnaziji, Modrijan, Ljubljana, 2011. - R. Jamnik, Matematika. Ljubljana: Društvo matematikov, fizikov in astronomov Slovenije, 19924. -J Prezelj-Perman, Teoretične osnove tiskarskih procesov [Elektronski vir]: matematični modul. Ljubljana: Naravoslovno tehniška fakulteta, 2014. Učbeniki za samostojno delo študentov: -A. Drobnič Vidic, Matematika v uporabi: visokošolska matematika z rešenimi nalogami in postopki reševanja za inženirske programe na področju zdravja in varnosti pri delu. Ljubljana: Zdravstvena fakulteta, 2023. -P. Mizori-Oblak, Matematika za študente tehnike in naravoslovja. Ljubljana: Fakulteta za strojništvo, 1997. -R. Kladnik: Visokošolska fizika (deli 1-3), DZS, Ljubljana, 1989-1991 -R. Kladnik, H. Šolinc: Zbirka fizikalnih problemov z rešitvami, DZS, Ljubljana, 1991

Cilji in kompetence:

Poznavanje osnovnih zakonitosti kemije in njihovo razumevanje ter utemeljevanje opažanj pri grafičnih postopkih in materialih. Poznavanje elementov in spojin; agregatna stanja; fazni prehodi; razumevanje reakcij in prepoznavanje osnovnih materialov, pomembnih v grafiki. Študenti bodo pridobili osnova matematična znanja, potrebna za računanje pri naravoslovno tehniških predmetih. Spoznali bodo osnovne zakone narave, kot jih obravnava fizika. Razvijali bodo logično razmišljanje, induktivno

Objectives and competences:

Understanding the basic laws of chemistry and their understanding, reasoning observations in graphic techniques and materials. Knowing the elements and compounds; physical states; phase transitions; understanding of reactions and identifying basic materials relevant for graphics. Students will acquire the basic mathematical knowledge and skills necessary for computation in science and technology courses. They will get acquainted with the fundamental laws of nature as addressed by physics.

sklepanje in veščine za reševanje problemov. Razvijali bodo natančnost in doslednost.	They will get used to logical thinking, inductive reasoning and problem solving. They will develop precision and consistency.
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Predvideni študijski rezultati:

Znanje in razumevanje: Študent razume osnovne kemijske pretvorbe, zna zapisati in imenovati spojine, razume osnovne fizikalno-kemijske lastnosti in reaktivnost spojin, pozna osnovne stereokemijske pojme, pozna osnovne makromolekule in polimere, pomembne za materiale ter razume izvor barve in osnovna barvila. Znanje in razumevanje: Poznavanje in razumevanje pojmov funkcij, limit, odvodov in integralov. Uporaba višje matematike v naravoslovju in tehniki. Poznavanje izbranih pojavov s področja mehanike, termodinamike, električnega polja, valovanja in optike.

Intended learning outcomes:

Knowledge and understanding: The student understands the basic chemical transformations, is able to record and name compounds, understands the basic physico-chemical properties and reactivity of compounds, knows the basic concepts of stereochemistry, knows the basic macromolecules and polymers which are essential for materials, and understands the origin of colors and basic dyes. Knowledge and understanding: Knowledge and understanding of concepts of functions, limits, differentiation and integration. Application of higher mathematics in science and technics. Knowledge of selected phenomena from the field of mechanics, thermodynamics, electrodynamics, waves, and optics.

Metode poučevanja in učenja:

Predavanja.

Learning and teaching methods:

Lectures.

Načini ocenjevanja:

Pisni izpit 100 %

Delež/Weight

100,00 %

Assessment:

Examination 100 %

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

- (1) CERKOVNIK, Janez, PLESNIČAR, Božo. Recent advances in the chemistry of hydrogen trioxide (HOOH). Chemical Reviews, 2013, vol. 113, no. 10, 7930–7951, doi: 10.1021/cr300512s. [COBISS.SI-ID 1615407]
- (2) STRLE, Gregor, CERKOVNIK, Janez. A simple and efficient preparation of high-purity hydrogen trioxide (HOOH). Angewandte Chemie, 2015, vol. 54, no. 34, str. 9917–9920, doi: 10.1002/anie.201504084. [COBISS.SI-ID 1536385475]
- (3) STAMENKOVIĆ, Nikola, POKLAR ULRIH, Nataša, CERKOVNIK, Janez. An analysis of electrophilic aromatic substitution: a "complex approach". PCCP: Physical chemistry chemical physics. 2021, vol. 23, no. 9, str. 5051–5068, doi: 10.1039/d0cp05245k. [COBISS.SI-ID 49484035]
- (4) JANSEN-VAN VUUREN, Ross D., LIU, Susana, MIAH, M. A. Jalil, CERKOVNIK, Janez, KOŠMRLJ, Janez, SNIECKUS, Victor. The versatile and strategic O-carbamate directed metalation group in the synthesis of aromatic molecules: an update. Chemical Reviews, 2024, vol. 124, iss. 12, str. 7731–7828, ilustr. doi: 10.1021/acs.chemrev.3c00923. [COBISS.SI-ID 198743811]
- (5) SILJANOVSKA, Ana, VIRANT, Miha, LOZINŠEK, Matic, CERKOVNIK, Janez. Ph₃AsO as a strong hydrogen-bond acceptor in cocrystals with hydrogen peroxide and *gem*-dihydroperoxides. Inorganic chemistry, 2025, vol. 64, iss. 5, str. 2329–2335, doi: 10.1021/acs.inorgchem.4c04535. [COBISS.SI-ID 224558083]
- (1) Drobnič Vidic, A. (2015). First-year students' beliefs about context problems in mathematics in university science programmes. International Journal of Science and Mathematics Education, 13 (5), pp. 1161–1187.
- (2) Drobnič Vidic, A. (2011). Impact of problem-based statistics course in engineering on students' problem solving. International Journal of Engineering Education, 27(4): 885-896.
- (3) Drobnič Vidic, A. (2016). Using a problem-based leaning approach to incorporate safety engineering into fundamental subjects. Journal of Professional Issues in Engineering Education and Practice, 142 (2), DOI: [http://dx.doi.org/10.1061/\(ASCE\)EI.1943-5541.0000264](http://dx.doi.org/10.1061/(ASCE)EI.1943-5541.0000264).

- (4) Drobnič Vidic, A. (2008). Development of transferable skills within engineering science context using problem-based learning. *International Journal of Engineering Education* 24(6): 1071-1077.
- (1) SKAČEJ, Gregor, ZANNONI, Claudio. Controlling surface defect valence in colloids. *Physical review letters*, 2008, vol. 100, str. 197802-1-197802-4, [COBISS.SI-ID 2088036]
- (2) SKAČEJ, Gregor, ZANNONI, Claudio. Molecular simulations elucidate electric field actuation in swollen liquid crystal elastomers. *Proceedings of the National Academy of Sciences of the United States of America*, 2012, vol. 109, no. 26, str. 10193-10198. [COBISS.SI-ID 2439012]
- (3) SKAČEJ, Gregor, ZANNONI, Claudio. Molecular simulations shed light on supersoft elasticity in polydomain liquid crystal elastomers. *Macromolecules*, 2014, vol. 47, iss. 24, str. 8824-8832. [COBISS.SI-ID 2766948]
- (4) SKAČEJ, Gregor. Elastocaloric effect in liquid crystal elastomers from molecular simulations. *Liquid crystals*. 2018, vol. 45, iss. 13/15, str. 1964-1969. [COBISS.SI-ID [3212900](#)]
- (5) SKAČEJ, Gregor, ZANNONI, Claudio. The nematic-isotropic transition of the Lebwohl-Lasher model revisited. *Philosophical transactions. Mathematical, physical and engineering sciences*. Jul. 2021, vol. 379, 2020011.7 [COBISS.SI-ID [64547075](#)]

TIPOGRAFSKI ELEMENTI

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Tipografski elementi
Course title:	Typographic elements
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	1. letnik	2. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068074
Koda učne enote na članici/UL Member course code:	10267

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
45	0	45	0	0	90	6

Nosilec predmeta/Lecturer:	Klementina Možina
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik študija. Za pristop h končnemu izpitu sta pogoja: opravljene vse zadolžitve in pozitivno ocenjeno znanje pridobljeno pri (računalniških) vajah. Pri čemer mora biti prisotnost pri vajah 100%.	Enrolment in the programme. For the final exam conditions are: completed all assignments and a positive assessment of the knowledge acquired in the (computer) exercises. Attendance at exercises must be 100%.

Vsebina:	Content (Syllabus outline):
Spoznavanje temeljnih elementov tipografije; deli črk, različice pisave, pisava, oblika znakov, tipografski merski sistem (vključno z merjenjem in spoznavanjem tipografskega merila – tipometra); spoznavanje značilnosti posameznih črkovnih slogov; elementi razporejanja besedila, ligature, razpiranje, prirezovanje, prostor med črkami in besedami, razmik, dolžina vrstice, poravnava na levo naslonilo, na desno naslonilo, sredinsko in na polni format, zrcalo, mreža, beli robovi; mikrotipografija; korektura in korekturna znamenja (slovenska); spoznavanje delovanja naprave za sledenje očesnim premikom, ki omogoča testiranja uporabnosti grafičnih rešitev; spoznavanje praktične uporabe in izvedbe stavljenja	Learning about the basis elements of typography; parts of the characters variations in typeface weight and width, font and typographic measurement systems (including measuring and getting to know the typographic ruler – typometer); the characterisation of individual type styles; elements of text position, ligatures, tracking, kerning, letter and word space, leading, line length, flush-left, flush-right, centred, justified, layout, grids, margins; typesetting various typewriting; micro detail-typography; proofreading proofreading marks (Slovene); learning about operation of the eye-tracking device, which enables testing the usability of graphic solutions; knowledge of practical use and execution of printing in the

ter odtisovanja v primarni, Gutenbergovi metodi – z izvedbo praktične delavnice v tipografsko-tiskarskem muzeju.

primary, Gutenberg method – from a practical workshop in the museum of typography.

Temeljna literatura in viri/Readings:

Baines, P., Haslam, A., *Type & typography*. London : Laurence King Publishing, 2002. Bringhurst, R., *The Elements of Typographic Style*. Vancouver : Hartley & Marks, 2008. Felici, J., Bringhurst, R., *The Elements of Typographic Style*. Vancouver : Hartley & Marks, 2008. Felici, J., *The Complete Manual of Typography*. Berkeley : Adobe Press, 2003. Možina, K., *Knjižna tipografija*. Ljubljana : Filozofska fakulteta in Naravoslovnotehniška fakulteta, 2003, <https://www.dlib.si/stream/URN:NBN:SI:DOC-6YLGQIG8/64f60a3c-ec5e-4293-adc9-674b38605004/PDF>. Možina, K., *Mikrotipografija*. Ljubljana : Naravoslovnotehniška fakulteta, 2009, <https://image.linotype.com/files/pdf/Mikrotipografija.pdf>. Možina, K., *Tipografska kunsť: Upodobitev informacij*. Ljubljana: Naravoslovnotehniška fakulteta, 2023. Müller-Brockmann, J., *Grid, systems in graphic design: a visual communication manual for graphic designers, typographers and three dimensional designers*. Zürich : Niggli, 2007. White, A. W., *Type in Use: Effective typography for electronic publishing*, New York : W.W. Norton & Company, 1999. *Literatura je dostopna v knjižnici Oddelka za tekstilstvo, grafiko in oblikovanje, NTF.*

Cilji in kompetence:

Cilji:

Študent spozna temeljne elemente tipografije, njihove posamezne dele ter njihovo namembnost in uporabnost pri razporejanju besedila po pomenskih sklopih. Spozna razporeditve tipografije v posamezne črkovne sloge. Seznani se s tipografskimi pravili in korekturnimi znamenji. Razume zgodovinski napredek tehnološkega razvoja in razume razkorak v možnostih tipografskih rešitev v preteklosti in sedanjosti. Razume metode preverjanja uporabnosti tipografskih oblikovnih rešitev v sodobnosti. Ve, da je to natančno izmerljivo z uporabo naprave za sledenje očesnim premikom.

Predmetno specifične kompetence:

- poznavanje in razumevanje pomena posameznih elementov tipografije,
- sposobnost merjenja tipografskih elementov s tipometrom
- sposobnost za reševanje konkretnih delovnih problemov v pripravi besedila,
- sposobnost umeščanja novih interpretacij (tehnoloških rešitev) v kontekst temeljnega področja tipografije,
- razvoj spretnosti pri uporabi tipografskih elementov, uporabi grafičnih programov za oblikovanje in prelom besedila,
- sposobost generiranja novih idej (kreativnosti) v uporabi in razporejanju tipografskih elementov,
- razumevanje preteklosti in sedanjosti v tipografskem oblikovanju ter njuno nadgrajevanje,
- poznavanje in razumevanje pomena preverjanja uporabnosti tipografskih rešitev z napravo za slednje očesnim premikom.

