Óbuda University

Rejtő Sándor Faculty of Light Industry and Environmental Engineering



**TRAINING PROGRAM**

**Industrial Design Engineering BSc (F)**

Budapest, 01 September 2023.

**DEGREE PROGRAM CURRICULUM**

**1. Degree program name:**

Industrial Design Engineering

**2. Field of training:**

technical

**3. Language of training:**

English

**4. Training schedule(s) and duration of courses in semesters, number of contact hours:**

regular / evening / correspondence / distance training

full time, 7 semesters, 2142 hours

**5. Optional specialties:**

Product design specialization (Interior-textile, fashion-accessories)

Packaging design

**6. Number of credits to collect to earn degree:**

210 credits

**7. Level of qualification and professional qualification as indicated in the degree certificate:**

* level of qualification: bachelor - BSc
* professional qualification: Industrial Design Engineer

**8. Study area classification of professional qualification according to the standard classification system of training areas:**

214/0212

**9. Educational objective:**

The aim is to train industrial product and design engineers capable to design, manufacture and distribute industrial products, particularly within an SME framework. Graduate industrial product and design engineers are technical specialists who are out-of-the-box thinkers and primarily design, manufacture and distribute durable consumer products and articles for personal use. In possession of their knowledge and skills of technology, aesthetics, humanities, and economics, they are able to carry out independent creative work in each phase of product development; they also know the innovation process of product development, as well as the material, organizational and human resources required for product development; and they are capable to manage product lifetime cycles. They are prepared to continue their studies at a Masters course.

**10. Professional competencies to be mastered:**

*a)*knowledge

- Knowledge of general and specific mathematical and natural scientific principles, rules, relations, and procedures as required to pursue activities in the special field of product design.

- Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes.

- Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria.

- Knowledge of basic construction designs and their dimensioning basics.

- Knowledge of the fundamental methods, rules and standards of ergonomy and psychology as required for industrial product design.

- Knowledge of the fundamental rules and technological limitations of shaping products, of striking a harmony between content and form.

- Knowledge of major analogies between natural and technical systems, and their possible applications in design.

- Knowledge of expectations and requirements prevailing in the areas of health and safety, fire protection and safety engineering as related to the relevant special field, as well as applicable environmental regulations.

- Knowledge of the basics, limitations and requirements of the special fields of marketing, management, environment protection, quality assurance, information technology, law, and economics, intrinsically linked to the special area of product design.

- Knowledge of the learning, knowledge acquisition, and data collection methods of the special field of product design, their ethical limitations and problem solving techniques.

- Knowledge of the most important practical work techniques of their special field.

- Knowledge of the historical periods, outstanding designers and characteristic objects of industrial design.

- Knowledge of the basic rules of intellectual property management.

- Knowledge of the ethics and methods of team work.

*b)*capabilities

- Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment.

- Able to present graphical product concepts and sketches using traditional manual techniques.

- Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation.

- Able to produce, examine and test real models and prototypes using direct digital production technologies based on both traditional and 3D product models.

- Able to master new knowledge by solving practical problems empirically.

- Able to transplant solutions evolved in nature into technical practice.

- Able to apply the calculation and modelling principles and methods of special literature related to industrial product design.

- Able to interpret and characterize the structure and operation of the structural units and components of relatively simple technical systems, as well as the design and connection of the system components applied.

- Able to explore the causes of failures and to select elimination operations.

- Understand and use characteristic online and printed references characteristic of their special field, both in Hungarian and in at least one foreign language.

- Know and apply the terminology and special expressions of their professional field in Hungarian and in at least one foreign language.

- Adequate perseverance and endurance of monotony to perform practical operations.

- Able to take part in and also to manage team work.

- Able to initiate, compile, and carry out projects in team work, primarily in a multidisciplinary environment.

- Able to take into account the aspects of the historical, cultural, socio-economic and industrial environment in the process of industrial design and product development.

- Able to give reasons for the decisions related to the product designed, as well as to test them and support them by technical and standard investigation methods.

- Able to analyze design projects by applying design methods and to give methodological reasons for the workflows applied.

- Able to resolve relatively simple health and safety tasks.

*c)*attitude

- Efforts to make self-education in the special area of industrial product design a continuous process in line with professional objectives.

- Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith.

- Motivated to familiarize with the latest development trends, solutions and innovations in their special field.

- Market, environment, and customer oriented.

- Committed to observe and make observe quality requirements as related to product design and development.

- Open to transmitting own knowledge to colleagues.

- Efforts to comply with legal regulations and to take the ethical rules of engineering into account during work.

- Taking care to promote subordinates’ professional development, to manage and help such endeavors.

- Taking care of ensuring equal access opportunities in problem solving.

- Complying and ensuring compliance with the applicable requirement systems of security, health and safety, environment protection, quality assurance and inspection during work.

*d)*autonomy and responsibility

- Managing the work of the staff they are in charge of as instructed by their workplace supervisor.

- Assessing the efficiency, effectiveness and safety of subordinates’ work.

- Prepared to coordinate innovation and product design processes.

- Valuing and using ideas arising at workshops and meetings as collective results.

- Prepared to find employment or launch a venture in the special field of product design.

- Acting as expected by quality and environment control systems.

**11. Main training areas:**

|  |  |
| --- | --- |
| According to the Regulation of 18/2016. (VIII. 5.) EMMI | Credit points |
| Science basics (35-50 credits) | 37 |
| Economic and human knowledge (14-30 credits) | 22 |
| Professional core material (70-105 credits) | 80 |
| Specific professional knowledge (25-45 credits) | 42 |
| Optional subjects (10 credits) | 10 |
| Thesis (15 credits) | 15 |
| Physical education | 4 |
| **Total:** | **210** |

**12. Criteria prescribed:**

**Physical education:** Each regular student is required to complete four semesters of Physical education. The subject is announced in semesters 1-4. in the model curriculum, with a load of 1 lessons per week.

**Specialty language requirements: -**

**Professional traineeship:**

Professional traineeship of at least six weeks, organized at a location of professional practice. Professional traineeship is included in the criteria prescribed.

**13. Knowledge verification:**

a) during the study period, by written or verbal reports, written (classroom) tests, by the evaluation of home assignments (designs, measurement records, etc.), mid-semester grading or signature,

b) by preliminary examination passed in the study period,

c) by examination or comprehensive examination passed in the examination period, and

d) by final examination.

**14. Criteria for admission to a final examination:**

a) Final completion certificate (absolutorium) granted,

b) Thesis accepted by supervisor.

Admission to a final examination is subject to a final completion certificate being granted. A final completion certificate is issued by a higher education institution to a student who has complied with the study and examination requirements prescribed in the curriculum and completed the professional traineeship required – except for meeting the foreign language requirement and completion of the thesis –, and has acquired the credits prescribed.

**15. Parts of the final examination:**

The final examination consists of defending the thesis and oral examinations taken on the subjects prescribed in the curriculum (time allowed for preparation: at least 30 minutes per subject), to be passed by the student consecutively within the same day.

Subjects (subject groups) comprising, in the aggregate, a body of knowledge corresponding to at least 20 and up to 30 credit points may be designated for the final examination.

The list of questions of the oral examination is made available to candidates 30 days before the date of the final examination.

Candidates may start the examination if their thesis has been accepted by the final examination board with at least sufficient (2) qualification. Criteria for correcting a failed thesis are defined by the competent institute.

**16. Result of the final examination:**

The weighted average of the grades of the degree project / thesis and the oral part of the final examination – taking into consideration the number of subjects included in the final examination – as follows:

***Z =(SZD + Z1+Z2+…+Zm)/(1+m).***

**17. Criteria for issuing a diploma:**

a) Successful final examination,

b) Compliance with the foreign language requirement.

**18. Dual training option: -**

**19. Cooperative training option:**

Cooperative training is a voluntary supplementary practice module linked to a regular bachelors training course at the university, in the framework of which the university and a business company, firm or institution cooperate in order to enable university students to acquire professional experience as specified in the educational objective.

**20. Date of entry into effect:** 01 September 2023.

Dated in Budapest, 01. 12. 2022.

