



Budapest University of Technology and Economics

BULLETIN
2020-2021

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BULLETIN

Budapest University of Technology and Economics

2020–2021

An ECTS Guide



Programs in English
www.future.bme.hu
admission@mail.bme.hu

**Bulletin of the Budapest University of Technology and Economics
Engineering Programs in English**

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This Catalogue provides information on the programs and services of the Budapest University of Technology and Economics. Curricula, courses, degree requirements, fees and policies are subjects to revision. Specific details may vary from the statements printed here without further notice.

HU ISSN 1786-5352

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Dear Student,

You are reading the Bulletin of the Budapest University of Technology and Economics. Its direct predecessor, the Institutum Geometricum, was established in 1782 by Emperor Joseph II, as part of the Faculty of Liberal Arts at the University of Buda. During the past 237 years the professors of the university have striven to provide an outstanding quality of education. This has earned the university an international reputation, attracting students and also professors from all over the world.

Our university has eight faculties. They are, in order of foundation: Civil Engineering, Mechanical Engineering, Architecture, Chemical Technology and Biotechnology, Electrical Engineering and Informatics, Transportation Engineering and Vehicle Engineering, Natural Sciences, Economic and Social Sciences.

“Education is the most powerful weapon which you can use to change the world.”

This is the quotation from Nelson Mandela. It is unquestionably true and especially applicable for engineers who have the power to make a better world:

Sustainable energy, clean water, safe transport on roads and on bridges, producing less pollution, buildings for comfortable living and working, machines and robots for work and for amusement, fast and reliable communications, medical equipment that assure a good quality of life for the individual and can be financed by society, and healthy food for us all. All of these goals need engineering solutions to make the world a safer, better and more exciting place to be. **This is also your responsibility.** You can acquire the necessary knowledge and skills to make your own contribution. As a graduate you will certainly do your best for your colleagues, company and society.

Two components are decisive for a good diploma: good teachers and a good student. I can say our university provides you with excellent teachers – **you must be good students!** I am sure it is worth being so. Besides, you will love it: the university years will be your best memory, the engineering profession will provide you the joy of creation.

Hungary is a member of the European Union. As a student in Budapest you will find general European as well as particular Hungarian cultural customs: food, fashion, folk art, music and dance.

Use this bulletin to help you consider our programs. Come to visit our campus. Better yet, come to study with us for one or two semesters or for an entire degree program. Should you decide to stay for only one semester, this bulletin will also help you choose from among the different semester programs.

The Budapest University of Technology and Economics extends a special welcome to students from abroad.

Károly Veszprémi
vice-rector for education

Available study programmes for 2021/2022 academic year

| BSc programmes | Faculty |
|-------------------------------|---|
| Chemical Engineering | Faculty of Chemical Technology and Biotechnology |
| Civil Engineering | Faculty of Civil Engineering |
| Computer Engineer | Faculty of Electrical Engineering and Informatics |
| Electrical Engineering | |
| Mathematics | Faculty of Natural Sciences |
| Mechanical Engineering | Faculty of Mechanical Engineering |

| MSc/MA* programmes | Faculty |
|---|---|
| Applied Mathematics | Faculty of Natural Sciences |
| Architecture (Five-year Integrated Master Program and Master in Architecture Program) | Faculty of Architecture |
| Chemical Engineering | Faculty of Chemical Technology and Biotechnology |
| Computer Engineer | Faculty of Electrical Engineering and Informatics |
| Electrical Engineering | |
| Environmental Engineering | Faculty of Chemical Technology and Biotechnology |
| Finance* | Faculty of Economic and Social Sciences |
| Management and Leadership* | |
| Regional and Environmental Economic Studies* | |
| Mechanical Engineering Modelling | Faculty of Mechanical Engineering |
| Physics | Faculty of Natural Sciences |
| Structural Engineering | Faculty of Civil Engineering |
| Autonomous Vehicle Control Engineering | Faculty of Transportation Engineering and Vehicle Engineering |
| Transportation Engineering | |
| Vehicle Engineering | |
| Logistics Engineering | |

| PhD programmes | Faculty |
|--|---|
| Architecture Engineering | Faculty of Architecture |
| Architecture (DLA program) | |
| Business and Management | Faculty of Economic and Social Sciences |
| Chemistry | Faculty of Chemical Technology and Biotechnology |
| Chemical- Bio- and Environmental Engineering | |
| Civil Engineering Sciences and Earth Sciences | Faculty of Civil Engineering |
| Computer Engineer | Faculty of Electrical Engineering and Informatics |
| Electrical Engineering | |
| Mathematics and Computer Science | Faculty of Natural Sciences |
| Physical Sciences | |
| Mechanical Engineering Science | Faculty of Mechanical Engineering |
| Autonomous Vehicle Control Engineering | Faculty of Transportation Engineering and Vehicle Engineering |
| Transportation Engineering | |
| Vehicle Engineering | |
| Logistics Engineering | |

Tuition Fees for 2021/2022 academic year

| Course | Faculty | For non-EU citizens EUR/ semester | For EU citizens EUR/ semester |
|--|---|---|-------------------------------------|
| Preparatory | Pre-engineering | 3200 | 3200 |
| Preparatory | General course | 3200 | 3200 |
| | Faculty of Civil Engineering | 3200 | 3200 |
| | Faculty of Mechanical Engineering | | |
| BSc | Faculty of Chemical Technology and Biotechnology | 3200 | 2250 |
| | Faculty of Electrical Engineering and Informatics | | |
| | Faculty of Natural Sciences | | |
| MSc | Faculty of Civil Engineering | 3800 | 3800 |
| | Faculty of Architecture (10 semesters) | 3200 | 2850 |
| | Faculty of Mechanical Engineering | | |
| | Faculty of Architecture (4 semesters) | | |
| MSc for graduates of external higher education institutions | Faculty of Chemical Technology and Biotechnology | 3500 | 3200 |
| | Faculty of Electrical Engineering and Informatics | | |
| | Faculty of Natural Science | | |
| | Faculty of Transportation Engineering and Vehicle Engineering | | |
| | Faculty of Economic and Social Sciences | | |
| MSc for graduates of BME | Faculty of Chemical Technology and Biotechnology | 3200 | 2850 |
| | Faculty of Electrical Engineering and Informatics | | |
| | Faculty of Natural Science | | |
| | Faculty of Transportation Engineering and Vehicle Engineering | | |
| | Faculty of Economic and Social Sciences | | |
| PhD* | Faculty of Civil Engineering | 4500 | 4500 |
| | Faculty of Mechanical Engineering | | |
| | Faculty of Architecture | | |
| | Faculty of Chemical Technology and Biotechnology | | |
| | Faculty of Electrical Engineering and Informatics | | |
| | Faculty of Natural Science | | |
| | Faculty of Transportation Engineering and Vehicle Engineering | | |
| | Faculty of Economic and Social Sciences | | |

+ Application fee: 100 EUR

* For PhD application please contact the faculties: <http://www.bme.hu/faculties?language=en>

The University Bank Account Number for payments of application (only bank transfer accepted)

Bank name: National Bank of Hungary (MNB)

Bank address: H-1850 Budapest, Szabadság tér 6-8., Hungary

Bank account number: 10032000-01425279-01110009

Swift code: MANEHUHB

IBAN code: HU22 1003-2000-0142-5279-0111-0009

Beneficiary name: BME

Beneficiary address: H-1111 Budapest, Műgyetem rkp. 3., Hungary



FACULTY OF ARCHITECTURE

Introduction

The Faculty of Architecture of the Budapest University of Technology and Economics focuses on training highly professional experts in architectural engineering who are aware of the social and cultural implications of their profession. Versatility is emphasised so that students will gain fundamental knowledge and abilities in every possible field of architecture and be able to find work in a highly competitive job market, and in any building- or design-related area of consulting, construction, and management.

Graduates of the Faculty of Architecture are qualified for a broad spectrum of architectural occupations:

- Design, construction and maintenance of residential, public, industrial and agricultural buildings;
- Reconstruction and the preservation of historical monuments;
- Urban design and settlement planning; and
- Administration of all these activities.



The curricula were organised on Swiss and German models. The Faculty has maintained these traditions for the last 40 years but provides additional European and international dimensions through guest lecturers from abroad, topical short courses, workshop seminars and exchange programs.

The Academic Programs of the Faculty of Architecture taught in English are in full conformity with the Integrated MSc Program and MSc Program provided in Hungarian, which after two years practice and experience are accepted for access to EUR-ING title.

Students, both International and Hungarian, who have a command of both languages can choose from either program. The participation of Hungarian students in the program given in English has obvious advantages. It eases the integration of international students into the society, which surrounds them during the years of their studies. It also attracts students from European, American and other universities worldwide to study in Budapest within the framework of the International Student Exchange Program and other agreements.

Hungarian students likewise gain the opportunity to study at schools of architecture abroad. These exchanges will become a powerful factor in achieving real convertibility among educational system worldwide and, eventually, mutual international recognition of degrees.

Graduation

Graduation from the University is based on the successful completion of examinations in all subjects and on the successful defence of a diploma project in front of a Final Examination Board. The examinations are public and the Board consists of professors and eminent specialists in the profession. Diploma projects are prepared in the last semester under departmental guidance and can be submitted only by students with an "absolutorium" (university leaving certificate). The diploma project is expected to reflect its author's familiarity with technical and aesthetic knowledge fundamental to architectural practice, and his/her creativity in applying it. Currently, international agreements make it possible for certain Hungarian students to prepare and defend their diploma projects in the university of another country. Students from abroad can correspondingly prepare and defend their thesis projects under the guidance of the Faculty of Architecture at the Budapest University of Technology and Economics.

The Academic Programs of the Faculty of Architecture in English language are as follows:

General Course in Architecture (Preparatory Program)

The 1-2 semester program called General Course precedes the Integrated MSc Program. It is designed to develop the skills of students from abroad so they will be at no disadvantage in meeting the Faculty's exacting educational standards. Students are introduced to various aspects of the profession they have selected, and they concentrate on studying English and basic technical subjects such as mathematics and freehand drawing. The partial fulfilment of the General Course doesn't replace the Placement Test. Students who successfully pass the Placement Test can automatically (immediately) start the Integrated MSc Program.

Integrated MSc Program in Architectural Engineering

The Integrated MSc Program is a five-year (10 semester) long training and leads directly to an MSc degree in Architecture and Architectural Engineering (Dipl. Ing. Arch.).

For integrated MSc degree (10 semesters) students have to accumulate min 300 credit points. The Program requires to accomplish obligatory subjects and elective subjects too.

Currently there isn't BSc program offered in English language.

Preparatory Year for Master of Science Program in Architecture (Pre-MSc Program)

The 1-2 semester program called Pre-MSc Program precedes the MSc Program. The Pre-MSc Program is offered for students who have earned BSc degrees in other schools of architecture and could legally join the MSc Program, but could not successfully complete the entrance exam of the MSc Program. Based on the different kind of BSc studies there might be differences in their preparedness. The aim of the Program is to equal these differences and prepare the students for the MSc Program.

Students are offered to join the courses of the Integrated MSc Program. There are two kinds of courses in the Program: obligatory and suggested courses. Successful fulfilment of all the obligatory courses is equal to a successful entrance exam. Suggested courses are tendered to develop the skills of students in various fields.