Objectives and competences:

Objectives:

Student learns about basic elements in typography, their parts and their purpose and usefulness in the organization of the text according to semantic clusters. Learns about the subsequent allocation of the individual typographic styles. They are acquainted with the typographic rules and correction marks. He/She understands the historical progress of technological development and understands the leap forward in the possibilities of typographic solutions in the past and in the present. Understands methods of checking the usability of typographic design solutions in modern times. He knows that it can be accurately measured using an eye-tracking device.

Subject-specific competencies:

- knowledge and understanding of the importance of individual typographic elements,
- the ability to measure typographic elements with a typometer,
- the ability to solve real work problems in typographic prepress,
- the ability to include new interpretations (technological solutions) in the context of the basic areas of typography,
- the development of skills in the use of typographic elements, the use of graphic designing software and text layout,
- ability to generate new ideas (creativity) in the use and allocation of typographic elements,
- understanding the past and the present in typographical design and their upgrading,
- knowledge and understanding of the importance of verifying the usability of typographic solutions from the right behind the latter by eye movement.

Uporaba informacijsko-komunikacijske tehnologije v prevzemu in nadaljnem posredovanju podatkov in osnovnega gradiva pri tipografski obdelavi podatkov.	The use of information and communication technology in the acquisition and subsequent transmission of data and basic material for typographic processing of data
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Predvideni študijski rezultati:

Znanje in razumevanje: Pozna posamezne tipografske elemente in njihove značilnosti; pozna značilnosti posameznih črkovnih slogov in njihov zgodovinski razvoj, zna jih prepoznati v individualnih pisavah; pozna različnosti v razporejanju besedila; zna izmeriti tipografske elemente besedila; pozna pravila mikrotipografije; pozna pomen korekture ter različna znamenja, ki se zanjo uporabljajo. Razume pomen in vlogo posameznih tipografskih elementov v obdelavi besedila; razume hierarhijo razporejanja besedila za različno posredovanje informacij; razume pomen kakovostne priprave besedila za nadaljne grafične postopke in pomen preverjanja uporabnosti tipografskih rešitev z napravo za slednje očesnim premikom ter njenega delovanja. Razume razlikovanje preteklih tehnoloških zmogljivosti s sodobnimi; zato zna umestiti pretekle oblike tipografskega oblikovanja v sodobno oz. ga zna ovrednotiti, ker je praktično preveril na tipografsko-tiskarski delavnici v muzeju.

Intended learning outcomes:

Knowledge and understanding: Knows different individual typographic elements and their characteristics; knows the characteristics of individual typographic styles, able to identify them in individual fonts typefaces; knows the differences in the text layout; knows how to measure typographical elements of the text; knows the micro detail-typographic rules; knows the importance of the proofreading and different proofreading marks. He/She understands the importance and role of typographic elements in the processing of the text; understands the hierarchy of text mapping for different communication and information; understands the importance of text quality preparation for further graphical operations and in the importance of verifying the usability of typographic solutions from the right behind the latter with an eye shift of its action. Understands the distinction between outdated technological capabilities and modern ones; but he/she knows how to place the past forms of typographical design in modern times, that is knows how to evaluate and practically checked them at the typographic and printing workshop in the museum.

Metode poučevanja in učenja:

Predavanja, računalniške vaje, vodeno individualno delo, v študenta osredinjeno poučevanje. Predavanja in vaje se lahko izvajajo v živo (predavalnica, računalniška učilnica) in/ali na daljavo z uporabo primerne programske opreme. Pri delu študenti dobijo gradivo na spletnih povezavah predmeta.

Learning and teaching methods:

Lectures, computer exercises, guided individual work and the student-centered teaching. Lectures and exercises can be conducted in a classroom/a computer room and/or online using suitable software tools. During work, students get material on the online links of the subject.

Načini ocenjevanja:

Delež/Weight

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt): – ustni/pisni izpit (v predavalnici ali na daljavo), – ocena znanja iz računalniških vaj, izdelki posameznih računalniških vaj Pozitivno: 6–10 (60–100 %) Negativno: 5 (0–59 %)	70,00 %	Type (examination, oral, coursework, project): – oral/written exam (in a classroom or online), – the assessment of knowledge of computer tutorials, individual computer exercises Positive: 6–10 (60–100%) Negative: 5 (0–59%)
– ocena znanja iz računalniških vaj, izdelki posameznih računalniških vaj	30,00 %	– the assessment of knowledge of computer tutorials, individual computer exercises

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

Možina, K., *Knjižna tipografija*. Ljubljana : Filozofska fakulteta in Naravoslovnotehniška fakulteta, 2003, <https://www.dlib.si/stream/URN:NBN:SI:DOC-6YLGQIG8/64f60a3c-ec5e-4293-adc9-674b38605004/PDF>.

Možina, K., *Mikrotipografija*. Ljubljana : Naravoslovnotehniška fakulteta, 2009, <https://image.linotype.com/files/pdf/Mikrotipografija.pdf>.

Možina, K., *Tipografska umetnost: Upodobitev informacij*. Ljubljana: Naravoslovnotehniška fakulteta, 2023.

Franken, G., Podlessek, A., Možina, K. Eye-tracking study of reading speed from LCD displays: influence of type style and type size. *Journal of eye movement research*, vol. 8, no. 1, str. 1–8, 2015.

Kovačević, D., Brozović, M., Možina, K. Improving visual search in instruction manuals using pictograms. *Ergonomics*, vol. 59, no. 11, str. 1405–1419, 2016.

Možina, K., Bračko, S., Kovačević, D., Blaznik, B., Možina, K. Legibility of prints on paper made from Japanese knotweed. *Bioresources*, vol. 15, no. 2, str. 3999–4015, 2020.

TIPOGRAFSKO NAČRTOVANJE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Tipografsko načrtovanje
Course title:	Typographic design
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	2. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068084
Koda učne enote na članici/UL Member course code:	10268

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	45	0	0	90	6

Nosilec predmeta/Lecturer:	Klementina Možina
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Vpis v letnik študija. Za pristop h končnemu izpitu so pogoji: opravljene vse zadolžitve in pozitivno ocenjeno znanje pridobljeno pri (računalniških) vajah, opravljeno in predstavljeno seminarsko delo ter opravljen izpit pri predmetu Tipografski elementi (1. letnik). Pri čemer mora biti prisotnost pri vajah in seminarju 100%.

Prerequisites:

Enrolment in the programme. For the final exam conditions: completed all assignments and a positive assessment of the knowledge acquired in the (computer) exercises, completed and presented seminar work, and passed course Typographic elements (1st year). Attendance at exercises and seminars must be 100%.

Vsebina:

Spoznavanje različnih tehnoloških zapisov nabora črkovnih znakov; tiskani in digitalni mediji; uporabnost tipografije v različnih medijih; uporabnost tipografije v različnih medijih in za različne vrste besedila; vidnost, čitljivost, branje, percepcija, oblikovanje in načrtovanje pisav ter preverjanje njihove čitljivosti z napravo za sledenje očesnim premikom; vpliv barve na uporabnost tipografije v različnih medijih in za različne vrste besedila. Vpliv umetnostnih slogov na tipografsko oblikovanje. Ekološko tipografsko in grafično oblikovanje v različnih medijih.

Content (Syllabus outline):

Learning about various fonts; printed and digital media; the use of typography in various media and for various type of text; visibility, legibility, reading and perception, typeface design and checking its legibility with an eye-tracking device; the effect of colour on the usability of a typography in various media and for various type of text. The influence of art styles on typographic design. Ecological typeface and graphic design in various media. Understanding of practical use and execution of printing in the primary, Gutenberg method – from a practical workshop in the museum of typography.

Razumevanje praktične uporabe in izvedbe stavljenja ter odtisovanja v primarni, Gutenbergovi metodi – z izvedbo praktične delavnice v tipografsko-tiskarskem muzeju. <i>Predmetno specifične kompetence:</i> • poznavanje in razumevanje pomena in uporabnosti posameznih elementov tipografije za različne grafične izdelke in v različnih medijih, • poznavanje različnih metod in tehnologij sledenju očnim premikom za vrednotenje čitljivosti besedila, • poznavanje vloge posameznih elementov oblikovanja pisav, • uporaba estetskih parametrov pri načrtovanju in oblikovanju pisave, • sposobnost za reševanje konkretnih delovnih problemov v pripravi besedila za različne grafične izdelke in v različnih medijih, • razvoj spretnosti pri izboru in uporabi tipografskih elementov, uporabi grafičnih programov za oblikovanje in prelom besedila za različne medije, • razumevanje in uporaba različnih umetnostnih slogov v tipografskem oblikovanju, • upoštevanje ekoloških načel v tipografskem oblikovanju, • razumevanje preteklosti in sedanjosti v tipografskem oblikovanju ter njuno nadgrajevanje.	<i>Subject-specific competencies:</i> • knowledge and understanding of the importance and usefulness of individual elements of typography in various graphic products and in various media, • knowledge of different methods and techniques for eye-tracking for evaluation legibility, • knowledge of the role of individual type design elements, • the use of aesthetic parameters in the design of the typeface, • the ability for preventing the specific working problems of text in the drafting of different graphic products and in various media, • the development of skills in the selection and use of typographic elements, the use of graphic designing software and text layout for various media, • understanding and using different artistic styles in typographic design, • consideration of ecological principles in typographic design, • understanding the past and the present in typographical design and their upgrading
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Temeljna literatura in viri/Readings:

Cheng, K., *Designing Type*. London : Laurence and King, 2020.

Možina, K., Barva v tipografiji. V *Interdisciplinarnost barv*, 1. del., Maribor : Društvo koloristov Slovenije, str. 341–364, 2001.

Možina, K., *Knjižna tipografija*. Ljubljana : Filozofska fakulteta in Naravoslovnotehniška fakulteta, 2003, <https://www.dlib.si/stream/URN:NBN:SI:DOC-6YLGQIG8/64f60a3c-ec5e-4293-adc9-674b38605004/PDF>.

Tracy, W., *Letters of credit: A view of type design*. London : Gordon Fraser Gallery, 2003.

Trufte, E. R., *The Visual Display of Quantitative Information*. Cheshire : Graphics press, 2001.

Literatura je dostopna v knjižnici Oddelka za tekstilstvo, grafiko in oblikovanje, NTF.

Cilji in kompetence:

Cilji: Študent spozna pomen razvoja tehnologije glede na zapise nabora črkovnih znakov in njihovo uporabo. Spozna elemente, ki vplivajo na čitljivost različnih vrst besedila v različnih medijih, spozna različne metode preverjanja čitljivosti, vključno z uporabo tehnologije za sledenje očesnim premikom. Spozna tehnološke in oblikovne zahteve pri načrtovanju in oblikovanju pisav. Seznani se s primerno pripravo besedila za tipografsko oblikovanje, z različnimi računalniškimi programi za obdelavo besedila in različnimi zapisi obdelanega besedila za različne medije. Predmetno specifične kompetence: – poznavanje in razumevanje pomena in uporabnosti posameznih elementov tipografije za različne grafične izdelke in v različnih medijih, –

Objectives and competences:

Objectives: Student learns about the importance of developing technologies according to the records set of typographic characters and their use. Learns about the elements that affect the legibility of different types of texts in different media, learns about different methods of checking legibility, including the use of eye-tracking technology. Learns about the technological and design requirements for designing typefaces. Knows about the proper preparation of the text of the typographical design, with various computer programs and a variety of records processed text for a number of different media. Subject-specific competencies: – knowledge and understanding of the importance and usefulness of individual elements of typography in various graphic

poznavanje različnih metod in tehnologij vrednotenja čitljivosti besedila, – poznavanje vloge posameznih elementov oblikovanja pisav, – uporaba estetskih parametrov pri načrtovanju in oblikovanju pisave, – sposobnost za reševanje konkretnih delovnih problemov v pripravi besedila za različne grafične izdelke in v različnih medijih, – razvoj spretnosti pri izboru in uporabi tipografskih elementov, vključno z ekološkim razmišljanjem, uporabi grafičnih programov za oblikovanje in prelom besedila za različne medije. Razume zgodovinski razkorak v možnostih tipografskih rešitev v preteklosti in sedanjosti. Zna uporabljati napravo za sledenje očesnim premikom in z njo preverjati čitljivost.	products and in various media, – knowledge of different methods and techniques of evaluation legibility, – knowledge of the role of individual type design elements, – the use of aesthetic parameters in the design of the typeface, – the ability for preventing the specific working problems of text in the drafting of different graphic products and in various media, – the development of skills in the selection and use of typographic elements, including ecological thinking, the use of graphic designing software and text layout for various media. He/She understands the historical gap in the possibilities of typographic solutions in the past and the present. Knows how to use an eye-tracking device to check legibility.
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Predvideni študijski rezultati:

Znanje in razumevanje: Pozna posamezne tipografske elemente in njihovo vplivnost na čitljivost besedila; pozna raznolikosti posredovanja informacij za različne grafične izdelke in v različnih medijih; zna uporabiti različne metode za preverjanje čitljivosti, vključno s tehnologijo za sledenje očesnim premikom; zna upoštevati tehnološke in oblikovne zahteve pri načrtovanju in oblikovanju pisav; zna pripraviti, obdelati in zapisati besedilo za različne medije. Razume pomen tehnološkega razvoja in njegovega vpliva na tipografsko oblikovanje; razume različne pojave oblike čitljivosti povezane s tehnološkim razvojem; razume vlogo vidnosti in čitljivosti v različnih grafičnih izdelkih in za različne medije, zna uporabljati napravo za sledenje očesnim premikom za preverjanje čitljivosti; razume pomen kakovostne priprave, obdelave in zapisa besedila za nadaljne grafične in/ali informacijske postopke; zna umestiti pretekle oblike tipografskega oblikovanja v sodobno oz. ga zna ovrednotiti, ker je praktično preveril na tipografsko-tiskarski delavnici v muzeju.

