



SUBJECT DATA SHEET

I. DESCRIPTION OF THE SUBJECT

BME COS¹ 31.§ (4)

I.1. Name of the subject (in Hungarian and English)	BME COS 31.§ (4) 1.	
Épületszerkezetan 3 Building Constructions 3		
I.2. Subject code	BME COS 31.§ (4) 2.	
BMEEPESA401		
I.3. Subject lecture language	BME COS 31.§ (4) 3.	
Hungarian and English		
I.4. Type of the subject	BME COS 31.§ (4) 4.	
study unit with contact hours		
I.5. Role of the subject in the curriculum, recommended semester	BME COS 31.§ (4) 5.	
required in the following training:		
1. 3N-A0 • Architect full-time BSc program • 4 th semester		
2. 3N-A1 • Architect full-time BSc program in Hungarian • 4 th semester (from 2017)		
3. 3N-M0 • Architect full-time undivided MSc program in Hungarian • 4 th semester		
4. 3NAA0 • Architect full-time BSc program in English • 4 th semester		
5. 3NAM0 • Architect full-time undivided MSc program in English • 4 th semester		
I.6. Subject types and hours	BME COS 31.§ (4) 6.	
subject type	weekly hours	type
lecture (theory)	2	
tutorial	2	connected
I.7. Credit value of the subject	BME COS 31.§ (4) 7.	
4		
I.8. Type of study performance assessment (quality evaluation)	BME COS 31.§ (4) 8.	
examination and mark (v)		
I.9. The subject coordinator	BME COS 31.§ (4) 9.	
name:	Dr. Becker Gábor	
contact:	gbecker@epsz.bme.hu	
organization unit:	Department of Building Constructions	
I.10. The educational organization unit managing the subject	BME COS 31.§ (4) 10.	
Department of Building Constructions (www.epsz.bme.hu)		
I.11. The role of the subject in implementing the aims of the program	BME COS 31.§ (4) 11.	
The aim of the subject is overall introduction of the most important facade cladding systems and doors and window structures, most common solutions, introducing and practicing of principles and designing rules. Including:		

¹ Code of Studies and Exams of BME (BME CoS)

- operation modes and typical sizes of doors: elements and structure of commonly used door frame types and door leaves with examples.
- system of requirements and performance characteristics of doors: external and internal entrance doors and common use internal doors
- sealings and hardware of doors, locks, panic lock
- characteristics of doors of different materials (timber, aluminium, steel, plastic), doors with special operation modes (e.g. sliding, swinging, folding) and high performance doors (e.g. used in humid environment, fire-rated, high acoustic performance)
- system of requirements and performance characteristics of windows, operation modes, elements and structure of windows
- coordination of protection planes, structures of build-in, hardwares, windows with non-wood material and special operation mode.
- aspects of selection internal and external door and window structures, practicing their build-in design
- definition of solar radiation and shading, main types of shading systems, versions of structural design
- getting familiar with main principles and rules of application, selection and designing of shading structures, presenting different shading system types
- overview of different structured facade claddings, presenting their typical structural systems
- structural scheme possibilities of facade claddings: external boundary walls with homogeneous, layered, core-insulated, ventilated facade claddings
- selection of thermal insulation in wall structures with a specific facade cladding and rules of its application
- effects on facade claddings, system of performance requirements for them, classification of facade claddings, their general structure of order of layers.
- fixing principles and rules of supporting sub-structure of ventilated facade claddings
- dimensioning of cavity gap in case of ventilated facade claddings, providing adequate amount of ventilating air, joints of cladding elements, risk and prevention of spread of fire facade
- presentation, analysis and evaluation of facade cladding's typical solutions of adjoining structures (footing, positive and negative corners, parapet etc.)
- design principles of ventilated and core-insulated heavy weight facade claddings, their relation to the building's load-bearing and infill wall structures, their typical details
- ETICS (external thermal insulation composite systems), as facade claddings, review of their development, set of elements, order of layers, fixing system, analysis of their building physics phenomena, details (footing, corners, openings etc.)
- overview and analysis as well as design principles of the most important aspects of building physics, energetics, acoustical affecting the selection, application and relations of the above mentioned facade claddings and their accessories
- overview of the evolution directions of the facade claddings, development intentions, expected tendencies
- the role of the above-mentioned structures in noise protection, a summary of the factors influencing the airborne sound insulation characteristics of the structures and the issues of installation, and description of the related task of the acoustic laboratory