Master of Science Program in Architecture (MSc Program)

MSc Program, which is a two-year (4 semester) long training and leads to an MSc in Architecture. Students who have earned BSc degrees in other schools of architecture can join the MSc Program. For MSc degree (4 semesters) students have to accumulate min 120 credit points. The Program requires to accomplish obligatory subjects and elective subjects too. During the MSc Program, students can choose after the first semester from the following specialisations:

- Real-Estate Development and Facility Management
- Architectural and Interior Design
- City Design
- Structural Design

Note: The Faculty of Architecture reserves the right of changing the Curricula. Specialisations have a minimum required number of students to start.

The Faculty of Architecture offers Postgraduate studies in its two Doctoral Schools.

Doctoral Studies PhD (Csonka Pál Graduate School)

Studies in Csonka Pál Graduate School cover a wide range of scientific and engineering topics related to architecture, including urban sciences, energetics and sustainability, architectural heritage and history of architecture, structures, applied mechanics and applied geometry. The focus of this school is independent research under personal supervision.

Doctoral Studies DLA (Doctoral School of Architecture)

The program of the Doctoral School of Architecture leads to the PhD-equivalent degree Doctor of Liberal Arts (DLA). The four year-long curriculum strongly focuses on creative architectural design supported by project-based research.

Departments

- | | |
|---|---|
| <ul style="list-style-type: none"> • Department of Architectural Geometry and Informatics • Department of Construction Technology and Management • Department of History of Architecture and Monument Preservation • Department of Building Energetics and Building Service • Department of Building Constructions | <ul style="list-style-type: none"> • Department of Industrial and Agricultural Building Design • Department of Public Building Design • Department of Residential Building Design • Department of Graphics, Form, and Design • Department of Mechanics, Materials and Structures • Department of Urban Planning and Design • Laboratory of Building Acoustics • Laboratory of Thermal Physics |
|---|---|

Budapest University of Technology and Economics
Faculty of Architecture

Dean: Dr. György Alföldi DLA

Vice-Dean for International Education (Undergraduate, Graduate Programs):

Dr. Ágnes Gyetvai-Balogh

Vice-Dean for Science (Postgraduate Programs):

Dr. Péter Várkonyi

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Study Program Administrator:

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Address: H-1111 Budapest, Műegyetem rkp. 3.

K Bldg. 2./14.

E-mail: tamas.gyongyi@epk.bme.hu

Phone: +36-1-463-3526



General (Preparatory) Courses in Architecture

| Subject | | | hours/week | | Requisites |
|---------------------------------------|-------------|---------|------------|--------|------------------------------|
| Name | Code | Credits | 1 | 2 | |
| Basic Mathematics 1 | BMETETOPB22 | - | 0/4/0p | | |
| Computer Literacy 1 | BMEEPAGG101 | - | 0/4/0p | | |
| Engineering Sciences | BMETETOP117 | - | 0/4/0p | | |
| Geometrical Construction 1 | BMEEPAGG111 | - | 2/3/0p | | |
| Freehand Drawing 1 | BMEEPAGG101 | - | 0/6/0p | | |
| Design Skills 1 | BMEEPAGG111 | - | 0/2/0p | | |
| Basic Mathematics 2 | BMETETOPB23 | - | | 0/5/0p | Basic Mathematics 1a |
| Computer Literacy 2 | BMEEPAGG201 | - | | 0/2/0p | Computer Literacy 1a |
| Geometrical Constructions 2 | BMEEPAGG211 | - | | 2/1/0p | Geometrical Constructions 1a |
| Freehand Drawing 2 | BMEEPAGG201 | - | | 0/6/0p | Freehand Drawing 1a |
| Fundamental of Structures | BMEEPSTG201 | - | | 4/0/0p | |
| Basic Tools of Building Constructions | BMEEPESG201 | - | | 0/2/0p | |
| Design Skills 2 | BMEEPAGG211 | - | | 0/2/0p | Freehand Drawing 1a |
| Fundamentals of Architectural Design | BMEEPAGG221 | - | | 0/2/0p | |
| English for Studies 1. | BMEGT630101 | - | 0/6/0p | | |
| English for Studies 2. | BMEGT630102 | - | | 0/6/0p | English for Studies 1.a |

a) can be taken parallelly in the same semester. For students of BME Faculty of Architecture only criteria subjects (no credit points)

Curriculum of Integrated MSc Program 1-10. semester

| Subject | | | lectures/practical lectures/laboratory | | | | | Requisites |
|---|-------------|---------|--|--------|--------|--------|--------|---|
| Name | Code | Credits | 1 | 2 | 3 | 4 | 5 | |
| Mathematics EP1 | BMETE90AX33 | 4 | 2/2/0e | | | | | - |
| Philosophy | BMEGT411099 | 2 | 2/0/0p | | | | | - |
| Descriptive Geometry 1 | BMEEPAGA102 | 5 | 3/2/0e | | | | | - |
| Introduction to Building construction | BMEEPESA101 | 2 | 1/1/0p | | | | | - |
| History of Architecture I. (The Beginnings) | BMEEPETA101 | 3 | 2/1/0e | | | | | - |
| Introduction to Structural Design | BMEEPSTA101 | 2 | 2/0/0e | | | | | - |
| Drawing 1 | BMEEPRAA101 | 5 | 0/5/0p | | | | | - |
| Introduction to Architecture | BMEEPUIA101 | 2 | 2/0/0p | | | | | - |
| Space Composition | BMEEPKOA101 | 5 | 0/5/0p | | | | | - |
| Mathematics EP2 | BMETE90AX34 | 2 | | 0/2/0p | | | | BMETE90AX33 |
| Descriptive Geometry 2 | BMEEPAGA202 | 5 | | 3/2/0e | | | | BMEEPAGA102 |
| Building Constructions 1 | BMEEPESA201 | 4 | | 2/2/0e | | | | BMEEPESA101, BMEEPSTA101s |
| Statics | BMEEPSTA201 | 4 | | 2/2/0e | | | | BMEEPSTA101 |
| History of Architecture 2 (Antiquity) | BMEEPETA201 | 3 | | 2/1/0p | | | | - |
| Drawing 2 | BMEEPRAA201 | 4 | | 0/4/0p | | | | BMEEPRAA101 |
| Residential Building Design 1 | BMEEPLAA201 | 2 | | 2/0/0e | | | | BMEEPUIA101 |
| Basics of Architecture | BMEEPLAA202 | 6 | | 0/6/0p | | | | BMEEPUIA101, BMEE-PRAA101, BMEEPKOA101 |
| Building Materials I | BMEEOEMA301 | 3 | | | 2/1/0p | | | - |
| Architectural Informatics 1 - IT Applications | BMEEPAGA301 | 2 | | | 1/1/0p | | | - |
| Building Physics | BMEEPGA301 | 2 | | | 2/0/0p | | | BMEEPESA101 |
| Strength of Materials 1 | BMEEPSTA301 | 4 | | | 2/2/0e | | | BMEEPSTA201, BMETE90AX33 |
| History of Architecture 3 (Medieval) | BMEEPETA301 | 3 | | | 2/1/0e | | | BMEEPETA201 |
| Drawing 3 | BMEEPRAA301 | 4 | | | 0/4/0p | | | BMEEPRAA201 |
| Public Building Design 1 | BMEEPKOA301 | 2 | | | 2/0/0e | | | BMEEPLAA201, BMEEPLAA202 |
| Residential Building Design 2 | BMEEPLAA301 | 6 | | | 0/6/0p | | | BMEEPLAA201, BMEEPLAA202, |
| Building Constructions 2 | BMEEPESA301 | 4 | | | 2/2/0e | | | BMEEPSTA101s, BMEEPAGA102, BMEEPESA101 |
| Sociology for Architects | BMEGT43A044 | 2 | | | | 2/0/0e | | - |
| Architectural Inf. 2 - Digital Representation | BMEEPAGA401 | 3 | | | | 1/2/0p | | BMEEPAGA202, |
| Building Constructions 3 | BMEEPESA401 | 4 | | | | 2/2/0e | | BMEEPESA201 |
| Strength of Materials 2 | BMEEPSTA401 | 6 | | | | 4/2/0p | | BMETE90AX34, BMEEPSTA301 |
| Strength of Materials Global | BMEEPSTA499 | | | | | global | | BMEEPSTA401a |
| History of Architecture 4 | BMEEPETA401 | 3 | | | | 2/1/0e | | BMEEPETA301 |
| Drawing 4 | BMEEPRAA401 | 2 | | | | 0/2/0p | | BMEEPRAA301 |
| Design Methodology | BMEEPKOA402 | 2 | | | | 2/0/0e | | BMEEPLAA301, BMEEPKOA301 |
| Architecture of Workplaces 1 | BMEEPIPA401 | 2 | | | | 2/0/0e | | BMEEPLAA301, BMEEPKOA301 |
| Public Building Design 2 | BMEEPKOA401 | 6 | | | | 0/6/0p | | BMEEPLAA301, BMEEPKOA301 |
| Architectural Inf. 3 - CAAD for Architects | BMEEPAGA501 | 3 | | | | | 1/2/0p | BMEEPAGA301, BMEEP-AGA401, BMEEPLAA301, BMEEPESA301 |
| CM1 - Basics of construction | BMEEPEKA501 | 2 | | | | | 2/0/0p | BMEEPESA301 |
| Building Service Engineering 1 | BMEEPGA501 | 2 | | | | | 2/0/0p | - |
| Building Constructions 4 | BMEEPESA501 | 4 | | | | | 2/2/0p | BMEEPESA301 |
| Comprehensive Exam in Building Constructions | BMEEPESA599 | | | | | | global | BMEEPESA401, BMEEPESA501a |
| Design of Load-Bearing Structures | BMEEPSTA501 | 6 | | | | | 4/2/0e | BMEEPSTA499a, BMEPSTA401 |
| History of Architecture 5 (19th century) | BMEEPETA501 | 3 | | | | | 2/1/0p | BMEEPETA401, BMEEPETA101 |
| Drawing 5 | BMEEPRAA501 | 2 | | | | | 0/2/0p | BMEEPRAA401 |
| Urban Design 1 | BMEEPUIA501 | 2 | | | | | 2/0/0e | BMEEPLAA201 |
| Architecture of Workplaces 2 | BMEEPIPA501 | 6 | | | | | 0/6/0p | BMEEPKOA401, BMEEPIPA401 |
| Design Global Basic | BMEEPKOA599 | | | | | | global | BMEEPIPA501a, BMEE-PRAA401, BMEEPKOA402 |



Curriculum of Integrated MSc Program 1-10. semester (contd.)

