

Information on the new specialisation – Sustainable Architecture Specialization

**Introduced in academic year 2022/2023 at the Faculty of Architecture
in 7–10 semesters of the Integrated Master Program in English**

1. Background

On 25.04.2022, the BME Senate decided, based on the proposal of the Faculty of Architecture on the introduction of new specialization curriculum units of the BME Faculty of Architecture Integrated MSc Program in 2022/2023. The purpose of the decision was to restructure and increase the specialization offer – specializations, subjects – and for the lecturers and departments to respond to the external demands and their own scientific and research results to offer curricular units that provide connected knowledge. The faculty has taken the current steps after several years of analysis, consultation, and debate, and expects from the renewal that the specializations will better cover external professional and internal student needs.

Sustainability, meant in a broad sense is a key issue of contemporary architectural thinking worldwide. So, the Faculty of Architecture decided that the newly introduced academic program of the last four semesters of study will focus on this topic through subjects offered in an obligatory elective way, giving a bigger freedom in selection according to students' interest at the same time.

The new specialization curriculum units are introduced for the 7th semester students starting in 2019 and after.

2. Frame of 7-10 semesters

Ú																							
	7. semester					8. semester					9. semester					10. semester							
01	CM2 - Building Project Management				EK.m	BA Ec.				EK.h	C.Law				EK.h	Elective				VT_	01		
02	2				2	v	4			2	0	f	2			2	0	f	4		02		
03						Elective				VT_	Elective				VT_	f					03		
04						2				3	f	5			2	3	f	5			04		
05	Elective				VT_					f					f	Diploma				TE.k	05		
06	BC6				ES.μ											0				26	f	26	06
07	2				2	f	4															07	
08						Colour Dinamics				AR.r	Ec. 2				GTK-ÉMK							08	
09						0				2	f	2			2	0	f	2				09	
10	Pres Hist.				ET.e	Real-Estate Dev.				KV.M	Des RFC				KV.M							10	
11	2				0	f	2			1	1	f	2			1	1	f	2			11	
12	Oblig.elective				KV.K	Oblig.elective				KV.K	Dip.Research				KV.K							12	
13	?				?	?	9			?	?	?	9			1	2	f	3			13	
14																						14	
15											Oblig.elective				KV.K							15	
16											?				?	?	6					16	
17																						17	
18																						18	
19																				ST.μ		19	
20																						20	
21	Spec.Complementary				SP.k	Complex 1.				TE.k	Complex 2.				TE.k							21	
22	0				4	f	4			0	10	f	10			0	10	f	10			ES.μ	22
23																						23	
24																						24	
25	Spec.Project				TE.k																EG.e		25
26	0				6	f	6															26	
27										ST.μ					ST.μ							27	
28										ES.μ					ES.μ					EK.m		28	
29										EG.e					EG.e							29	
30										EK.m					EK.m							30	

3. Typology of subjects

3.1. Non-specialisation subjects

If someone is not eligible to enter the specialisation, can fulfill these subjects if their pre-requisites are met.

3.1.1. Obligatory subjects

These subjects are obligatory for all the students.

3.1.2. Elective subjects

Students can select them freely from subjects offered by the University.

3.2. Specialisation subjects

3.2.1. Obligatory elective subjects

Students are obliged to fulfil eight subjects from the offered list of subjects, according to their selection.

Special Construction Technologies BMEEPEKQ903

History of Architecture in Hungary BMEEPETQ703

Contemporary City: Urban Form and Space Usage BMEEPUIQ701

Sustainable Conceptual Design of Structures BMEEPSTQ702

Craft/Shop – Experimental Object-making BMEEPKOQ701

Rehabilitation of Building Constructions (Building Constructions 9.) BMEEPESQ902

Constructive CAAD CE BMEEPAG0249

Praxis – Architectural Strategies BMEEPIPQ703

Competitions and a Conscious Practice BMEEPLAQ803

Visual Communication BMEEPRAQ801

OBLIGATORY ELECTIVE SUBJECTS

Course Name

Special Construction Technologies

Neptun

BMEEPEKQ903

Course Objectives & Outcomes

The course aims to deepen the students' knowledge with up-to-date information on various special fields of the construction industry. The theoretical lectures are on the construction technologies of special sub- and superstructures (e.g., metro tunnels, metro stations, special slurry walls, special reinforced concrete superstructures, or formwork systems), on the traditional and modern materials, methods, and technologies applied in the case of sustainable and ecological structures and in the case of preservation, restoration, and maintenance of monuments and historic buildings. Besides the lectures, many site visits are organized to support the theoretical knowledge of the subject.