The purpose of tutorials is the practice of the application of the above-described knowledge, establishing the basic skills in the frame of on-site workshop exercises under the guidance of a tutor, and in the form of semester project assignments to be developed at home by independent work aided by consultation. The semester assignment projects are usually consists of the elaboration of a reduced content execution plan of facade cladding and door and window design of a conventional multi-residential or small public building with pitched roof, with clear, understandable and aesthetic documentation.

Depending on the Time Schedule of the given semester, optionally organized visit of the Department's acoustic laboratory can demonstrate the measurement methods and characterization of the acoustic performance of the facade structures, and present the laboratory's work.

I.12. Conditions of enrollment (required preliminary studies)

BME COS 31.§ (4) 12.

- A. Strong pre-requisite:
BMEEPESA201
- B. Weak pre- requisite: —
- C. Parallel pre- requisite: —
- D. Excluding condition: —
- E. Recommended pre- requisite:
BMEEPESA301

I.13. Study results harmonized with TOR²:

BME COS 31.§ (4) 13.

The student having completed the subject will acquire:

- A. knowledge
 - 1. have knowledge of the most commonly used door and window structures, shading system and facade cladding systems applied in the practice of architecture, the effects working on them, the performance requirements for them;
 - 2. have gained an overview of basic structures of doors and windows, as well as facade cladding systems, have learnt the aspects of selecting and designing them.
 - 3. know the general rules of selection, application, drawing elaboration, visualizing and designing of the above-mentioned structures.

The listed competences of knowledge type are indispensable but not satisfactory conditions for the fulfillment of:

 - points 7.1.1.a.4-6 and 8-11 of the TOR for BsC program,
 - points 7.1.1.a.6, 8-11, 13, 21-22, 24 of the TOR for the undivided program.
- B. skills:
 - 1. to become able to select the adequate door and window structures, shading system and facade cladding systems to be applied in the most common construction situations, to design their build-in application, thereby became able to realize common architectural ideas and intentions;
 - 2. to be able to apply the drawing elaboration techniques learned for the above-mentioned structures;
 - 3. to be able to apply basic integration of the different types of requirements learned (e.g. building physics, comfort, implementation, usability);
 - 4. to be able to prepare building structural plans that are acceptable both aesthetically and technically in respect of the structures learned during the semester;
 - 5. considerably improving in the field of expanding knowledge and strengthen experience by working independently;
 - 6. considerably improving in the field of being able to work in an effective way even when performing tasks as a member of a team.

The listed competences of skill type are indispensable but not satisfactory conditions for the fulfillment of:

 - points 7.1.1.b.1-4, 7-8 of the TOR for BsC program,
 - points 7.1.1.b.1-4, 6, 8, 14-15, 18, 23 of the TOR for the undivided program.
- C. attitude:
 - 1. more cooperative with the tutors and fellow students by acquiring and practicing the application of knowledge;
 - 2. more motivated for acquiring and applying fundamental knowledge of building constructions required for solving problems occurring in the field of architecture;

3. more open to getting acquainted with new building structures and relations, to building construction problems, to the performance of tasks that is precise and free of faults;
4. more demanding in preparing structural plans of better quality and aesthetically demanding;
5. more provident in respect of considering legal regulations and ethical standards relating to his work.

The listed competences of attitude type are indispensable but not satisfactory conditions for the fulfillment of:

- points 7.1.1.c.2-4 of the TOR for BsC program,
- points 7.1.1.c.1, 3-6, 7 of the TOR for the undivided program.