| Subject | | | lectures/practical lectures/laboratory | | | | | Requisites |
|--|-------------|---------|--|----------|----------|----------|----------|--|
| Name | Code | Credits | 6 | 7 | 8 | 9 | 10 | |
| Economics 1. (Microeconomics) | BMEGT301004 | 2 | 2/0/0p | | | | | - |
| CM3 - Planning of Construction Technology | BMEEPEKA701 | 4 | 2/2/0e | | | | | BMEEPEKA501 |
| Building Service Engineering 2 | BMEEPEGA601 | 2 | 2/0/0e | | | | | BMEEPEGA301 |
| Building Constructions 5 | BMEEPEST602 | 4 | 2/2/0p | | | | | BMEEPESA301, BMEEPESA401 |
| History of Architecture 6 | BMEEPETO601 | 3 | 2/1/0p | | | | | BMEEPETA401 |
| Drawing 6 | BMEEPRAA601 | 2 | 0/2/0p | | | | | BMEEPRAA501 |
| Department's Design 1 | BMEEPUIQ601 | 3 | 0/3/0p | | | | | BMEEPKOAS99 or BMEEPE-SA599 or BMEEPSTA499 |
| Urban Design 2 | BMEEPUIA601 | 6 | 0/6/0p | | | | | BMEEPUIA501, BMEEPLAA301 |
| Special Load-Bearing Structures | BMEEPSTT601 | 4 | 2/2/0e | | | | | BMEEPSTA501 |
| History of Architecture Global (basic) | BMEEPETO699 | | global | | | | | BMEEPETA401 |
| Economics 2. (Macroeconomics) | BMEGT301924 | 2 | | 0/2/0p | | | | - |
| CM2 - Building Project Management | BMEEPEKK601 | 4 | | 2/2/0e | | | | BMEEPEKA501 |
| Building Constructions 6 | BMEEPESK702 | 4 | | 2/2/0e | | | | BMEEPESA599 |
| History of Art | BMEEPETT721 | 2 | | 2/0/0e | | | | BMEEPKOAS99 |
| Drawing 7 | BMEEPRAO702 | 2 | | 0/2/0p | | | | BMEEPRAA501, BMEEPKOAS99 |
| Department's Design 2 | BMEEPRA701 | 3 | | 0/3/0p | | | | BMEEPUI601 |
| Departmental Design 3 | BMEEPEXT711 | 8 | | 0/8/0p | | | | BMEEPKOAS99, BMEEPUIQ601, BMEEPUIA601, BMEEPETO699 |
| Global In Structures | BMEEPSTT799 | | | global | | | | BMEEPSTT601a |
| Preservation of Historic Monuments | BMEEPETT611 | 2 | | | 2/0/0p | | | BMEEPKOAS99, BMEEPETA501 |
| Building and Architectural Economics | BMEEPEKA801 | 2 | | | 2/0/0p | | | BMEEPLAA301 |
| Real-Estate Development | BMEEPEK0626 | 2 | | | 1/1/0e | | | - |
| History of Architecture in Hungary 1 | BMEEPETO801 | 2 | | | 2/0/0p | | | BMEEPKOAS99, BMEEPETA501 |
| Urbanism | BMEEPUI0805 | 2 | | | 2/0/0p | | | - |
| Contemporary Arch. Offices | BMEEPI0893 | 2 | | | 0/2/0p | | | - |
| Residential Design and Contemporary Competitions | BMEEPLA0897 | 2 | | | 2/0/0e | | | BMEEPLAA301 |
| Complex Design 1 | BMEEPXT811 | 10 | | | 0/10/0p | | | BMEEPXT711, BMEEPSTA501, BMEEPETO699 |
| Cumulative Exam in Building Constructions | BMEEPEST899 | | | | global | | | BMEEPEST602, BMEEPESK702 |
| Drawing 8 and Drawing 9 | BMEEPRAQ_0 | 2 | | | 0/2/0p | 0/2/0p | | BMEEPRAA501 |
| Construction Law | BMEEPEKO901 | 2 | | | | 2/0/0p | | - |
| Design of Reinforced Concrete structures | BMEEPST0655 | 2 | | | | 2/0/0e | | BMEEPSTA501 |
| Architectural Interiors | BMEEPKO0905 | 2 | | | | 0/2/0p | | BMEEPKOAA401 |
| The Form in Architecture | BMEEPRA0404 | 2 | | | | 0/2/0p | | - |
| History of Theory of Architecture 1 | BMEEPETO407 | 2 | | | | 2/0/0e | | - |
| Complex Design 2 | BMEEPXT911 | 10 | | | | 0/10/0p | | BMEEPXT811, BMEEPEKA701, BMEEPEGA601 |
| Theory of Design | BMEEPETO921 | 2 | | | | 2/0/0e | | BMEEPKOAS99 |
| History of Architecture in Hungary 2 | BMEEPETO901 | 2 | | | | 2/0/0p | | BMEEPETA501, BMEEPETO601 |
| History of Architecture Global | BMEEPETT999 | | | | | global | | BMEEPETO601, BMEEPE-T0801, BMEEPETO901a |
| Diploma Project Studio | BMEEPXTD03 | 26 | | | | | 0/26/0p | Min. 270 credits all subjects and basic globals |
| Electives subjects | | 17 | | 0/5/0e-p | 0/4/0e-p | 0/4/0e-p | 0/4/0e-p | |

a) can be taken parallelly in the same semester

s) signature only

Minimum number of credits for M. Sc. Degree: 300

Integrated MSc Program in Architectural Engineering elective subjects

| Subject | | | hours/week | | Prerequisites |
|--|-------------|---------|------------|--------|--------------------------|
| Name | Code | Credits | Fall | Spring | |
| CAAD and Architects Informatics F | BMEEPAG0236 | 3 | 0/0/2p | 0/0/2p | |
| Constructive CAAD F | BMEEPAG0246 | 3 | 0/0/2p | 0/0/2p | |
| Constructive CAAD CE | BMEEPAG0249 | 3 | 0/0/2p | 0/0/2p | |
| Computer Aided Project Management | BMEEPEK5008 | 2 | | 2/0/0e | |
| CM4. Controlling of Construction technologies | BMEEPEKK801 | 4 | | 2/2/0e | BMEEPESA501, BMEEPEKA701 |
| Special construction projects | BMEEPEKS901 | 2 | 2/0/0p | | |
| History of Theory of Architecture 2 | BMEEPET0408 | 2 | | 2/0/0e | |
| Hungarian Settlements | BMEEPUI0423 | 2 | 2/0/0e | | |
| Contemporary Urban Design | BMEEPUI0801 | 2 | | 2/0/0e | |
| Cities of the World | BMEEPUI0893 | 2 | 2/0/0p | | |
| Urban housing | BMEEPUI0901 | 2 | 2/0/0p | | |
| Landscape Architecture | BMEEPUI0904 | 2 | | 2/0/0p | |
| Participation, simulation, activism: new methods in urban design | BMEEPUI0906 | 2 | | 0/2/0p | |



Offered courses for the pre-MSc Program among the courses of the Integrated MSc Program

| Subject | | | hours/week | | Obligatory/Suggested |
|-----------------------------------|-------------|---------|------------|--------|----------------------|
| Name | Code | Credits | Fall | Spring | |
| Descriptive Geometry 1 | BMEEPAGA102 | 5 | 3/2/0e | | Suggested |
| Basics of Structural Design | BMEEPST0151 | 2 | 0/2/0e | | Obligatory |
| Building Constructions 1 | BMEEPESA201 | 4 | | 2/2/0e | Obligatory |
| Residential Building Design 2 | BMEEPLAA301 | 6 | 0/6/0p | | Suggested |
| Building Constructions 2 | BMEEPESA301 | 4 | 2/2/0e | | Obligatory |
| Architectural Informatics 2 | BMEEPAGA401 | 3 | | 1/2/0p | Suggested |
| Building Constructions 3 | BMEEPESA401 | 4 | | 2/2/0e | Obligatory |
| Public Building Design 2 | BMEEPKOA401 | 6 | | 0/6/0p | Suggested |
| Building Constructions 4 | BMEEPESA501 | 4 | 2/2/0p | | Obligatory |
| Design of Load-Bearing Structures | BMEEPSTA501 | 6 | 4/2/0e | | Suggested |
| Architecture of Workplaces 2 | BMEEPIPA501 | 6 | 0/6/0p | | Suggested |
| Urban Design 2 | BMEEPUIA601 | 6 | | 0/6/0p | Suggested |
| CM1 - Basics of Construction | BMEEPEKA501 | 6 | | 2/0/0p | Suggested |
| Special Load-Bearing Structures | BMEEPSTT601 | 4 | 2/2/0e | | Preceding study |

You can find the detailed course descriptions under Description of Integrated MSc Program Subjects

Curriculum of Masters' Program

1-4. semester

| Subject | | | lectures/practical lectures/laboratory | | | | Requisites |
|---|-------------|---------|--|---------|---------|---------|--|
| Name | Code | Credits | 1 | 2 | 3 | 4 | |
| Construction Management 2M - Building Project Management | BMEEPEKM101 | 4 | 2/2/0e | | | | - |
| Building Constructions 6 | BMEEPESM101 | 4 | 2/2/0e | | | | - |
| Special Load-Bearing Structures | BMEEPSTM101 | 4 | 2/2/0p | | | | - |
| CAAD & Architectural Informatics | BMEEPAGM102 | 3 | 0/2/0p | | | | - |
| Drawing 7 | BMEEPRAO702 | 2 | 0/2/0p | | | | - |
| History of Architecture 6 (Contemporary) | BMEEPETM101 | 3 | 2/1/0p | | | | - |
| Basics of Design Theory | BMEEPIPM101 | 3 | 3/0/0e | | | | - |
| Department's Design 3 | BMEEPxxM111 | 8 | 0/8/0p | | | | - |
| Complex Design 1 | BMEEPxxM1KX | 10 | | 0/10/0p | | | BMEEPxxM111 |
| Complex Design 2 | BMEEPxxM2KX | 10 | | | 0/10/0p | | BMEEPxxM1KX |
| Preservation of Historic Monuments | BMEEPETM2T1 | 2 | | | | 2/0/0p | - |
| Diploma Project Studio | BMEEPxxMD01 | 26 | | | | 0/26/0p | Milestone based on Compulsory subjects |
| Urbanism *, **, *** | BMEEPUi0805 | 2 | | 2/0/0p | | | - |
| Building and Architectural Economics *, ** | BMEEPEKA801 | 2 | | 2/0/0p | | | - |
| City Design 1 *, ** | BMEEPUiM1V1 | 2 | | 2/0/0e | | | - |
| Basics of Real-Estate Development *, ** | BMEEPEKM111 | 4 | | 2/2/0p | | | BMEEPEKM101 |
| Real-estate Knowledge 1 * | BMEEPEKM112 | 4 | | 2/2/0e | | | BMEEPEKM101 |
| Supplemental Real-estate Knowledge to Complex Design 1 * | BMEEPEKM113 | 2 | | 0/2/0p | | | BMEEPxxM1KXa |
| Computer aided construction management * | BMEEPEK5008 | 2 | | 0/2/0e | | | - |
| Geodesy*, ** | BMEEOAfM201 | 2 | | | 2/0/0p | | - |
| Rehabilitation of Building Constructions * | BMEEPESM111 | 4 | | | 2/2/0p | | - |
| Real-estate Knowledge 2 * | BMEEPEKM212 | 4 | | | 2/2/0e | | BMEEPEKM112 |
| Supplemental Real-estate Knowledge to Complex Design 2 * | BMEEPEKM213 | 2 | | | 0/2/0p | | BMEEPEKM113, BMEEPxxM2KXa |
| Mathematics 3 *, **, *** | BMETE95AX21 | 2 | | | 0/2/0p | | - |
| Construction Management 5 - Special Construction Projects * | BMEEPEKS901 | 2 | | | 2/0/0p | | - |
| Real-estate development and building rehabilitation * | BMEEPEKM211 | 2 | | | 1/1/0p | | BMEEPEKM101 |
| Real-estate Global * | BMEEPEKM219 | | | | global | | BMEEPEKM111, BMEEPEKM212a |
| Contemporary Arch. Offices ** | BMEEPIPO893 | 2 | | 0/2/0e | | | - |
| Department's Practice 1 ** | BMEEPxxM1TG | 6 | | 0/6/0p | | | BMEEPxxM1KXa |
| Res. Design and Contemporary Competitions ** | BMEEPLA0897 | 2 | | 2/0/0e | | | - |
| Real-Estate Development ** | BMEEPEK0626 | 2 | | 1/1/0/e | | | - |
| Drawing 8 and Drawing 9 | BMEEPRAQ_0_ | 2 | | 0/2/0p | 0/2/0p | | - |
| Department's Practice 2 ** | BMEEPxxM2TG | 6 | | | 0/6/0p | | BMEEPxxM2KXa |
| Cities of the World **, ***, **** | BMEEPUi0893 | 2 | | | 2/0/0p | | - |
| History of Theory of Architecture 1 ** | BMEEPET0407 | 2 | | | 2/0/0e | | - |
| Design of Reinforced Concrete structures **, ***, **** | BMEEPST0655 | 2 | | | 2/0/0e | | - |
| Theory of Architecture and Design global ** | BMEEPIPM2T9 | | | | global | | BMEEPIPM101, BMEEPIPO893, BMEEPKO0905a |
| Architectural Interiors ** | BMEEPKO0905 | 2 | | | 0/2/0p | | - |
| Environmental Design *** | BMEEPUiM1V2 | 4 | | 2/2/0p | | | - |
| Urban Research *** | BMEEPUiM1V3 | 4 | | 2/2/0p | | | - |
| Sociology for Architects*** | BMEGT43A044 | 2 | | 2/0/0e | | | - |
| Hungarian Cities *** | BMEEPUi0423 | 2 | | | 2/0/0e | | - |
| City Design 2 *** | BMEEPUiM2V1 | 6 | | | 2/4/0p | | BMEEPUiM1V1 |
| Studies for Chief Architects *** | BMEEPUiM2V2 | 5 | | | 4/1/0e | | BMEEPUi0805 |
| Digital Cities *** | BMEEOFTMEP1 | 3 | | | 3/0/0p | | - |