Intended learning outcomes:

Knowledge and understanding: Learns specific typographic elements and their influence on the legibility; learns diversity to provide information for a variety of graphic products and in various media; knows to use various methods for legibility, including eye-tracking technology; knows how to take account of technological and design requirements for the designing typefaces; knows how to prepare and process typography for different media. He/She understands the importance of technological development and its impact on the typographic design; understand the different forms of legibility related to technological development; understands the visibility and legibility of different graphic products and for various media, knows how to use an eye-tracking device to check legibility; understands the importance of quality in producing, processing and format text for further graphic and/or information procedures. He/She knows how to place the past forms of typographical design in modern times, that is knows how to evaluate and practically checked them at the typographic and printing workshop in the museum.

Metode poučevanja in učenja:

Predavanja, seminarsko delo, računalniške vaje, vodeno individualno delo, v študenta osredinjeno poučevanje.
Končna naloga pri vajah je v medpredmetni povezavi s Studijsko fotografijo.
Pri delu študenti dobijo gradivo na spletnih povezavah predmeta.
Predavanja, seminarji in vaje se lahko izvajajo v živo (predavalnica, računalniška učilnica) in/ali na daljavo z uporabo primerne programske opreme.

Learning and teaching methods:

Lectures, seminar work, computer exercises, guided individual work and the student-centered teaching. The final assignment in the exercises is in the cross-curricular connection with Studio photography. During work, students get material on the online links of the subject.
Lectures, seminars and exercises can be conducted in a classroom/a computer room and/or online using suitable software tools.

Načini ocenjevanja:

Način (pisni izpit, ustno izpraševanje, naloge, projekt): – ustni/pisni izpit (v

Delež/Weight

60,00 %

Assessment:

Type (examination, oral, coursework, project): – oral/written exam (in a classroom or online),

predavalnici ali na daljavo), Pozitivno: 6–10 (60–100 %) Negativno: 5 (0–59 %)		
– ocena znanja iz računalniških vaj, izdelki posameznih računalniških vaj in seminarske naloge	40,00 %	– the assessment of knowledge of computer tutorials, individual computer exercises and seminar work

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

Možina, K., Barva v tipografiji. V *Interdisciplinarnost barv*, 1. del., Maribor : Društvo koloristov Slovenije, str. 341–364, 2001.

Franken, G., Podlesek, A., Možina, K., Eye-tracking study of reading speed from LCD displays: influence of type style and type size, *Journal of eye movement research*, vol. 8, no. 1, str. 1–8, 2015.

Kovačević, D., Brozović, M., Možina, K. Improving visual search in instruction manuals using pictograms. *Ergonomics*, vol. 59, no. 11, str. 1405–1419, 2016.

Možina, K., Podlesek, A., Bračko, S. Preserving typographic cultural heritage using contemporary digital technology. *Journal of cultural heritage*, vol. 36, [No.] mar.–apr., str. 166–173, 2019.

Možina, K., Bračko, S., Kovačević, D., Blaznik, B., Možina, K. Legibility of prints on paper made from Japanese knotweed. *Bioresources*, vol. 15, no. 2, str. 3999–4015, 2020.

TISK 1

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Tisk 1
Course title:	Printing 1
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	1. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068075
Koda učne enote na članici/UL Member course code:	11277

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Deja Muck
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v program. Pogoj za opravljanje obveznosti je prisotnost na predavanjih, seminarjih in vajah. Zahtevana prisotnost na vajah je 100 %.	Enrolment in the programme. Attendance at lectures, seminars and tutorials is a prerequisite for fulfilling obligations. The attendance requirement for tutorials is 100%.

Vsebina:	Content (Syllabus outline):
Pregled, delitev in primerjava različnih konvencionalnih in digitalnih tehnologij tiska. Vrednotenje kakovosti tiska na osnovi denzitometričnih in spektrofotometričnih analiz. Tehnologija ofsetnega tiska, tiskarski stroji za tisk na pole: -konstrukcijske značilnosti sodobnih tiskarskih strojev -tiskovni členi, vlagalni, prenosni, obračalni in izlagalni sistemi -vlažilni in barvilni sistemi -sušenje odtisov Akcidenčne ofsetne rotacije: -konstrukcijske značilnosti sodobnih tiskarskih strojev -tiskovni členi, vlažilni in barvni sistemi -vlagalni in izlagalni sistemi -sušenje odtisov Oplemenitenje tiskovin: -premazovanje, lakiranje Dejavniki, ki vplivajo na kakovost ofsetnega tisa: -vrsta rastra -tiskarska barva	An overview, classification and comparison of various conventional and digital printing technologies. Evaluation of print quality on the basis of densitometric and spectrophotometric analysis. Printing machines for sheet-fed offset printing: - construction of modern printing machines - printing unit, feeder and delivery units, perfecting units - dampfening and color units - drying of prints Web-fed offset printing machines: - construction of modern printing machines - printing unit, dampfening and color systems - feeder and delivery systems - drying of prints Print finishes: -coating, varnishing Factors affecting the quality of offset printing: - type of halftone screening -ink and

in tiskovni material -gumijeva prevleka (napona) - vrsta tiskarskega stroja -tiskovna forma. Ozaveščanje pomembnosti integracije zelenih tehnologij z usmeritvijo na trajnostnem in ekološkem vidiku na področju grafičnih tehnologij.	printing material - offset blanket - type of printing machine - printing form. Raising awareness of the importance of integrating green technologies with a focus on sustainable and environmental aspects in the field of graphic technologies.
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Temeljna literatura in viri/Readings:

- KUZNETSOV, Y. V., Principles of Image Printing Technology, Springer, 2021.
- MAJNARIĆ I., Osnove digitalnog tiska, Manualia Universitatis studiorum Zagrabiensis, 2015.
- KUMAR, M. Tehnologija grafičnih procesov, Tretja, prenovljena in razširjena izdaja, Center RS za poklicno izobraževanje, Ljubljana, 2008.
- KIPPHAN, H. Handbook of Print Media : Technologies and Production Methods. Berlin [etc.] : Springer, 2001.
- AULL, M. Tehnologija tiska. Ljubljana : Tehniška založba Slovenije, 1997.
- MacPHEE, J. Fundamentals of Lithographic Printing, Pittsburgh : GATF Press, 1998.
- FIELD, G. Color and Its Reproduction. Pittsburgh : GATF Press, 1999.
- LEUTERT, A. Allgemeine Fachkunde der Drucktechnik. Baden : Baden Verlag, 1993.
- TESCHNER, H. Offsetdrucktechnik. Fellbach : Fachschriften Verlag, 1997.
- SCHLÄPFER, K. Farbmessung in der Reproduktionstechnik und im Mehrfarbendruck. St. Gallen : UGRA, 1993.
- LOOS, H. Farbmessung. Itzehoe : Verlag Beruf+Schule, 1989.

Dodatna literatura in viri:

- ZAPKA W., Handbook of Industrial Inkjet Printing, Wiley-VCH Verlag GmbH & Co. KGaA, 2018.
- Spletne strani proizvajalcev ofsetnih tiskarskih strojev (Heidelberg, MAN Roland, KBA, Komori, Müller-Martini ...), tiskovnih materialov (Sappi ...), tiskarskih barv (Flint Ink, Sun Chemical, Huber ...) in naprav za vodenje procesov (X-Rite, Techkon ...).
- Spletna stran The Print Guide, Gordon Pritchard.
- Standardi (SIST-ISO), specifikacije (Fogra, SystemBrunner, IFRA, SWOP, SNAP, GraCol, NAA ...).

Cilji in kompetence:

Poznavanje in razumevanje konvencionalnih in digitalnih tehnologij tiska. Poznavanje in razumevanje prednosti in pomanjkljivosti različnih tiskarskih tehnik in konstrukcijskih značilnosti tiskarskih strojev. Sposobnost povezovanja znanja z različnih področij in aplikacij na podlagi poznavanja tehnologij tiska in tehnologije oplemenitenja tiskovin. Ozaveščanje pomembnosti umeščanja zelenih tehnologij na področju tehnologij tiska in oplemenitenja tiskovin na tiskarskem stroju. Razumevanje in uporaba standardiziranih preskuševalnih metod za vodenje procesa tiska in določanju kakovosti odtisov.

Objectives and competences:

Knowledge and understanding of conventional and digital printing techniques. Knowledge and understanding of the advantages and disadvantages of various printing techniques and the design features of printing presses. Ability to combine knowledge from different fields and applications based on knowledge of printing technologies and techniques of print finishing. Awareness of the importance of using green technologies in the field of printing technologies and finishing of printed products on the press. Understanding and applying standardized test procedures to control the printing process and determine print quality.

Predvideni študijski rezultati:

Študentje bodo osvojili najnovejša znanja s področja vseh najpomembnejših tehnologij tiska in se seznanili s trajnostnimi ter ekološkimi vidiki. Pridobili bodo tudi praktična znanja s področja tiska. Spoznali bodo vzroke za nastanek napak in odpravo le teh. Na vajah študent spozna opremo za okolju prijaznejše oplemenitenje tiskovin.

Intended learning outcomes:

Students acquire the latest knowledge in all major printing technologies and learn about sustainable and ecological aspects. They also acquire practical knowledge in the field of printing. They learn the causes of errors and how to eliminate them. In the exercises, students learn about equipment for more environmentally friendly finishing of printed products.

Metode poučevanja in učenja:

Learning and teaching methods:

Predavanja, seminarji, laboratorijske vaje in / ali projektno delo potekajo v predavalnici, v laboratoriju in / ali preko spleta s pomočjo ustrezne opreme.	Lectures, seminars, laboratory exercises, and/or project work will take place in the lecture hall, in the laboratory, and/or online using appropriate equipment.
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Načini ocenjevanja:	Delež/Weight	Assessment:
Teoretični del, predavanja: pisni in/ali ustni izpit	60,00 %	Theoretical part, lectures: written and/or oral exam
Vaje	40,00 %	Tutorial

Ocenjevalna lestvica:	Grading system:
5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

Izvirni znanstveni članki / Original scientific article:

GREGOR-SVETEC, Diana, LESKOVŠEK, Mirjam, VRABIČ BRODNJAK, Urška, STANKOVIČ ELESINI, Urška, MUCK, Deja, URBAS, Raša. Characteristics of HDPE/cardboard dust 3D printable composite filaments. *Journal of materials processing technology*. February 2020, vol. 276, 9 str.

KAVČIČ, Urška, MRAOVIČ, Matija, BRAČKO, Sabina, MUCK, Deja. Printed thermochromic displays. *Coloration technology : the journal of the Society of Dyers and Colourists*. Feb. 2019, vol. 135, no. 1, str. 60-66.

AHTIK, Jure, MUCK, Deja, STAREŠINIČ, Marica. Detail diversity analysis of novel visual database for digital image evaluation. *Acta polytechnica Hungarica*. 2017, vol. 14, no. 6, str. 115-132.