D. Independence and sense of responsibility:

1. more independent in the field of continuous acquisition of knowledge, considering basic building construction tasks and problems and solving them;
2. his work is more characterized by the right balance of cooperation and independent work;
3. more open to founded critical opinions, taking them into consideration;
4. increased knowledge of responsibility in respect of range of problems concerned during his work and the products created, as well as his undertaking responsibility connected with his fellows in the frame of teamwork.

The listed competences are indispensable but not satisfactory conditions for the fulfillment of:

- points 7.1.1.d.1-3 of the TOR for BsC program,
- points 7.1.1.d.1-3 of the TOR for the undivided program.

I.14. Methods of performance evaluation of study results

BME COS 31.§ (4) 14.

- The existence of **knowledge**-type competence elements are primarily intended to be tested by the first part (theoretical questions) of summarizing performance evaluations (classroom tests and written exam).
- Acquired **skills** are checked by semester project assignments (partial performance), and the second part (practical design tasks) of summarizing performance evaluations (classroom tests and written exam).
- Study results of **attitude** type primarily develop and can be evaluated during workshop exercises, consultations and the preparation of semester project assignments.
- The competence elements of **independence** and responsibility type can be identified and will be checked in all forms of performance evaluation.

I.15. Availability of recommended study supporting materials

BME COS 31.§ (4) 15.

- A. Professional literature
Ernst Neufert: Building and design studies
- B. Subject materials:
Slide handouts of lectures, suitable for taking notes
Electronic study materials available for download on the subject home page
Product descriptions, technical and application guides available on the home page of main producers.
- C. Materials available for download:
<http://www.epszerk.bme.hu/index.php?id=C0604>

I.16. Validity of the subject description

Specialty of the Faculty of Architecture

Submitted for approval to the Council of the Faculty of Architecture: on May 23, 2018.

Approved by the Faculty Council of the Faculty of Architecture by its resolution made on May 30, 2018.

Beginning of validity: 1st semester of the academic year 2018/19. - End of validity:

II. SUBJECT REQUIREMENTS

BME COS 33.§ (3)

II.1. Teaching methods of the subject

BME COS 33.§ (3) c)

- A. Lectures: intended to present the most important theoretical knowledge and basic principles connected to the subject topic, illustrated by examples. Lectures are held mainly by the responsible lecturer of the subject, and partly by other tutors experienced in the topic, or guest lecturers invited from the professional life. In order to follow the lectures, it is recommended to intensively use the aiding materials downloadable from the home page, suitable for taking notes. Due to limitations of time, the lectures do not cover the whole scope of topics of the semester, so the completion of the subject also requires the student to collect materials and study independently.
- B. Large hall workshop exercise: held typically at the time and place of the lectures, less frequently by uniting some studio (atelier), in which the tutor solves a certain design/application problem, accompanied by explanations, using a projector or free-hand drawing on the blackboard. The students must have their own drawing instruments for the exercise, and are required to make the drawings and take notes in parallel with the tutor.
- C. Workshop exercises: in the frame of tutorials, in classrooms, the tutor solves a certain design/application problem, accompanied by explanations, using a projector or drawing on the blackboard. The students must have their own drawing instruments for the exercise, and are required to make the drawings and take notes in parallel with the tutor.
- D. Workshop practice: small-scale design/drawing task handed out at the beginning of the lesson, which can be solved in several variations, performed in small teams of 2 or 3 students, with the tutor's support in the necessary degree, using own drawing instruments. The plan parts prepared in the workshop exercises have to be presented at the end of the lesson, which is a condition of registering attendance in the given lesson. Elaborating and handing in a clean copy of the plan parts made there (by the beginning of the next class) is optional, which may be rewarded by the tutor (max. total 10 % of overall result of the semester).
- E. Consultations: intended for providing tutor support for the student's semester project assignment prepared at home and checking its continuous progress. The drawings of the semester project must be presented at the scheduled consultation occasions; presenting a plan at a state of readiness corresponding to the scheduled progress is a condition for registering attendance.
- F. Independent work, out of contact hours: a condition of the successful fulfillment of the subject is preparing the semester project assignment at home, performing relating research for materials, studying the professional literature, preparing for classroom tests and exams, and practicing.
- G. Performance evaluations: both the classroom test and the exam are intended not only for checking the competences acquired, but they also contribute to strengthening such competences by practicing independent problem recognition, conceptualization and fast documenting. The student shall come to written tests/exams with own drawing instruments suitable for preparing drawings at the test.