Curriculum of Masters' Program

1-4. semester (contd.)

| Subject | | | lectures/practical lectures/laboratory | | | | Requisites |
|--|-------------|---------|--|--------|--------|---|---|
| Name | Code | Credits | 1 | 2 | 3 | 4 | |
| City Design Global exam *** | BMEEPUIM2V9 | | | | global | | BMEEPUIM1V1, BMEEPUIM2V1a |
| Building Materials 2 ME **** | BMEEOEMM101 | 3 | | 2/0/1e | | | - |
| Reinforced Concrete Structures **** | BMEEPSTM201 | 4 | | 2/2/0e | | | - |
| Timber Structures **** | BMEEPSTM202 | 4 | | 2/2/0e | | | - |
| Design of Steel Structures **** | BMEEPST0650 | 2 | | 2/0/0e | | | - |
| Building Dynamics and Design for Earthquake **** | BMEEPSTM051 | 4 | | 2/2/0e | | | - |
| Steel Structures **** | BMEEPSTM301 | 4 | | | 2/2/0e | | - |
| Soil Mechanics **** | BMEEOGMM101 | 3 | | | 2/1/0e | | - |
| Mechanics - Finite Element Method 1 **** | BMEEPSTM151 | 4 | | | 2/2/0e | | - |
| Global in Structures **** | BMEEPSTM259 | | | | global | | BMEEPSTM101, BMEEPSTM201, BMEEPSTM202, BMEEPSTM301a |
| Argumentation, Negotiation and Persuasion **** | BMEGT41MS01 | 2 | | | 2/0/0p | | - |

*: For Real-estate Development and Facility Management

** : For Architectural and Interior Design

***: For City Design

****: For Structural Design

a) can be taken paralelly in the same semester

s) signature only

Minimum number of credits for MSc degree: 120



Master of Science Program in Architecture

elective subjects

| Subject | | | hours/week | | Requisites |
|--|-------------|---------|------------|--------|--------------------------|
| Name | Code | Credits | Fall | Spring | |
| CAAD and Architects Informatics F | BMEEPAG0236 | 3 | 0/0/2p | 0/0/2p | |
| Constructive CAAD F | BMEEPAG0246 | 3 | 0/0/2p | 0/0/2p | |
| Constructive CAAD CE | BMEEPAG0249 | 3 | 0/0/2p | 0/0/2p | |
| Real-Estate Development A | BMEEPEK0626 | 2 | | 2/0/0e | |
| Computer Aided Project Management R | BMEEPEK5008 | 2 | | 2/0/0e | |
| CM4. Controlling of Construction technologies | BMEEPEKK801 | 4 | | 2/2/0e | BMEEPESA501, BMEEPEKA701 |
| Special construction projects R | BMEEPEKS901 | 2 | 2/0/0p | | |
| History of Theory of Architecture 1 A | BMEEPET0407 | 2 | 2/0/0e | | |
| History of Theory of Architecture 2 | BMEEPET0408 | 2 | | 2/0/0e | |
| Contemporary Architect Offices A | BMEEPIP0893 | 2 | | 2/0/0e | |
| Architectural Interiors A | BMEEPKO0905 | 2 | 2/0/0e | | |
| Residential Design and Contemporary Competition Applications A | BMEEPLA0897 | 2 | | 1/1/0e | |
| The Form in Architecture | BMEEPRA0404 | 2 | 0/2/0p | | |
| Basics of Structural Design | BMEEPST0151 | 2 | 0/2/0p | | |
| Design of Reinforced Concrete Structures A, S | BMEEPST0655 | 2 | 2/0/0p | | |
| Hungarian Settlements C | BMEEPUI0423 | 2 | 2/0/0e | | |
| Contemporary Urban Design | BMEEPUI0801 | 2 | | 2/0/0p | |
| Urbanism A, C, R | BMEEPUI0805 | 2 | | 2/0/0p | |
| Cities of the World A, C | BMEEPUI0893 | 2 | 2/0/0p | | |
| Urban housing | BMEEPUI0901 | 2 | 2/0/0p | | |
| Landscape Architecture | BMEEPUI0904 | 2 | | 2/0/0p | |
| Participation, simulation, activism: new methods in urban design | BMEEPUI0906 | 2 | | 0/2/0p | |

Note: some of these subjects are compulsory for certain specialisations. These are marked with A= Architectural and Interior Design, C= City Design, R= Real-Estate Development and Facility Management, S=Structural Design.

Description of General Courses in Architecture

Basic Mathematics 1

BMETETOPB22

Algebra part: Integers, rational, real numbers. Arithmetic operations and their properties. Prime factorization. Powers. Working with arithmetic expressions. Equations of first degree and second degree. Equations with radicals. Factoring polynomials. Notion of sets. Set operations and their properties. Inequalities. Word problems.

Geometry part: Basic notions: lines, angles. Triangles (equilateral, isosceles, right triangles, bisector, altitude, etc. in triangles). Circles. Circumscribed and inscribed circles of triangles. Tangents to circles, angles of circumference. Angles in radian. Perimeter and area of planar figures. Sine, cosine, tangent of angles in right triangles and in triangles with obtuse angle. Sine theorem, Cosine theorem. Parallelograms. Sphere, tetrahedron, prism, cylinder, pyramid, cone, parallelepiped. Surface area and volume. Cartesian coordinate system. Area and volume of similar figures.

Computer Literacy 1

BMEEPAGG101

General information about computing, computers, and peripheral devices. Input, output and data storage. Methods of problem solving on computers. Algorithms and programs. Basic elements of a programming language, such as symbols, datatypes, statements, control structures and elementary I/O. Practical work on a computer; development and running of small programs. Text editor and translator.

Geometrical Constructions 1

BMEEPAGG111

Introduction of drawing instruments, writing letters, text. Special lines and points of a triangle, theorems on right triangle. Parallel transversals. Circle power. Loci problems. Geometrical transformation: congruencies, similarity. Golden ratio, constructions on regular pentagon. Affine mapping, axial affinity, circle and ellipse. Osculating circles at vertices of an ellipse. Central-axial collineation.

Freehand Drawing 1

BMEEPAG101

Introduction to the basic laws of perspective, one and two vanishing-point systems, proportions through the drawing of simple installations of modular geometrical elements. Basic techniques of shading, tonal interpretation of the effects of light.

Freehand Drawing 2

BMEEPAG201

Drawing of complex and more refined forms. Drawing of ornaments, fabric and simple interiors. Advanced techniques of shading.

Design skills 1.

BMEEPAG111

The Basic formal components of Buildings: walls, beams, pillars, floors. Their appearance and formal varieties. The Basics of spatial compositions. The idea of the architectural space and its typology.

Basic Mathematics 2

BMETETOPB23

Algebra part: Notion of functions (domain, range, composite function, inverse function), and their representation (graph) in Cartesian coordinate system. Exponential and logarithmic functions. Exponential and logarithmic equations and inequalities. The absolute value function. Equations and inequalities with absolute value. Arithmetic and geometric sequences.

Geometry part: Straight lines in Cartesian coordinate system (parallel, perpendicular). Circles and parabolas in Cartesian coordinate system. Sine, cosine, tangent functions and their graphs. Trigonometric equations. Notion of complex numbers, complex arithmetic, rotation. Polar coordinate system. Basics of vector algebra, dot product.

Computer Literacy 2

BMEEPAGG201

Introduction to computers, operating systems and computer networks. Browsing and organizing information through Internet, use of Internet based communication. Computers in architectural office: word processing, using spreadsheets, creating presentations. Basics of pixelgraphics and image manipulation.

Geometrical Constructions 2

BMEEPAGG211

Apollonian problems. Focal definitions of conic sections, tangents, asymptotes of hyperbola. Spatial elements and their relative positions. Angles and distances. 3D loci problems. Constructions in 3D, axonometric sketch. Orthogonal projection. Multi-view system. Reconstruction of 3-dimensional object from 2-dimensional images. Development of polyhedral surfaces, paper models. Platonic solids. Calculation on angles distances, surface area and volume.

Fundamentals of Structures

BMEEPSTG201

Introduction: requirements of the built environment. 1st site visit: an existing, functioning building. Parts of buildings. Discussion of experiences of the 1st site visit: functions and requirements of parts of buildings. 2nd site visit: a construction site. Loadbearing parts of buildings. Discussion of experiences of the 2nd site visit: functions and requirements of loadbearing parts of buildings. The notion of safety. 3rd site visit: laboratory testing of structural members (brickwork column, reinforced concrete beam). Loads and responses when being loaded. Discussion of experiences of the 3rd site visit: structural members; ways of becoming unfit for use: rupture, loss of stability (overturning, sliding, buckling), excessive cracking and deformations. 4th site visit: laboratory testing of structural materials. Yield and rupture. Collection of strength measurement data. Discussion of experiences of the 4th site visit: statistical evaluation of measurement data. The notion of safety, safety factors of materials and loads. 5th site visit: a project bureau. Graphical presentations of buildings. Architecture and structure. Results of structural analysis. Discussion of experiences of the 5th site visit: Parts and kinds of documentations. Scales and graphical symbols. Modelling of structures, structural projects. 6th site visit: ready structure construction site. Discussion of experiences of the 5th site visit: modelling of structures. The static model.