KLANČNIK, Maja, RIJAVEC, Brigita, PIVAR, Matej, MUCK, Deja. Vpliv substrata in nanosa tiskarske barve na delovanje RFID-anten = Influence of printing material and printing ink layer on RFID antenna operation. *Tekstilec : glasilo slovenskih tekstilcev*. [Tiskana izd.]. 2018, vol. 61, no. 3, str. 162-170.

VRABIČ BRODNJAK, Urška, MUCK, Deja. Printing quality of chitosan-rice starch coated packaging paper. *Bulgarian chemical communications*. [Print ed.]. 2017, vol. 49, special iss. 1, str. 86-92.

Mentorstvo pri diplomskih delih / Supervisor for undergraduate theses:

BRCE, Jon. *Izdelava in uporaba 3D tiskane forme za slepi tisk : diplomsko delo = Design and production of travel journal : diploma thesis*. Ljubljana: [J. Brce], 2020. XII, 43 f., ilustr.

DJURIČ, Aleš. *Izdelava nalepk in magnetov s termokromnimi barvami : diplomsko delo = Printing of stickers and magnets using thermochromic colors : diploma thesis*. Ljubljana: [A. Djurič], 2020. IX, 37 str., ilustr.

ROŠER, Anja. *Izdelava pripomočka za prepoznavanje in učenje barv slabovidnih otrok : diplomsko delo = Development of accessory for easier learning and recognition of colours for visually impaired children : diploma thesis*. Ljubljana: [A. Rošer], 2020. XI, 31 f., ilustr.

ŽIŽEK, Mojca. *Reliefna reprodukcija umetniškega dela : diplomsko delo = Relief reproduction of an artwork : diploma thesis*. Ljubljana: [M. Žižek], 2020. XIII, 59 f., ilustr.

KOBAL, Ivana. *Tisk na tekstil z uporabo funkcionalnih barv : diplomsko delo = Printing on textile with functional inks : diploma thesis*. Ljubljana: [I. Kobal], 2020. VIII, 33 f., ilustr.

TISK 2

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Tisk 2
Course title:	Printing 2
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik, 3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068048
Koda učne enote na članici/UL Member course code:	10270

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Deja Muck
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Vpis v program. Pogoj za opravljanje obveznosti je prisotnost na predavanjih, seminarjih in vajah. Zahtevana prisotnost na vajah je 100 %.

Prerequisites:

Enrolment in the programme. Attendance at lectures, seminars and tutorials is a prerequisite for fulfilling obligations. The attendance requirement for tutorials is 100%.

Vsebina:

Pregled trendov na področju tiskarskih tehnologij. Poglobljeno spoznavanje tehnologij, ki so na trgu grafične industrije najmočnejše zastopane in so v porastu. Konvencionalne tehnologije: flekso tisk, sitotisk, tampotisk. Digitalne tehnologije tiska: kapljični tisk, elektrofotografija, termografija. Hibridne tehnologije tiska – kombinacije konvencionalnih in digitalnih tehnologij. Vplivi različnih dejavnikov na kakovost tiska v flekso tisku, sitotisku, tampotisku oz. v elektrofotografiji in kapljičnem tisku. Pregled področij funkcionalnega, industrijskega tiska in tiska elektronike. Ozaveščanje pomembnosti integracije zelenih tehnologij z

Content (Syllabus outline):

Overview of trends in printing technologies. In-depth knowledge of the technologies that are most prevalent and on the rise in the graphic arts market. Conventional technologies: Flexographic printing, screen printing, pad printing. Digital printing technologies: Ink jet printing, electrophotography, thermography. Hybrid printing technologies - combinations of conventional and digital processes. The effects of various factors on print quality in flexographic printing, screen printing, pad printing or electrophotography and ink jet printing. An overview of the fields of functional, industrial printing and printing electronics. Raising awareness of the importance of integrating green technologies with a

usmeritvijo na trajnostnem in ekološkem vidiku na področju grafičnih tehnologij.	focus on sustainable and ecological aspects in the field of graphic technologies.
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Temeljna literatura in viri/Readings:

- KUZNETSOV, Y. V., Principles of Image Printing Technology, Springer, 2021.
- ZAPKA W., Handbook of Industrial Inkjet Printing, Wiley-VCH Verlag GmbH & Co. KGaA, 2018.
- MAJNARIĆ I., Osnove digitalnog tiska, Manualia Universitatis studiorum Zagrabensis, 2015.
- KUMAR, M. Tehnologija grafičnih procesov, Tretja, prenovljena in razširjena izdaja, Center RS za poklicno izobraževanje, Ljubljana, 2008.
- HIRD, K., F., FINLEY, C., E., Offset Lithographic Technology, fourth edition, 2009
- KIPPAN, H. Handbook of Print Media. Berlin [etc.] : Springer, 2001.
- SUGUMAR, C. The Technique of Screen Printing, Published by C. Sugumar, Kandy, Sri Lanka, 2011.
- ROSEN, M., OHTA, N. Color Desktop printer Technology, Taylor&Francis, CRC Press, 2006.
- Flexography : Principles and Practices. Ronkonkoma : Foundation of Flexographic Technical Association, 1997.
- GIORGIANNI, E. J., in MADDEN, T. E. Digital Color Management : Encoding Solutions. Reading : Addison-Wesley, 1998.
- BRTESS, S. Postscriptum on Color Management. LOGO, 1999.
- HOFF, S. Screen Printing : Contemporary Approach. Albany [etc.] : Delmar Publishers, 1997.
- Handbook for Screen Printers. Thal : SEFAR, 1999.

Dodatna literatura in viri:

- ZAPKA W., Handbook of Industrial Inkjet Printing, Wiley-VCH Verlag GmbH & Co. KGaA, 2018.
- ABBOTT, S., How to be a great Screen printer, MacDermid Autotype Ltd, 2008.
- Spletne strani proizvajalcev ofsetnih tiskarskih strojev (Heidelberg, MAN Roland, KBA, Komori, Müller-Martini ...), tiskovnih materialov (Sappi ...), tiskarskih barv (Flint Ink, Sun Chemical, Huber ...) in naprav za vodenje procesov (X-Rite, Techkon ...).
- Spletna stran The Print Guide, Gordon Pritchard.
- Standardi (SIST-ISO), specifikacije (Fogra, SystemBrunner, IFRA, SWOP, SNAP, GraCol, NAA ...).

Cilji in kompetence:

Študenti nadgradijo svoje znanje na področju poznavanja perspektivnih konvencionalnih, digitalnih in hibridnih tehnologij tiska. Seznanijo se z vplivi različnih dejavnikov na kakovost tiska pri vseh navedenih tehnologijah. Spoznajo tudi področje funkcionalnega, industrijskega tiska in tiska elektronike. Ozaveščajo pomembnost umeščanja zelenih tehnologij na področju tehnologij tiska in uporabo le teh na najrazličnejših področjih.

Objectives and competences:

Students expand their knowledge in the field of perspective conventional, digital and hybrid printing technologies. They learn about the influence of various factors on print quality for all the mentioned technologies. They also learn about the field of functional, industrial and electronic printing. They become aware of the importance of placing green technologies in the field of printing technologies and using only them in various fields.

Predvideni študijski rezultati:

Znanje in razumevanje: poglobljeno poznavanje najpomembnejših konvencionalnih, digitalnih in hibridnih tehnologij tiska. Poznavanje najpomembnejših dejavnikov, ki vplivajo na končno kakovost odtisov pri različnih tehnologijah tiska. Seznanitev s trajnostnimi ter ekološkimi vidiki v najširšem segmentu aplikacij (funkcionalni tisk, industrijski tisk, tisk elektronike). Na vajah študent spozna opremo za povezovanje konvencionalnih tehnologij z digitalnih tehnologijami tiska s poudarkom na ekološkem vidiku.

Intended learning outcomes:

Knowledge and understanding: in-depth knowledge of the main conventional, digital and hybrid printing technologies. Knowledge of the main factors affecting the final quality of prints in the different printing technologies. Familiarity with sustainable and environmental aspects in a wide range of applications (functional printing, industrial printing, printing electronic). In the exercises, the student will learn the equipment for combining conventional technologies with digital printing technologies, focusing on the ecological aspect.

Metode poučevanja in učenja:

Learning and teaching methods:

Predavanja, seminar, laboratorijske vaje, projektno delo potekajo v predavalnici ali laboratoriju in / ali preko spleta s pomočjo ustrezne opreme.	Lectures, seminars, laboratory exercises, project work take place in a lecture hall or laboratory and/or online using appropriate equipment.
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Načini ocenjevanja:	Delež/Weight	Assessment:
Teoretični del, predavanja: pisni in / ali ustni izpit	50,00 %	Theoretical part, lectures: written and / or oral exam
Seminarska naloga in / ali poročilo o projektne delu	20,00 %	Seminar and / or report of project work
Vaje	30,00 %	Tutorial

Ocenjevalna lestvica:	Grading system:
5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

Izvirni znanstveni članki / Original scientific article:

GREGOR-SVETEC, Diana, LESKOVŠEK, Mirjam, VRABIČ BRODNJAK, Urška, STANKOVIČ ELESINI, Urška, MUCK, Deja, URBAS, Raša. Characteristics of HDPE/cardboard dust 3D printable composite filaments. *Journal of materials processing technology*. February 2020, vol. 276, 9 str.

KAVČIČ, Urška, MRAOVIČ, Matija, BRAČKO, Sabina, MUCK, Deja. Printed thermochromic displays. *Coloration technology : the journal of the Society of Dyers and Colourists*. Feb. 2019, vol. 135, no. 1, str. 60-66.

AHTIK, Jure, MUCK, Deja, STAREŠINIČ, Marica. Detail diversity analysis of novel visual database for digital image evaluation. *Acta polytechnica Hungarica*. 2017, vol. 14, no. 6, str. 115-132.

KLANČNIK, Maja, RIJAVEC, Brigita, PIVAR, Matej, MUCK, Deja. Vpliv substrata in nanosa tiskarske barve na delovanje RFID-anten = Influence of printing material and printing ink layer on RFID antenna operation. *Tekstilac : glasilo slovenskih tekstilcev*. [Tiskana izd.]. 2018, vol. 61, no. 3, str. 162-170.

VRABIČ BRODNJAK, Urška, MUCK, Deja. Printing quality of chitosan-rice starch coated packaging paper. *Bulgarian chemical communications*. [Print ed.]. 2017, vol. 49, special iss. 1, str. 86-92.

Mentorstvo pri diplomskih delih / Supervisor for undergraduate theses:

BRCE, Jon. *Izdelava in uporaba 3D tiskane forme za slepi tisk : diplomsko delo = Design and production of travel journal : diploma thesis*. Ljubljana: [J. Brce], 2020. XII, 43 f., ilustr.

DJURIČ, Aleš. *Izdelava nalepk in magnetov s termokromnimi barvami : diplomsko delo = Printing of stickers and magnets using thermochromic colors : diploma thesis*. Ljubljana: [A. Djurič], 2020. IX, 37 str., ilustr.

ROŠER, Anja. *Izdelava pripomočka za prepoznavanje in učenje barv slabovidnih otrok : diplomsko delo = Development of accessory for easier learning and recognition of colours for visually impaired children : diploma thesis*. Ljubljana: [A. Rošer], 2020. XI, 31 f., ilustr.

ŽIŽEK, Mojca. *Reliefna reprodukcija umetniškega dela : diplomsko delo = Relief reproduction of an artwork : diploma thesis*. Ljubljana: [M. Žižek], 2020. XIII, 59 f., ilustr.

KOBAL, Ivana. *Tisk na tekstil z uporabo funkcionalnih barv : diplomsko delo = Printing on textile with functional inks : diploma thesis*. Ljubljana: [I. Kobal], 2020. VIII, 33 f., ilustr.

TISKOVNE FORME

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Tiskovne forme
Course title:	Printing plates
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068049
Koda učne enote na članici/UL Member course code:	10950

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	15	0	0	60	4

Nosilec predmeta/Lecturer:	Maja Klančnik
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Vpis v letnik študija. Pogoj za opravljanje študijskih obveznosti je prisotnost pri predavanjih, seminarju in vajah. Zahtevana prisotnost na vajah je 100 %. Za pristop k izpitu je pogoj opravljen seminar in kolokvij iz laboratorijskih vaj.	Enrolment into the study year. Prerequisite to complete study obligations is participation at lectures, seminar and tutorials. Requested presence at tutorials is 100 %. Student can attend the exam after passing the tutorials and the seminar.