The proportions and quantities of the tuition methods of the subject are determined in the schedule of the semester and the specification of tasks. The student must possess appropriate own drawing instruments for fulfilling the subject.

- A. Attending the lectures is compulsory, presence can be checked in the form of occasional assessment tests at the lectures, also aimed at checking the existence of knowledge elements required for continuous progress at workshops. Its evaluation and result (pass or fail) is indifferent from the point of view of qualifying for the signature. If the student was absent at more than 30 % of the occasional checks of the lecture, the signature should be denied.
- B. Attending the tutorials is compulsory. Only the active performance of activities scheduled for the given occasion can be considered as real presence, which is checked and registered by the workshop tutor at each lesson. The number of permitted absences is limited by the Code of Studies and Exams of BME (BME CoS) in force; exceeding this number implies the automatic denial of signature.
- C. Student performances missed due to absence cannot be made up for, the reason for absence is not verified by the Department and no excuse is accepted.

- A. Performance evaluation during the semester:
 - 1. *Level evaluations*: random occasional assessment tests at the lectures aimed at checking the existence of knowledge elements required for continuous progress at workshops, the evaluation and result of which (pass or fail) is not taken into consideration when giving the signature.
 - 2. *Partial performance evaluations*: Semester project assignments (2 pcs), intended first of all for complex assessment of the skill, attitude, as well as independence and responsibility type competence elements of the subject; its form of presentation is a checked drawing task prepared individually (or, according to the task specification, in team work), out of study hours (typically at home), but supported by consultation with tutor scheduled occasions. The requirements concerning contents and form of the semester project, its deadline of submission and the mode of evaluation are determined by the responsible of the subject and subject coordinator together in the task specification for the given semester.
 - 3. *Summarizing study performance evaluations*: Classroom tests (2 pcs), being a complex written assessment method for knowledge and skills competence elements of the subject. They focus to a smaller extent on the knowledge (theoretical) elements acquired (theoretical questions or theoretical part), and to a greater extent on the application of knowledge acquired (design-drawing task or design part), thereby concentrating on problem recognition and solving. In the frame of the tests, the design and drawing tasks of a determined building, part of building or subsystem have to be solved (without using any aiding materials). The scope of the study material serving as the basis of evaluation is determined by the responsible teacher of the subject and the subject coordinator in the schedule; the working time available is generally 90 minutes.

In addition to fulfilling the requirements of participation, a condition of getting the signature is that the result of all performance evaluations during the semester shall be at least 50%.

- B. Performance evaluation during the examination period:
 - 1. *Summarizing study performance assessment*: Written exam consisting of several parts. Its first part focuses mostly on the theoretical, knowledge-based competence elements of the subject, a series of questions based on the lecture materials and the recommended subject materials, which are generally to be answered in short texts or illustrations (theoretical questions). The second part is intended to give a complex evaluation of knowledge and skills as well as independence in the form of on-site practical design task, checking the application of the knowledge acquired (design tasks). The student must come to the exam with his own drawing instruments; apart from this, no aids are permitted to be used on the exam. The working time available is generally appr. 150 minutes.

- C. The students can find information on mid-term and exam results on the Department's website, under the Results menu.