Basic Tools of Building Constructions

BMEEPESG201

Construction is the realization of architecture. Building construction classes will help students master the control of this realization process, through the learning of academic principles behind practical construction theory. Design must be realized through techniques founded on proper methods and principles of building construction. Course develops a basic understanding of building construction vocabulary, drafting symbolism, various building systems and building components and their interactions. To be able to select appropriate building systems and detail solutions for design tasks.

Design skills 2.

BMEEPRA211

Developing the skills of students to read 2D architectural drawings. To develop skills to transfer 2D drawings to 3D expression. To develop skills to transform 3D reality into 2D projection drawings.

Fundamentals of Architectural Design

BMEEPRA221

Introduction to the grammar and vocabulary of architecture design, and the basic factors on which the creative process of design depends. The course intends to identify the fundamental principles of the profession and to provide guidance on the attitude of mind that will help students in developing their individual approach to design problems in the future.



Description of Integrated MSc Program Subjects

Mathematics EP1

BMETE90AX33

This course covers the elements of single variable calculus and linear algebra. Special emphasis is put on the concepts of linear algebra which are later used by architects in structural design. These are the systems of linear equations, matrices and determinants with their properties. From the elements of calculus, the limit of sequences, the differentiation, the integration and applications belong to the course material. (4 credits)

Descriptive Geometry 1

BMEEPAGA102

Analysis of relative position of spatial elements in multi-view system; intersection of line and plane, pair of planes. Auxiliary projections, intersection of polyhedron and plane, pair of polyhedrons, Representation of regular polyhedron by means of transformations. Revolution of plane, metrical problems. Construction of shadow. Oblique and orthogonal axonometry. Perspective. Images of circle and sphere. Intersection of sphere and plane. (5 credits)

Introduction to Building construction

BMEEPESA101

This subject introduces all major building construction components (walls, foundations, floors, roofs, skeleton frames, stairs, ramps, doors and windows) and primary building engineering service systems. During lectures, the building is considered as a composition of spaces with different functions, separated by special surfaces. The course aims to introduce and explain the grammar of architectural design through practical tasks, such as the survey of one's own flat. Concurrently, the basic dependant factors of the creative design process are described. Students are acquainted with technical terminology as well as the role and use of various construction solutions including their classifications. The above shall assist students with both starting independent design exercise work and the continuing of building construction studies in greater detail. (2 credits)

History of Architecture I. (The Beginnings)

BMEEPETA101

The course gives an overview of the architecture in the first period of the evolution of human culture. The classes follow chronology – mainly in the first part of the course – with focusing on the development of building constructions and the development of settlements.

Prehistory: Palaeolithic human claim to space, from the cave to the hut. Building activity of Neolithic peasants, one-celled houses and fortified settlements. Introduction to building construction in the Near East and Europe.

In the second part the course gives an overview of the vernacular architecture of the world. Native architecture: comparative outline of the architecture of hunting, pastoral and farming peoples. Construction, building materials and decorations. Native American, African and European architecture. The practical lessons show details were delivered in the lecture before. The drawings drawn by students help them to understand the colourful world of common and rural architecture. (3 credits)

Introduction to Structural Design

BMEEPSTA101

The most important methods of analysis and design of engineering structures are presented, together with their modelling, and the applied approximations. It is shown how high school statics (and math) can be applied to engineering structures. The understanding of the behaviour of structures is emphasized. (2 credits)

Drawing and Composition 1

BMEEPRAA101

The objective of this subject is to introduce students to the fundamentals of perspective spatial representation based on geometrical solids (e.g. cube, cylinder, quadratic and triangular prisms.) In the course of the semester, drawing tasks range from simple arrangements to complex spatial constructions, while representation techniques range from constructive line drawing to tinted drawings (showing light-shadows effects), applying lead pencil. (5 credits)

Introduction to Architecture

BMEEPUIA101

The intent of subject is to raise and maintain first-year students' professional interest and give a common architectural language preparing for further special courses. The purpose of the subject is to make students' attitude positive towards architecture; enlarge their intellectual capacities and get them to understand the many-sided learning processes of architecture: lectures, texts, project analyses, films etc. (2 credits)

Space Composition

BMEEPKOA101

Space composition is the creative course of the first semester, during which the students study the basics of the composition of (architectural) space. The aim of the course on one hand is to develop one's creativity, on the other hand getting a deeper knowledge about the nature of creating architectural space through space-composition exercises. This knowledge will be the basis of the process of architectural design in the forthcoming semesters. (5 credits)

Mathematics EP2

BMETE90AX34

Limit, continuity, partial derivatives and differentiability of functions of multiple variables. Equation of the tangent plane. Local extrema of functions of two variables. Gradient and directional derivative. Divergence, rotation. Double and triple integrals and their applications. Polar coordinates. Substitution theorem for double integrals. Curves in the 3D space, tangent line, arc length. Line integral. 3D surfaces. Separable differential equations, first order linear differential equations. Algebraic form of complex numbers. Second order linear differential equations with constant coefficients. Taylor polynomial of $\exp(x)$, $\sin(x)$, $\cos(x)$. Eigenvalues and eigenvectors of matrices. (2 credits)



Descriptive Geometry 2

BMEEPAGA202

Curved lines and surfaces; quadratic surfaces, surfaces of revolution; developable surfaces, screw surfaces, ruled surfaces. Representation in multi-view system, axonometry and perspective. Construction of tangent plane, contour and shadow. Intersection of surface and plane, intersection of a pair of surfaces. Topographic map, projection with elevation, sections, earth works platform, road, cuts and fills. (5 credits)

Building Constructions 1

BMEEPESA201

This subject presents the details of the main load-bearing constructions (walls, floors, stairs) and the joints between them. Wall supported / skeleton frame, or mixed construction. Walls: Effects on walls, and how to fulfil the requirements. Sorting the walls by function, position, material, by layer-order. Walls built from elements, the development of walling elements. Floors: Functions, effects on floors, how to fulfil the requirements. Elements of floor construction. Types: plain floors (in details), arches (overview). The materials, construction lines, building methods, About the future of floors Joints between walls – floors, skeleton frames – floors. Methodology of the floor design. Stairs: Functions, effects on stairs, how to fulfil the requirements, principles of stressing and how to choose construction. Sorting the constructions by material, load bearing method, building method etc. Design possibilities. (4 credits)

Statics

BMEEPSTA201

The basic laws and theorems of statics are presented and applied to engineering structures. We learn to determine reactions and internal forces (stress resultants) of 2D and 3D line structures including statically determinate trusses, beams, frames, cables, vaults and assembled structures. (4 credits)

History of Architecture 2 (Antiquity)

BMEEPETA201

The intended task of the subject is to investigate the evaluation and formation of the European architecture of the four main cultures as Mesopotamia, Egypt, Greece and Rome. Before introducing to the evaluation of architecture we are speaking the used building materials and the structures involved. The presentation of architecture follows chronological order, analysing the functional expectation of the building types used. In Mesopotamia we discuss the space demands of the sacral, the dwelling and the palace architecture. The analysis makes possible to prove the early use of space systems in architecture. The accented topic in Egypt is the evaluation of monumental architecture in stone. It is important to understand, that the later funerary buildings are not unique architectural constructions, but part of a composition. The Hellenic and the Roman civilisation is basically an urbanistic culture. That is the reason, that both cultures are discussed through their developments in settlements. The analysis of Hellenic temple construction gives opportunity to discuss the evaluation of the Greek and Roman orders. (3 credits)

Drawing and Composition 2

BMEEPRAA201

This subject intends to inspire students to think creatively via free-hand drawing tasks. It is closely related to the material covered by preceding semester, however, spatial arrangements are complex, and students are expected to creatively supplement them and apply light-shadow effects. Classes present the basics of the theory of colours and its architectural application. After a creative model building task, students return to the representation of complex spatial forms practised in the previous semester (e. g. furniture, drapery, details of space, drawing studio etc.) to apply and practise a wide range of drawing techniques (e.g. pencil, crayon, ink, washed drawing). (4 credits)

Residential Building Design 1

BMEEPLAA201

The lecture series covers the theory and fundamentals of residential building design. The aim of the course is to introduce students to housing design, from historical examples to usable knowledge on functional and spatial relations in a dwelling. Throughout the semester lectures introduce new pieces of information with the analyses of historically important residential buildings. Contemporary examples are used to provide deeper insights into the extremes of dwellings of the 21st century. The semester is broken up into three parts. In the first third students get an insight into the basics of residential building design. Lectures in the second third show off the anatomy of the residential building where residential functions are analysed and discussed. In the final third a possible workflow of residential building design is presented. The course is based on the textbook: Residential Building Design by Dr. János Bitó, and ends with a written exam in the exam period. (2 credits)

Basics of Architecture

BMEEPLAA202

Architectural planning is a creative process, typified mainly by an end result that is either one-of-a-kind in its details or uncommon as a whole. Hence, the design path is unique in and of itself. In the case of design activity, instruction does not only impart basic knowledge of the profession (the mastery and practice of which is a requirement of the design process), but also develops creative skills. The Fundamentals of Architecture class consists of weekly practice; before receiving each assignment, however, there is a general lecture held for all that year's students. Within the subject, architectural pupils encounter tasks that require architectural-based problem solving and creative trouble-shooting. Classes of 25-28 pupils are run by 3-4 main instructors. In the course of the semester, there are several small planning tasks to be solved, modelling, architectural drawing, and technical drawing with equipment. Design tasks are built around a unifying theme or motto. (6 credits)

Building Materials I

BMEEOEAMA301

Material properties and classification of building materials (densities, mechanical properties, hydrotechnical properties, thermal properties). Detailed introduction of timber, masonry, mortar, concrete (and constituent materials), metals, polymers, glass used in architecture. Fields of application. Types of commercial products. Material testing methods for building materials (tensile, compressive and bending testing). Observation of basic natural stones and applications. Students work individually or in small groups



during the laboratory sessions and study the physical and mechanical properties of building materials. (3 credits)

Architectural Informatics 1

BMEEPAGA301

Informatics in the architectural office. Solving common tasks of the architectural practice with the extensive use of word-processors, spreadsheets, and other applications. Numerical solutions of mathematical problems in the architectural practice. Communications through Internet-based applications. Presence on the Internet. The subject expects ECDL-level knowledge in Word processing and Spreadsheets. (2 credits)

Building Physics

BMEEPGA301

One dimensional steady state heat transfer of composite slabs. Thermal condition for a room, balance temperature of a nonheated space, energy conservation approaches. Conduction: Fourier's equation, Concept of thermal conductivity, Range of thermal conductance of building materials, One-dimensional steady state conduction through a plane slab. Convection. Steady state heat transfer of composite slabs, overall heat transfer coefficient, temperature gradient. Modified conduction of insulations. Air gaps. Reverse tasks: Maximizing inner temperature different. fulfilling new U-value requirement for existing wall. Examples.

Linear heat transmission

Introduction to Thermal Bridges, Definition of Self-Scale Temperature, two applications of SST, Definition of Apparent Thickness, Generalized model of wall corner, generalized model of wall corner temperature, Example: estimation of wall corner temperature.

Moisture transfer

Definition of Moist air, Dalton's Law, Moisture content, Saturation vapour pressure, Relative humidity, dew point, dry and wet bulb temperatures, Specific Enthalpy, Moisture balance, Mechanism of vapour transfer, Scope of calculation, Vapour conductivity and resistance, Overall vapour resistance of multilayer wall, Overall vapour transfer, Design consideration, example.