Dr. habil. Koltai László

Dean

CURRICULUM









SUBJECT DESCRIPTIONS

|  |  |  |  |
| --- | --- | --- | --- |
| ***Title of the course:***  **Fundamentals of Natural Sciences** | **NEPTUN-code:**  RKXTA1EBNF | ***Weekly teaching hours:*** *l+cw+lb* 1+3+0 | **Credit:** 5  ***Requirements:*** practice mark |
| ***Course leader:***  Csaba Ágoston Ph.D. | ***Position:***  senior lecturer | ***Required preliminary knowledge:***  - | |
| ***Course Description:*** | | | |
| The primary aim of the course is to develop students' scientific literacy, critical thinking and problem-solving skills. In addition to learning about natural laws, systems and processes, emphasis is placed on developing students' ecological perspectives. The tasks and projects to be solved in the framework of the internship are based primarily on the knowledge learned in secondary school, thus enabling the assessment of the knowledge acquired and the establishment of a learning background for the university subjects. In addition to basic knowledge of physics, biology, geography, chemistry and environmental protection, the course will provide a synthesis of knowledge focusing on the interrelationship of environmental elements that will help to solve engineering problems and develop environmentally aware behaviour. The integration of complex knowledge is realised in the understanding of the basic interrelationships between natural systems and is applied in project work, and integrated into the students' thinking and actions. | | | |
| ***Professional competencies:*** | | | |
| - Open and receptive to the application of new, modern and innovative organic farming practices and methods.  - In his/her work, he/she strives to act in a law-abiding manner and to respect engineering ethics.  - Ability to acquire new knowledge through the empirical solution of practical problems.  - Ability to translate solutions developed in nature into technical practice.  - Ability to participate in and lead teamwork.  - Understand and authentically represent the role of the environment in society and its fundamental relationship with the world. | | | |
| ***Bibliography:*** | | | |
| |  | | --- | | 1. Townsend, C.R., Begon, M., Harper, J.L. (2006). Essentials of Ecology (2nd Edition). Blackwell Publishing. 2. Darrell Ebbing,‎ Steven D. Gammon: General Chemistry, Cengage Learning, 2015, Cengage Learning, Boston, ISBN-13: 978-1305580343; ISBN-10: 1305580346 3. Serway Jewett: Physics for Scientist and Engineers 4. William M. Marsh, Martin M. Kaufman: Physical geography, Cambridge University Press, 2013. 5. Michael Allaby (2000): Basics of Environmental Science, Routledge, New York, ISBN 0415-21175-1 | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Title of the course:***  **Mathematics I.** | ***NEPTUN-code:***  RKXMA1EBNF | ***Weekly teaching hours:*** *l+cw+lb*  2+2+0 | ***Credit*:** 6 ***Requirements***  examination |
| ***Course leader:***  Aurél Galántai, Dr. Prof. | ***Position:***  professor | ***Required preliminary knowledge:***  - | |
| ***Course Description:*** | | | |
| The goals of this course are: introduction of basic concepts of the real line, the complex plane and the three-dimensional space; development of differential and integral calculus with the help of the concepts of sequences, real functions, convergence and continuity to the level of practical applicability in further engineering / mechanical / physical studies. Introduction to the application of program MatLab. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of general and specific mathematical, natural and social scientific principles, rules, relations, and procedures as required to pursue activities in the special field of environment protection.  - In possession of state-of-the-art IT skills, being able to use professional databases and certain design, modelling, and simulation software depending on their specialty.  - Able to participate creatively in engineering work based on their multidisciplinary skills, as well as to adapt to continuously changing circumstances.  - Open to professional cooperation with specialists related to their profession but involved in other areas. | | | |
| ***Bibliography:*** | | | |
| 1. Thomas – Weir – Hass: Thomas’ Calculus, 13e, Pearson, 2013. 2. Anton – Bivens – Davis: Calculus, 10e, Wiley, 2012. 3. Anton – Rorres: Elementary Linear Algebra, 11e, Wiley, 2013. 4. Gilbert Strang: Differential Equations and Linear Algebra, Cambridge University Press, ISBN 9780980232790, 2015 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Mathematics II.** | ***NEPTUN code:***  RKXMA2EBNF | ***Number of hours:***  *lec+gs+lab*  2+2+0 | ***Credit:*** 6  ***Requirements:***  examination |
| ***Course coordinator:***  Aurél Galántai Dr. Prof. | ***Title:***  professor | ***Prerequisite:***  RKXMA1EBNF sign | |
| ***Course Description:*** | | | |
| Introduction of complex numbers. The most important types of ordinary differential equations and construction of their solutions. Basic concepts of linear algebra. Vector geometry of the 3-dimensional euclidean space. Convergence in n-dimernsional euclidean spaces. Differential calculus of functions in several variables. Geometrical problems connected to smooth curves and surfaces. Basic concepts of mathematical statistics. Construction of the line of linear regression. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of general and specific mathematical, natural and social scientific principles, rules, relations, and procedures as required to pursue activities in the special field of environment protection.  - In possession of state-of-the-art IT skills, being able to use professional databases and certain design, modelling, and simulation softwares depending on their specialty.  - Able to participate creatively in engineering work based on their multidisciplinary skills, as well as to adapt to continuously changing circumstances.  - Open to professional cooperation with specialists related to their profession but involved in other areas. | | | |
| ***Bibliography:*** | | | |
| 1. Anton, H., Rorres, C.: Elementary Linear Algebra with Applications, 9e, Wiley, 2005, ISBN: 0-471-66959-8. 2. Thomas, G.B. et al.: Thomas’ Calculus, 11e, Addison-Wesley, 2005, ISBN: 0-321-18558-7. 3. Gilbert Strang: Linear Algebra for Everyone, Wellesley Cambridge Press, ISBN 9781733146630, 2020 4. Douglas C. Montgomery-Elizabeth -A Peck, G. Geoffrey Vining: Introduction to Linear Regression Analysis, Yohn Wiley & Sons, INC. ISBN 0 471 31565 6, 2001 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Title of the course:***  **Knowledge of sustainability, environmental ethics** | **NEPTUN-code:**  RKWFK1EBNF | ***Weekly teaching hours:*** *l+cw+lw*  2+0+0 | ***Credit:*** 4  ***Exam type****:*  examination |
| ***Course leader:***  Rita Kendrovics-Boda, Ph.D. | ***Position:***  associate professor | ***Required preliminary knowledge:*** *-* | |
| ***Course Description:*** | | | |
| The course aims to provide an introduction to sustainability concepts and challenges, introducing the Sustainable Development Goals (SDGs). It explores the major threats to the way of life of future generations, such as climate change, ecosystem degradation, health and nutrition, pollution and resource depletion, with a focus on sustainability challenges and solutions, including food supply, water use, energy use, waste management, biodiversity loss and the impacts of urbanisation. It also aims to raise awareness of the importance of moving from linear to circular systems and maximising life-cycle resource use. This will include an introduction to sustainable engineering design methods for the reuse, repair, remanufacture and recycling of products based on the principles of the circular economy. Case studies will be presented to highlight the optimal use of available resources. The termly assignments carried out in the projects will also aim to provide a guide to action for an environmentally conscious lifestyle.  In the second part of the course, the principles of environmental ethics will be introduced in relation to the principles of sustainability. We will study the moral relationship of man to his natural (non-human) environment and the value and moral status of this relationship. Through case studies, the course will focus attention on responsible behaviour towards the environment. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of learning, knowledge acquisition and data collection methods, their ethical limitations and problem-solving techniques in the environmental field.  - Comprehensive knowledge of the basic characteristics and interrelationships of environmental elements and systems and the pollutants that affect them.  - Knowledge of the properties of environmental elements and their interactions.  - Ability to apply a holistic approach to environmental tasks  environmental issues.  - Demonstrates responsible behaviour towards the environment.  - Multidisciplinary knowledge enables them to participate creatively in engineering work and to adapt to constantly changing requirements. | | | |
| ***Bibliography:*** | | | |
| 1. Thompson Allen: The Oxford Handbook of Environmental Ethics, Oxford University Press Inc, 2019, ISBN: 9780190933388 2. Mackenzie Davis: Principles of Environmental Engineering & Science, McGraw-Hill Education, 2019, ISBN: 9781260548020 3. Emma Hutchinson - Sari Kovats: Environment, Health and Sustainable Development, Open University Press, 2017, ISBN:9780335245376 4. M.H. Fulekar - Bhawana Pathak - R K Kale: Environment and Sustainable Development, Springer Nature, 2014, ISBN: 978-8132211655 5. Brennan, Andrew – Lo, Yeuk Sze: Environmental Ethics, Standard Encyclopedia of   Philosophy, 2002.,http://plato.stanford.edu/entries/ethics-environmental/#Bib | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Chemistry** | ***NEPTUN-code:***  RMXKE1EBNF | ***Number of hours:*** *lec+gs+lab*  1+0+1 | ***Credit:*** 4 ***Requirements:*** examination |
| ***Course coordinator:***  Tamás Csiszér Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  **-** | |
| ***Course Description:*** | | | |
| The aim of the subject is to provide essential basic knowledge about the structure, properties and transformations of chemical substances. The subject covers the properties and reactions of substances, from the formation of individual atomic and molecular structures, through chemical bonds and interactions, to the characterisation of homogeneous and heterogeneous sets. It also introduces students to the classification, preparation and main applications of elements and inorganic compounds. In the exercises, students will also practise solving the main computational problems in inorganic chemistry (writing and solving reaction equations based on oxidation numbers, calculating the concentration of solutions, converting concentration units, gas laws). The subject covers the grouping and chemistry of dyes for product design. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of general and specific mathematical, natural and social scientific principles, rules, relations, and procedures as required to pursue activities. Comprehensive knowledge of the basic features and interrelations of environmental elements and system. Knowledge of the main methods to examine the quantity and quality features, their typical measuring instruments and limitations thereof, as well as methods for the evaluation of data measured. * The subject performs basic tests of the quantity and quality characteristics and systems by state-of-the-art measuring instruments; to draw up and implement measurement plans; and to evaluate data. * Chemistry solves tasks of water, soil, air, radiation, and noise protection, as well as of waste treatment and processing at proposal level; to participate in preparing decisions; to perform authority audits; and to take part in the operation of these technologies. * The subject is able to reveal deficiencies in the technologies applied and process risks and to initiate mitigation measures after getting familiarized with the technology concerned. | | | |
| ***Bibliography*** | | | |
| 1. N. Akhmetov: General and Inorganic Chemistry, MIR Publishers, Moscow, 1983 2. A. Pahari, B. Chauhan: Engineering Chemistry, Infinity Science Press LLC, Hinghan, Massachusetts, New Delhi, India, 2007 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Physics for Engineers** | ***NEPTUN-code:***  RKXFI1EBNF | ***Number of hours: lec+gs+lab***  2+2+0 | ***Credit*:** 4  ***Requirements:***  examination |
| ***Course coordinator:***  Sándor Pekker Ph.D. | ***Title:***  research professor | ***Prerequisite:***  **-** | |
| ***Course Description:*** | | | |
| The following topics will be covered in the course: the propagation and speed of light. Fundamentals of physical optics. Interference and diffraction phenomena. Principles of light scattering. Optical fibres. Lens exchange systems, imaging errors. Imaging of optical devices. Temperature. Thermal expansion of solids, liquids and gases. Basic thermodynamic concepts. Principles of thermodynamics. Fundamentals of statistical physics. Phase transitions. Irreversible thermodynamic processes. Electrostatics. Current conduction, direct currents. Basic magnetic phenomena. The magnetic field. Forces in magnetic field. Magnetic properties of materials. Law of excitation. Mechanisms of conduction. Electromagnetic induction. Electromagnetic waves. Theory of relativity. Thermal radiation. The photoelectric phenomenon. Photons. Fundamentals of quantum mechanics. Basics of quantum electronics, lasers. Basic properties of nuclei, models of nuclei.  The following topics are presented in the Fundamentals of Science subject: Newtonian mechanics, such as Description of motions, reference frame. Newton's laws. Laws of force and the equation of motion. The work theorem. Periodic motion. The law of angular momentum. The gravitational force field. Description of motions in an accelerating coordinate system. Basics of mechanics of point systems. Plane motion of a rigid body. Spinning motion. Elastic deformations. Mechanics of quiescent liquids and gases. Molecular forces in fluids. Flow of liquids. Wave theory. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of general and specific mathematical, natural and social scientific principles, rules, relations, and procedures as required to pursue activities in the special field of environment protection.  - Able to participate creatively in engineering work based on their multidisciplinary skills, as well as to adapt to continuously changing circumstances.  - Open to professional cooperation with specialists related to their profession but involved in other areas.  - Efforts to improve knowledge by on-going self-education and continuously update their knowledge of the world. | | | |
| ***Bibliography:*** | | | |
| 1. Serway Jewett: Physics for Scientist and Engineers 2. Bueche, F., Hecht, E.: Schaum’s Outline of College Physics, 11th edition, McGraw-Hill Education, 2011. 3. Feynman R., Leighton, R.B. and Sands M.: The Feynman Lectures on Physics. Volumes I-III. Revised and extended edition, Addison-Wesley, 2005. 4. Shankar, R.: Fundamentals of Physics: Mechanics, Relativity, and Thermodynamics. Yale University Press, 2014. 5. Shankar, R.: Fundamentals of Physics II: Electromagnetism, Optics, and Quantum Mechanics. Yale University Press, 2016. 6. Feynman R., Leighton, R.B. and Sands M.: The Feynman Lectures on Physics. Volumes I., II. Revised and extended edition, Addison-Wesley, 2005. 7. Fleisch, D., Kinnaman, L.: A Student’s Guide to Waves, Cambridge University Press, 2015. 8. Shankar, R.: Fundamentals of Physics: Mechanics, Relativity, and Thermodynamics. Yale University Press, 2014. | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Technical Mechanics** | ***NEPTUN-code:***  RKXME1EBNF | ***Number of hours:***  *lec+gs+lab*  1+2+0 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Lóránt Szabó Ph.D. | ***Title:***  senior lecturer | ***Prerequisite:***  **-** | |
| ***Course Description:*** | | | |
| Engineering mechanics is the application of mechanics to solve problems involving common engineering elements. The goal of this Engineering Mechanics course is to expose students to problems in mechanics as applied to plausibly real-world scenarios. Dividing of Engineering mechanics. Physical quantities.  **Statics** (part of dynamics). Basic concepts, fundamentals. Planar forces, force systems. Power system bound to tractrix action on the rigid body. Planar forces, force systems. Centre of gravity, bearing force. Holders and articulated mechanisms. Friction. Strength of Materials. Basic concepts, stress and stress states. Material Laws. Simple strain of prismatic bars. Stress theories.  **Kinematics.** The kinematics of a point. Basic concepts, uniform and uniformly changing motion. Projectile motions, circular motion, harmonic motion, swinging motion. Kinematics of the rigid body. Basic concepts, velocity and acceleration states, elemental and finite motions. The kinematics of relative motions.   1. **Kinetics** (part of dynamics). Kinetics of the material point, axioms, general theorems. The free, forced and relative motion of the material-point. The kinetics of a rigid body. The moment of inertia, and general theorems and principles. The rotation of a rigid body around an axis, translational and plane motion of a rigid body. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of general and specific mathematical, natural and social scientific principles, rules, relations, and procedures as required to pursue activities in the special field of environment protection.  - Adequate perseverance and endurance of monotony to perform practical operations.  - Open to professional cooperation with specialists related to their profession but involved in other areas.  - Efforts to improve knowledge by on-going self-education and continuously update their knowledge of the world.  - Responsible proclamation and representation of the value system of the engineering profession; openness to professionally well-founded critical remarks. | | | |
| ***Bibliography:*** | | | |