Course Outline

THEORY

- History of construction development, the role of the special construction technologies
- Constructions technologies of special engineering structures (tunnels, metro stations, etc.), special reinforced concrete technologies
- Application of traditional, sustainable, and green technologies
- Restoration technologies and materials (I-II.)
- Maintenance strategies, diagnostics, and preservation technologies

SITE VISITS

- Construction of special load-bearing structures I
- Construction of special load-bearing structures I
- Application of sustainable and green technologies I
- Application of sustainable and green technologies II
- Resoration, instauration, preservation I
- Resoration, instauration, preservation II

Course Name

Rehabilitation of Building Constructions

Neptun

BMEEPESQ902

Course Objectives & Outcomes

The course aims at enabling students to reach knowledge in building failures and damages with their possible reasons, with improvement possibilities. After the theoretical presentations, the practical of building diagnostics is introduced through several site visits of failed buildings waiting for retrofit and already refurbished buildings. At the semester project, students have to design a refurbishment for an existing building introduced with drawings and detailed descriptions.

Course Outline

CHAPTER I

- Presentations in Building Diagnostics:
 - Failures of loadbearing structures and possible reasons
 - Failures of pitched roofs, roof claddings, flat roofs and waterproofings
 - Failures of external building envelope (facade claddings, doors, and windows)
 - Failures of finishings

CHAPTER II

- Site Visits

CHAPTER III

- Semester Project Development, Consultation and Submission

Course Name**History of Architecture in Hungary****Neptun****BMEEPETQ703****Course Objectives & Outcomes**

The course gives an overview of the architecture in Hungary from the classical Antiquity up to now. The principle of the presentation is the chronological interdependence. However, particular attention is given to the main trends within the different periods as the main architectural tendencies or external and internal factors that determine the historical and architectural context; while following the timeline, the classes concentrate on the main problems of the investigated periods, like the important building types, character of the styles. A great emphasis is given to the exploration of the connections between the European and Hungarian history of architecture.

Course Outline

- Pannonia
- Romanesque Architecture
- Gothic Architecture
- Renaissance
- Baroque
- Neo-Classicism and Romanticism
- Historicism and Turn of the Century
- Modernism and the Socialist Realism
- Late Modern and Contemporary Tendencies

Course Name**Visual Communication****Neptun****BMEEPRAQ801****Course Objectives & Outcomes**

The course aims at enabling students to reach an advanced level in graphic design, the conscious and appropriate use of typography in their design work and visual communication. It introduces students to the principles, potentials and tools of Branding, Graphic Arts & Publishing, as well as of Environmental Graphic Design.

Course Outline**CHAPTER I**

- Visual Communication
- Elements and Principles of Graphic Design
- Typography I – Typeface / Font Anatomy / Alignment / Kerning
- Typography II – Text Layout
- Publishing I – Layout / Poster
- Publishing II – Booklet Design

CHAPTER II

- Branding I – The Image
- Branding II – Additional Branding Tools
- Environmental Graphic Design I
- Environmental Graphic Design II

CHAPTER III

- Publishing I – Printed Publishing
- Publishing I – Digital / Online Publishing

Course Name**Sustainable Conceptual Design of Structures****Neptun****BMEEPSTQ702****Course Objectives & Outcomes**

The course aims at enabling the students to have knowledge on conceptual design of sustainable load-bearing structures and sustainable rehabilitation of heritage load-bearing structures. The discussion puts the emphasis on how the embodied carbon content of the structures can be reduced by the right choice of building materials, structural forms, and structural systems to fulfil the climate requirements. Important part of the course is knowledge on how the resilience, retrofitting and rehabilitation of the historical load-bearing structure may be provided on a sustainable way.