Introduction to Solar Architecture

Indirect Solar collecting walls. Mass walls: principles, surface, shading, energetic operation, delaying, losses, operation in summer, irradiated solar energy, examples, simplified thermal model. Example: calculation of thermal balance of a mass wall

Solar Design Strategies

Sustainable future (global impact of buildings, energy crises, the 2030 challenge, sustainable future). Energy Conscious Design (historical overview - traditional and modern architecture, international style, energy conscious architecture and refurbishment). Energy Conscious Refurbishment. Building Energy Standards (building energy regulation, certifications, standards). Energy Consumption of Buildings (Low and Passive and "zero" energy buildings). Autonomous buildings. Energy Conscious Architecture, Passive Solar Systems (smart conceptual design, building volumes, thermal mass, mass wall, Trombe wall, transparent insulation, sun space, green roofs). Active Solar Systems (pv-panels, solar collectors, heat pump, wind turbine) (2 credits)

Strength of Materials 1

BMEEPSTA301

Basic concepts of strength of materials. Behavior of solid bodies. Material laws, constitutive equations: elasticity and plasticity. Central tension and compression. Design criterion. Pure shear. Steel and carpenter joints. Pure bending. Second moment of inertia. Bending in elastic stress state. Symmetric bending and skew bending. Eccentric tension and compression. Core of section. Materials not having tensile strength. Bending in plastic stress state. Bending combined with shear. Calculation of shear stresses. Design for bending. Normal force – moment interaction curve. Torsion. Plane stress state. Possible failure conditions: rupture and yield. Elastic energy. (4 credits)

History of Architecture 3 (Medieval)

BMEEPETA301

The architecture of the Late Roman Empire. The birth of Christianity and its "Necessity architecture". The birth of the monumental Christian architecture – Early Christian architecture in Rome. – Early Christian architecture in the eastern Provinces: Palestine, North Africa, Syria – Late Roman and Oriental traditions. Early Byzantine architecture in Thessalonica and in Constantinople. Load bearing structures of the Early Christian period. Different types of barrel vaults, Roman-type cross vault. – Syrian influences in Armenia. The "Iconoclasm" and the aftermath in Greece. Architecture in the radius of influence of Byzantium. The comparison of the basilicas in Rome and in Syria. – Ravenna. The penetration of Christian architecture into barbarian Europe – Scattered monuments". Byzantine vaulting systems. The main stream of the Romanesque architecture: the Carolingian architecture with the "evangelizer" Benedictine movements, the three periods of the German-Roman Empire. The Langobard architecture in North-Italy. The Romanesque vaulting systems: Romanesque cross vault, Sexpartite vaulting, "groin-rib" vaulting. Squire-bayed and free vaulting systems – the pointed arch. Basilica and "false basilica" type space organization. – The retrospective inter-regional influences in Romanesque architecture. – Antique influences. Byzantine influences. The progressive inter-regional influences in Romanesque architecture – monastic movements: Benedictine and Cistercian, Norman Imperial" Romanesque architecture. Morphology of medieval detailing. The Early French Gothic cathedrals. – The flourishing period of the French cathedrals, and its influences in South-France, in England, in Germany and in Italy. Inter-regional influences in gothic architecture: Cistercian gothic formations, the Franciscan and Dominican movements. – The special characteristics of English and German gothic architecture. Late gothic vaulting systems: Cylindrical (or net vaults) and Spherical (or stellar) vaults. Halls and false-halls – Civic movements in Late Gothic in Germany and the proto-renaissance in Italy. Medieval secular architecture. (3 credits)

Drawing and Composition 3

BMEEPRAA301

This subject introduces students to professional specific applications of the drawing skills they acquired so far. Classes present drawing methods for the representation of reality irrespective of the given point of view, from any other one. Students learn to consciously apply perspective in drawing small-scale models as tall buildings, and develop various graphic skills by practising the architectural graphic representation of masonry, stone, wooden and glass surfaces and those of materials. A creative modeling task assigned

to students is building an autonomous construction, which focuses on the relations of materials and volume, internal space and the phenomenon of transparency. During model building, problems of space, form and structural arrangement are investigated; while at graphic elaboration, great emphasis is laid on the representation of materials, fluency in perspective drawing and abstraction. (4 credits)

Public Building Design 1

BMEEPKOA301

Our basis for public building design methodology, the function of public buildings and technical requirements, achieved via a knowledge of architectural history and precedent of type. The course pattern will analyze important examples of Hungarian and International public buildings regarding architectural space, architectural form, the use of materials and structures, in relationship to various environmental factors. (2 credits)

Residential Building Design 2

BMEEPLAA301

This course is the design course of the residential building design studies, with the same content for both the integrated MSc and the BSc education. The theoretical knowledge of the course of Residential Building Design 2. is based on the lectures of Residential Building Design 1. The course is held once a week, for 6 hours, in the form of studio sessions and consultations. The central element of the course is the dwelling, students design a detached single family house and smaller design tasks during the semester. The main aim is the acquisition of basic knowledge on the subject of housing, the practical application of this knowledge and the assessment of the relations of dwelling and building, as well as building and environment. Students encounter one of the first complex design projects during the course of Residential Building Design 2. In an architects practice the detached family house is one of the smallest projects in size and scale, it is also the most personal design task, with dynamically changing demands. The main project of the semester, the detached family house, has multiple mid-term presentations, where students present their projects and open ended discussions are initiated into the topic of residential building design. The course ends with a project hand-in at the end of the semester. (6 credits)

Building Constructions 2

BMEEPESA301

The subject deals mainly with pitched roof constructions, roof coverings and different types of foundations – the latter with consideration to waterproofing solutions. During seminar lectures the principles and details of shallow and deep foundations are introduced, according to functional and load bearing requirements of various building constructions as well as subsurface water and soil type effects. Also introduced are the functions and primary principles of different pitched roof constructions such as: traditional roof, rafter type (modern) roof, purlin and truss type roof as well as contemporary methods of carpentry. Further explanation is provided on occupied (built-in) attic constructions with focus on principles, layers, ventilation, windows and lighting. The main types of roof coverings are shown, such as concrete and clay tiles, flashings and metal roof coverings with special attention to principles and details. (4 credits)

Sociology for Architects

BMEGT43A044

Dr. János Farkas, Dr. Adrienne Csizmady

Benefits of sociology. Origins of sociology as a science. Principles and concepts of sociology. Formal organisations in the extension of human capabilities. Interaction in formal organisations. Culture, modernism, and computerisation. Public opinion. Statistical analysis. Change from country life to modern city life. Housing and public policy. Political ideology and housing policy. The home and social status. (2 credits)

Architectural Informatics 2

BMEEPAGA401

Fundamentals of vector graphics, two-dimensional (2D), and three-dimensional (3D) Computer Aided Design (CAD) systems. Application of Cartesian and polar coordinate systems. CAD principles from simple 2D drafting to the developing of architectural drawings with the use of layers and library elements (blocks). 3D modelling of geometrical shapes and architectural details. (3 credits)

Building Constructions 3

BMEEPESA401

General and detailed review of the structures of the elevation constructions. The most important aim of the subject is the analysis of the external separating constructions. Principles of the continuity of the protecting levels depending on the position in the structure. Multi-layer external separating walls, construction methods of the elevation claddings and elevation coverings, the ordinary and special external doors and windows. Complementary structures for the external doors and windows, especially the shading devices. Requirements for the external separating structures and performances of the different constructions. Building physics: heat and vapour physics, acoustic features of the external separating structures. (4 credits)

Strength of Materials 2

BMEEPSTA401

Strength of materials is a compulsory engineering subject for second year students in architecture. The goals of the subject are to show how to

- determine the deformations of load-bearing structures
- find the internal forces of statically indeterminate structures.

In addition to theoretical methods, we also show examples in structural engineering. (6 credits)

History of Architecture 4

BMEEPETA401

Brunelleschi and the early renaissance architecture in Tuscany. The evolution of the renaissance palace in Florence and in the Northern regions of Italy. The architect and scholar Leon Battista Alberti. Bramante and the influence of his circle in the first half of the 16th century. Michelangelo Buonarroti architect. Renaissance in Lombardy and Venice. Mannerist architecture. The late sixteenth century: Palladio and Vignola. Urban development and early baroque architecture in Rome under Pope Sixtus V. The architecture of Lorenzo Bernini and Francesco Borromini. Baroque in Venice and in Piedmont. Architecture in France in the 16-17th centuries. Baroque in central Europe: Austria, Bohemia and Germany. (3 credits)



Drawing and Composition 4

BMEEPRAA401

The main topic in the syllabus of the subject is the 'analytic' representation of external spaces: students learn how to recognise the invisible geometrical-structural relations below the surface of buildings through preparing 'X-ray drawings'. Not only the views but also the sections of buildings are studied in order to understand and grasp the gist of the architectural structure behind the view, and to prepare such 'X-ray drawings' that represent more complex architectural compositions than what the eyes can see. Students prepare drawings on external sites (such as the Museum of Fine Arts, the Great Market Hall, and the assembly halls of BUTE and Corvinus University) to investigate the options of perspective drawing and the versions of plane representation of large spaces. (2 credits)

Design Methodology

BMPEKOA402

Design Methodology deals with theoretical and practical methodology of architectural design flow. The point of theoretical Design Methodology is the design itself as a process that can be modeled. The process of architectural design thus can be compared to an informatics system, so for making the method more clear. Practical Design Methodology is closely connected to the Public Building Design 2 process itself, extending it with special design factors and details. Through analyzing existing buildings and fictional situations interesting practical problems and solutions can be discussed. With the help of invited practicing architects, special methods of new facilities and building-reconstructions are presented, along with the design of technologically or structurally determined buildings. Because of its importance, sustainability, free access and ecological design will be touched along whole study. (2 credits)

Architecture of Workplaces 1

BMEEPIPA401

The history of industrial architecture, the history of Hungarian industrial architecture. Load-bearing structures of halls and of multi-storey buildings. Size standardization. Constructions of space separation, facades, subsystems of space separation constructions (foundations, roof structures, intermediate floors, external wall systems, finishes. Characteristic architectural requirements, social facilities. Logistics: transport, storage. From location to layout, emplacement of industrial plants. Design methodology, re-use, reconstruction. Offices. (2 credits)

Public Building Design 2

BMPEKOA401

Target of the exercise, how to realize the general architectural design of a public building without loss of focus regarding the types collective characteristic. What does the studio hope to achieve? The architectural design of a smaller public building, with assistance from architect consultants. The student should learn the process from within regarding the architectural design process and the unusual stress placed upon development of space / manipulation of form whilst considering their approach to solving real environmental problems.

Communication of this architectural design is the key to making a successful presentation and your ideas should encompass dialogue with client (class tutors), relationship to the surrounding environment both built and natural, understanding of trends, financial awareness and understand-

ing of intellectual property. It is expected that this work will involve a deeper research into project types and location - site visits, photographs, topographical mapping and land use mapping. (6 credits)

Architectural Informatics 3

BMEEPAGA501

Use of state-of-the-art CAAD software to develop professional architectural solutions. Extensive use of 3-D computer model development. Architectural documentation with computers. Computer animation and fly-through pictures for architectural space analysis. (3 credits)

Construction Management 1

Basis of Construction

BMEEPEKA501

The goal of the subject is to present basic information on the technologies and organization of construction work, with special respect on construction activities of sub and super-structures. Considering the character of the subject both theoretical and practical knowledge is essential, therefore besides the lectures the site visits play emphasized role as well.

