



SUBJECT DATASHEET

I. SUBJECT DESCRIPTION

1. GENERAL DATA

1.1. Subject name (in Hungarian, in English)

Polymer processing • Polymer processing

1.2. Neptun code

BMEGEPTAGE3

1.3. Type

study unit with contact hours

1.4. Course types and number of hours (weekly / semester)

course type	number of hours (weekly)	nature (connected / stand-alone)
lecture (theory)	1	-
exercise	-	-
laboratory exercise	1	coupled

1.5. Type of assessments (quality evaluation)

mid-term grade

1.6. ECTS

3

1.7. Subject coordinator

name: Dr. Bárány Tamás (71957654580)
post: associate professor
contact: barany@pt.bme.hu

1.8. Host organization

Department of Polymer Engineering (<http://www.pt.bme.hu>)

1.9. Course homepage

<http://www.pt.bme.hu/tantargy.php?id=90&l=a>

1.10. Course language

english

1.11. Primary curriculum type

mandatory

1.12. Direct prerequisites

Strong prerequisite:	BMEGEPTBG01
Weak prerequisite:	-
Parallel prerequisite:	-
Milestone prerequisite:	-
Excluding condition:	-

(the subject cannot be taken if you have previously completed any of the following subjects or groups of subjects)

2. AIMS AND ACHIEVEMENTS

2.1. Aim

The aim of the course is for students to get acquainted with polymer processing technologies (materials, machines, technology, parameters), pre-processing steps, extrusion (eg film, profile, plate, tube, wire coating), hot forming, hollow plastic parts production methods (extrusion blow molding, injection molding, rotary molding, two-layer thermoforming), polymer foams and elastomers processing technology.

2.2. Learning outcomes

Competences that can be acquired by completing the course:

A. Knowledge

- Knows basic polymer processing technologies.
- Define the concepts of viscosity, shear deformation and MFI.
- It provides an overview of the entire polymer processing process (from the raw material to the finished product).
- He is aware of the preparatory steps for polymer processing.
- Understands the extrusion process and the extruder tool.
- Understands the operation of basic hollow body manufacturing technologies.
- He is knowledgeable about thermoforming technologies for thermoplastics.
- Knows the basic foaming procedures, their characteristics.
- Knows the basic rubber processing technologies.
- He is familiar with basic polymer bonding technologies.

B. Ability

- It is able to differentiate between polymer processing technologies.
- Selects the right quality raw material for the given processing technology.
- It designs the manufacturing process of the entire polymer product (from raw material to finished product).
- Selects the appropriate raw material preparation processes for the specific product manufacturing technology.
- It analyzes the extrusion process as well as the extruder forming tool.
- It separates the production technologies suitable for the production of the main hollow body.
- It distinguishes between the main heat-forming processes.
- Select the appropriate foaming process, taking into account the requirements of the particular product.
- It differentiates between basic rubber processing technologies.
- He chooses the appropriate knitting technique taking into account the specifics of a given product.

C. Attitude

- It constantly monitors its findings and conclusions.
- He is constantly expanding his knowledge in the field of polymer processing.
- Open to the use of information technology for problems with polymer processing.
- It strives for accurate problem solving and engineering accuracy.

- It supports the spread of energy efficient and sustainable technologies.
- It strives to apply the latest trends and technologies in the field of polymer processing.

D. Independence and responsibility

- With his knowledge, he makes a responsible, informed decision based on his analyzes.
- Accepts well-founded professional and other critical remarks.
- As a member of a team, he works together to solve technical problems.
- He is committed to the principles and methods of systematic thinking and problem solving.
- He feels a responsibility for the sustainable use of the environment and for present and future generations.

2.3. Teaching methodology

The course integrates optional frontal lectures and mandatory laboratory sessions. Presentations include hands-on presentations as well as PowerPoint presentations. Polymer processing technologies are also demonstrated using short videos available on the Internet. Various polymer processing techniques are demonstrated during laboratory practice. The acquired knowledge is further deepened by practical home preparation and online study materials.

2.4. Support materials

a) Textbooks

Osswald T., Hernandez J.: Polymer Processing. Modeling and Simulation. 2006, Hanser Publications, Cincinnati, OH, USA ISBN 9783446403819

b) Lecture notes

Polymer Processing lecture notes, available at www.pt.bme.hu, 2020

c) Online materials

<http://www.pt.bme.hu/tantargy.php?id=90&l=a>

2.5. Validity of the course description

Start of validity:	2021. September 1.
End of validity:	2024. August 31.