Course Outline

CHAPTER I: General principles and materials

- Climate goals, principles of sustainability – requirements for structures
- Embodied carbon content of the building materials – principles of material selection
- Sustainable/Environmentally-compatible structures – principles of structure type selection
- Innovative, sustainable structural building materials of the past and future

CHAPTER II: Structures

- The effect of structural form, structural system, and material on sustainability of buildings – case studies:
- Circular economy – structural applications – principles, case studies
- Optimization of structural geometry and behaviour – sustainability – space structures
- Second life of the load-bearing structures – urban mining – adaptive/optimal reuse – principles and digital tools

CHAPTER III: Rehabilitation of structures

- Protecting the load-bearing structures of architectural heritage – principles – case studies
- Structural behaviour of the historical load-bearing structures – case studies
- Resilience, retrofitting and rehabilitation principles of historical load-bearing structures – adaptation to climate changing – case studies

Course Name**Contemporary City: Urban Form and Space Usage****Neptun****BMEEPUIQ701****Course Objectives & Outcomes**

Understanding the contemporary development of the inherited urban landscape is not about what to do, but how to think about what to do. The seminar focuses on the closed/open duality of the urban fabric because this qualitative dimension characterizes not only the physical context, but is strongly related to the social, as well. On one hand, the degree of closeness/openness is one of the most important characteristics of every historic, modern, and contemporary urban form, and on the other hand, these physical forms influence or define the space usage within the city.

As international students have various cultural and educational backgrounds, the course uses the opportunity to learn from each other, to discover, and compare several urban case studies. The practical part facilitates this method by analysing so-called “déjà vu” urban situations from all over the world. The course introduces local and global components that shape the contemporary city and gives tools for further complex discovery related to urban design or research.

Course Outline

The double lessons are every second Friday afternoon.

- 1-2 Introduction: urban form and space usage
- 3-4 Study trip within Budapest
- 5-6 Closed block pattern
- 7 design week
- 8-9 Open block pattern
- 10-11 In-between pattern
- 12-13 Comparative studies: students’ work presentations
- 14 design week

Course Name**Constructive CAAD – 3D Modeling****Neptun****BMEEPAG0249****Course Objectives & Outcomes**

The aim of the course is to provide students with a practical overview of typical architectural shapes and the tools and concepts of their 3D modelling. It also introduces general modelling concepts and techniques, the use of texturing, lighting, and rendering.

Course Outline**CHAPTER I / Spire Polyhedra**

- Basic Spire Shapes
- Compound Spire Shapes
- Generalization for Rectangular Base

CHAPTER II / Vault Morphology

- Typical Vault Shapes
- Morphological Map of Vaults
- Dome Types and Pendentive Shapes
- Pointed and Complex Rib Vaults
- Simple Star Vault

CHAPTER III

- Lighting, Light Types and Properties
- Materials, Texture Types
- Views, Visual Styles, Rendering

Course Name**PRAXIS – Architectural Strategies****Neptun****BMEEPIPQ703****Course Objectives & Outcomes**

University studies models real professional processes in many ways, but due to its educational nature, it is more like a laboratory setting. It takes a different kind of knowledge to design or implement a high-quality architectural intervention. Students gain insight into the design process during their university studies, with the subject 'PRAXIS – Architectural Strategies' providing insight into another segment of architectural work. What is needed to make a good plan come true which include the original idea in the details of the building being built? How to win an architectural competition? What strategy do practitioners follow to achieve quality? We are looking for answers to these questions with the help of renowned architects and interior designers in the framework of guest lectures, site visits and roundtable discussions.

Course Outline

- Introductory lecture – Description of the semester, the nature and methodology of the course
- 1–5 Lectures – Presentations of Guest lecturers related to the current year's theme.
- Preliminary Design Week
- 6–8 – Site visits organized by Guest lecturers related to the current year's theme.
- 9 – Semester assignment, final lecture
- Consultation 1 – Semester assignment consultation
- Consultation 2 - Semester assignment consultation
- Project Finalisation Week – Submission of semester assignment
- Delayed submission of semester assignment

Course Name**Craft/Shop – Experimental Object-making****Neptun**

BMEEPQOQ701

Course Objectives & Outcomes

The primary object of the course is to examine the range of theories behind development of spaces, undertaken in the form of a lectures, seminars, and apply the gained knowledge by creating experimental physical models. The lecture course is to be broken down into individual study areas, followed by the consultation and, carrying out the semester submission.