Vsebina:	Content (Syllabus outline):
iskarska plošča, tiskovna forma: funkcija, sestava, materiali. Osnovne razlike tiskovnih form v posameznih klasičnih tehnikah tiska. Fotokemični in mehanski postopki pri izdelavi tiskovne forme. Pozitivni in negativni kopirni postopek. Klasična in digitalna izdelava tiskovne forme. Upodobljevalne enote. Digitalna izdelava tiskovne forme izven (iz računalnika na tiskarsko ploščo) in v tiskarskem stroju (iz računalnika na tiskarski stroj/direktno upodobljanje). Struktura tiskarskih plošč in tehnologije izdelave tiskovne forme za mokri in suhi ofsetni (ploski) tisk. Struktura tiskarskih plošč in tehnologije izdelave tiskovne forme za fleksotisk.	Printing plates, printing master: function, composition, materials. Basic differences of printing masters in the classical printing techniques. Photochemical and mechanical procedures in the platemaking process. Positive and negative copying procedure. Analog and digital platemaking. Plate imagesetters. Digital platemaking outside (Computer to Plate) and inside the printing presses (Computer to Press/ Direct Imaging). Composition of printing plates and technologies of platemaking for wet offset and waterless offset printing. Composition of printing plates and technologies of platemaking for flexographic printing. Composition of printing plates

Struktura tiskarskih plošč in tehnologije izdelave tiskovne forme za knjigotisk. Sita in tehnologije izdelave tiskovne forme (šablone) za sito tisk Struktura gravurnih valjev in tehnologije izdelave tiskovne forme za globoki tisk. Struktura tiskarske plošč in tehnologije izdelave tiskovne forme za tampotisk. Okolju prijaznejše tiskarske plošče v posameznih tehnikah tiska.	and technologies of platemaking for letterpress printing. Screens and technologies of platemaking for screen printing. Composition of gravure cylinders and technologies of platemaking for gravure printing. Composition of printing plates and technologies of platemaking for pad transfer printing. Environmentally friendly printing plates in the individual printing techniques.
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Temeljna literatura in viri/Readings:

-Klančnik, Maja. *Tiskovne forme : študijsko gradivo*. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, grafiko in oblikovanje, 2021. 1 zv. (loč. pag.), ilustr. [COBISS.SI-ID [73356547](#)], - Kipphan, H. Handbook of Print Media, Technologies and Production Methods. Verlag; Berlin; Heidelberg; New York : Springer, 2001. - Eldred, N. R. Chemistry for the Graphic Arts. 3rd edition. Pittsburg : GattfPress, 2001. - Thomson, B. Printing Materials: Science and Technology. Letherhead : Pira Int., 1998. - Crouch, J. P. Flexography Primer. 2nd edition. Pittsburg : GattfPress, 2000. - Flexo Printing Technology. Edited by K. H. Meyer. 4th edition. St. Galen : Coating Books for specialists, 2000. - Hudoklin, V., in Appolonio, Z. Sitotisk, Ljubljana : ČGP Delo, 1978.

Cilji in kompetence:

Študent se podrobno seznani z vrstami tiskarskih plošč za različne tehnike tiska. Spozna klasične in digitalne tehnološke postopke izdelave različnih tiskovnih form, pomembnost uporabe okolju prijaznejših tiskarskih plošč in se nauči izdelati tiskovne forme najbolj zastopanih tehnik tiska. Seznani se s kemijskimi reakcijami in fizikalno kemijskimi spremembami, ki se dogajajo v posameznih fazah. izdelave tiskovne forme. Kompetence: - poznavanje in razumevanje osnov ter razvoja tiskarskih plošč in tehnologij izdelave tiskovnih form za različne tehnike tiska, - sposobnost razlikovanje med različnimi vrstami tiskarskih plošč, postopki izdelave tiskovne forme in tehnikami tiska, - sposobnost uvajanja in vodenja tehnologije izdelave tiskovnih form, - sposobnost uporabe teoretičnega znanja in ugotovitev za kritično analiziranje in reševanje konkretnih delovnih problemov, - poznavanje strokovne terminologije, - sposobnost umeščanja novih znanj in informacij v kontekst grafične stroke in okoljevarstva.

Objectives and competences:

The students are precisely introduced to different types of printing plates for different printing techniques. They get knowledge about analogue and digital technological procedures of platemaking of different printing masters, the importance of using more environmentally friendly printing plates and how to make printing master for the most often printing techniques. They are introduced with chemical and physical-chemical changes in the individual phases of platemaking. Competences: - knowing and understanding the bases and development of printing plates and technologies of platemaking for different printing techniques, - ability to distinguish between different types of printing plates, procedures of platemaking and printing techniques, - ability to introduce and lead the technology of platemaking, - ability to use of theoretical knowledge and findings for critical analyses and solving working problems, - knowing the professional terminology, - ability to apply newly gained knowledge and information into graphic professional field and environmental protection.

Predvideni študijski rezultati:

Poznavanje strukture različnih tiskarskih plošč. Razumevanje razlike med tiskovnimi formami za različne tehnike tiska. Razumevanje principa pozitivnega in negativnega postopka izdelave tiskovne forme. Razumevanje fotokemičnih in fizikalnih procesov izdelave. Razumevanje klasičnega in digitalnega postopka upodabljanja tiskarskih plošč. Poznavanje digitalnih osvetljevalnih (upodobljevalnih) enot. Poznavanje in razumevanje različnih tehnologij, kemijskih reakcij in fizikalno kemijskih sprememb v posameznih fazah izdelave tiskovnih form. Poznavanje stanja izdelave tiskovne

Intended learning outcomes:

Knowing the composition of different printing plates. Understanding the differences between printing masters for different printing techniques. Understanding the principle of positive and negative procedure of platemaking. Understanding the photochemical and physical processes of platemaking. Understanding the classical and digital procedures of imaging of printing plates. Knowing the plate imagesetters. Knowing and understanding the different technologies, chemical reactions, physical-chemical changes in the particular phases of platemaking. Knowing the state of platemaking at

forme doma in v svetu ter pomembnosti okoljevarstva. Na vajah študent spozna opremo za izdelavo tiskovnih form in preverjanje njihove kakovosti, vključno s tiskanjem.	home and in the world and the importance of environmental protection. At tutorials the student learns about equipment for platemaking and quality control, including printing.
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Metode poučevanja in učenja:

Predavanja, seminar, laboratorijske vaje, ki potekajo v predavalnici oziroma v laboratoriju in/ali preko spleta s pomočjo ustrezne računalniške opreme.

Learning and teaching methods:

Lectures, seminar, tutorials, that take place in a classroom or in a laboratory and/or online using appropriate computer equipment.

Načini ocenjevanja:
Delež/Weight
Assessment:

vaje	20,00 %	Tutorial
seminarska naloga	10,00 %	Seminar
pisni/ustni izpit	70,00 %	Written/Oral exam
Ocena: pozitivno: 6-10, negativno: 1-5.		Positive: 6–10; Negative: 1–5.

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

1. **KLANČNIK, Maja.** Printing with natural dye extracted from *Impatiens glandulifera* Royle. *Coatings*. 13 April 2021, vol. 11, iss. 4, str. 1-12, ilustr. ISSN 2079-6412.
2. **KLANČNIK, Maja.** Screen printing with natural dye extract from Japanese knotweed rhizome. *Fibers and polymers*. 19 May 2021, vol. , no. , 9 str. ISSN 1229-9197.
3. JEREB, Ana, JAVORŠEK, Dejana, **KLANČNIK, Maja.** Comparison of two thermal decomposition offset printing plates. *Acta graphica*, ISSN 0353-4707. [Print ed.], 2014, vol. 25, no. 3/4, str. 91-100, ilustr.
4. **KLANČNIK, Maja,** RIJAVEC, Brigita, PIVAR, Matej, MUCK, Deja. Vpliv substrata in nanosa tiskarske barve na delovanje RFID-anten = Influence of printing material and printing ink layer on RFID antenna operation. *Tekstilac*, ISSN 0351-3386, 2018, vol. 61, no. 3, str. 162-170.

TRENDI PRI RAZVOJU EMBALAŽE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Trendi pri razvoju embalaže
Course title:	Trends in packaging development
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni
Grafične in interaktivne komunikacije, prva stopnja, univerzitetni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code: 0644019

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer: Diana Gregor Svetec

Vrsta predmeta/Course type: Izbirni/Elective

Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Vpis v letnik študija. Pogoj za vpis je opravljen predmet Embalažni materiali in tehnologija. Pogoj za opravljanje študijskih obveznosti je prisotnost pri predavanjih, seminarju in vajah. Zahtevana prisotnost na vajah in pri drugih oblikah dela je 100 %, pri seminarjih 80 % in predavanjih 50 %.

Prerequisites:

Enrolment into the year of study. The requirement for enrollment is a passed course Packaging Materials and Technology. Prerequisites for performing study obligations is presence at lectures, seminar and tutorials. Requested presence at tutorials and other forms of tutorials is 100 %, at seminar 80 % and lectures 50 %.

Vsebina:

Predavanja: Novosti in trendi na področju embalaže; embalaža z dodano vrednostjo, trajnostna embalaža, zakonodaja, predpisi in sistemi ravnanja z embalažo; Predstavitev naprednih embalaž: jedilna, samogrelna, samoohlajevalna, embalaža posebnih oblik, z zaščito pred ponarejanjem, večfunkcionalna, aktivna, inteligentna, interaktivna in druge vrste napredne embalaže; embalaža prilagojena različnim starostnim skupinam in osebam s posebnimi potrebami.

Content (Syllabus outline):

Lectures: News and trends in packaging field; packaging with added value, sustainable packaging, legislation and systems for packaging management. Introduction to advanced packaging: edible, self-heating, self-cooling, packaging with special shapes and functions, with anti-counterfeit function, active, intelligent, interactive and other kind of advanced packaging; Packaging suited for different age groups and for people with special needs. Introduction to

Seznanitev s trajnostno embalažo: vpliv embalaže na okolje, recikliranje, biorazgradnja, ekološko oblikovanje embalaže in krožno gospodarjenje. Seminar: raziskovalna seminarska naloga. Druge oblike študija: pregled literature in predstavitev novosti. Vaje: načrtovanje in izdelava embalaže z dodano vrednostjo.	sustainable packaging: the influence of packaging on environment, recycling, biodegradation, eco-design and circular economy. Seminar: research seminar work. Other forms of study: literature overview and presentation of novelties. Tutorial: design and manufacturing of packaging with added value.
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Temeljna literatura in viri/Readings:

- Debeaufort, F., Galić, K., Kurek, M., Benbettaieb, N., Ščetar, M. Packaging Materials and Processing for Foods, Pharmaceuticals and Cosmetics, London, Hoboken, ISTE and Wiley, 2021
 - Cerqueira, M.A., Lagaron, J.M., Castro, L.M.P., Vicente A.A. Nanomaterials for Food Packaging: Materials, Processing Technologies and Safety Issues, Amsterdam, Elsevier, 2018
 - Kerry, J., Butler, P. Smart packaging technologies for fast moving consumer goods. Chichester, Wiley, 2008
 - Han, H. J. Innovations in food packaging, London, Academic Press, 2014
- Literatura je dostopna v knjižnici NTF-Oddelka za tekstilstvo, grafiko in oblikovanje. Literature is available in the library NTF-Department of Textiles, Graphic Arts and Design.
- DODATNA LITERATURA**
- E-Revije in e-knjige iz podatkovnih zbirk univerze / e-journals and e-books from university databases

Cilji in kompetence:

Študenti spoznajo embalažo z dodano vrednostjo, napredno embalažo in trende pri razvoju embalaže ter nove smernice kot so trajnostni razvoj, krožno gospodarjenje in ekološko oblikovanje. Dobijo pregled zakonodaje, predpisov, specifikacij, testnih metod za določene vrste embalaž.

Predmetnospecifične kompetence:

- poznavanje in razumevanje dejavnikov, ki podajo embalaži dodano vrednost,
- poznavanje in razumevanje posebnih zahtev za določene vrste embalaže,
- obvladovanje postopka načrtovanja pametne embalaže,
- obvladovanje postopka načrtovanja trajnostne embalaže,
- uporaba informacijsko-komunikacijske tehnologije pri načrtovanju napredne embalaže, posredovanju in obdelavi podatkov ter zasledovanju novosti,
- sposobnost umeščanja novih informacij in spoznanj v kontekstu razvoja novih izdelkov.

Objectives and competences:

Students get to know packaging with added value, advanced packaging and trends in packaging development, new directions such as sustainability, circular economy and eco-design. They get overview of the legislation, regulations, specifications, test methods for certain types of packaging.