| 1. Serway Jewett: Physics for Scientist and Engineers 2. (**Statics**) <http://www.icivil-hu.com/Civil> team/2nd/Statics/Statics,%20R.C.%20Hibbeler,%2012th%20book.pdf 3. (**Dynamics**) <https://docs.google.com/file/d/0Bw8MfqmgWLS4V0NFR2dVUWpuYzg/edit> | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Discriptive Geometry** | ***NEPTUN-code:***  RTXAG1EBNF | ***Number of hours:***  *lec+gs+lab*  1+0+2 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Gabriella Oroszlány Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| Knowledge of the essential technical –and design principles, methods and relationships: basic concepts of the plan and the space geometry.  Modes of representation: 1. Perspective 2. Axonometry. Monge’s multi-view representation.  Representation of polyhedra, intersecting a polyhedron with a line or planes, intersection. Representation of solids of revolution, their intersection with a line, with planes, intersection.  Image plane transformation, rotation, surface development.  Application of computer-aided graphic systems for the display of the constructions. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the general and specific mathematical and scientific principles, rules, relationships and procedures required for product design.  - Ability to design and construct simple products, taking into account the constraints of production technology, expected costs and environmental impact.  - Ability to present product concepts and sketches in drawings using traditional hand techniques.  - Ability to create virtual models of product concepts and products and to prepare technical documentation using three-dimensional computer-aided design systems. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor Dr. 2. Jon Allen: Drawing Geometry: A Primer of Basic Forms for Artists, Designers and Architects. Floris Books, Edinburgh, United Kingdom, 2007. ISBN13 9780863156083 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Management and Enterprise Economics** **(blended)** | ***NEPTUN-code:***  GVEVG2QBNF | ***Number of hours:***  *lec+gs+lab*  2+1+0 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Péter Szikora Ph.D. | ***Title:***  senior lecturer | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| The aim of the course is for students to acquire knowledge which will enable them to deal with economic and financial problems from a corporate point of view. Students are introduced to the concepts of enterprise, objectives, business environment, business forms, value creation, production processes, organizational forms, strategy creation and corporate marketing. Students also gain an insight into the development of enterprises, different development strategies, problems of growing, optimal operational size and various other essential aspects of managing a corporation.  The aim of the course is to further develop the students' basic business and economic knowledge and thinking, keeping the practical requirements in mind, with appropriate theoretical knowledge acquisition. Students are introduced into company asset management, labor management issues, cost management, cost accounting methodology, analysis of the economics of investments and the basics of corporate finance. Students also gain an insight into basic marketing concepts and methods. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the concepts of economics and environmental economics, project and environmental management, tools in the field of environmental protection.  - Ability to carry out administrative tasks related to environmental protection, to perform official tasks  - Ability to participate in environmental consultancy, advisory and decision-preparation work.  - Understand and credibly represent the role of the environment in society and its fundamental relationship with the world.  - Is open to professional cooperation with professionals in other fields related to his/her profession.  - Strives to continuously improve his/her knowledge through self-learning and to keep his/her knowledge of the world up to date.  - To be accountable to society for the choices he/she makes in the environmental field  - In the performance of his/her professional duties, he/she cooperates with qualified professionals in other fields (primarily economic and legal). | | | |
| ***Bibliography:*** | | | |
| 1. Kadocsa, Gy. (2007): Entrepreneurial Management. Amicus Press, Budapest – München 2. Spinelli, S., Adams, R. (2011): New venture creation: Entrepreneurship for the 21st   Century. McGraw-Hill Education | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Engineering Legal Basics and Consumer Protection** | ***NEPTUN-code:***  RTXMJ1EBNF | ***Number of hours:***  *lec+gs+lab*  2+0+0 | ***Credit: 4 Requirements:***  examination |
| ***Course coordinator:***  Áron Takács Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| Fundamental rights (Fundamental Rights of Citizens). Knowledge of Hungarian citizenship. Civil law (law of persons, property, property law, law of obligations, contract law, certain types of contracts). Civil law contracts with general terms and conditions. Rules applicable to legal persons and companies, sole proprietorship. Basics of labour law (employment contract and its content, rules on safety and security at work).  Tasks and means of consumer protection, consumer rights. The institutional system of consumer protection law in Hungary and in the European Union. Basic concepts of consumer protection law (goods, products, producer, distributor, etc.) Rules on typical and specific contracts between consumers and businesses (internet and off-premises sales). Rules on marketing. Instructions for use, certification of conformity, packaging and CE marking. Information on marking of goods. Defective performance, warranty of accessories, product warranty, guarantee. Product liability. Handling customer and service complaints. Consumer protection organisations. The role of conciliation bodies and NGOs. Case studies.  Warranty and guarantee rules. Specific rules on consumer contracts.  Copyright (copyright, inventions, patents, trademarks). Basic rules on intellectual property management. Ethical limits in the field of product design. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the basics, boundaries and requirements of marketing, management, environmental protection, quality assurance, information technology, law, economics, which are integrally related to product design.  - Knowledge of the basic rules of intellectual property management.  - Ability to identify the causes of failures and to select measures to remedy them.  - Market, environment and customer oriented.  - In his/her work, he/she will strive to act in accordance with the law and the rules of engineering ethics. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/> electronic notes and aids prepared by the instructor 2. Dee Pridgen, Gene Marsh: Consumer Protection Law in a Nutshell (Nutshells) 4th Edition. West Academic Publishing, 2016. ISBN-13: 978-1634604710 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Art studies** | ***NEPTUN-code:***  RTXMT1EBNF | ***Number of hours:***  *lec+gs+lab*  2+1+0 | ***Credit:*** 4  ***Requirements:***  examination |
| ***Course coordinator:***  Dóra Papp-Vid DLA | ***Title:***  associate professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| Art as part of visual culture. Art in prehistoric times, in ancient Egypt and Mesopotamia. The ancient Greek and Roman art. The art of the early medieval times. Byzantium and the Migration Period. The Romanesque and Gothic art. The art of the Renaissance. Baroque and Rococo art.  Art in the 19th century. (classicism, romanticism, historicism, impressionism, post- impressionism, secession)  Art in the 20th century. (avant-garde art movements, fauvism, expressionism, cubism, futurism, surrealism, geometric abstraction, functionalism, modern architecture, post- modern, action art) | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of the learning, knowledge acquisition, and data collection methods of the special field of product design, their ethical limitations and problem solving techniques. * Knowledge of the historical periods, outstanding designers and characteristic objects of industrial design. * Understand and use characteristic online and printed references characteristic of their special field, both in Hungarian and in at least one foreign language. * Know and apply the terminology and special expressions of their professional field in   Hungarian and in at least one foreign language. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Anne D'Alleva, Michael Cothren: Fundamentals of Art History. Laurence King Publishing. London, United Kingdom, 2021. ISBN13 9781913947019 3. Janetta Rebold Benton: How to Understand Art. Thames & Hudson Ltd. London, United Kingdom, 2021. ISBN13 9780500295830 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Learning Methodology** | ***NEPTUN-code:***  RTXTM1EBNF | ***Number of hours:***  *lec+gs+lab*  1+2+0 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Marianna Halász Ph.D. Prof. | ***Title:***  professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| The aim of the course is to prepare students entering higher education to learn effective and efficient learning strategies, to develop individual conditions for self-regulated learning. Students will learn techniques for tuning in to learning, learning and resting while learning. They develop individual and cooperative learning skills. They will learn to deal with learning difficulties in a conscious way and to form success-oriented learning attitudes. Students will gain comprehensive and practical knowledge of factors influencing learning effectiveness, effective learning methods, effective ways of obtaining and organising information online, learning support interfaces and constructive career development. The main aim is to develop competences that will help students to succeed in the subjects they have studied and to prepare for exams. | | | |
| ***Professional competencies:*** | | | |
| - The ability to see and manage the phenomenon of learning in a complex way, and to use effective communication techniques.  - Ability to make adequate use of a varied and up-to-date toolbox of learning methods, based on individual needs.  - Ability to learn independently.  - Ability to work in a cooperative way, preferably by listening to the opinions of colleagues under his/her control, in order to solve problems and make management decisions.  - Ability to implement lifelong learning.  - Ability to continuously develop his/her skills by participating in organised training in his/her field. | | | |
| ***Bibliography:*** | | | |
| 1. Nick Rushby- Dan Surry: The Wiley Handbook of Learning Technology, Wiley-Blackwell, 2016, ISBN: 978-1-118-73643-2 2. John Branch - Paul Bartholomew - Claus Nygaard :Technology-Enhanced Learning in Higher Education, Libri Publishing Ltd., Oxfordshire, UK, 2015, ISBN: 9781909818613 3. Terri Pantuso -Sarah LeMire - Kathy Anders: Informed Arguments: A Guide to Writing and Research, Texas A&M University, 2019 4. Chunfang Zhou: Handbook of Research on Creative Problem-Solving Skill Development in Higher Education, Paratext, 2017, ISBN: 9781522506430Iroda, ISBN 9639704636ö, ISBN 9639724041 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Construction of a Tutoring System and Modern Learning Techniques** | ***NEPTUN-code:***  RTXTK1EBNF | ***Number of hours:***  *lec+gs+lab*  1+1+0 | ***Credit:*** 3  ***Requirements:***  practice mark |
| ***Course coordinator:***  Marianna Halász Ph.D. | ***Title:***  professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| The aim of the course is to prepare students for tutoring, where one or a small group of students receive individual, personalised instruction. The tutorials are designed to develop individual learning pathways, independent learning, subject skills, communication and social competences, so that students are able to help each other in their learning and thus reduce drop-outs. The role of the tutor in reducing drop-outs and catching up. The responsibilities of the student mentor, data management of mentored students. The role of the peer mentor. Mentor responsibilities related to role provision. The person of the mentor, the competency requirements of mentoring. Getting to know the peer mentor, the specificities of communication with them. Developing relational skills. Exploring the mentor's prior knowledge, subject skills and personal characteristics. The characteristics of adult learning. Subject-specific support for the mentored person (mentoring and tutoring). Identification of mentoring problems. Personal mentoring support needs for successful learning progress. Objectives of mentoring support, stages of mentoring work, the spectrum process of mentoring. Planning mentoring support. Choice of mentoring strategies, their application. Methods of mentoring support. Motivating the mentored. Peer learning strategies and techniques. Developing reflective thinking. Levels of reflection. Opportunities for self-development. Processing, analysis and evaluation of contemporary mentoring case studies. Diagnostic-, formative-, formative-, developmental assessment-, sensitive feedback/evaluation in mentoring. Outcomes of mentoring, holistic evaluation of the mentee. Aftercare of the mentored. | | | |
| ***Professional competencies:*** | | | |
| - Able to listen to others sympathetically and give meaningful answers.  - Ability to ask questions that help to self-discover the other person's abilities, personal qualities and aspirations.  - Ability to create a climate of trust that supports the learning/acquisition/catching-up process.  - Ability to take into account the confidentiality of the mentored person.  - Empathic and cooperative.  - Ability to help a less experienced student to correct minor mistakes and prevent major mistakes.  - Ability to make a consistent, effective and efficient professional impact in the mentoring relationship.  - Ability to recognize the needs of the mentored, even if the mentored cannot articulate them.  - Believes in the positive impact of mentoring, especially in the area of professional identification, and is willing to help others. | | | |
| ***Bibliography:*** | | | |
| 1. Joseph Psotka - L. Dan Massey - Sharon A. Mutter: Intelligent Tutoring Systems: Lessons Learned, Psychology Press, 1988, ISBN: ‎978-0805801927 2. Scotty D. Craig: Tutoring and Intelligent Tutoring Systems, Nova, 2016, ISBN: 978-1-53614-085-9 3. 3. Beverly Park Woolf: Building Intelligent Interactive Tutors: Student-centered Strategies for Revolutionizing E-learning, Morgan Kaufmann Publishers, 2009, ISBN: 978-0123735942 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Student Tutorial** | ***NEPTUN-code:***  RTXHT1EBNF | ***Number of hours:***  *lec+gs+lab*  0+2+0 | ***Credit:*** 3  ***Requirements:***  practice mark |
| ***Course coordinator:***  Marianna Halász Ph.D. | ***Title:***  professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| The aim of the course is to provide tutoring to a student or a small group of students in an individual, personalised way. The practical lessons are designed to develop individual learning pathways, independent learning, subject-specific skills, communication and social competences, and to help students meet subject requirements by explaining and practising the subject matter of a particular subject, in order to reduce drop-out rates. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the subject content and ability to transfer knowledge.  - Ability to provide personalised assistance.  - Ability to listen to others sympathetically and give meaningful answers.  - Ability to ask questions that help to self-discover the other person's abilities, personal qualities and aspirations.  - Ability to create a climate of trust that supports the learning/acquisition/catching-up process.  - Ability to take into account the confidentiality of the mentored person.  - Empathic and cooperative.  - Ability to help a less experienced student to correct minor mistakes and prevent major mistakes.  - Ability to make a consistent, effective and efficient professional impact in the mentoring relationship.  - Ability to recognize the needs of the mentored, even if the mentored cannot articulate them.  - Believes in the positive impact of mentoring, especially in the area of professional identification, and is willing to help others. | | | |
| ***Bibliography:*** | | | |
| 1. Catherine A. Simon - Stephen Ward: A Student's Guide to Education Studies, Routledge, 2020, ISBN 9780367276690 2. Charles Neil : The Tutorial Prayer Book: For the Teacher, the Student, and the General Reader (Classic Reprint) Forgotten Books, 2017, ISBN: ‎978-1331693697 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Material Science I.** | ***NEPTUN-code:***  RMXAT1EBNF | ***Number of hours:***  *lec+gs+lab*  2+0+2 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Judit Borsa Ph.D. | ***Title:***  professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| The students get a summary on basic chemistry based upon their high school studies (types of materials, atoms, molecules, primary and secondary bonds). Polymers as most important material for future industrial designers are presented: natural polymers, synthetic polymers (polymerization reactions, structure of polymers and their properties, polymer manufacture methods). Practice: chemical and instrumental (FTIR) analysis of polymers; microscopy, thermal analysis, chromatography, water uptake of hydrogels, evaluation of experimental data. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the general and specific mathematical and scientific principles, rules, relationships and procedures required for product design.  - Knowledge of the main raw materials used in product design, their production and conditions of use.  - Ability to build, test and verify real models and prototypes using direct digital manufacturing techniques based on traditional and three-dimensional product models. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Miodownik Mark: Stuff Matters: Exploring the Marvelous Materials That Shape Our Man-Made World. Mariner Books, 2015. **ISBN13 (EAN):** 9780544483941 3. Lawrence E. Murr: Handbook of Materials Structures, Properties, Processing and Performance. Springer Cham , 2015. ISBN: 978-3-319-01815-7 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Material Science II.** | ***NEPTUN-code:***  RMXAT2EBNF | ***Number of hours:***  *lec+gs+lab*  2+0+2 | ***Kredit*:** 4  ***Requirement****:*  examination |
| ***Subject owner:***  Judit Borsa Ph.D. | ***Rank:***  professor | ***Pre-requisite:***  Material Science I. | |
| ***Course Description:*** | | | |