II. SUBJECT REQUIREMENT

3. ACHIEVEMENT CONTROL AND EVALUATION

3.1 General rules

The signature requirement is (1) at least 4 successful laboratory measurements and (2) successful submission of homework. Student participation in the measurement should reflect previously defined knowledge, skills, attitudes, and autonomy competencies. The requirements for the final grade are successful mid-term examinations as well as submitted homework that meets the requirements at least to a sufficient degree.

3.2 Assessment methods

A. Detailed description of mid-term assessments

1. Mid-term assessment

type: summative assessment
count: 1
purpose, description: The end-of-semester examination includes the full curriculum. Students must provide the definition, draw a schematic diagram of the different processing methods, and draw the necessary curves (e.g., vulcanization curve, thermomechanical curves). Students should select an appropriate method for the production of a given product and describe it briefly.

2. Mid-term assessment

type: formative assessment, project-based, complex
count: 1
purpose, description: The requirement is to submit the homework successfully. The homework must include a description of the given product and the requirements for it. In the homework, the student must present the range of materials for a given product and recommend and describe the appropriate processing, preparation, and complementary technology to make it. The student must report on his / her activities in writing.

B. Detailed description of assessments performed during the examination period (if relevant)

Elements of the exam:

1. written partial exam

-

2. oral partial exam

-

3. practical partial exam

-

4. inclusion of mid-term results

-

3.3 The weight of mid-term assessments in signing or in final grading

identifier	weight
1 . Mid-term assessment	80 %
2 . Mid-term assessment	20 %

3.4 The weight of partial exams in grade (if relevant)

type	weight
written partial exam	0 %
oral partial exam	0 %
practical partial exam	0 %
inclusion of mid-term results	0 %

3.5 Determination of the grade

grade • [ECTS]	the grade expressed in percents
very good(5) • Excellent [A]	above 91%
very good(5) • Very Good [B]	86% .. 91%
good(4) • Good [C]	71% .. 86%
satisfactory(3) • Satisfactory [D]	56% .. 71%
sufficient(2) • Pass [E]	41% .. 56%
insufficient(1) • Fail [F]	below 41%

The lower limit specified for each grade already belongs to that grade.

3.6 Attendance and participation requirements

Must be present at at least **0%** (rounded down) of lectures.

At least **100%** of laboratory practices (rounded down) must be actively attended.

3.7 Special rules for improving, retaken and replacement

The special rules for improving, retaken and replacement shall be interpreted and applied in conjunction with the general rules of the CoS (TVSZ).

Need mid-term assessment to individually complete?

NO

Can the submitted and accepted partial performance assessments be resubmitted until the end of the replacement period in order to achieve better results?

NO

The way of retaking or improving a summary assessment for the first time:

each summative assessment can be retaken or improved

Is the retaking-improving of a summary assessment allowed, and if so, than which form:

retake or grade-improving exam possible for each assesment separately

Taking into account the previous result in case of improvement, retaken-improvement:

out of multiple results, the best one is to be taken into account

The way of retaking or improving a partial assessment for the first time:

partial assesment(s) in this group cannot be improved or repeated, the final result is assessed in accordance with Code of Studied 122. § (6)

Completion of unfinished laboratory exercises:

missed laboratory practices must be performed in the repeat period

Repetition of laboratory exercises that performed incorrectly (eg.: mistake in documentation):

incorrectly performed laboratory practice (e.g. Incomplete/incorrect report) can be corrected by repeating the practice

3.8 Study work required to complete the course

Activity	hours / semester
participation in contact classes	28
preparation for laboratory practices	14
preparation for summary assessments	16
elaboration of a partial assessment task	30
additional time required to complete the subject	2
summary	90

3.9. Validity of subject requirements

Start of validity:	2021. September 1.
End of validity:	2024. August 31.

4. ADDITIONAL INFORMATION

4.1 Primary course

The primary (main) course of the subject in which it is advertised and to which the competencies are related:
mechanical engineering

4.2 Link to the purpose and (special) compensations of the Regulation KKK

This course aims to improve the following competencies defined in the Regulation KKK>

a) knowledge

- Student has the comprehensive knowledge of machine, system and process design methods in the field of mechanical engineering.

b) ability

- Student has the ability to apply an integrated knowledge of machinery, mechanical equipment, systems and processes, materials and technologies for mechanical engineering, and related electronics and information technology.

c) attitude

- Student is committed to high quality work and sets an example to student's colleagues in this respect.

d) independence and responsibility

- Student acts independently and proactively in solving professional problems.

4.3 Prerequisites for completing the course

Knowledge type competencies

(a set of prior knowledge, the existence of which is not obligatory, but greatly facilitates the successful completion of the subject)	-
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Ability type competencies

(a set of prior abilities and skills, the existence of which is not obligatory, but greatly contributes to the successful completion of the subject)	-
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