Competences:

- knowledge and understanding of factors, which give packaging added value,
- knowledge and understanding of the specific requirements for certain types of packaging,
- managing of design process of smart packaging,
- managing of eco-design process of sustainable packaging,
- use of information-communication technology at packaging development, data evaluation and following innovations,
- ability to include new information and knowledge in the context of the development of new products.

Predvideni študijski rezultati:

Znanje in razumevanje: študent pozna različne vrste napredne embalaže, trende in novosti pri razvoju embalaže. Pozna in razume postopek načrtovanja pametne embalaže. Pozna pomen trajnostnega razvoja na področju embalaže in razume postopek ekološkega oblikovanja embalaže. Pozna predpise in zahteve za določene vrste embalaže. Teoretična podlaga mu pomaga prenesti znanje v delovni proces pri izdelavi napredne embalaže in izdelavi trajnostne embalaže.

Intended learning outcomes:

Knowledge and understanding: student knows various types of advanced packaging, trends and news at packaging development. Knows and understands the design process of smart packaging. Knows the meaning of sustainability in the field of packaging and understands the process of eco-design of packaging. Knows the regulations and requirements for a particular type of packaging. Theoretical basis helps him to implement the knowledge into the working process at advance packaging manufacturing and manufacturing of sustainable packaging.

Metode poučevanja in učenja:

- Klasična in interaktivna predavanja, poučevanje z uporabo IKT tehnologije,
 - projektno delo, diskusije, interpretacije, skupinsko delo,
 - samostojno analitično pisno delo s predstavitvijo in individualno delo pri vajah.
 Vse oblike (predavanja/seminar/vaje) se lahko izvajajo v živo v učilnicah ali preko spleta (online) v spletnih učilnicah, z uporabo specifičnih orodij ter ustrezne programske opreme.

Learning and teaching methods:

- Classic and interactive lectures, teaching using IKT technology,
 - project work in groups, discussions, interpretation, group work,
 - independent analytical written work with presentation and individual work at tutorials.
 All forms (lectures/seminar/tutorials) can be conducted live in classrooms or online in online classrooms, using specific tools and suitable software.

Načini ocenjevanja:**Delež/Weight****Assessment:**

Ustni ali pisni izpit ali izpitna naloga. Poteka lahko v predavalnici ali na daljavo.	40,00 %	Oral or written exam or exam assignement. Performed in classroom or on-line.
Seminar	20,00 %	Seminar
Druge oblike študija	10,00 %	Other forms of study
Vaje	30,00 %	Practical exercises

Ocenjevalna lestvica:**Grading system:**

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10
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Reference nosilca/Lecturer's references:

- ŽURBI, Tina, GREGOR-SVETEC, Diana. NFC tag awareness and its visual implementation on food packaging: case study in Slovenia. *Applied sciences*. October 2024, vol. 14, iss. 21, [article no.] 9933, str. 1-14.
- POGAČAR, Andreja, BOLANČA MIRKOVIĆ, Ivana, GREGOR-SVETEC, Diana. Print durability and recyclability of label paper equipped with printed RFID antenna. *Sustainability*. 2024, vol. 16, iss. 1, str. 1-16.
- ŽURBI, Tina, GREGOR-SVETEC, Diana. Use of QR code in dairy sector in Slovenia. *SAGE open*. April-June 2023, vol. 13, iss. 2, str. 1-16.
- GREGOR-SVETEC, Diana. Intelligent packaging. V: CERQUEIRA, Miguel Ângelo Parente Ribeiro (ur.), et al. *Nanomaterials for food packaging : materials, processing technologies and safety issues*. Amsterdam: Elsevier, 2018. Str. 203-247. Micro & nano technologies series..
- GREGOR-SVETEC, Diana, RAVNJAK, David. Različni sistemi aktivne in pametne embalaže za živila. V: VOLFAND, Jože (ur.), AMBROŽ, Goran. *Razvoj embalaže v krožnem gospodarstvu : priročnik*. Celje: Fit media, 2019. Str. 87-93, Zbirka Zelena Slovenija.
- GREGOR-SVETEC, Diana. Reciklabilnost papirne in kartonske embalaže ter postopki recikliranja. V: VOLFAND, Jože (ur.), AMBROŽ, Goran. *Razvoj embalaže v krožnem gospodarstvu : priročnik*. Celje: Fit media, 2019. Str. 144-150.

UVOD V GRAFIČNE MEDIJE

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Uvod v grafične medije
Course title:	Introduction to graphic media
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	1. letnik	1. semester	obvezni

Univerzitetna koda predmeta/University course code:	0068076
Koda učne enote na članici/UL Member course code:	10275

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Raša Urbas
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Vrsta predmeta/Course type:	Obvezni / Compulsory
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Pogoj za vključitev v delo je vpis v letnik študija in izbira predmeta ter aktivna udeležba na vseh segmentih predmeta.
Izdelana seminarska naloga z zagovorom ter pozitivno opravljene vaje so pogoj za pristop k končnemu izpitu.
Pogojena prisotnost pri posameznih učnih enotah:

- predavanja: 70 %
- vaje 100 % in
- seminar: 80 %.

Prerequisites:

The prerequisite for inclusion present enrollment in the study year and selection of the subject as well as active participation in all segments of the course.
Finished seminar work with presentation and positively performed tutorials are a condition for the final exam.
Conditional attendance for individual course units:

- lectures: 70%,
- practicum (tutorials) 100 % and
- seminar: 80%.

Vsebina:

Vsebina predmeta obsega sledeča področja: vloge komuniciranja v sodobni družbi; osnove vizualnega, zvočnega in kombiniranega komuniciranja; interaktivnost in večpredstavnost v komuniciranju; vrste komunikacijskih kanalov in sistemov za vnos; digitalizacija; modulacija in upodabljanje reprodukcij; komunikacijske tehnologije; klasična in digitalna fotografija; video; vrste in načini skeniranja; izdelava

Content (Syllabus outline):

The lectures include following areas: the role of communication in modern society; basics of visual, audio and combined communication; interactivity and multimedia in communication; types of communication channels and entry systems; digitization; modulation and rendering reproductions; communication technologies; classic and photography; video; types and methods of scanning;

tiskovnih form; konvencionalne in digitalne tiskarske tehnike; grafična dodelava; lokalna omrežja; internet; mobilna telefonija; trendi razvoja komunikacijskih tehnologij. Projektno delo obsega predstavitev in primerjavo različnih komunikacijskih tehnologij. Seminarско delo obsega poglobljeno predstavitev dela snovi. Vaje obsegajo osnove konvencionalne (črno-bela negativ pozitiv tehnologija) in digitalne fotografske tehnologije, skeniranja, vnosa in obdelave teksta (OCR, konverzije, korektura), prelom strani (tekst in slika), digitalni tisk (rastriranje, RIP), osvetljevanje filmov, izdelava montaže (konvencionalno), izdelava tiskovne forme, tiskanje (enobarvno, ofsetni tisk), osnove komuniciranja z naročnikom (barvni vzorčniki, karte, tipografski merski sistem, korekturna znamenja), izdelava spletne strani, postavitev spletne strani na strežnik.

production of printing forms; conventional and digital printing techniques; graphic finishing; LANs; internet; mobile telephony; trends in communication technologies. Project work includes presentation and comparison of different communication technologies. Seminar includes an in-depth presentation of lectures topics. Tutorials include basics of conventional (black-and-white negative positive technology) and digital photography technology, scanning, entry and processing of text (OCR, conversion, correction), page break (text and images), digital printing (rasterization, RIP), lighting of films, imposition (conventional), production of printing forms, printing (monochrome, offset printing), basics of communication with the customer (color sampler, maps, typographic measurement system, corrective signs), making website, setting up a website on a server.

Temeljna literatura in viri/Readings:

KIPPHAN, H. Handbook of Print Media. Berlin [etc.] : Springer, 2001.
 NOVAK, G. Grafični materiali. Ljubljana: Naravoslovnotehniška fakulteta, Oddelek za tekstilstvo, 2004, 324 str.
 KUMAR, M. Tehnologija grafičnih procesov. 3. izdaja, Ljubljana: Center RS za poklicno izobraževanje, 2008, 480 str.
 Revije Grafičar in JGED.
 Možina K. Tipografska kunšt: upodobitev informacij. Ljubljana: Naravoslovnotehniška fakulteta, 2023

Cilji in kompetence:

Študenti spoznajo vlogo grafičnih in interaktivnih medijev v sodobni družbi, temelje vizualnega, zvočnega in kombiniranega komuniciranja; seznani se s komunikacijskimi kanali in osnovami komunikacijskih tehnologij, seznani se z vnosom informacij oz. podatkov v komunikacijski sistem, digitalizacijo in modulacijo podatkov, upodabljanjem na izhodnih napravah, prenosom reprodukcij končnemu uporabniku, problemi izmenjave, razširjanja in shranjevanja informacij v različnih medijih; seznani se z osnovami tehnologij, ki se uporabljajo v grafičnih (konvencionalna in digitalna fotografija, skeniranje, video, vnos in obdelava tekstovnih informacij izdelava tiskovne forme, konvencionalne in digitalne tehnike tiska, dodelava) in interaktivnih medijih (interaktivno komuniciranje človek – stroj, večpredstavnost, lokalna omrežja, internet, mobilna telefonija). Predmetno specifične kompetence so: poznavanje in razumevanje temeljev, razvoja in pomena komuniciranja in komunikacijskih tehnologij, poznavanje in razumevanje vizualnega, zvočnega in kombiniranega komuniciranja, procesa vnosa, obdelave in upodabljanja informacij ter značilnosti interaktivnega komuniciranja, sposobnost prepoznavanja prednosti in pomanjkljivosti različnih načinov komuniciranja in komunikacijskih tehnologij, sposobnost povezovanja znanja z različnih področij in aplikacij na podlagi poznavanja zahtev in

Objectives and competences:

Students get familiar with the role of graphic and interactive media in contemporary society, the foundations of visual, audio and combined communication; they familiarize themselves with the basics of communication channels and communication technologies, get acquainted with entering information or. data communication system, digitization and modulation data, rendering on output devices transfer reproductions of end user problems exchanges, dissemination and storage of information in various media; get acquainted with the basics of technologies that are used in the graphic (conventional and digital photography, scanning, video recording and processing of textual information, printing form production, conventional and digital printing techniques, finishing), interactive media (interactive communication man - machine Multimedia , local area networks, the Internet, mobile telephony). Subject-specific competencies are: knowledge and understanding of the foundations of development and the importance of communication and communication technologies, knowledge and understanding of visual, audio and combined communication process input, processing and rendering of information and interactive communication features, the ability to identify the strengths and weaknesses of different methods of communication and communication technologies, the

problemov pri komuniciranju in uporabi različnih grafičnih in interaktivnih komunikacijskih tehnologij, razumevanje splošne strukture grafične stroke ter povezanosti med njenimi poddisciplinami, sposobnost umeščanja novih informacij in interpretacij v kontekst temeljne grafične stroke, razumevanje in uporaba metod kritične analize in razvoja teorij na področju grafičnih in interaktivnih tehnologij, razvoj veščin in spretnosti pri razvoju grafičnih in interaktivnih komunikacijskih tehnologij.

ability to integrate knowledge from different fields and applications based on knowledge of the requirements and problems in communicating and using various graphic and interactive communication technologies; understanding the general structure of the graphic profession and the connection between its sub-disciplines, ability to place new information and interpretation in the context of basic graphic profession, understanding and application of methods of critical analyzes and development of theories in the field of graphics and interactive technologies, development of skills and expertise in the development of graphic and interactive communication technologies.

Predvideni študijski rezultati:

Študent je sposoben poznati in razumeti pomen komuniciranja ter osnove grafične in interaktivne komunikacijske tehnologije, proces vnosa, digitalizacije, modularanja in upodabljanja informacij, pomen in osnove tehnologije interaktivnega komuniciranja, osnove konvencionalne in digitalne fotografije, skeniranja, videa, izdelave tiskovnih form, konvencionalne in digitalne tehnike tiska, grafične dodelave, pojme povezane s komunikacijskimi tehnologijami, strokovno terminologijo s področja grafične in interaktivne komunikacijske tehnologije, vlogo komuniciranja v sodobni družbi, prednosti in pomanjkljivosti različnih načinov komuniciranja. Cilj rabe IKT opreme in sodobnega pristopa poučevanja je doseganje boljšega razumevanja in znanja vsebine teoretičnega in praktičnega dela predmeta ter hkrati zagotavljanje trajnostnega znanja rabe in pomena IKT tehnologij v učnem procesu in praktični rabi v postopkih grafične tehnologije in oblikovanja. Študent bo s pridobljenim znanjem znal interdisciplinarno povezovati osvojene vsebine z drugimi predmeti.