| The subject familiarizes the students with materials from microstructure to macrostructure, basic features, relationships, physical explanation, properties and intervention possibilities needed for the design of material parameters, and some examination procedures.   * Special, moisture-related features of polymer structures. Typical features of fibres. * Processes and their characteristics related to moisture, moisture absorption and drying. Examinations. * Structure and characteristics of metals as crystalline materials. Possibilities and characteristic-modifying effects of alloying and heat treatments of metals. Basic examinations of metallic structures. * Basic terms of mechanical characteristics and examinations. Explanation and principles of bundle and chain in the case of mechanically collaborating systems * Friction and its accompaniments. * Explanations of ‘membrane’. Membrane structures and their importance. * Combination of materials. Introduction of composite structures. * General permeability characteristics (moisture, gas, radiation). * Isotropy and anisotropy. Direction-related features of 2D products. * Magnetic and electric features of materials. * Micro and nano systems. Size-determined characteristics of micro and nano range. * Failures. Typical failure processes of metals, polymers and composite structures. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the general and specific mathematical and scientific principles, rules, relationships and procedures required for product design.  - Knowledge of the main raw materials used in product design, their production and conditions of use.  - Ability to build, test and verify real models and prototypes using direct digital manufacturing techniques based on traditional and three-dimensional product models. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Miodownik Mark: Stuff Matters: Exploring the Marvelous Materials That Shape Our Man-Made World. Mariner Books, 2015. **ISBN13 (EAN):** 9780544483941 3. Lawrence E. Murr: Handbook of Materials Structures, Properties, Processing and Performance. Springer Cham , 2015. ISBN: 978-3-319-01815-7 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Industrial Technologies and Machines I. (blended)** | ***NEPTUN-code:***  RTEIT1EBNF | ***Number of hours:***  *lec+gs+lab*  1+0+1 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Gabriella Oroszlány Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| Machinery fundamentals, basic concepts, principles and operational requirements are closely related to the product design expertise area. Operation, development and relations of structural units and building elements of ubiquitous machines of industrial technologies and simple technical systems. Kinematic basic concepts and fundamental mechanisms. Mechanisms of degrees of freedom (DOF calculations), structural - kinematic analysis.  The material processing and manufacturing process technology associated with each step of the special equipment, their structure, operating principles and basic concepts.  Textile machinery, non-woven fabrics production of machines, production machines of knitted products. Finishing machines, equipments used for painting and pattern-making. Types and operating principles of equipments for carrying out the key packaging products and packaging operations.  The latest development trends, solutions and innovations. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Able to interpret and characterize the structure and operation of the structural units and components of relatively simple technical systems, as well as the design and connection of the system components applied.   Able to explore the causes of failures and to select elimination operations. | | | |
| ***Bibliography:*** | | | |
| 1. Steven R. Schmid, Bernard J. Hamrock, Bo. O. Jacobson: Fundamentals of Machine   Elements, ISBN 9781439891322   1. Machine elements, handbook, [http://www.gbi.bgk.uni-](http://www.gbi.bgk.uni-/)   obuda.hu/oktatas/segedanyagok/gepelemek/Machine\_Design\_2/Machine%20Element.pdf  3. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Industrial Technologies and Machines II. (blended)** | ***NEPTUN-code:***  RTEIT2EBNF | ***Number of hours:***  *lec+gs+lab*  1+0+1 | ***Credit:*** 4  ***Requirements:***  examination |
| ***Course coordinator:***  Gabriella Oroszlány Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  Industrial Technologies and Machines I. | |
| ***Course Description:*** | | | |
| Further machinery fundamentals, basic concepts, principles and operational requirements which are closely related to the product design expertise area.  The material processing and basic settings of special equipment for each process step of the manufacturing process. Knowledge of the structural parts of machines (mechanical machine components, pneumatic components, etc.) will enable to understand the design and the operating principle of machines and make it possible to select the appropriate machines and equipment.  Working principles and structural designs of the overall garment processing equipments (sewing machines, irons and glue machines, presses etc.).  Special clothing machining: clothing welding, laser cutting, engraving technology tools, sewing machines and pneumatic cam control.  The latest developments and innovative solutions of equipments producing packaging tools and performing packaging. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Able to interpret and characterize the structure and operation of the structural units and components of relatively simple technical systems, as well as the design and connection of the system components applied.   - Able to explore the causes of failures and to select elimination operations. | | | |
| ***Bibliography:*** | | | |
| 1. Steven R. Schmid, Bernard J. Hamrock, Bo. O. Jacobson: Fundamentals of Machine   Elements, ISBN 9781439891322   1. Machine elements, handbook, [http://www.gbi.bgk.uni-](http://www.gbi.bgk.uni-/)   obuda.hu/oktatas/segedanyagok/gepelemek/Machine\_Design\_2/Machine%20Element.pdf   1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Technical Drawing Basics, CAD** | ***NEPTUN-code:***  RKEMR1EBNF | ***Number of hours:***  *lec+gs+lab*  1+0+2 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Bodáné Kendrovics Rita Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| The aim of this course is to provide an introduction to drawing fundamentals and to develop drawing skills of students. The first part of the course covers such topics as layout of Technical Drawings, line styles, lettering, scale, geometric construction, transformation, projection (ortographic projection, central or perspective projection, oblique projection), axonometric view (isometric, diametric, Cavalier etc.). The second part of the course focuses on topics as follows: sketching, dimensioning, sectioning, fits and tolarences, surfaces roughness, symbolical representation, detail and assembly drawing. | | | |
| ***Professional competencies:*** | | | |
| - With up-to-date IT skills, you can use professional databases and, depending on your specialisation, certain design, modelling and simulation software.  - You have the stamina and tolerance of monotony needed to carry out practical activities.  - In the development and application of production and other technologies, the ability to work with engineers developing and applying the technology in order to improve the technology from an environmental point of view.  - Their multidisciplinary knowledge enables them to participate creatively in engineering work and to adapt to constantly changing requirements. | | | |
| ***Bibliography:*** | | | |
| 1. Coli H.Simmons, Dennis E. Maguire: Manual of Engineering drawing in e-learning   system   1. David Anderson: Technical drawing, Spring, 2006 2. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Informatics (blended)** | ***NEPTUN-code:***  RMEIF1EBNF | ***Number of hours: lec+gs+lab***  1+0+3 | ***Credit*:** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Eszter Kormány Ph.D. | ***Title:***  senior lecturer | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| The aim of the course is to provide a basic knowledge of IT for university studies and future engineering work. In the lectures of the course, students will learn about computer architecture, the hardware and software components required for operation, ethical and safe computer use, the basics of database management and programming, algorithm description tools and their use.  The exercises include data analysis, problem solving and algorithmic exercises. The knowledge gained can be used for coursework and in future work. Students will learn how to create and manage databases using Ms Access, design databases, normalization steps, create tables, set up key relationships, query, report and use SQL language. Simplify algorithms, create functions to extend the toolset of the Ms Office application. | | | |
| ***Professional competencies:*** | | | |
| - Ability to learn new skills through solving practical problems through experience.  - With up-to-date IT skills, you can use professional databases and, depending on your specialisation, design, modelling and simulation software.  - Have the stamina and tolerance of monotony needed to carry out practical activities.  - Understand and use online and printed literature in Hungarian and at least one foreign language. | | | |
| ***Bibliography:*** | | | |
| 1. PPT files on the homepage of Moodle learning system | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Colour Theory and Colorimetry** | ***NEPTUN-code:***  RTXSZ1EBNF | ***Number of hours: lec+gs+lab***  2+0+2 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Ákos Borbély Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| Basic notions of color theory. The physical, physiological and psychological bases connected to colors. The spectrum of electromagnetic radiation, optical radiations. The structure of the human eye, photoreceptors, the structure of the retina. The general context of visual performance, the basics of color vision, the properties of color perception. Color features. The factors influencing color sensing. The methods and tools of color communication: the questions of subjective and objective color characterization; color systems, color sample atlases. The basic principles of color systems. The bases of color measurement, the objective modelling of reduced color vision. The methods and instruments of color stimulus measuring, spectrophotometers. Color contrasts. Color harmony systems. The effects and functions of colors, colorful environment. The basics of color dynamic design, the relationships of people and colors. The special characteristics of color usage. The questions of color reproduction, reproducible color ranges. Colorful techniques.  The most important practical methods of the professional field. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic ergonomic and psychological methods, rules and standards for the design of industrial products.  - Understands and uses the online and printed literature in Hungarian and at least one foreign language.  - Knows and uses the language and special terms of his/her field of specialisation in Hungarian and at least one foreign language.   * Ability to justify decisions on the designed product, to test them and to support them with technical and standard test methods. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Josef Albers: Interaction of Color: 50th Anniversary Edition. Yale University Press, United States, 2020. ISBN13 9780300179354 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **CAD/CAM I.** | ***NEPTUN-code:***  RTXCC1EBNF | ***Number of hours: lec+gs+lab***  0+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Eszter Kormány Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  Informatics I. | |
| ***Course Description:*** | | | |
| The course introduces students to the theoretical foundations of computer-aided design (Adobe Illustrator and Adobe Photoshop). Using computer applications, they will practice various image manipulation and drawing methods. Skills development will include learning how to adapt visual branding to different products/forms and how to process their own photos for different applications.  Interoperability between different systems. Standard data exchange formats. The data formats necessary for production. Solution of tasks from conceptual modelling to tool making.  The role of realistic display in technical design systems.  The basic knowledge of the graphic design of composition tasks and visual image elements. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic design principles and methods, major manufacturing processes and operational procedures.  - Ability to design simple products in terms of form and construction, taking into account manufacturing constraints, expected costs and environmental impact.  - Ability to create virtual models of product concepts and products and to prepare technical documentation using three-dimensional computer-aided design systems.  - Have the stamina and tolerance for monotony required to carry out practical activities. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Books of Adobe® Photoshop® és Illustrator® programs | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **CAD/CAM II.** | ***NEPTUN-code:***  RTXCC2EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+3 | ***Credit: 4***  ***Requirements:***  practice mark |
| ***Course coordinator:***  Orsolya Nagyné Szabó Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  CAD/CAM I. | |
| ***Course Description:*** | | | |
| Virtual modelling and visualisation of products using computer systems used in engineering practice. Preparation of technical documentation. The language and specialised terminology of computer programmes.  Engineering vector graphics systems. Basic functions, creation and modification of shapes and forms, transformations, zooming, navigation, alignment, editing curves, cutting tools, other profession-specific representations. Learning, using and practising computer-aided drafting techniques. Editing and displaying clothing, interior and packaging products, providing information for production using computer tools. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic construction designs and their sizing principles.  - Ability to use three-dimensional computer-aided design systems to create virtual models of product concepts or products and to prepare their technical documentation.  - Ability to build, test and verify real models and prototypes using direct digital manufacturing techniques based on traditional and three-dimensional product models.  - Ability to apply computational and modelling principles and methods from the industrial product design literature. | | | |
| ***Bibliography:*** | | | |
| 1. Books of Adobe® Photoshop® és Illustrator® programs  2. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Product Design Methodology and Design (blended)** | ***NEPTUN-code:***  RTXTM1EBNF | ***Number of hours:***  *lec+gs+lab*  4+0+0 | ***Credit:*** 4  ***Requirements:***  examination |
| ***Course coordinator:***  Daniella Koós DLA | ***Title:***  associate professor | ***Prerequisite:***  Form Design I. | |
| ***Course Description:*** | | | |
| Product life cycles and the product environment. Design schools. The product development process, exploring and defining the product idea. Optimisation of product characteristics.  Developing a product concept. Product features. Product functions, technical (materials, technologies, ergonomics), economic (marketing, energy optimisation, technology), psychological (impact on the consumer, safety), sociological (prestige, brand), ecological (resource management), and documentary (historical and contemporary stylistic interpretation) functions and methods for the design of industrial products. Cost factors in design. Design for manufacturability.  Historical periods, subjects and creators of industrial design. Design aspirations and opportunities in the past and present. Design principles. Functions of industrial design, design process. Industrial Revolution. Art Nouveau.  Functional design. Progressive and conservative modernism. Industrial design after the First World War. Avant-garde, Constructivism, Bauhaus. Art Deco in Europe and America. The American model of commercial design. European design after World War II. Design in the second half of the 20th century. Organic design. Systematic design. Design trends in the early 21st century. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic design principles and methods, major manufacturing processes and operational procedures.  - Knowledge of the basic rules and technological constraints for shaping products and finding the right balance between content and form.  - Knowledge of the main raw materials used in product design, their production and conditions of use.  - Knowledge of the basic construction designs and the principles of their sizing.  - Knowledge of learning, knowledge acquisition, data collection methods, their ethical limitations and problem solving techniques in product design.  - Knowledge of the historical periods of industrial design, its prominent designers and typical subjects.  - Knowledge of the basic rules of intellectual property management.  - Ability to apply the principles and methods of calculation and modelling of industrial product design literature.  - Understand and use online and printed literature in Hungarian and at least one foreign language typical of his/her field of specialisation.  - Know and use the language and special terms of his/her field of specialisation in Hungarian and at least one foreign language.  - Knowledge of the main analogies between natural and technical systems and their application in design.  - Ability to take into account the historical, cultural, socio-economic and industrial environment aspects in the process of industrial design and product development. | | | |
| ***Bibliography:*** | | | |
| 1. Luz Del Carmen Vilchis Esquivel: Design Methodology: Theoretical Fundamentals. Authorhouse, 2014. ISBN13 (EAN): 9781463391782 2. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Integrated Product Design I.** | ***NEPTUN-code:***  RTXTT1EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Prof. Márta Kisfaludy DLA | ***Title:***  professor | ***Prerequisite:***  Form Design I. | |
| ***Course Description:*** | | | |
| Knowledge of basic design principles and methods, the main factors that influence the design of a product or service, and the way in which it is used. Gathering information. Solving simple design problems by applying design principles in individual and group work. Modelling, presentation and evaluation of the product.  Designing a functional structure. Philosophy of creation. Model families. Design support using applied computing.  Systematic design progresses from simple problem statement to more complex projects. The focus of the course is on product development in team work, primarily through the creation of functional prototypes according to plans. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic design principles and methods, major manufacturing processes and operational procedures.  - Knowledge of the main materials used in product design, their production and conditions of use.  - Knowledge of teamwork ethics and methods.  - Ability to design and construct simple products, taking into account the constraints of production technology, expected costs and environmental impact.  - Ability to use three-dimensional computer-aided design systems to create virtual models of product concepts and products and to prepare technical documentation.  - Ability to create, test and verify real models and prototypes using direct digital manufacturing techniques based on traditional and 3D product models.  - Ability to acquire new knowledge by solving practical problems through experience.  - Ability to apply computational and modelling principles and methods from the industrial product design literature.  - Ability to take into account historical, cultural, socio-economic and industrial context aspects in the process of industrial design and product development.  - Ability to analyse design projects using design methods and to justify methodologically the workflows used.  - He/she will strive to ensure that his/her self-learning in industrial product and design engineering is continuous and consistent with his/her professional goals.  - He/she shall endeavour to ensure that his/her self-training in industrial product and design engineering is continuous and consistent with his/her professional objectives.  - Is open to transferring his/her knowledge to his/her colleagues.  - He/she is attentive to promoting the professional development of his/her subordinates and to managing and assisting them in this endeavour.   * Ensures that the principle of equal access is applied in problem solving. | | | |
