Course description

Department/Unit /	KKS / KNM			**Academic Year**	2023/2024	
Title	Eng. Design Using Unconv. Materials			**Type of completion**	Exam	
Accredited/Credits	Yes, 4 Cred.			**Type of completion**	Combined	
Number of hours	Lecture 2 [Hours/Week] Tutorial 2 [Hours/Week]					
Occ/max	Status A	Status B	Status C	**Course credit prior to**	YES	
Summer semester	0 / -	5 / -	1 / -	**Counted into average**	YES	
Winter semester	0 / -	0 / -	0 / -	**Min. (B+C) students**	10	
Timetable	Yes			**Repeated registration**	NO	
Language of instruction	Czech			**Semester taught**	Summer semester	
Optional course	Yes			**Internship duration**	0	
Evaluation scale	1|2|3|4			**Ev. sc. – cred.**	S|N	
No. of hours of on-premise						
Auto acc. of credit	Yes in the case of a previous evaluation 4 nebo nic.					
Periodicity	K					
Substituted course	None					
Preclusive courses	N/A					
Prerequisite courses	N/A					
Informally recommended courses	N/A					
Courses depending on this Course	N/A					

Course objectives:

The aim of this course is to provide students with information about technology injection moulding, moulding machines and design of injection moulds.
- Inform students of basic technologies injection moulding and moulding machines.
- To introduce students to the basic principles of design injection moulds.

Requirements on student

- active part at seminars
- hand in semester works
- fulfil a credit test
- written and oral exam

Content

Types of unconventional materials. Plastic materials features important from the point of view of products design. Systematic attitude to the design of plastic moulding products and moulding forms. Technologies of moulding and other technologies suitable for working with plastic materials. Basic knowledge about moulding machines and types according to mechanism and type of moulding technologies.

List of lectures
1. Polymeric materials and their properties
2. Polymer processing technology, injection technology
3. Injection molding and construction of injection molds
4. Design of injection molds
5. Design of injection molds and principles of construction of injection molded products
6. Principles of construction of injection molded products
7. Defects of injected products
8. Polymer processing technology
9. Another unconventional materials

10. Consultation

Fields of study

Studentům jsou k dispozici podklady pro výuku v Teams a v Courseware.

Guarantors and lecturers

- **Guarantors:** Ing. Eva Kubec Krónerová, Ph.D. (100%)
- **Lecturer:** Ing. Zdeněk Chval, Ph.D. (100%), Doc. Ing. Václav Kubec, Ph.D., Ing. Eva Kubec Krónerová, Ph.D. (100%)
- **Tutorial lecturer:** Ing. Zdeněk Chval, Ph.D. (100%), Doc. Ing. Václav Kubec, Ph.D., Ing. Eva Kubec Krónerová, Ph.D. (100%)

Literature

- **Basic:** Šuba, Oldřich. *Dimenzování a navrhování výrobků z plastů*. Vyd. 1. Ve Zlíně : Univerzita Tomáše Bati, 2005. ISBN 80-7318-287-4.
- **Basic:** Kolouch, Jan. *Strojní součásti z plastů*. 1. vyd. Praha : SNTL, 1981.
- **Recommended:** Ehrenstein, Gottfried W. *Polymeric materials : structure - properties - applications*. Munich : Hanser Publishers, 2001. ISBN 1-56990-310-7.
- **Recommended:** Ducháček, Vratislav. *Polymery : výroba, vlastnosti, zpracování, použití*. Vydání třetí, přepracované (dotisk 2015). 2011. ISBN 978-80-7080-788-0.

Time requirements

All forms of study

Activities	Time requirements for activity [h]
Contact hours	52
Individual project (40)	40
Preparation for comprehensive test (10-40)	20
Total:	**112**

assessment methods

Knowledge - knowledge achieved by taking this course are verified by the following means:

Test

Oral exam

Skills - skills achieved by taking this course are verified by the following means:

Seminar work

prerequisite

Knowledge - students are expected to possess the following knowledge before the course commences to finish it successfully:

to describe the basic structure of the polymer

to separate polymers depending on changing their behaviour at increasing temperatures

to use basic theoretical knowledge of strength and elasticity

Skills - students are expected to possess the following skills before the course commences to finish it successfully:

to use a 3D modelling program

to have and apply your own opinion on problem solving

to gain additional knowledge through self-study

teaching methods

Knowledge - the following training methods are used to achieve the required knowledge:

Lecture supplemented with a discussion

Task-based study method

Skills - the following training methods are used to achieve the required skills:

Practicum

Task-based study method

Individual study

learning outcomes

Knowledge - knowledge resulting from the course:

to propose dimensions of plastic products

to design a simple injection mould

to explain basic concepts of polymer processing technology

Skills - skills resulting from the course:

to use the injection mould standards catalogue

to use calculations regarding filling the injection mould cavity

to create a model and a drawing of the injection mould assembly

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Engineering	Bachelor	Full-time	Automotive Industry Specialist	1	2020	2023	Compulsory courses	A	3	LS
Design	Bachelor	Full-time	Design, specialization Industrial Design	1	4	2023	Povinně volitelné - specializační FST	B	2	LS
Mechanical Engineering	Bachelor	Combined	Design Engineering of Machines and Technical Devices	1	2020	2023	Povinně volitelné předměty specializace 3. roč. LS	B	3	LS
Mechanical Engineering	Bachelor	Full-time	Design Engineering of Machines and Technical Devices	1	2020	2023	Povinně volitelné předměty specializace	B	3	LS
Certifikátové programy	Postgraduate Master	Full-time	Modern materials	1	1	2023	Doporučené výběrové předměty	C		LS