Intended learning outcomes:

The student is capable of knowing and understanding the importance of communication and the basics of graphic and interactive communications technologies, input process, digitization, modulation and rendering information, the importance and basics of interactive communication technology, basics of conventional and digital photography, scanning, video, manufacturing printing forms, conventional and digital printing techniques, graphic finishing, concepts related to communication technologies, professional terminology in the field of graphic and interactive communications technologies, the role of communication in modern society, the advantages and disadvantages of different ways of communicating.

The aim of the use of ICT devices and a modern teaching approach is to achieve a better understanding and knowledge of the contents of the theoretical and practical part of the studies, while ensuring sustainable knowledge of the use and importance of ICT technologies in the learning process and practical use in graphic technology and creative processes. With the knowledge acquired, the student will be able to combine the acquired content with other subjects in an interdisciplinary manner.

Metode poučevanja in učenja:

Aktivnosti poučevanja in učenja potekajo na fakulteti in/ali prek spleta (online). Pri predmetu se uporabljajo spletne učilnice (gradivo, kvizi, preverjanje znanja, igre, druge aktivnosti) in IKT metode poučevanja (multimedijsko gradivo, praktične demonstracije itd.). Komunikacija in oddaja seminarских nalog poteka prek spletne učilnice, kjer študentje tudi medsebojno vrednotijo projektno delo. Uporabljajo se inovativne metode poučevanja v smislu obogatitve predavanj z relevantnimi vabljenimi predavanji, povezovanjem z industrijo, seminarским delom na realnih izzivih iz industrije in gospodarstva. Izvedba predavanj, vaj, seminarja in drugih oblik dela poteka v slovenskem jeziku in/ali angleškem.

Learning and teaching methods:

Teaching and learning activities take place at the faculty and/or online. The course uses online classroom (materials, quizzes, knowledge tests, games, other activities) and ICT teaching methods (multimedia materials, practical demonstrations, etc.). Communication and submission of seminar assignments is done through the online classroom, where students also assess each other's project work. Innovative teaching methods are used in terms of enriching lectures with relevant invited lectures, communication with industry, seminar work on real challenges from industry and business.

	Lectures, practicum, seminars and other forms of work are held in Slovenian and/or English.
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Načini ocenjevanja:	Delež/Weight	Assessment:
Praktično znanje, osvojeno pri izdelavi seminarske naloge in teoretično znanje pridobljeno na predavanjih in vajah ter iz drugih virov se oceni s pomočjo pisnega in/ali ustnega preverjanja, ki se izvede v živo, v predavalnici, ali prek spleta (online) s pomočjo ustreznih programskih rešitev/orodij. Seminarska naloga oz. izdelek je ocenjen na podlagi vsebinske, oblikovne in kontekstualne zasnove ter predstavitve. Skupna ocena seminarske naloge, vaj in teoretičnega znanja predavanj se oceni z negativno oceno 5 ali s pozitivnimi ocenami od 6 do 10. Za pozitivno oceno je treba doseči vsaj 55 % ali več.		The practical knowledge acquired with seminars and the theoretical knowledge from the lectures and practicum (tutorials) and other sources is graded by a written and/or oral examination, which is conducted in the classroom or online using suitable software solutions/tools. The seminar, i.e. the product, is graded according to content, design, context quality as well as presentation. The overall grade of the seminar, practicum (tutorials) and the theoretical knowledge of the lectures is graded with a negative grade 5 or with positive grades from 6 to 10. For a positive grade, at least 55 % or more must be achieved.
seminar oz. izdelek	20,00 %	seminar i.e. product
vaje	30,00 %	practicum (tutorials)
izpit teoretičnega znanja	50,00 %	exam of theoretical knowledge

Ocenjevalna lestvica:	Grading system:
5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10	5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:
1.URBAS, Raša, STANKOVIČ ELESINI, Urška, CIGULA, Tomislav, MAHOVIČ POLJACEK, Sanja. Pad printing. V: IZDEBSKA, Joanna (ur.), THOMAS, Sabu (ur.). Printing on polymers: fundamentals and applications. Amsterdam [etc.]: Elsevier, 2016, str. 263-278. 2.STANKOVIČ ELESINI, Urška, URBAS, Raša. Microcapsules in printing. V: IZDEBSKA, Joanna (ur.), THOMAS, Sabu (ur.). Printing on polymers: fundamentals and applications. Amsterdam [etc.]: Elsevier, 2016, str. 389-396. 3.STANKOVIČ ELESINI, Urška, LESKOVŠEK, Mirjam, BERNIK, Slavko, ŠUMIGA, Boštjan, URBAS, Raša. Influence of co-current spray drying conditions on agglomeration of melamine-formaldehyde microcapsules. Drying technology, ISSN 0737-3937, [in press] 2016, 36 str., doi: 10.1080/07373937.2015.1131713. 4.URBAS, Raša, STANKOVIČ ELESINI, Urška. Color differences and perceptive properties of prints made with microcapsules. JGED, ISSN 2217-379X, Jun 2015, vol. 6, no. 1, str. 15-21, ilustr. 5. ROTAR, Bojan, STANKOVIČ ELESINI, Urška, HAJDU, Peter, LESKOVAR, Blaž, URBAS, Raša. Morphological and dimensional properties of unmodified and modified braille dots produced with UV inkjet printing = Morfološke in dimenzijske lastnosti nemodificirane in modificirane brajice izdelane z UV kapljičnim tiskom. <i>Materiali in tehnologije</i>. [Tiskana izd.]. 2020, letn. 54, št. 6, str. 879-887, ilustr. ISSN 1580-2949.

VIDEO

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Video
Course title:	Video
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	2. letnik, 3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0148212
Koda učne enote na članici/UL Member course code:	10220

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	15	30	0	15	90	6

Nosilec predmeta/Lecturer:	Helena Gabrijelčič Tomc
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Slovenščina
	Vaje/Tutorial:	Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Pristop k predmetu:
Vpis v študij letnika. Osnovno znanje uporabe računalnika.
Pristop k izpitu:
K izpitu lahko pristopijo študenti/ke, ki imajo opravljen izpitni projekt, seminar in vaje ter izpolnjeno predpisano prisotnost pri vseh sklopih predmeta.
Prisotnost:
Pri predmetu se zahteva naslednja prisotnost: predavanja 80 %, seminar in druge oblike dela 90 %, vaje 100 %.

Prerequisites:

Course:
Enrolment in the study year. Basic knowledge of computer use.
Exam/Assessment:
Students who have completed the exam project, seminar and practical course and who have met the attendance requirements for all sections of the course can take the exam.
Presence:
Parts of the subject require the presence of: Lectures 80%, seminar and other forms of work 90 %, Practical Course 100 %.

Vsebina:

- Spoznavanje uporabe programskih orodij in tehnik za delo z večpredstavnimi digitalnimi vsebinami.
- Načrtovanje in grafična priprava vsebinskih elementov večpredstavnostnih izdelkov.
- Razvojno avdiovizualni koncepti v digitalnih medijih.

Content (Syllabus outline):

- Tools and techniques for manipulations with multimedia content.
- Planning and preparing of multimedia content elements.
- Development of audiovisual concepts in digital media.

• Termini in lokacijski plani predprodukcije, produkcije in postprodukcije večpredstavnih vsebin s poudarkom na video vsebinah. • Priprava in načrtovanje, zgodboris in priprava referenc z uporabo risarsko ilustratorske opreme • Oprema, naprave, programi v video produkciji. • Osnove slovnice slik v gibanju. • Forma, narativnost in postavitev na sceno. • Zgradba in razvoj zgodbe, pripovedovanje zgodbe. • Teorija in praksa ustvarjanja vizualne komunikacije s slikami v gibanju. • Priporočila snemanja: kompozicija, plan, kader, sekvenca, perspektiva (pomožna orodja in stabilizirana glava). • Snemanje z zraka (priporočila, plan, kader), 360 stopinjsko snemanje za okolja razširjenih resničnosti. • Kompozicija, plan, kader, sekvenca, perspektiva. • Časovni in prostorski potek slik v gibanju in video produkciji. • Tranzicije. • Urejanje posnetkov, elementov video produkcije in montaža. • Barvna korekcija in barvno gradiranje. • Delo z delovno postajo za barvno korekcijo. • Vizualni in posebni učinki v avdiovizualnih medijih. • Teorija digitalnega sestavljanja.	• Time and location planning of preproduction, production and postproduction of multimedia content with an emphasis on video content. • Preparation and planning, storyboarding and preparation of references using drawing and illustration equipment • Equipment, devices, programs in video production. • Basic grammar of moving pictures • Film form, narration and mise-en-scene. • Developing of story, storytelling. • Theory and practice of creating visual communication with moving images. • Recording: composition, shot, cadre, sequence, and perspective (auxiliary tools and a stabilized head). • Shooting from the air (guidelines, cadre), 360 recording for environments of extended realities. • Editing and transitions. • Manipulation of time and space in multimedia content (video content). • Color correction and grading. • Theory and practice of digital compositing. • Working with a workstation for color correction. • Visual and special effects in production of visual media. • Theory of digital composition.
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Temeljna literatura in viri/Readings:

- Owens, J., Millerson, G. Video production Handbook, 7th ed. Routledge, 2023
- [Bordwell, D.](#), [Thompson, K.](#), [Smith, J.](#) Film Art: An Introduction, Mc Graw Hill, 2016
- Barnwell, J. Production Design for Screen: Visual Storytelling in Film and Television, Bloomsbury Academic, 2020
- Wright, S. Digital Compositing for Film and Video: Production Workflows and Techniques 4th Ed., Routledge, 2017

Dodatna literatura:

- Curbiss Cherrier M. Voice & Vision: A Creative Approach to Narrative Film and DV Production, 2011
- Frank, L. Real-Time Video Content for Virtual Production & Live Entertainment: A Learning Roadmap for an Evolving Practice 1st Ed., Focal Press, 2022

Cilji in kompetence:

Cilj je seznaniti študenta s tehnološko in vsebinsko pripravo, obdelavo in dodelavo večpredstavnih elementov za različne digitalne medije, s poudarkom na video vsebinah.

Predmetno-specifične kompetence:

- Oblikovanje delokroga od zamisli in načrtovanja do priprave in izbora ustreznih tehnik in orodij ter do realizacije končne večpredstavne vsebine.
- Koordiniranje priprave produkcijskega načrta večpredstavne vsebine.
- Obvladovanje postopkov izgradnje ustrezne večpredstavne vsebine.
- Kritična presoja izbora in oblikovanja možnih elementov večpredstavne vsebine.

Objectives and competences:

Basic goals of a course is the introduction of technological and content preparation, processing and postprocessing of multimedia elements of different digital media, with an emphasis of video content production.

Subject-specific competences:

- Design of workflow from the basic idea and planning to choice of techniques and tools and realisation of final multimedia content.
- Coordination of preparation for production plan of multimedia contents.
- Knowledge of processes for building up a useful multimedia content.
- Critical evaluation of selection and design of multimedia elements.
- Knowledge of postproduction processes.

• Obvladovanje ustreznih postproduksijskih postopkov za zagotavljanje vizualne in tehnične korektnosti večpredstavnega izdelka. • Uporaba ustreznih tehnologij, orodij in postopkov za zagotavljanje vizualne in tehnične ustreznosti večpredstavnega izdelka. • Spoznavanje osnovnih in naprednih prijemov dela z opremo za ustvarjanje avdio-vizualnih vsebin, vključno s specifikami snemanja in zraka, 360 produkcije. • Razumevanje sodobne merilne in predstavitvene opreme za video produkcijo in vizualizacijo končnih upodobitev. • Praktične spretnosti prenosa znanj ustvarjanja avdio-vizualnih vsebin na interdisciplinarna področja in na človeka in planet usmerjene tematske sklope.	• Understanding the importance of technologies and tools for ensuring visual and technical correctness of audio-visual product. • Understanding of basic and advanced techniques of working with equipment for creating audio-visual content, including the specifics of shooting from air and 360 production. • Understanding of modern measurement and presentation equipment for video production and visualization of final renderings. • Practical skills of transferring the knowledge of creating audio-visual content to interdisciplinary fields and human- and planet-oriented topics.
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Predvideni študijski rezultati:

Razumevanje teoretičnih osnov in praktične uporabe načrtovanja, priprave, izdelave in sestavljanja različnih elementov avdio-vizualnih medijev, s poudarkom na video produkciji. Sposobnost vključevanja veščin načrtovanja in izgradnje avdio-vizualnega medija v komunikacijske pristope z uporabo na interdisciplinarnih področjih in na človeka in planet osredotočenih tematikah.