| ***Bibliography:*** | | | |
| 1. Bjarki Hallgrimsson: Prototyping and Modelmaking for Product Design : Second Edition. Laurence King Publishing, London, United Kingdom, 2019. ISBN13 9781786275110 2. Rob Thompson: Manufacturing Processes for Design Professionals. Thames & Hudson Ltd., London, United Kingdom, 2007. ISBN13 9780500513750 3. Rob Thompson: The Materials Sourcebook for Design Professionals. Thames & Hudson Ltd., London, United Kingdom, 2017. ISBN13 9780500518540 4. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |
| ***Name of subject:***  **Professional Environmental Protection (blended)** | ***NEPTUN-code:***  RTESK1EBNF | ***Number of hours:***  *lec+gs+lab*  1+1+0 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Gabriella Oroszlány Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| A description of the safety, health, environmental, quality and control requirements for the relevant professional sectors (textiles, clothing, leather, paper, plastics, etc.). Environmental impact of technologies, environmental problems in industrial production, their analysis and modern management. General rules and standards for waste management. Waste minimisation, recycling, re-use, disposal guidelines. Resource management. | | | |
| ***Professional competencies:*** | | | |
| - He/she is familiar with the expectations and requirements in the fields of occupational health and safety, fire protection, safety and health at work, and environmental protection.  - Knowledge of the basics, boundaries and requirements of marketing, management, environmental protection, quality assurance, information technology, legal and economic disciplines integrally related to product design.  - Understands and uses the online and printed literature in Hungarian and at least one foreign language.  - Knows and uses the language and specialised terminology of his/her field of specialisation in Hungarian and at least one foreign language.  - Adheres to and complies with the relevant health and safety, environmental protection, quality assurance and control requirements. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Kate Fletcher: Sustainable fashion and Textile Design Journeys, Taylor & Francis, 2014. ISBN10 0415644569, ISBN13 9780415644563 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Visual Communication** | ***NEPTUN-code:***  RTXVK1EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Daniella Koós Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  Form Design I. | |
| ***Course Description:*** | | | |
| Communication through images. The forms of the visual conveyance of meaning. Creativity and visual thinking.  Based on freehand drawing, practicing the different graphical methods, genres, techniques, introducing the possibilities of graphic design.  The psychological context of vision. Basic concepts of aesthetics. The development of individual visual expressions. Style exercises.  The concept, content and form elements of corporate identity. Corporate identity and image. Corporate identity and corporate design. The main aspects of designing the information system.  Designing corporate identity through group projects. Documentation. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the basic rules and technological limits of product shaping, content and form matching.  - Knowledge of the main analogies between natural and technical systems and their application in design.  - Ability to present product concepts and sketches in drawings using traditional hand techniques. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>PPT-s and aids prepared by the instructor 2. Karen Cheng: Designing Type, Laurence King Publishing Ltd., London, 2020.ISBN10 0300111509, ISBN13 9780300111507 3. Josef Müller-Brockmann: Grid Systems in Graphic Design : "A Visual Communication Manual for Graphic Designers, Typographers and Three Dimensional Designers" ISBN10 3721201450, ISBN13 9783721201451 4. Philip B. Meggs: Meggs’History of Graphic Design. John Wiley& Sons Inc, 2016. ISBN13 (EAN): 9781118772058 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Ergonomics** | ***NEPTUN-code:***  RTXER1EBNF | ***Number of hours:***  *lec+gs+lab*  1+1+0 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Gabriella Oroszlány Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  Form Design I. | |
| ***Course Description:*** | | | |
| The concept, purpose and stages of development of ergonomics. The man - product and machine system. Anthropometric knowledge, use of anthropometric data in design  Physiological and psychological basis of ergonomics: vision, hearing, smell, touch, perception, memory.  Product ergonomics. The user environment. Design approaches. Product ergonomic quality. Ergonomic criteria.  Biomechanical principles, human force and torque.  Design for specific user groups (significantly different, limited). Product development process, user involvement in product development. Ergonomics of product use.  Ergonomics of product information, advertising, packaging, design of product documentation. Environmental ergonomics. Ergonomics of the working environment. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic design principles and methods, major manufacturing processes and operational procedures.  - Knowledge of basic ergonomic and psychological methods, rules and standards for the design of industrial products.  - Ability to design simple products in terms of form and construction, taking into account the constraints of production technology, expected costs and environmental impact.  - Ensure equal access to the principle of equal opportunity in problem solving. | | | |
| ***Bibliography:*** | | | |
| 1. Ergonomics In Product Design. Sendpoints Publishing Co., Ltd., Honkong, 2019. • ISBN13 9789887849377 2. Karwowski Waldemar: Handbook on Standards and Guidelines in Ergonomics and Human Factors. Taylor&Francis Inc., 2005. ISBN13 (EAN): 9780805841299 3. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Marketing and Trade** | ***NEPTUN-code:***  RTXMK1EBNF | ***Number of hours:***  *lec+gs+lab*  1+2+0 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Orsolya Nagy Szabó Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| The role, functions and structure of trade. Actors in distribution channels, classification of traders. Content of the foreign trade contract. Specificities of cultures in international trade. Principles of business ethics. Sustainable development, the concept of fair trade. Sales promotion methods. Online sales: webshop. Online marketing (ADWords, FB Twitter, etc.). Personal selling. Personality types. Consumer behaviour. Sales and negotiation techniques. Intellectual property. Concepts of inventions, patents, trademarks, know how, industrial design, licensing, franchising. Advertising objectives, pricing strategies. Basics of advertising psychology. Mechanism of action of advertising. Advertising messages in practice: historical and contemporary advertising. Exhibitions, trade fairs. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the basics, boundaries and requirements of marketing, management, environmental protection, quality assurance, information technology, law, economics, which are integrally related to product design.  - Understands and uses the online and printed literature in Hungarian and at least one foreign language.  - Knows and uses the language and specialised terminology of his/her field of specialisation in Hungarian and at least one foreign language.  - Market-, environment- and customer-oriented. | | | |
| ***Bibliography:*** | | | |
| 1. Anthony G. Bennett: The Big Book of Marketing. McGraw-Hill Companies, 2010 ISBN: 978-0-07-162615-66. 2. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Projectmanagement (blended)** | ***NEPTUN-code:***  RMEPR1EBNF | ***Number of hours:***  *lec+gs+lab*  1+1+0 | ***Credit*:** 4  ***Requirement:***  examination |
| ***Course coordinator:***  Áron Takács Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| The topics of the course provide knowledge on how to implement projects with different objectives in a strategy-oriented way, how to manage uncertainties and risks, and how to find solutions to project-related problems using organisational-management, technical-technical and economic knowledge. In industrial and service activities, in the competitive sector, each task is solved by means of a specific design and implementation, in which a new product has to be produced within a given budget and within a given deadline, using finite resources (building a facility, designing a service, designing a product, etc.). Projects of this kind and similar activities require a new approach, the use of specific methods and techniques. In this sense, project management also represents the emergence of a new discipline. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the concepts of economics and environmental economics, project and environmental management, tools in the field of environmental protection.  - In the development and application of production and other technologies, the ability to cooperate with engineers developing and applying the technology in order to improve the technology from an environmental point of view.  - Their multidisciplinary knowledge enables them to participate creatively in engineering work and to adapt to constantly changing requirements  - Ability to identify shortcomings in the technologies used, process risks and take the initiative to mitigate them.  - Open to professional collaboration with professionals in other fields related to his/her profession.  - In the performance of his/her professional duties, he/she will also cooperate with qualified professionals from other disciplines (primarily economic and legal).  - He/she monitors and implements changes in legislation, technical, technological and administrative developments in the field. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Project management guide (PMBOK® Guide) 5. Akadémiai Kiadó, Budapest, 2013,   ISBN: 978 963 05 9426 4 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Form Design and Modelling I.** | ***NEPTUN-code:***  RTXFO1EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+5 | ***Credit: 4***  ***Requirements:***  practice mark |
| ***Course coordinator:***  Dóra Papp-Vid DLA | ***Title:***  associate professor | ***Prerequisite:***  Freehand Drawing I. | |
| ***Course Description:*** | | | |
| Developing a creative design approach to the design of industrial products, understanding the concept of design in design. Modelling studies help to understand the analogies between natural and technical systems and their application in design.  To learn about the properties of different types of materials, both discipline-specific and modelling materials, and to explore the possibilities of shaping them. Innovative experiments in the design of spatial forms.  Modular structures, connection laws. Proportion systems, dimensional and material properties, possibilities for further development of spatial structures in leather, paper, plastic and textile.  Functionality and visual appearance.  Taxonomy of geometric and organic forms. Analysis of the laws of geometric and natural forms. The concept and uses of modelling. Development of a design engineering vision for the development of form through the representation of the basic shapes that make up geometric models, the study of their characteristics and properties. Analysis of organic shapes through the production of study drawings. Scale modelling of natural forms. Production of models from geometric shapes. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic design principles and methods, major manufacturing processes and operational procedures.  - Knowledge of the main raw materials used in product design, their production and conditions of use.  - Knowledge of the main analogies between natural and technical systems and their application in design.  - Ability to translate solutions developed in nature into engineering practice.  - Knowledge of basic design concepts and the principles of their dimensioning.  - Knowledge of the basic rules and technological constraints of product design, content and form.  - Ability to design simple products in terms of form and construction, taking into account technological constraints, expected costs and environmental impact.  - He/she will endeavour to keep his/her self-training in industrial product and design engineering continuous and in line with his/her professional goals. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>PPT-s and aids prepared by the instructor 2. J. Robert Rossman , Mathew D. Duerden: Designing Experiences. Columbia University Press, New York, United States, 2019. ISBN13 9780231191685 3. Paul Jackson: Folding Techniques for designers: From Sheet to Form. 2022. Quercus Publishing. ISBN10 1856697215, ISBN13 9781856697217 4. Paul Jackson: Cut and Fold Techniques for Pop-Up Designs. Laurence King Publishers, 2014. ISBN13 (EAN): 9781780673271 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Form Design and Modelling II.** | ***NEPTUN-code:***  RTXFO2EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Dóra Papp-Vid DLA | ***Title:***  associate professor | ***Prerequisite:***  Form Design and Modelling I. | |
| ***Course Description:*** | | | |
| Developing a creative design approach to the design of industrial products, understanding the concept of design in design.  To learn about the properties of different types of materials, both trade-specific and modelling materials, and to experiment with their shaping possibilities.  Exploring and analysing technical, structural, functional and aesthetic solutions through innovative experiments in spatial form design. Bionics as a source of inspiration. The role of information exploration in the design process. The application of design principles in the design process. Product design: design principles, defining shape characteristics, aesthetic and technical interpretation and design of dimensions. Functional analysis.  Acquisition of the most important working concepts in the field for subsequent design tasks. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic design principles and methods, major manufacturing processes and operational procedures.  - Knowledge of the main raw materials used in product design, their production and conditions of use.  - Knowledge of basic construction designs and their sizing principles.  - Knowledge of the basic rules and technological limits of product shaping, content and form matching.  - Ability to design simple products in terms of form and construction, taking into account technological constraints, expected costs and environmental impact.  - Ability to translate solutions developed in nature into technical practice.  - He/she will endeavour to pursue self-training in industrial product and design engineering on an ongoing basis and in line with his/her professional goals. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>PPT-s and aids prepared by the instructor 2. J. Robert Rossman , Mathew D. Duerden: Designing Experiences. Columbia University Press, New York, United States, 2019. ISBN13 9780231191685 3. Paul Jackson: Folding Techniques for designers: From Sheet to Form. 2022. Quercus Publishing. ISBN10 1856697215, ISBN13 9781856697217 4. Paul Jackson: Cut and Fold Techniques for Pop-Up Designs. Laurence King Publishers, 2014. ISBN13 (EAN): 9781780673271 5. Kapsali Veronika: Thames &Hudson, London, 2021. Biomimetics for Designers. ISBN13 (EAN): 9780500296387 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Freehand drawing I.** | ***NEPTUN-code:***  RTXRA1EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Tantárgyfelelős:***  Edit Csanák DLA | ***Title:***  associate professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| Freehand modes of representation with traditional manual techniques. Analysis and representation of the structural relationships between geometric objects. Relationship between the subject and the background/space.  Understanding the principles of artistic representation. Conditions of composition design. Geometric perspective view of the body. Light - shadow, linear and tonal drawings.  Drapery - and object representation with various techniques. Color compositions and color  harmonies of still life. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the basic rules and technological limits of product shaping, content and form matching.  - Knowledge of the main analogies between natural and technical systems and their application in design.  - Ability to present product concepts and sketches in drawings using traditional hand techniques. | | | |
| ***Bibliography:*** | | | |
| 1. How to Draw: Drawing and Sketching Objects and Environments from Your Imagination 2. Stephanie Travis: Sketching for Architecture and Interior Design. ‎ Laurence King Publishing, 2015. ISBN-13 978-1780675923 3. <https://elearning.uni-obuda.hu/>PPT-s and aids prepared by the instructor 4. Stan Smith: Anatomy, Perspective and Composition for the Artist, Dover Publications Inc., 2014. **EAN:** 9780486492995 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Freehand Drawing II.** | ***NEPTUN-code:***  RTXRA2EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Tantárgyfelelős:***  Edit Csanák DLA | ***Title:***  associate professor | ***Prerequisite:***  Freehand Drawing I. | |
| ***Course Description:*** | | | |
| Freehand modes of representation with traditional manual techniques.  Artistic anatomy of the human body proportions. The study of the structure of bones and musculoskeletal system.  Stylized figural group-compositions through creative practices. Spatial representations. Building and interior elements. Color compositions based on natural inspiration. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the basic rules and technological limits of product shaping, content and form matching.  - Knowledge of the main analogies between natural and technical systems and their application in design.  - Ability to present product concepts and sketches in drawings using traditional hand techniques. | | | |
| ***Bibliography:*** | | | |
| 1. How to Draw: Drawing and Sketching Objects and Environments from Your Imagination 2. Stephanie Travis: Sketching for Architecture and Interior Design. ‎ Laurence King Publishing, 2015. ISBN-13 978-1780675923 3. <https://elearning.uni-obuda.hu/>PPT-s and aids prepared by the instructor | | | |