Main topics: The construction process. Phases and participants of the construction process (roles, responsibilities, connections, etc.).

Technical preparation and controlling of the construction. Handover – take-over of the building (reviewing the constructions – quality and quantity – and the plans)

Introduction to construction technologies, conditions, requirements. Aspects of selecting the technology. Sequence of construction works (the follow-up of processes).

Main equipment of construction (earthwork, foundation work, construction of loadbearing structures, etc.) Material supply on site – to the site. Informations about the construction site. Construction site planning.

Time scheduling. Types, relations. List of operations, survey for quantities, labour schedule, plant schedule, material schedule. (2 credits)

Building Service Engineering 1

BMEEPEGA501

Water supply

The physical and chemical properties of water. Obtaining of water from the nature. Mechanical, chemical and biological treatment of water. Water treatment process of swimming pools. Transport of water. Characteristics of water pumps. Fresh water demand and production, hydrofords and hydroglobes. Cold water distribution network in a building. Metering of water consumption. Pipe materials and appliances: valves and taps, safety equipments. Fire protection networks. Domestic hot water demand and production. Domestic hot water networks in a building. Boiler types. Circulation. Appliances: toilets, baths, showers, washing machines, etc. Legionella.

Waste water systems

Requirements of waste water networks. Traps and syphons. Sanitary rooms for disabled people. Waste water networks. Rain water networks. Pipe materials and fittings.

Gas supply

Physical properties of natural and PB gas. Dangers of gas supply. Safety requirements. Gas supply networks outside and inside the building. Gas meters. Materials and fittings of gas networks. Gas appliances: boilers, stoves, ovens. Categorisation and safety requirements of appliances. Chimneys: types and requirements. Parameters of drought. Drought diverter.

Artificial lighting

Visual environment and its components. Characteristics of the human vision. Essential ideas of lighting technique: luminous flux, luminous intensity, illuminance, luminance. Characterisation of surfaces: reflection and transmission, spreading of light, colour. Requirements concerning the lighting. Average illuminance and its uniformity. Colour rendering. Modelling – shadows effect. Limitation of glare. Colour appearance. Balanced ratio of luminance. Cost efficiency. Artificial light-sources. Incandescent lamps. Fluorescent tubes. Compact tubes. HID lamps: mercury lamps, metal halide lamps and sodium lamps. Meeting of requirements. Efficiency-method. Proposed setting of luminaries. Electric network of buildings Parts of the network. Characteristics of the network: form, nominal voltage. Typical installations: lighting, building services and technology. Connection of building to public network. Transformers and its placing. Required areas of switchboards and transformers. Indirect contact. (2 credits)

Building Constructions 4

BMEEPESA501

Flat roofs. Classification, general design aspects, basic construction principles (inclination and geometry of the water collecting areas) according to the impacts on the roofs. Arrangement of roofing layers. Requirements concerning to the different constructions, layers, materials, building physics. Waterproofing (membranes, coatings), applied materials and their features. Technologies and details. Tracking type and terrace roofs, green roofs. Flooring. Effects and requirements. Layers, subsystems, acoustical evaluation. Substructures of floor coverings and their technical features. Classification according to the materials, specifications. Waterproofing against domestic and industrial wet effects. Drywalls, suspended ceilings, internal wall coverings. Labelling systems, design aspects, effects, requirements, basic structural principles. Internal separating structures of residential buildings satisfying acoustical requirements, connecting details of slabs, floorings and stairs. Principles of primary building engineering service systems and building constructions of sanitary block. (4 credits)

Design of Load-Bearing Structures

BMEEPSTA501

Basic conceptual and computational design methods of load-bearing structures are discussed for reinforced concrete-, steel-, timber and masonry buildings. The main goal is to gain knowledge about structural design problems and principles of structural design in order to understand how and why the load-bearing structure influences the work of an architect. (6 credits)

History of Architecture 5 (19th century)

BMEEPETA501

The period of this History of Architecture subject is the “long nineteenth century” from the 1750s to the 1910s. In this era the architecture and the art turned to the past, to the previous styles using them in a new approach. The architects had discovered the history of art and artistic liberty at the same time. At the turn of the 20th century the art and also the architecture searched for new ways instead of using historical architectural elements or motifs. The changes led to the Modern Movement when buildings were being erected without decoration or ornaments in the first quarter of the 20th century.

This period was divided into different eras, but these types of periodization were different in different countries and changed in the course of the 20th century. Beside the ques-

tion of styles 19th century is important not only because of the appearing of new structures and materials in the architecture but because of the great development in the field of the functional planning. While following the timeline, the classes concentrate on the development of the styles in several areas of Europe (Great Britain, France, Germany, Russia) looking out to the United States of America too, because there the styles reflected the European ones. (3 credits)

Drawing and Composition 5

BMEEPRAA501

In this semester students apply their previously acquired skills in the most complex architectural representation: in drawing after imagination. After practising the representation of reality and preparing creative perspective drawings (with the help of the real view, which could not be drawn from real points of view), students in this course prepare fully detailed, external and internal perspective views of buildings of various size, based on plans (e.g. ground plans, sections, elevations), using their experience and creative imagination, applying conventional graphic techniques. Students have to accomplish a modelling task during the semester, which improves creative thinking. (2 credits)

Urban Design 1

BMEEPUIA501

The subject is the theoretical course of the fifth semester. The goal is to introduce students to the theoretical background of Urban Planning and Design with specially focusing on the knowledge and skills necessary for the successful participation in the Design courses later on in the curriculum. The course deals with the historical background, fundamental theories, basic typologies, most wide spread urban forms and basic sustainability aspects of the urban environments worldwide. (2 credits)

Architecture of Workplaces 2

BMEEPIPA501

Architecture of Workplaces 2 is the main practical course of the Department for Industrial and Agricultural Building Design. The aim of the course is to summarize the acquired architectural-technical knowledge, to prepare for the complex architectural thinking before the Complex Design course, to develop independent thinking, capability of decision and cooperation in team work. There are two design tasks during the semester. The first one is a small intervention; the second task is a rather more complex task. The overall net area of the buildings to be designed is about 800 m². The semester starts with the presentation of the programs and a site visit. (6 credits)

Economics 1. (Microeconomics)

BMEGT301004

Objectives and description of the course: The aim is to allow students to understand today's economic environment. After having finished the course, students should understand the key concepts of microeconomics (e.g. opportunity cost, supply and demand, market equilibrium, prices, cost functions, profit, competition and monopoly), master a basic set of tools of economic analysis and demonstrate the ability to apply them to simple practical problems. This course is primarily designed as an introduction to microeconomic theory for undergraduate students pursuing a bachelor's degree in engineering. Both the course and the recommended textbook are accessible to students without a strong math background. Integral calculus is not used and the most important ideas are also demonstrated in graphs. (2 credits)



Construction Management 3 (Planning of Construction Technology)

BMEEPEKA701

The goal of the subject is to present information on the planning of elementary construction technologies related to superstructures and finishing work.

The subject introduces how to apply recent innovations of building technologies during design and realisation. It gives a basic knowledge to evaluate construction options and make appropriate decisions about technology. There are case studies of building technologies used in construction of loadbearing structures, finishing and cladding works.

The practical part contains workshops on planning of construction technologies: connection of structures and technologies, volume calculation, resource estimation, scheduling and construction site planning. (4 credits)

Building Service Engineering 2

BMEEPEGA601

Calculation of heat loss of buildings. Energy consumption of a heated space. Introduction to fluid flow. Classification of Heating. Central heating. Elements of water heating system. Pipe distributing networks Emitters and surface heating. Controlling. Renewable energy sources for heating and producing domestic hot water. Introduction to psychometrics. Psychometric processes. Ventilation (Classification, natural ventilation and mechanical one, fundamental systems of air inlet and extract) Estimation of the necessary air volume. Air heating and cooling systems. Air conditioning. (2 credits)

Building Constructions 5

BMEEPEST02

This subject introduces the students to the precast reinforced concrete, steel and the timber load bearing construction systems of the big span halls and their special additional structures by a system- and performance-based approach. Details both of heavy elevation and roof slab structures made of prefabricated r.c. sandwich panels and lightweight external constructions are presented. Specific flooring, big size doors and partitions of industrial and commercial halls are shown.

It is also an objective to present the special construction rules and the service system aspects of the buildings of lightweight system and their particularities in the terms of building physics and fire protection.

Additional information is presented about multilevel precast r.c. skeleton frames, its typical technical details and the structural solutions of mass produced blocked and panel load bearing systems in case of residential buildings.

The main object of the course is to explain the constructions of one storey high big span halls. Students practice knowledge transmitted during the presentations and workshops in their semester projects on basis of the whole complexity of previous studies. (4 credits)

Preservation of Historic Monuments

BMEEPETT611

The course gives an overview on history and theory of the architectural preservation in Europe and Hungary. Presents the evaluation of the way of thinking from purism to the modern practice of restoration. It is an important part, when national and international documents and theoretic papers are discussed, from Morris and Ruskin's work, over Boito's "Prima carta del restauro" (1883) to Krakow Charter 2000. Following the historic part some technical aspects of preservation are discussed, i.e. surveying methods and tech-

niques, non-destructive and destructive building archaeological methods etc. The brief introduction to building archaeology helps to understand the importance of theoretic reconstruction of independent building phases of the historic monument. The detailed discussion of the topic is part of the Preservation of historic buildings 2 – Building archaeology elective subject.

The third part is dealing with architectural and design-methodological questions of preservation. Especially the architectural problems of presentation of archaeological heritage, the reuse and functional problems of industrial and vernacular buildings for modern purposes. (2 credits)

History of Architecture 6

BMEEPETO601

The course gives an overview of the architecture in the 20-21st centuries. The classes follow chronology with focusing on the works of some great architects: Modernism and Modern Movement. Architecture between the two world wars – De Stijl, Bauhaus, Russian Constructivism, Less is more – Architecture of Ludwig Mies van der Rohe, Toward a New Architecture – Architecture of Le Corbusier. The Nordic Classicist Tradition – Architecture of E. G. Asplund and S. Lewerentz. Alvar Aalto and the modern Finnish architecture. In the second part the course picks up some relevant architectural trends: New Empiricism, New Humanism, New Brutalism and the Team X, the way from large housing estates to architecture without architects. Unfolding post-modern architecture, participation and the Las Vegas strip, Colin Rowe's studio, Critical Regionalism. The third part concentrates on timely problems: new materials or the multi-sensorial experience of space and surface, Rem Koolhaas's Dirty Realism, new technology and digital perception, architecture of seduction. (3 credits)

Drawing and Composition 6

BMEEPRAA601

The main topic in the syllabus in this semester is the intuitive representation of internal and external spaces: this subject aims at teaching students perspective representation at a higher level (applying 3-6 vanishing points). While drawing the streets and squares of the Buda Castle and the internal spaces of some atmospheric old public building in Budapest (e.g. Saint Stephen Cathedral, Opera House, Hungarian National Museum) students investigate invisible geometrical and structural relations and improve their drawing skills (applying lead pencil, ink and crayon techniques). The objective is not to simply represent a naturalistic view as a camera, but to prepare a drawing of the architectural structure of a real space after grasping the gist of the composition. (2 credits)

Department's Design 1

BMEEPUIQ601

A special urban design course focusing mainly on urban public space design with the help of invited lecturers and landscape designer consultants. The course is a partly theoretical and partly practical where students get acquainted with special issues and problems of public space definition, basic notions and tools of public realm and public space design. In the design assignment students deal with a smaller spatial entity, where they start from the analysis of the urban problem and provide a possible solution for the publicly attainable zones in between buildings. (3 credits)

Urban Design 2

BMEEPUIA601

Urban Design 2. is the main practical course of the Department of Urban Planning and Design. On-site investigation and the planning process of the studio work create an experimental laboratory for urban interventions. After the analysis of large scale urban environment, the task is to prepare an urban design concept for a large urban unit and later develop it into an urban scaled architectural design (development plan / master plan). In the classroom, Hungarian and international students work together, which gives the opportunity to compare different perspectives, visions and exchange of experiences. The site of the design task is the same urban environment for all students. The studio work includes common site visits, lectures and project presentations. (6 credits)

Special Load-Bearing Structures

BMEEPSTT601

The subject introduces the special load-bearing structures, such as large span, tall and spatial structures. We introduce the trusses, box-beams, wall-beams and arches as large span structures. We show the static behavior of tall buildings: the concept of the vertical and horizontal load-bearing structures. The behavior of spatial structures is the main topic of the semester. We introduce the RC shells, the brick-shells, the cable and textile membranes, space-trusses, grid shells (4 credits)

History of Architecture Global (basic)

BMEEPETO699

The complex exam (BMEEPETO699) is mandatory for students following the new education system. The complex exam comprehends the architecture of classical antique, the medieval, the Early Modern (renaissance and baroque) and the 19th century periods.