Intended learning outcomes:

Understanding of theoretical basis and practical use of planning, preparing, production and compositing of different elements of digital media, with an emphasis on video production. Ability to integrate audio-visual media design and construction skills into communication approaches using interdisciplinary fields and human- and planet-centred topics.

Metode poučevanja in učenja:

Predavanja, seminar (samostojno ali skupinsko projektno delo), računalniške vaje in vodeno individualno delo. IKT podprto učenje in poučevanje, uporaba spletne učilnice. Sklopi predmeta se izvajajo v računalniških in drugih fakultetnih učilnicah/predavalnicah in/ali preko spleta (online) s pomočjo primerne in ustrezne programske opreme, ki omogoča delo.

Learning and teaching methods:

Lectures, seminar (individual or group project work), computer exercises and guided individual work. ICT-supported learning and teaching, use of the online classroom. Course assemblies are conducted in computer and other faculty classrooms/lecture rooms and/or online with the help of suitable and appropriate software that enables work.

Načini ocenjevanja:

Delež/Weight

Assessment:

a.) izpit teoretskih znanj in postopkov dela in ocena projektnega dela. Pogoji za pristop k zagovoru projektnega dela so opravljene računalniške vaje in pozitivno ocenjeno teoretično znanje.	70,00 %	a) exam of theoretical knowledge and evaluation of project work Prerequisites to the final presentation of project are completed computer tutorials and positive grade of theoretical knowledge of work procedure.
b) ocena iz računalniških vaj	30,00 %	b) completed computer tutorials
Ocena od 6 - 10 je pozitivna		Rating: positive – marks 6-10

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

VRHOVNIK, Blaž, KLOBUČAR, Špela, HROVAT, Petra, LESKOVAR, Zalka, ŠTIP, Martin, BRAKIĆ, Danej, PEROVNIK, Lucija, ROŽIČ, Boštjan, NOVAK, Matevž, UČAKAR, Andrej, ŽVAB ROŽIČ, Petra,

GABRIJELČIČ TOMC, Helena. "Stories of Montanistika" in the world of virtual reality. Athens Journal of Tourism. 2020, vol. 7, iss. 4, str. 259-278.

KOMPARE, Rok, GABRIJELČIČ TOMC, Helena. Analysis of Movie genre Experiencing when changing post-production stylistic elements of the media. Journal of print and media technology research. 2019, vol. 8, no. 1, str. 57-69.

KNIFIC KOŠIR, Aja, GABRIJELČIČ TOMC, Helena. Visual effects and their importance in the field of visual media creation. JGED : Journal of Graphic Engineering and Design. 2022, vol. 13, no. 2, str. 5-13

PLOT, Mojca, ROŠKAR, Saška, GABRIJELČIČ TOMC, Helena. Evaluation of the impact of an awareness-based animation on students' knowledge about mental illness. V: DEDIJER, Sandra (ur.). Proceedings. 10th International Symposium on Graphic Engineering and Design GRID 2020, Novi Sad, November 12-14th, 2020. Novi Sad: Faculty of Technical Sciences, Department of Graphic Engineering and Design, 2020. Str. 659-666

MALAČIČ, Veronika, CAFNIK, Marko, GABRIJELČIČ TOMC, Helena. Opis delokroga za produkcijo 360-stopinjskega glasbenega videospota = Description of a framework for the production of a 360 degree music video. V: ŽEMVA, Andrej (ur.), TROST, Andrej (ur.). Zbornik devetindvajsete mednarodne Elektrotehniške in računalniške konference ERK 2020 = Proceedings of the Twenty-ninth International Electrotechnical and Computer Science Conference ERK 2020. ERK 2020, Portorož, Slovenija, 21.-22. september 2020. Ljubljana: Slovenska sekcija IEEE: = Slovenian Section IEEE, 2020. str. 107-110

VODENJE KAKOVOSTI

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Vodenje kakovosti
Course title:	Quality management
Članica nosilka/UL Member:	UL NTF

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Grafična in medijska tehnika, prva stopnja, visokošolski strokovni (od študijskega leta 2025/2026 dalje)	Ni členitve (študijski program)	3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code:	0068064
Koda učne enote na članici/UL Member course code:	10278

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
30	60	0	0	0	90	6

Nosilec predmeta/Lecturer:	Klemen Možina
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Vrsta predmeta/Course type:	Izbirni / Elective
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Jeziki/Languages:	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

/Vpis v letnik študija in izbira predmeta. Pogoj za opravljanje izpita sta pozitivno opravljena seminar in predstavitev seminarja o poljubno izbrani temi s področja kakovosti.

Prerequisites:

Enrolment into study year and selecting the course. A prerequisite for access to the exam are positively evaluated seminar paper and its presentation on a topic from the field of Quality chosen by students.

Vsebina:

Osnovni pojmi in definicije. Pomen vodenja kakovosti z vidika svetovne konkurenčnosti. Značilnosti sistemov vodenja kakovosti za mala in velika podjetja. Zgodovinski pregled sistemov vodenja kakovosti od pregledovanja do celovitega vodenja kakovosti. Najpomembnejši teoretiki na področju vodenja kakovosti (Juran, Deming, Garvin, Crosby, Conti, Ishikava, Taguchi in drugi). Razvoj standardov za vodenje kakovosti. Struktura standardov skupine ISO 9000. Pregled zahtev standarda ISO 9001:2000. Presojanje in certificiranje sistemov kakovosti po standardu ISO 9001. Pregled osnovnih metod in tehnik na področju vodenja kakovosti (osnovne tehnike statistične analize,

Content (Syllabus outline):

Basic terms and definitions. Meaning of quality management from the viewpoint of world competition. Characteristics of quality management systems for small and large companies. Historical overview of quality management systems from inspections to total quality management. Important scientists in the field of quality management (Juran, Deming, Garvin, Crosby, Conti, Ishikava, Taguchi and others). Development of quality management standardisation. Structure of ISO 9000 standardisation. Overview of ISO 9001:2000 standard requirements. Certification of quality systems according to ISO 9001. Overview of basic methods and techniques in the field of quality management

statistična procesna kontrola, načrtovanje in analiza eksperimentov, tehnike, ki se uporabljajo v procesu stalnih izboljšav kakovosti). Ekonomika kakovosti. Celovito vodenje kakovosti. Samoocenjevanje in nagrade za kakovost. Pomen vrednotenja kakovosti za prehod v ogljično nevtralno družbo.	(basic techniques of statistical analysis, statistical process control, design of experiments, techniques for constant quality improvements. Economics of quality. Total quality management. Self-evaluation and awards for quality. The importance of quality evaluation for the transition to a carbon neutral society.
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Temeljna literatura in viri/Readings:

– EVANS, J. R. Total Quality : Management, Organization, and Strategy. Mason, OH : Thomson/South-Western, 2003. – CONTI, T. Samoocenjevanje družb. Ljubljana : DZS, 1999. – LOGOTHEITIS, N. Managing for Total Quality : from Deming to Taguchi and SPC. New York [etc.] : Prentice Hall, 1992. – WEALLEANS, D. The Quality Audit for ISO 9001:2000 : a Practical Guide. Hampshire : Gower, 2000. SLUGA, F. , DEMŠAR, A. Zagotavljanje kakovosti : študijsko gradivo. Ljubljana : NTF, 2014.

Cilji in kompetence:

Temeljni cilj je opredelitev sodobnega pojmovanja kakovosti in sistemov vodenja kakovosti v kontekstu svetovne konkurenčnosti in značilnosti orodij za vodenje kakovosti vključno s standardi za sisteme vodenja kakovosti, njihovega presojanja in certificiranja. Kompetence: sposobnost razumevanja sodobnih konceptov sistemov vodenja kakovosti in pojmovanja kakovosti, razvijanje zavesti o pomenu kakovosti v kontekstu svetovne konkurenčnosti, spoznavanje razvoja sistemov vodenja kakovosti in njihova kritična analiza, sposobnost kritične analize orodij za vodenje kakovosti, vključno s standardi za sisteme vodenja kakovosti, sposobnost uporabe metod in orodij za postopke stalnih izboljšav, ki vodijo v trajnostno naravnane delovne procese, sposobnost izbire in uporabe temeljnih statističnih metod pri analizi podatkov, sposobnost uporabe metod samoocenjevanja in razumevanje njihovega pomena za doseganje poslovne odličnosti, sposobnost dela v skupini na področju kakovosti.

Objectives and competences:

Objectives: definition of modern understanding of quality management systems in the frame of world competition and characteristics of tools for quality management, including standardisation for quality management, assessment and certification. Competences: ability to understand modern concepts of quality and quality management systems, development of awareness of the meaning of quality in the frame of world competition, learning about the development of quality management systems and their critical evaluation, ability of critical analysis of tools for quality management including standardisation for the quality management systems, ability to use methods and tools for constant improvement which lead to sustainable work processes, ability to choose and use basic statistical methods at data analysis, ability to use methods for self-evaluation and understanding of their meaning for development of business excellence and ability to work in a team in the field of quality.

Predvideni študijski rezultati:

Znanje in razumevanje: Pozna sodobni pomen kakovosti in sistemov vodenja kakovosti in jih zna kritično analizirati. Pozna osnovna orodja, ki se uporabljajo na področju vodenja in v procesu stalnih izboljšav kakovosti. Pozna in razume pomen standardov za sisteme vodenja kakovosti. Razume različne koncepte vodenja kakovosti. Pozna in razume osnovne metode statistične analize. Razume pomen kontrolnih kart kot orodja za odkrivanje neskladnosti v procesih. Razume metode samoocenjevanja in nagrade za poslovno odličnost.

Intended learning outcomes:

Knowledge and understanding of: modern meaning of quality and quality management systems and their critical evaluation; tools which are used in the field of management and in the process of constant quality improvement; quality management standardisation; different concepts of quality management; basic statistical methods for data analysis; control charts as a tool for discovering discrepancies in processes; self-evaluation and awards for business excellency.

Metode poučevanja in učenja:

Predavanja in seminarsko delo potekajo v živo in/ali on-line.

Learning and teaching methods:

Lectures and seminar work which are carried out live and/or on-line.

Načini ocenjevanja:

Delež/Weight Assessment:

- pisni izpit, 50 %	50,00 %	- written exam, 50 %
- seminarska naloga, 30 %	30,00 %	- seminar paper, 30 %
- predstavitev seminarske naloge 20 %	20,00 %	- presentation of seminar paper 20 %

Ocenjevalna lestvica:

5 - 10, pri čemer velja, da je pozitivna ocena od 6 - 10

Grading system:

5 - 10, a student passes the exam if he is graded from 6 to 10

Reference nosilca/Lecturer's references:

SARJANOVIĆ, Anja, MOŽINA, Klemen, GREGOR-SVETEC, Diana. Print quality of coated paper from invasive alien plant Goldenrod. *Coatings*. 2023, vol. 13, iss. 10, str. 1–11, ilustr. ISSN 2079-6412, DOI: [10.3390/coatings13101754](https://doi.org/10.3390/coatings13101754), [COBISS.SI-ID [167947267](#)].

BRESKVAR, Kaja, AHTIK, Jure, MOŽINA, Klemen. Cracking phenomena of coatings on label papers. *Cellulose chemistry and technology*. 2021, vol. 55, no. 3–4, str. 289–297, ISSN 0576-9787, DOI: [cellulosechemtechnol.ro/firstonline.php](https://doi.org/10.2166/10000000000000000000), [COBISS.SI-ID [59536643](#)].

MOŽINA, Klemen. Sistem kakovosti v izobraževalnem procesu. *Grafičar: revija slovenskih grafičarjev*. 2020, [št.] 5, str. 22–23, ISSN 1318-4377, [COBISS.SI-ID [33097219](#)].

MOŽINA, Klemen. Vodenje kakovosti v izobraževalnem procesu = Quality management in education. *Papir: revija Društva inženirjev in tehnikov papirništva*. 2020, letn. 48, št. 24, str. 28, ISSN 0350-6614, [COBISS.SI-ID [40284675](#)].

MOŽINA, Klemen. Iz zelenega v modro = From green to blue. *Papir: revija Društva inženirjev in tehnikov papirništva*. 2023, letn. 50, št. 29, str. 1–2, ISSN 0350-6614, [COBISS.SI-ID [162160643](#)].

MOŽINA, Klemen (intervjuvanec). Papir ustreza načelom trajnostnega razvoja. *Delo*. [Tiskana izd.]. 22. jul. 2019, leto 61, št. 166, str. 10, ISSN 0350-7521, [COBISS.SI-ID [3619696](#)].