# **Product design specialization (Interior-Textile, Fashion-Accessories)**

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:* Integrated Product Design II. (Interior and**  **Fashion)** | ***NEPTUN-code:***  RTWTT2EBNF | ***Number of hours:*** *lec+gs+lab*  0+0+4 | ***Credit:*** 5 ***Requirements:*** practice mark |
| ***Course coordinator:***  Prof. Márta Kisfaludy DLA | ***Title:***  professor | ***Prerequisite:***  Integrated Product Design I. | |
| ***Course Description:*** | | | |
| Consumer needs, survey of habits and market participants, analysis and feedback into planning. By endorsing design principles, solution of simple design tasks individually and in group work. Product modeling, presentation and evaluation.  Colour and form, colour and ergonomics, colour harmonies, colour dynamics design. The cooperation of designers and manufacturers. The cost factors of designing.  The criteria of product features with individual, series and mass products as well as production management. Design for manufacturability, standardization of types (standardization), designing collections, model families. Supporting design with applied computer technology.  System design ranges from the suggestion of simple problems to more complicated projects.  The course focuses on product development in team work primarily by helping the preparation of functional prototypes according to the plans.  Redesign of a common place taking into account the specific characteristics of particular community areas. Coordination of materials, technology and style.  Designing uniforms and accessories, taking into account the specifics of a particular corporate image. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic design principles and methods, major manufacturing processes and operational procedures.  - Knowledge of the main materials used in product design, their production and conditions of use.  - Knowledge of the basic rules and technological constraints of product design, content and form.  - Knowledge of the most important practical working methods in the field.  - Knowledge of the ethics and methods of teamwork.  - Ability to design and construct simple products, taking into account the constraints of production technology, expected costs and environmental impact.  - Ability to use three-dimensional computer-aided design systems to create virtual models of product concepts and products and to prepare technical documentation.  - Ability to create, test and verify real models and prototypes using direct digital manufacturing technologies based on traditional and 3D product models.  - Ability to acquire new knowledge by solving practical problems through experience.  - Ability to apply computational and modelling principles and methods from the industrial product design literature.  - Ability to participate in and lead group work.  - Ability to initiate, set up and implement projects in team work, especially in a multidisciplinary environment.  - Ability to take into account historical, cultural, socio-economic and industrial context aspects in the process of industrial design and product development.  - Ability to analyse design projects using design methodologies and to methodologically justify the work processes used.  - He/she will strive to ensure that his/her self-study in industrial product and design engineering is continuous and consistent with his/her professional goals.  - He/she will endeavour to solve problems and make management decisions by listening to the opinions of his/her colleagues, preferably in cooperation.  - He/she is open to sharing his/her knowledge with his/her colleagues.  - He is attentive to promoting the professional development of his subordinates and to managing and helping them in their efforts in this direction.  - Ensures that the principle of equal access is applied in problem solving. | | | |
| ***Bibliography:*** | | | |
| 1. William Lidwell , Kritina Holden , Jill Butler: Universal Principles of Design : 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach through Design. [Rockport Publishers Inc.](https://www.bookdepository.com/publishers/Rockport-Publishers-Inc) Rockport, United States, 2010. ISBN13 9781592535873 2. Bjarki Hallgrimsson: Prototyping and Modelmaking for Product Design : Second Edition. Laurence King Publishing, London, United Kingdom, 2019. ISBN13 9781786275110 3. Rob Thompson: Manufacturing Processes for Design Professionals. Thames & Hudson Ltd., London, United Kingdom, 2007. ISBN13 9780500513750 4. Rob Thompson: The Materials Sourcebook for Design Professionals. Thames & Hudson Ltd., London, United Kingdom, 2017. ISBN13 9780500518540 5. Donald A. Norman: The Design of Everyday Things. Basic Books, New York, United States, 2013. ISBN13 9780465050659 6. <https://elearning.uni-obuda.hu/>PPT-s and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:* Integrated Product Design III. (Interior and Fashion)** | ***NEPTUN-code:***  RTWTT3EBNF | ***Number of hours:*** *lec+gs+lab*  0+0+4 | ***Credit:*** 5 ***Requirements:*** practice mark |
| ***Course coordinator:***  Prof. Márta Kisfaludy DLA | ***Title:***  professor | ***Prerequisite:***  Integrated product design II. (Interior and Fashion) | |
| ***Course Description:*** | | | |
| Ecological approach in product design. Recycling-reuse-redesign.  The integrated product design on the basis of socio-economic and technical aspects lays great emphasis on the unified and coordinated display of products and product groups in addition to the functional, market, long standing, safety and feasibility aspects.  The experiments of colour and design studies aim at the diverse presentation of product variants through a design project.  The implementation of product design and development projects is aided by the preparation of prototypes and technological model experiments.  The most optimal creation of aesthetic product appearance is assisted by the product construction knowledge and the current state of the art industrial background.  Solutions for profession-specific project tasks. Re-use / redesign for interior design, clothing and accessories. Design, use of materials, technology and style coordination. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes.   * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of the fundamental rules and technological limitations of shaping products, of striking a harmony between content and form. * Knowledge of the most important practical work techniques of their special field. * Knowledge of the ethics and methods of team work. * Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment. * Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation. * Able to produce, examine and test real models and prototypes using direct digital production technologies based on both traditional and 3D product models. * Able to master new knowledge by solving practical problems empirically. * Able to apply the calculation and modelling principles and methods of special literature related to industrial product design. * Able to take part in and also to manage team work.   - Able to initiate, compile, and carry out projects in team work, primarily in a multidisciplinary environment.  - Able to take into account the aspects of the historical, cultural, socio-economic and industrial environment in the process of industrial design and product development.  - Able to analyze design projects by applying design methods and to give methodological reasons for the workflows applied.   * Efforts to make self-education in the special area of industrial product design a continuous process in line with professional objectives. * Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith. * Open to transmitting own knowledge to colleagues. * Taking care to promote subordinates’ professional development, to manage and help such endeavors.   - Taking care of ensuring equal access opportunities in problem solving. | | | |
| ***Bibliography:*** | | | |
| 1. William McDonough, Michael Braungart: The Upcycle: Beyond Sustainability - Designing for Abundance, North Point Press, Berkeley, California, United States, 2013. ISBN10 0865477485, ISBN13 9780865477483 2. Silvia Barbero, Brunella Cozzo: Ecodesign. Umweltfreundliches für den Alltag. Published by h.f.ullmann, 2012. ISBN10 3833163070, ISBN13 9783833163074 3. Rob Thompson: The Materials Sourcebook for Design Professionals. Thames & Hudson Ltd., London, United Kingdom, 2017. ISBN13 9780500518540 4. Donald A. Norman: The Design of Everyday Things. Basic Books, New York, United States, 2013. ISBN13 9780465050659 5. Jane Penty: Product Design and Sustainability. Routledge, 2019. ISBN 9781351400848 6. <https://elearning.uni-obuda.hu/>PPT-s and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Interior and Fashion Design I.** | ***NEPTUN-code:***  RTWEO1EBNF | ***Number of hours:***  *lec+gs+lab*  2+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Éva Hottó Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  Form design II. | |
| ***Course Description:*** | | | |
| Interior and furniture history. Eras, styles, manufacturing technologies. Today's typical interior style.  The architectural elements of design documentation, construction, sizing.  Architectural engineering and lighting elements markings, signal systems. Show the fixtures computer engineering floor plan and space.  Construction design documentation. Style variations of a given living space in and full design documentation of one style.  Aspects of designing clothes, elements, combinations. The proportions of the garment. Basic silhouettes.  Design according to article categories, creative shape experiments, drapery studies, basic wardrobe.  Article group design, types and typical design solutions. Drapery studies, creative form experiments, basic dress design. Systematization of leather goods. Types, functions and typical design solutions for leather goods. Development and presentation of tenders collections. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic construction designs and their dimensioning basics.   * Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment.   Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation.   * Able to give reasons for the decisions related to the product designed, as well as to test   them and support them by technical and standard investigation methods. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Kate Fletcher: Sustainable fashion and Textile Design Journeys, Taylor & Francis, 2014. ISBN10 0415644569, ISBN13 9780415644563 3. Michael Braungart: Cradle to Cradle. Vintage Publishing, 2018. ISBN13 (EAN): 9781784873653 4. Stephanie Travis: Sketching for Architecture and Interior Design. ‎ Laurence King Publishing, 2015. ISBN-13 ‏ : ‎ 978-1780675923 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Interior and Fashion Design II.** | ***NEPTUN-code:***  RTWEO2EBNF | ***Number of hours:***  *lec+gs+lab*  2+0+3 | ***Credit:*** 4  ***Requirements:***  examination |
| ***Course coordinator:***  Éva Hottó Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  Interior and Fashion Design I. | |
| ***Course Description:*** | | | |
| Simple and special fabric structures and their production. Pattern types, pattern and style. Color pattern design for striped and checkered fabrics  Textile printing and printing processes, production criteria of the samples. Possibilities for designing patterns, concept and techniques of report. Special color schemes (transfer printing, inkjet printing, etc.). Colorits, patterns, sample families on different surfaces, materials (tiles, concrete, paper, textiles, etc.). Effect of style and pattern in the interior. Computer aided pattern design.  Types of commercial garment trend collections, characteristics of their making.  Types, typical shapes and solutions of clothing and accessories made of leather and leather type materials. Leather decoration techniques. Typical shoe types. The language of profession and its special terms in Hungarian and foreign languages. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic construction designs and their dimensioning basics.   * Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment. * Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation. * Able to give reasons for the decisions related to the product designed, as well as to test them and support them by technical and standard investigation methods. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>PPT-s and aids prepared by the instructor 2. Kate Fletcher: Sustainable fashion and Textile Design Journeys, Taylor & Francis, 2014. ISBN10 0415644569, ISBN13 9780415644563 3. Michael Braungart: Cradle to Cradle. Vintage Publishing, 2018. ISBN13 (EAN): 9781784873653 4. Stephanie Travis: Sketching for Architecture and Interior Design. ‎ Laurence King Publishing, 2015. ISBN-13 ‏ : ‎ 978-1780675923 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Technology of Specialization I.** | ***NEPTUN-code:***  RTWST1IBNF | ***Number of hours:***  *lec+gs+lab*  0+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Orsolya Nagy Szabó Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  Machines of Industrial Technologies I. | |
| ***Course Description:*** | | | |
| The purpose of the subject is the knowledge of the basic concepts of sewing technology used in the clothing industry (sewing, seam, stitch, types of stitches, types of seams, types of sewing). Requirements to be met by the sewing. Basic influencing factors of the sewing. General characteristics of the sewing threads and sewing machine needles. Acquisition of the skill of threading, setting and operating industrial sewing machines. Learning essential modes of technical presentation. Learning techniques, types of sewing, their practical application and implementation when making various textile –and leather products.  Knowing the requirements of health protection, occupational safety and environmental  protection in the practical exercises. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of expectations and requirements prevailing in the areas of health and safety, fire protection and safety engineering as related to the relevant special field, as well as applicable environmental regulations. * Knowledge of the most important practical work techniques of their special field. * Able to explore the causes of failures and to select elimination operations. * Able to resolve relatively simple health and safety tasks.   - Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Adele Margolis: Complete Book of Tailoring. Echo Point Books & Media, 2019**. EAN**: 9781635610925 3. Fallon Jules: Dressmaking: The Indispensable Guide. Firefly Books Ltd., 2017. **ISBN13 (EAN):** 9781770859388 4. David E. James: Upholstery: A Complete Course. Guild of Master Craftsman, 2017. ISBN-13: 9781784946555  |  |  | | --- | --- | | 1. Brown Amanda: Spruce: Step-by-step Guide to Upholstery and Design. Storey Books, 2013. **SBN13 (EAN):** 9781612121376 2. David Sowle, Ruth Dye: Complete Step-by-Step Upholstery. |  | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Technology of Specialization II.** | ***NEPTUN-code:***  RTWST2IBNF | ***Number of hours:***  *lec+gs+lab*  2+0+3 | ***Credit:*** 4  ***Requirements:***  examination |
| ***Course coordinator:***  Orsolya Nagy Szabó Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  Technology of Specialization I. | |
| ***Course Description:*** | | | |
| The purpose of the course is to introduce the technologies of making home furnishings and clothing fabrics. Material manipulations, structures, textures. Technical preparation of production, calculation of the proportion of materials, laying rules, preparation of basic and consumable materials, technology of cutting. Sewing injuries.  Variations of technology decorations, special closing solutions, fabric edge processing. Spatial textile shapes. Sewing technology features in the production of different products. Leather manufacturing technology.  Basics of technology for upholstery of leather and skin type materials and upholstery fabrics.  During the exercises, carrying out a project assignment based on an inspiration and professional solutions to the technological details.  General criteria, conditions and requirements for making a garment product or accessory. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of expectations and requirements prevailing in the areas of health and safety, fire protection and safety engineering as related to the relevant special field, as well as applicable environmental regulations. * Knowledge of the most important practical work techniques of their special field. * Able to explore the causes of failures and to select elimination operations. * Able to resolve relatively simple health and safety tasks.   - Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Adele Margolis: Complete Book of Tailoring. Echo Point Books & Media, 2019**. EAN**: 9781635610925 3. Fallon Jules: Dressmaking: The Indispensable Guide. Firefly Books Ltd., 2017. **ISBN13 (EAN):** 9781770859388 4. David E. James: Upholstery: A Complete Course. Guild of Master Craftsman, 2017. ISBN-13: 9781784946555  |  |  | | --- | --- | | 1. Brown Amanda: Spruce: Step-by-step Guide to Upholstery and Design. Storey Books, 2013. **SBN13 (EAN):** 9781612121376 2. David Sowle, Ruth Dye: Complete Step-by-Step Upholstery. |  | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Technology of Specialization III.** | ***NEPTUN-code:***  RTWST3IBNF | ***Number of hours:***  *lec+gs+lab*  1+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Orsolya Nagy Szabó Ph.D. | ***Title:***  assistant lecturer | ***Prerequisite:***  Technology of specialization II. | |
| ***Course Description:*** | | | |
| Special technologies for making home furnishing textiles and garment products. Basic concepts of gluing, technological process, factors influencing gluing, areas and methods of gluing.  Basic concepts, technological process of wet heat treatment of textiles, factors influencing wet heat treatment.  Smart textiles in the interior. Innovative technologies.  Manufacturing technology of leatherwork industrial products, self-production of a leatherwork industrial product, and a clothing product.  Execution of home furnishing products and clothing models based on the project assignment, taking into account the material properties. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of expectations and requirements prevailing in the areas of health and safety, fire protection and safety engineering as related to the relevant special field, as well as applicable environmental regulations. * Knowledge of the most important practical work techniques of their special field. * Able to explore the causes of failures and to select elimination operations. * Able to resolve relatively simple health and safety tasks.   - Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Adele Margolis: Complete Book of Tailoring. Echo Point Books & Media, 2019**. EAN**: 9781635610925 3. Fallon Jules: Dressmaking: The Indispensable Guide. Firefly Books Ltd., 2017. **ISBN13 (EAN):** 9781770859388 4. David E. James: Upholstery: A Complete Course. Guild of Master Craftsman, 2017. ISBN-13: 9781784946555  |  |  | | --- | --- | | 1. Brown Amanda: Spruce: Step-by-step Guide to Upholstery and Design. Storey Books, 2013. **SBN13 (EAN):** 9781612121376   6. David Sowle, Ruth Dye: Complete Step-by-Step Upholstery. |  | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Knowledge of Textiles and Construction** | ***NEPTUN-code:***  RTWAK1EBNF | ***Number of hours:***  *lec+gs+lab*  2+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Judit Borsa Ph.D. | ***Title:***  professor | ***Course coordinator:***  Technology of Specialization I. | |
| ***Course Description:*** | | | |
| General characteristics and properties of raw materials used in the textile industry. Types of textiles, traditional and modern materials. The most common types and uses of woven, knitted and nonwoven fabrics  Functional and intelligent textiles.  Textile testings. Technical data, main characteristics and measurement of linear textiles, fabrics and knitted and crocheted fabrics. Investigation of the behavior of textiles against various stresses during use.  Basic knowledge of architecture, properties of materials used in buildings and their applications. Coverings, doors and windows, etc. Basics of building engineering. Dimensions / types / specifications of household and home equipments, lamps, lighting fixtures. Requirements for placement of interior materials (wall and floor tiles, parquet, wallpaper, etc.) and determination of quantity required.  Size research, size charts, size standards. The proportions of the human body in terms of clothing design. Body features and their effect on dress designs. Design solutions for various interior and clothing products. Modeling rules. Modeling methods for different component types.  Mock-up and innovative experiments for the project task. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic construction designs and their dimensioning basics.   * Knowledge of the most important practical work techniques of their special field.   - Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment.   * Able to master new knowledge by solving practical problems empirically.   - Motivated to familiarize with the latest development trends, solutions and innovations in their special field. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Geoffrey West: Leatherwork - A Manual of Techniques. The Crowood Press Ltd. 2005. ISBN13 9781861267429   3. Gail P. Silverman: A Woven Book of Knowledge. University of Utah Press, 2008. ISBN0874809096  4. Adele Margolis: Complete Book of Tailoring. Echo Point Books & Media, 2019**. EAN**: 9781635610925 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Design Visualization** | ***NEPTUN-code:***  RTWMT1IBNF | ***Number of hours:***  *lec+gs+lab*  0+0+2 | ***Credit:*** *4*  ***Requirements:***  practice mark |
| ***Course coordinator:***  Edit Csanák DLA | ***Title:***  associate professor | ***Előkövetelmény:***  CAD/CAM II. | |
| ***Course Description:*** | | | |
| The purpose of the subject is the acquisition of the technique of design visualization, aided with computer programs, of processing-industrial products. Proportional construction methods of representing the products. Representation of different products in 2 –and 3 dimensional form. Material surfaces, structures and representation of patterns. Plane –and space composition tasks.  Computer-aided drawing presentation of product compositions and sketches. Virtual modelling of products and the preparation of their technical documentations. Drawings of products and their environment. Poster design with compositional principles in mind. Creative ways of displaying the interior layout and elements of space. Compilation of complex visual documentation for clothing collections. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of the fundamental methods, rules and standards of ergonomy and psychology as required for industrial product design.   * Able to present graphical product concepts and sketches using traditional manual techniques. * Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation. * Able to produce, examine and test real models and prototypes using direct digital   production technologies based on both traditional and 3D product models. | | | |
| ***Bibliography:*** | | | |
| 1. CAD books 2. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 3. Jon Yablonski: Laws of UX : Using Psychology to Design Better Products & Services. O'Reilly Media, Sebastopol, United States, 2020. ISBN13 9781492055310 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Projectwork** | ***NEPTUN-code:***  RTPPM1IBNF | ***Number of hours:***  *lec+gs+lab 0+0+2* | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Rita Kendrovics Boda Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  Technology of Specialization III. | |
| ***Course Description:*** | | | |
| The purpose of the subject is that the students could use the theoretical knowledge, acquired in the framework of the professional subjects, in practice-oriented projects. The 3-4 strong student groups (occasionally independently as well) learn the workflows – from the raising of the problem through working out the basic ideas, to form experiments – in complex work. The students will get to know the appropriate distribution, time management of the work-phases. The will learn how to make a schedule and to co-ordinate the workflows. After collecting international information and analysing them, the students will design a coordinated exhibition interior in a specific style. They cooperate regularly with their consultants and the competent contact persons of professional organisations and firms. In written form and in presentations, too, the students will report their workflows and results and they will make their portfolios. When carrying out these tasks, in addition to their skill in solving problems, creating forms and in design as well, the adaptability and communication skill of the students will also develop, thus they can get a good background for joining the professional circles. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of basic construction designs and their dimensioning basics. * Knowledge of the learning, knowledge acquisition, and data collection methods of the special field of product design, their ethical limitations and problem solving techniques. * Knowledge of the most important practical work techniques of their special field. * Knowledge of the ethics and methods of team work. * Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment. * Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation. * Able to produce, examine and test real models and prototypes using direct digital production technologies based on both traditional and 3D product models. * Able to master new knowledge by solving practical problems empirically.   - Understand and use characteristic online and printed references characteristic of their special field, both in Hungarian and in at least one foreign language.   * Able to take part in and also to manage team work. * Able to initiate, compile, and carry out projects in team work, primarily in a multidisciplinary environment. * Able to take into account the aspects of the historical, cultural, socio-economic and industrial environment in the process of industrial design and product development. * Able to analyze design projects by applying design methods and to give methodological reasons for the workflows applied. * Efforts to make self-education in the special area of industrial product design a continuous process in line with professional objectives. * Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith. * Open to transmitting own knowledge to colleagues. * Taking care to promote subordinates’ professional development, to manage and help such endeavors.   - Taking care of ensuring equal access opportunities in problem solving. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