II.4. Proportions of performance evaluations in the qualification

BME COS 33.§ (3) c)

- A. Share of evaluations done during the semester:

performance assessment:	rate:
Classroom test 1	25%
Classroom test 2	25%
Project assignment 1 (including covering structure model)	16,7 %
Project assignment 2	33,3 %
Totally:	100 %

- B. At workshop practices, drawing tasks submitted by the student as optional performance may be awarded with reward scores or grades (for the whole semester) depending on the quality of performance, which will be taken into account in determining the semester's final mark for the subject. The reward of each workshop practice can't access the 5% of overall result of the semester. The sum of all reward during the semester can't access 10% of overall result of the semester.
- C. The first part of the exam (theoretical questions) will be evaluated by scores; getting at least 50% for the performance of theoretical questions is a requisite condition, if this level is not attained, the further part of the exam will not be evaluated. The result of the theoretical part is points or grade calculated from the scores.
- D. The second part of the exam (design parts) will be evaluated by grades on a five-level scale. The design task (or if there are several design parts in the exam, at least one of them) shall get a pass mark in order for the exam to be successful.
- E. The overall result of the exam is calculated by scoring (therefore the mark of the second task is converted into scores) or weighted average of the grades of the two parts (1/3-2/3). It is required that 50% of the total possible scores or the pass mark be reached in order for the exam to be successful.
- F. The mark for the subject has to be calculated on the basis of the sum of scores obtained during the semester and on the exam modified by rewards obtained during the ongoing semester. The results during the semester and the exam are calculated by 50-50% rate.
- G. On the basis of the student's performance during the semester, the department may propose an offered final mark, and if the student accepts it, he will be exempted from the exam. The general rules and subject-specific conditions of this is published by the department for each semester.

II.5. Determining the mark*

BME COS 33.§ (3) c)

Rate of result	Mark	ECTS qualification
≥ 90%	jeles (5)	Excellent [A]
85– 90%	jeles (5)	Very Good [B]
75 – 85%	jó (4)	Good [C]
65– 75%	közepes (3)	Satisfactory [D]
50 – 65%	elégséges (2)	Pass [E]
< 50%	elégtelen (1)	Fail [F]

* The lower limit value specified for each mark belongs already to the given mark.

II.6. Order of completing missing performances, retaking and revising exams

BME COS 33.§ (3) b)

- A. The acknowledgement of partial performances resulting from earlier enrollment to the subject, is not done automatically. The taking over of scores of project assignments already submitted and closed during earlier semesters, and evaluated at least grade 2 (pass level) can be requested in a application addressed to subject coordinator and submitted to the department secretariat until noon on the Friday of the second week of the semester. The subject coordinator may decide, at his own discretion, on taking over the partial scores, on permitting the continuation of the earlier

project assignment, or rejecting the request. Scores of classroom tests, workshop exercises of earlier semesters, or reward scores cannot be taken over, cannot be recognized. After the expiry of the pre-mentioned acknowledgement deadline, no former partial performance can be taken into consideration.

- B. There is no possibility for making up for any missed requirements of attendance type (lectures, tutorials, drawing exercises, workshop exercises, consultations).
- C. Any successful, failed or missed classroom tests can be retaken made up for free of charge once, on the week assigned for such completion, at the time determined in the faculty schedule. The student has to register for such completion on the Neptun (Integrated Study Administration System, SAS). Out of the results of the original classroom test and its retaking/revision, the department will consider the better one in each case when giving the signature and making the decision on giving the final mark.
- D. Late submission of project assessments failed to be handed in by the deadline is possible at the time determined in the faculty's schedule, by payment of a fee for special procedure. Project assignments submitted by the deadline for late submission will be taken into consideration with a score reduced by 10% when determining the final mark. A project assignment already submitted (closed partial performance assessment) cannot be revised or retaken.
- E. The retaking of exams is governed by the rules determined in the Study and Examination Regulation (BME CoS).

II.7. Study works required for fulfilling the subject

activity	hours / term
participation in contact study hours (lectures and workshop exercises together)	12×4=48
performing project exercises at home	48
preparation for the summarizing performance assessment (classroom test and exam)	24
total:	Σ 120

II.8. Approval and validity

Approved by: the Dean of the Faculty of Architecture on December, 2019; beginning of validity: 2nd semester of the academic year 2019/20.