Students will have to submit physical scaled models demonstrating the practical use of their gained theoretical knowledge. They will get familiar with the fundamental the tools and techniques for expressing their ideas and concepts through architectural model building.

Candidates in the semester will be expected to attend classes on a regular basis, submit the required tasks. (3 credits)

Course Outline

- 1 Briefing, introduction
- 2 General concept of space - Experimenting with solids
- 3 General concept of architectural space - Experiment with enclosed space
- 4 Expression of Sacred, communal, and private spaces.
- 5 Complex volumes
- 6 Working with light
- 7 Motion - Kinetic forms
- 8 Workshop
- 9 Abstraction
- 10 Consultation
- 11 Consultation
- 12 Presentation of models and evaluation

Suggested sources:

Matthew Mindrup: The material Imagination
Nick Dunn: Architectural Modelmaking

Course Name**Competitions and Conscious Practice****Neptun**

BMEEPLAQ803

Course Objectives & Outcomes

Taking part in an architectural competition is a resource-intensive commitment both for architectural practices and for architecture students. The aim of the course is for students to learn about the complex and often controversial system of architectural competitions to be better prepared to take part in them at a later stage.

Course Outline**CHAPTER I**

- 1st competition:
 - announcement
 - background, Q&A
 - Jury, results
 - Lecture
- 2nd competition:
 - announcement
 - background, Q&A
 - Jury, results
 - Lecture
- 3rd competition:
 - announcement
 - background, Q&A
 - Jury, results
- semester closing

3.2.2. Design subjects

7. semester: Theoretical subject + Project to be selected together at the same department

Specialized Project (BMEEPxxQ711 – 6 Cr) – Possible to choose on these departments:

- Explorative Architecture – https://drive.google.com/file/d/1daWraiQI8v8hc-MtH0KdAoegS0ZFpXfj/view?usp=drive_link
- History of Architecture and Monument Preservation – https://drive.google.com/file/d/1-mb1oSMbK4H5FCN/view?usp=drive_link
- Public Building Design – https://drive.google.com/file/d/1MYFtGxeQkJGCX7bKSEtYDizdZxGYiQlw/view?usp=drive_link
- Residential Building Design – <https://stt-lako.blogspot.com/>
- Urban Planning and Design – <https://urb.bme.hu/en/en-eng-department-design-2021-hidden-opportunities-of-the-urban-roofscape/>

How to apply:

To apply, students must enter the chosen departments in the order of their choice in the link below. Departments decide on admission depending on the number of applicants.

[Specialised project BMEEPxxQ711 - Google Úrlapok](#)

Specialization Complementary Course (BMEPExxQ712 – 4 Cr) is possible on the same department as the Specialized project.

8-9. semester: Comprehensive Design 1-2, to be selected freely from departments offering the subjects

9. semester: Diploma Research, to be selected at the department, where student is planning to do Diploma Project

10. semester: Diploma Project, to be selected freely from departments offering the subject

It is possible to change departments between different semesters, this matter must be discussed with the departments. (Between the two Comprehensive Design semester is not possible to change.)

4. Globals

A significant change is in the order of the global exams. In the new program, instead of the previous system, 5 + 1 global exams will be mandatory for all students (Strength of Materials, Design, History of Architecture, Building Construction, Construction Technology and Management + Architectural). The final global exam requirements of the old Bulletin will only be mandatory for students graduating in 2023. The two systems cannot be combined, i.e., according to either the old or the new Bulletin, the full range of requirements and subjects must be completed.

For the new specialization (for the students in the 7th semester), the Strength of Materials, the Building Construction, and the History of Architecture final global exams will not be mandatory, the Construction Technology and Management, and the Architectural global exams will be instead.

New global exams:

4.1. Global in Construction Technology and Management

4.2. Architectural Global Exam

5. Eligibility, pre-requisites

Students can enter the specialisation if following pre-requisites are met:

5.1. Having at least six accomplished active semesters

5.2. Having at least 150 credits out of the 180 credits of the first six semesters

5.3. Accomplished all the obligatory subjects of the first four semesters

5.4. Having at least one of the following globals: Global in Strength of Materials, Global in Building Constructions, Global in Design

Dr. Gábor Nemes

associate professor

Academic Head of the Specialisation

nemes.gabor@epk.bme.hu