**Packaging Specialisation**

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Integrated Product Design II. (packaging)** | ***NEPTUN-code:***  RTWIT2EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+4 | ***Credit:*** 5  ***Requirements:***  practice mark |
| ***Course coordinator:***  Prof. Márta Kisfaludy DLA | ***Title:***  professor | ***Prerequisite:***  Integrated Product Design I. (Packaging) | |
| ***Course Description:*** | | | |
| Consumer needs, survey of habits and market participants, analysis and feedback into planning. By endorsing design principles, solution of simple design tasks individually and in group work. Product modeling, presentation and evaluation.  Colour and form, colour and ergonomics, colour harmonies, colour dynamics design. The cooperation of designers and manufacturers. The cost factors of designing.  The criteria of product features with individual, series and mass products as well as production management. Design for manufacturability, standardization of types (standardization), designing collections, model families. Supporting design with applied computer technology. Goods protection and the design methodology of its tools (package design).  System design ranges from the suggestion of simple problems to more complicated projects.  The course focuses on product development in team work primarily by helping the preparation of functional prototypes according to the plans.  Industry specific design. Packaging design and packaging graphics with taking into  account the specific characteristics of the product. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of the fundamental rules and technological limitations of shaping products, of striking a harmony between content and form. * Knowledge of the most important practical work techniques of their special field. * Knowledge of the ethics and methods of team work. * Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment. * Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation. * Able to produce, examine and test real models and prototypes using direct digital production technologies based on both traditional and 3D product models. * Able to master new knowledge by solving practical problems empirically. * Able to apply the calculation and modelling principles and methods of special Bibliography: related to industrial product design. * Able to take part in and also to manage team work. * Able to initiate, compile, and carry out projects in team work, primarily in a multidisciplinary environment. * Able to take into account the aspects of the historical, cultural, socio-economic and industrial environment in the process of industrial design and product development. * Able to analyze design projects by applying design methods and to give methodological reasons for the workflows applied. * Efforts to make self-education in the special area of industrial product design a continuous process in line with professional objectives. * Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith. * Open to transmitting own knowledge to colleagues. * Taking care to promote subordinates’ professional development, to manage and help such endeavors. * Taking care of ensuring equal access opportunities in problem solving. | | | |
| ***Bibliography:*** | | | |
| 1. William Lidwell , Kristina Holden , Jill Butler: Universal Principles of Design : 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach through Design. [Rockport Publishers Inc.](https://www.bookdepository.com/publishers/Rockport-Publishers-Inc) Rockport, United States, 2010. ISBN13 9781592535873 2. Rob Thompson: Graphics and Packaging Production. Thames & Hudson Ltd., London, United Kingdom, 2012. ISBN13 9780500289884 3. Paul Jackson, Structural Packaging. Laurence King Publishers, 2012 ISBN10 1856697533, ISBN13 9781856697538 4. Bjarki Hallgrimsson: Prototyping and Modelmaking for Product Design : Second Edition. Laurence King Publishing, London, United Kingdom, 2019. ISBN13 9781786275110 5. Rob Thompson: Manufacturing Processes for Design Professionals. Thames & Hudson Ltd., London, United Kingdom, 2007. ISBN13 9780500513750 6. Rob Thompson: The Materials Sourcebook for Design Professionals. Thames & Hudson Ltd., London, United Kingdom, 2017. ISBN13 9780500518540   7. <https://elearning.uni-obuda.hu/>PPT-s and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Integrated Product Design III. (Packaging)** | ***NEPTUN-code:***  RTWTC3EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+4 | ***Credit:*** 5  ***Requirements:***  practice mark |
| ***Course coordinator:***  Prof. Márta Kisfaludy DLA | ***Title:***  professor | ***Prerequisite:***  Integrated Product Design II. (Packaging) | |
| ***Course Description:*** | | | |
| Ecological approach in product design. Recycling-reuse-redesign.  The integrated product design on the basis of socio-economic and technical aspects lays great emphasis on the unified and coordinated display of products and product groups in addition to the functional, market, long standing, safety and feasibility aspects.  The experiments of colour and design studies aim at the diverse presentation of product variants through a design project.  The implementation of product design and development projects is aided by the preparation of prototypes and technological model experiments.  The most optimal creation of aesthetic product appearance is assisted by the product construction knowledge and the current state of the art industrial background.  Profession-specific solutions of the project. Packaging of dry goods with eco-conscious  approach. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of the fundamental rules and technological limitations of shaping products, of striking a harmony between content and form. * Knowledge of the most important practical work techniques of their special field. * Knowledge of the ethics and methods of team work. * Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment. * Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation. * Able to produce, examine and test real models and prototypes using direct digital production technologies based on both traditional and 3D product models. * Able to master new knowledge by solving practical problems empirically. * Able to apply the calculation and modelling principles and methods of special Bibliography: related to industrial product design. * Able to take part in and also to manage team work.   Able to initiate, compile, and carry out projects in team work, primarily in a multidisciplinary environment.   * Able to take into account the aspects of the historical, cultural, socio-economic and industrial environment in the process of industrial design and product development. * Able to analyze design projects by applying design methods and to give methodological reasons for the workflows applied. * Efforts to make self-education in the special area of industrial product design a continuous process in line with professional objectives. * Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith. * Open to transmitting own knowledge to colleagues. * Taking care to promote subordinates’ professional development, to manage and help such endeavors.   - Taking care of ensuring equal access opportunities in problem solving. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. William McDonough, Michael Braungart: The Upcycle: Beyond Sustainability - Designing for Abundance, North Point Press, Berkeley, California, United States, 2013. ISBN10 0865477485, ISBN13 9780865477483 3. Silvia Barbero, Brunella Cozzo: Ecodesign. Umweltfreundliches für den Alltag. Published by h.f.ullmann, 2012. ISBN10 3833163070, ISBN13 9783833163074 4. Rob Thompson: The Materials Sourcebook for Design Professionals. Thames & Hudson Ltd., London, United Kingdom, 2017. ISBN13 9780500518540 5. Jane Penty: Product Design and Sustainability. Routledge, 2019. ISBN 9781351400848   6. [Philip B.](https://www.enbook.hu/catalog/product/view/id/1143316?gclid=CjwKCAjw7eSZBhB8EiwA60kCW23jCcKHwjMK9Ra3if_n_DZoSMKoRRTOqnU_8weuWaMcwHFm6-1p9xoCbbcQAvD_BwE/#/dfclassic/query_name=match_and&query=Meggs%20Philip%20B.) Meggs: Meggs’History of Graphic Design. John Wiley& Sons Inc, 2016. ISBN13 (EAN):9781118772058  7. Timothy Samara: Design Elements - A Graphic Style Manual, Rockport Publishers, Gloucester, Massachusetts, 2007 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Packaging Design I.** | ***NEPTUN-code:***  RMWCT1EBNF | ***Number of hours:***  *lec+gs+lab*  2+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Róbert Németh DLA | ***Title:***  associate professor | ***Prerequisite:***  Form design II. | |
| ***Course Description:*** | | | |
| The types of design tasks. Specific aspects of the consumer and multipack packaging design. Process of technical design of the packaging. Requirements planning. Packaging forms, structures, types and sizing concepts of flexible types of paper, cardboard and corrugated cardboard sheets and their system planning.  Cargo unit formation.  The role of typography in packaging design.  Analysis and redesign of a commercially available product packaging with the use of corporate identity elements. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic construction designs and their dimensioning basics.   * Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment. * Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation. * Able to give reasons for the decisions related to the product designed, as well as to test   them and support them by technical and standard investigation methods. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Giles Calver: What is packaging design?, RotoVision SA, 2004 3. Sarah Roncarelli, Candace Ellicott: Packaging Essentials - 100 design Principles for Creating 4. Packages, Rockport Publishers, 2010 5. Edwards, Klimchuk, Wallace & Werner: Really Good Packaging Explained, Crescent Hill Books, LLC., 2009 6. Steven Dupuis, John Silva: Package Design Workbook, Rockport Publishers, Inc., 2008 7. Paul Jackson: Structrural Packaging - Design Your Own Boxes and 3-D Forms, Laurence King Publishing Ltd, London, 2012 8. Marianne Rosner Klimchuk, Sandra A. Krasovec: Packaging Design - Successful Product Branding from Concept to Shelf, Wiley and Sons, Hoboken, New Jersey, 2012 9. William Lidwell, Gerry Manacsa: Deconstructing Product Design, Rockport Publishers, Beverly, Massachusetts, 2011 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Packaging design II.** | ***NEPTUN-code:***  RMWCT2EBNF | ***Number of hours:***  *lec+gs+lab*  2+0+3 | ***Credit:*** 4  ***Requirements:***  examination |
| ***Course coordinator:***  Róbert Németh DLA | ***Title:***  associate professor | ***Prerequisite:***  Packaging Design I. | |
| ***Course Description:*** | | | |
| Theoretical aspects of the packaging design: information content, advertising effect, possibilities of notation.  Acquiring of the basis of corrugated cardboard packaging design and practical application of it with ESKO Artios CAD program.  Box constructions (FEFCO).  The technical aspects of graphic design. Printing and marking.  Shrink-labeling.  Documentation of the entire process through a specific design task. | | | |
| ***Professional competencies:*** | | | |
| - Knowledge of basic construction designs and their dimensioning basics.   * Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment.   Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation.   * Able to give reasons for the decisions related to the product designed, as well as to test   them and support them by technical and standard investigation methods. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Giles Calver: What is packaging design?, RotoVision SA, 2004 3. Sarah Roncarelli, Candace Ellicott: Packaging Essentials - 100 design Principles for Creating   Packages, Rockport Publishers, 2010   1. 4.Edwards, Klimchuk, Wallace & Werner: Really Good Packaging Explained, Crescent Hill Books, LLC., 2009 2. Steven Dupuis, John Silva: Package Design Workbook, Rockport Publishers, Inc., 2008 3. 6.Paul Jackson: Structrural Packaging - Design Your Own Boxes and 3-D Forms, Laurence King Publishing Ltd, London, 2012 4. Marianne Rosner Klimchuk, Sandra A. Krasovec: Packaging Design - Successful Product Branding from Concept to Shelf, Wiley and Sons, Hoboken, New Jersey, 2012 5. William Lidwell, Gerry Manacsa: Deconstructing Product Design, Rockport Publishers, Beverly, Massachusetts, 2011 6. Kristin Cullen: Design Elements - Typography Fundamentals, Rockport Publishers, Beverly, Massachusetts, 2012 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Packaging and Paper Technology I.** | ***NEPTUN-code:***  RMWPT1EBNF | ***Number of hours:***  *lec+gs+lab*  1+0+2 | ***Credit:*** 4  ***Requirement:***  practice mark |
| ***Course coordinator:***  László Koltai PhD | ***Title:***  associate professor | ***Prerequisite:***  - | |
| ***Course Description:*** | | | |
| History of paper and paper- and pulp production. Position and future of the paper industry in the Hungarian and world economy. Semi-finished products of paper industry. Pulps and rawmaterials: mechanical, thermo-mechanical semi-finished chemical cellulose pulp and bleaching. Pulp preparation. Fiber pulping, sizing, filling, refining, coloring. Papermachines and the type of its structural arrangement. Cardboard and sheet production. The presentation operations, calenders. Paper after-processing. Areas of paper processing.  Corrugated board production. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of expectations and requirements prevailing in the areas of health and safety, fire protection and safety engineering as related to the relevant special field, as well as applicable environmental regulations. * Knowledge of the most important practical work techniques of their special field. * Able to explore the causes of failures and to select elimination operations. * Able to resolve relatively simple health and safety tasks.   - Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith. | | | |
| ***Bibliography:*** | | | |
| 1. Mark J. K.: Paper and Paperboard Packaging Technology 2005 by Blackwell   Publishing Ltd.   1. Herbert Holik (Editor): Handbook of Paper and Board, ISBN: 978-3-527-33184-0 2. J. F. Hanlon: Handbook of Package Engineering, Third Edition ISBN-13: 978-   1566763066   1. 4. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Packaging and Paper Technology II.** | ***NEPTUN-code:***  RMWPT2EBNF | ***Number of hours:***  *lec+gs+lab*  2+0+3 | ***Credit:*** 4  ***Requirement:***  examination |
| ***Course coordinator:***  László Koltai Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  Packaging and Paper Technology I. | |
| ***Course Description:*** | | | |
| Fundamentals of packaging technology. The aim of packaging, functions, grouping of requirements. Packing agents. Paper-based, glass and plastic packaging materials. Packaging and logistics. Transport packaging, loading units. Packaging and environmental protection. Hungarian legislation, waste utilization. Consumer packaging as an advertising medium. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of expectations and requirements prevailing in the areas of health and safety, fire protection and safety engineering as related to the relevant special field, as well as applicable environmental regulations. * Knowledge of the most important practical work techniques of their special field. * Able to explore the causes of failures and to select elimination operations. * Able to resolve relatively simple health and safety tasks.   - Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith. | | | |
| ***Bibliography:*** | | | |
| 1. Couzins-Scott Elizabeth: New Crafts Papermaking. Lorenz Books, 2014. **ISBN13 (EAN):** 978075482971 2. Husejin Durakovic: Technology of Extensible Paper Production. Planjax Graphic publishing house, 2010. ISBN:978-9958-34-079-6 3. Valentin I. Popa: Pulp Production and Processing. De Gruyter, 2020. EAN: 9783110658835   4. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Packaging and Paper Technology III.** | ***NEPTUN-code:***  RMWPT3EBNF | ***Number of hours:***  *lec+gs+lab*  1+0+3 | ***Credit:*** 4  ***Requirement:***  practice mark |
| ***Course coordinator:***  László Koltai Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  Packaging and Paper Technology II. | |
| ***Course Description:*** | | | |
| Fundamentals of packaging technology. The aim of packaging, functions, grouping of requirements. Packing agents. Paper-based, glass and plastic packaging materials. Packaging and logistics. Transport packaging, loading units. Packaging and environmental protection. Hungarian legislation, waste utilization. Consumer packaging as an advertising medium. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of expectations and requirements prevailing in the areas of health and safety, fire protection and safety engineering as related to the relevant special field, as well as applicable environmental regulations. * Knowledge of the most important practical work techniques of their special field. * Able to explore the causes of failures and to select elimination operations. * Able to resolve relatively simple health and safety tasks.   - Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith. | | | |
| ***Bibliography:*** | | | |
| 1. Marianne Rosner Klimchuk, Sandra A. Krasovec: Packaging Design - Successful Product Branding from Concept to Shelf, Wiley and Sons, Hoboken, New Jersey, 2012 2. Mark J. K.: Paper and Paperboard Packaging Technology 2005 by Blackwell   Publishing Ltd.   1. Herbert Holik (Editor): Handbook of Paper and Board, ISBN: 978-3-527-33184-0 2. J. F. Hanlon: Handbook of Package Engineering, Third Edition ISBN-13: 978-   1566763066   1. [https://elearning.uni-obuda.hu/](https://elearning.uni-obuda.hu/%20) electronic notes and aids prepared by the instructor | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Materials Science and Testing for Paper and Packaging** | ***NEPTUN-code:***  RMWPA1EBNF | ***Number of hours:***  *lec+gs+lab*  2+0+3 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  László Koltai Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  Packaging and Paper Technology I. | |
| ***Course Description:*** | | | |
| Paper types classification, and their main characteristics. Measurement theory, the reproducibility of measurements methods, evaluation of test results.  Introduction of general properties of the paper: production direction, transverse direction, sieve, the upper side, square weight, volume weight.  Understanding mechanical properties of paper, snatch, expansion, fracture, laceration, methods of measuring surface hardness. Knowledge of gluing properties, writeability, COBB, PLG, etc.  Introduce of advanced paper characteristics, flow, smoothness, etc.  Theory of measurement of optical properties, color measurement, whiteness measurement, opacity measurements. | | | |
| ***Professional competencies:*** | | | |
| Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria.   * Understand and use characteristic online and printed references characteristic of their special field, both in Hungarian and in at least one foreign language. * Know and apply the terminology and special expressions of their professional field in Hungarian and in at least one foreign language. * Adequate perseverance and endurance of monotony to perform practical operations. * Able to give reasons for the decisions related to the product designed, as well as to test them and support them by technical and standard investigation methods. * Efforts to comply with legal regulations and to take the ethical rules of engineering into account during work.   - Taking care of ensuring equal access opportunities in problem solving. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Material Matters 04: Paper. Creative interpretations of common materials. Victionary, 2019. I**SBN13 (EAN):** 9789887903369 3. Lotte Reinecker, Peter Stray Jorgensen: The Good Paper: International edition. Samfundslitteratur, 2018. **ISBN:** 9788759331330 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **ECO Frendly Packaging Materials** | ***NEPTUN-code:***  RMWKC1EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+2 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Róbert Németh DLA | ***Title:***  associate professor | ***Prerequisite:***  Material Knowledge of Paper Packaging | |
| ***Course Description:*** | | | |
| Environmental design and packaging development in the XXI. century. Trademarks of ECO friendly packagings.  The relevant environmental laws in packaging industry. Eco profiles of packagings. Biopolymer packaging materials. Degradation process of plastics. Types and environmental aspects of biodegradable polymer materials. Oxo-degradable polymer materials.  Recycling opportunities of glass, metal and textile packaging materials. Recycling and  composting options for paper packaging. Intelligent packagings. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of the basics, limitations and requirements of the special fields of marketing, management, environment protection, quality assurance, information technology, law, and economics, intrinsically linked to the special area of product design.   - Complying and ensuring compliance with the applicable requirement systems of security, health and safety, environment protection, quality assurance and inspection during work. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor 2. Packaging Sustainability Tools Systems and Strategies for Innovative Package Design. John Wiley & Sons, 2009. **ISBN:** 9780470246696 3. Daniel Imhoff: Paper or Plastic Searching for Solutions to an Overpackaged World Watershed Media. Watershed Media Press, 2013. **ISBN:** 9780984630455 | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name of subject:***  **Projectwork** | ***NEPTUN-code:***  RTPPM1EBNF | ***Number of hours:***  *lec+gs+lab*  0+0+2 | ***Credit:*** 4  ***Requirements:***  practice mark |
| ***Course coordinator:***  Rita Kendrovics Boda Ph.D. | ***Title:***  associate professor | ***Prerequisite:***  Packaging and Paper Technology III. | |
| ***Course Description:*** | | | |
| The purpose of the subject is that the students could use the theoretical knowledge, acquired in the framework of the professional subjects, in practice-oriented projects. The 3-4 strong student groups (occasionally independently as well) learn the workflows – from the raising of the problem through working out the basic ideas, to form experiments – in complex work. The students will get to know the appropriate distribution, time management of the work-phases. The will learn how to make a schedule and to co-ordinate the workflows. After collecting international information and analysing them, students will design products for a given group of firms. They cooperate regularly with their consultants and the competent contact persons of professional organisations and firms. In written form and in presentations, too, the students will report their workflows and results and they will make their portfolios. When carrying out these tasks, in addition to their skill in solving problems, creating forms and in design as well, the adaptability and communication skill of the students will also develop, thus they can get a good background for joining the professional circles. | | | |
| ***Professional competencies:*** | | | |
| * Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. * Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. * Knowledge of basic construction designs and their dimensioning basics. * Knowledge of the learning, knowledge acquisition, and data collection methods of the special field of product design, their ethical limitations and problem solving techniques. * Knowledge of the most important practical work techniques of their special field. * Knowledge of the ethics and methods of team work. * Able to design the form and construction of relatively simple products by taking into account the limits of production technology, the costs expected, and impacts on the environment. * Able to perform the virtual modelling of product concepts and products using 3D computer-aided design systems as well as to produce their technical documentation.   Able to produce, examine and test real models and prototypes using direct digital production technologies based on both traditional and 3D product models.   * Able to master new knowledge by solving practical problems empirically.   - Understand and use characteristic online and printed references characteristic of their special field, both in Hungarian and in at least one foreign language.   * Able to take part in and also to manage team work. * Able to initiate, compile, and carry out projects in team work, primarily in a multidisciplinary environment. * Able to take into account the aspects of the historical, cultural, socio-economic and industrial environment in the process of industrial design and product development. * Able to analyze design projects by applying design methods and to give methodological reasons for the workflows applied. * Efforts to make self-education in the special area of industrial product design a continuous process in line with professional objectives. * Efforts to solve tasks and make management decisions by being aware of the opinions of the colleagues supervised, possibly in cooperation therewith. * Open to transmitting own knowledge to colleagues. * Taking care to promote subordinates’ professional development, to manage and help such endeavors.   - Taking care of ensuring equal access opportunities in problem solving. | | | |
| ***Bibliography:*** | | | |
| 1. <https://elearning.uni-obuda.hu/>electronic notes and aids prepared by the instructor | | | |

**Criteria required**

|  |  |  |  |
| --- | --- | --- | --- |
| ***Title of the course:***  **Mentoring** | **NEPTUN-code:**  RTIPTKEBNF | ***Weekly teaching hours:*** *l+cw+lw*  0+1+0 | ***Credit:*** 0  ***Exam type****:* s |
| ***Course leader:***  Lajos Norbert Berecz | ***Position:***  assistant lecturer | ***Required preliminary knowledge:*** *-* | |
| ***Curriculum:*** | | | |
| The aim of the patronage teaching system is to help first-year students integrate into university education and support them in continuing their studies successfully. Ongoing contact with students helps to solve problems that arise during their studies. The aim of the sessions and discussions is to introduce the structure of the University, the main departments, the life of the student organisations and, above all, to help students find their way around the regulations. | | | |
| ***Professional competencies:*** | | | |
| - Know the relationship between individual, pair and group learning and the functioning of learning communities.  - Ability to participate in the management of a learning organisation in a supportive and guided way.  - Ability to independently develop a self-critical plan based on the knowledge required for a career,  skills and attitudes, based on the learning outcomes of the occupation.  - He/she is ready to continuously seek supportive resources, to develop his/her professional responsibility and knowledge.  - Ability to work on a project basis, with a collaborative approach based on the division of labour  ability to work in a collaborative environment, sees individual contributions to shared success.  - Open to research-based problem solving. | | | |
| ***Literature:*** | | | |
| - | | | |