The main purpose of the exam is to summarise main tendencies in history of architecture that determined the forming of the architectural space in different historic periods. Exam topics are based on the History of Architecture 1 - 5 courses, a list is available in the department (credits)

Economics 2. (Macroeconomics)

BMEGT301924

The aim is to allow students to understand today's economic environment. After having finished the course, students should understand the key concepts of macroeconomics (e.g. national income, unemployment, inflation, budget balance, exchange rates and the balance of payments), master a basic set of tools of economic analysis and demonstrate the ability to apply them to simple practical problems. (2 credits)

Construction Management 2 (Building Project Management)

BMEEPEKK601

The subject introduces the investment process from emerging the idea through tendering until the hand-over and use. It shows the role and tasks of an architect in different phases of a construction process. It gives an introduction of real estate investment, basics of project management. The relationship between costs, time and quality: scheduling, planning and estimating and the procurement methods are revealed. There are case studies in the field of construction

projects, their preparation and performance, planning, organising leading and commanding of works.

Main topics: Building project management; Participants of the construction; Start-up of the construction project - architectural competition; Tendering and contracting; Scheduling, networks; Cost estimation; Post occupancy evaluation (4 credits)

Building Constructions 6

BMEEPEST702

This subject introduces the students to the precast reinforced concrete, steel and the timber load bearing construction systems of the big span halls and their special additional structures by a system- and performance-based approach. Details both of heavy elevation and roof slab structures made of prefabricated r.c. sandwich panels and lightweight external constructions are presented. Specific flooring, big size doors and partitions of industrial and commercial halls are shown.

It is also an objective to present the special construction rules and the service system aspects of the buildings of lightweight system and their particularities in the terms of building physics and fire protection.

Additional information is presented about multilevel precast r.c. skeleton frames, its typical technical details and the structural solutions of mass produced blocked and panel load bearing systems in case of residential buildings.

The main object of the course is to explain the constructions of one storey high big span halls. Students practice knowledge transmitted during the presentations and workshops in their semester projects on basis of the whole complexity of previous studies. (4 credits)

History of Art

BMEEPETT721

Beginnings of the art: the pictures of the cavemen. – Ancient art of the East: Egypt. – Classical art of the Antiquity: Greek and Roman art. – Early Christian and Medieval art. – Renaissance and Baroque art. – The art at the age of Enlightenment: Gothic revival, Classical revival, Classicism. – Romanticism, Realism, Impressionism, Postimpressionism. (2 credits)

Drawing 7

BMEEPRAO702

The course examines the relationship between colour and colour, colours and humans, and between colours and the built environment. Technical introduction of pigments, behaviour of colours when mixing pigments, the basic techniques of painting. The role of colours in the creative character and in the thoughtfully built environment. Presentation of the exterior architectural colour design, colour preferences and theories in the different historical periods. The concept and conditions of colour harmonies, guide to the effective use of the different harmony-theories. The use of colour design in everyday projects (authentic colouration in historic renovation, aesthetic urban rehabilitation, etc.) Students learn the architectural use of colour design through a series of projects, from the manual techniques of painting to digital colouration (2 credits).

Department's Design 2

BMEEPRAT701

This subject based on interior design. The design process focuses on abstract formal approach. Students create different 3D possibilities in the first half of the semester, then they analyse them. The project becomes in this way interior



design. The design project based on the fundamental decisions and 3D modelling, which are completed by manual works. (3 credits)

Departmental Design 3

BMEPEXT711

Department Design 3 for students is a one semester design course in English, organized by the Departments of Design in. The object of the course is to introduce a multilevel design method for students from general urban concept to the design of an architectural element. A comprehensive urban-architectural design based on the analysis of the urban tissue, cultural heritage, architectural details is going to give a common frame for individual architectural proposals. Teamwork and individual work will constantly implement and define each other. The semester will also give space to work on some contemporary questions in architecture, like the sustainability of an established urban environment, the relationship and social aspects of public and private spaces, the effects of landscape design and design of public spaces buildings. (8 credits)

Building and Architectural Economics

BMEPEKA801

Aim: investigate the economic side of a real estate development emphasizing the social cost and benefit of development.

This module concentrates economical computation models, theories dealing with real estate valuation. There is a homework concerning with calculation, valuation of a real estate development. Successful submission is required for the module acceptance. Written mid-semester test as indicated, minimum pass grade required.

Following main topics are discussed: construction cost, estimates, time value of money, building life cycle cost, measuring the worth of real estate investments. (2 credits)

Real-Estate Development

BMEPEK0626

Basics of RE development: The RE Cycle. Contributors and actors in the process. Real estate Market. Descriptive figures of market segments. RE Market, presentation of different markets. Market Valuation, Definition of the Market Value. Other valuation bases: RICS, TEGOVA. Valuation methodology. Development Process : the process and the Developer. Main international development companies. Feasibility Study, legal, technical and economic analysis. Sensitivity analysis. Development Parameters: GBA, GLA, lot coverage ratio, green area. Functional mix. Potential rental and other revenues. Development Cost, elements of the building costs, structure of the operation costs, yearly CF calculation. RE Marketing: Sales methodology, traditional and new marketing tools. RE Agencies and their activities. Contracting, contract types, contracting process. RE Financing.. (2 credits)

History of Architecture in Hungary 1

BMEEPOT801

The subject History of Architecture in Hungary I. aims to present and analyze the architecture of historic Hungary in European and domestic context from the history of Pannonia to the end of Baroque. 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 stylistic tendencies or external and internal factors that determine the historical and architectural context. A great emphasis is given to the exploration of the

connections between the European and Hungarian history of architecture.

Lecture topics include: The beginnings of architecture in the Carpathian Basin. Roman architecture in Hungary. Early medieval architecture in Hungary - Christian Architecture between West and East. The flourishing Romanesque and the beginnings of Gothic Architecture. The rise of Gothic Architecture - architecture in towns and Gothic architecture of the orders. The beginning and the first period of the renaissance till the middle of the 16th century. The architecture of fortified palaces and fortifications. The renaissance architecture in Transylvania. The beginnings of the baroque in Western Hungary in the 17th century. The High Baroque in Hungary. (2 credits)

Drawing 8

BMEEPRAQ80

'Identity Design' has become unavoidable in the self-management of today's architects. It determines the entire character, the image of a business and affects its efficiency. Identity Design symbolises the integrity, the personality of the author and at the same time reflects the quality of the work. During the course, students will have the opportunity to design their own logo, business card and graphic portfolio. The different parts of the project are to be unified by a thorough graphic layout which also reflects the designer's identity and personality. A wide range of different visual techniques and graphical tools will be introduced to help achieve the best outcome (2 credits).

Urbanism

BMEEPU10805

The goal of the course is to get students acquainted with the multidisciplinary characteristics of Urban Studies. The semester is divided into two blocks dealing with: urbanisation processes in the world, in Hungary and Budapest; the issues of contemporary urbanity; related fields of science and planning tools in various field of the profession. In the series of lectures professors of the Department of Urban Planning and Design and some invited experts of various fields are presenting lectures on various topics. On the end of the semester, you have to present a specific urban topic of your home city. (2 credits)

Contemporary Architectural Offices

BMEEPIP0893

This subject is about contemporary Hungarian architecture. The course is set up of weekly lectures or a site visits by a famous/talented Hungarian architects. The lectures are Hungarian language, for the international students it will be translated by an interpreter. For execution of the subject an essay is to be written about one of the lectures. The topics will be personalized for everyone during the last lecture. (2 credits)

Residential Design and Contemporary Competitions

BMEEPLA0897

Through the study of actual, current public commissions, this class provides a perspective on contemporary Hungarian residential building design praxis. Also, through past projects, it presents the main changes over recent years. The aim is to complement lectures in the Residential Building Design 1 course by acquainting students with as many concrete examples as possible – of contemporary Hungarian architectural creations and, primarily, of the bubbling,

fertile, and often controversial world of public commissions. The highlighted standpoint and aim is for students to observe architectural praxis in today's Hungary, even if that is through more or less successful answers to questions that are posed. Another goal is for students to develop a routine of following public commissions, as well as an understanding of the procurement system, where to find such opportunities, and the rules and methodology regarding tenders. The hidden aim, by engaging with the given public tenders within the course, is to develop an active discourse among pupils on the basis of the evaluation and 'judgment' that follows. (2 credits)

Complex Design 1

BMEEPXST811

Students must develop a plan to the level requested for permit or for a large-scale project, to the depth of an investment program plan. Part of the building must be developed to the construction plan level. Students must also prepare dossiers of structural calculation, work details, mechanical installations and the organisation of the construction site and consult with staff members of various departments for assistance. Students can select their project as well as their Studio Master. (10 credits)

Construction Law

BMEPEKO901

The subject introduces the legal environment of construction projects: contracts, building permit, permission of use, etc. (2 credits)

Design of Reinforced Concrete structures

BMEEPST0655

The subject introduces students into the way of design of approximate dimensions, joints and structural solutions of reinforced concrete structures. Invited lecturers expose some of the most significant recent investments in reinforced concrete in Hungary. The aim of the course is to develop the ability of students - on the basis of EUROCODE 2 - to adopt architectural dimensions and to evaluate the effect of the chosen architectural lay-out onto the structural solution. (2 credits)

Drawing 9

BMEEPRT901

The course provides a wide selection of representation techniques from traditional pencil drawing to collage, and from architectural geometry to computer aided visual rendering. The offered courses cover variable areas of basic architectural graphics, from which students have the opportunity to choose. (2 credits)

Architectural Interiors

BMEEPKO0905

The primary object of the Interior Architecture course is to examine the range of theories behind development of this spatial type, undertaken in the form of a lecture course and practical exams. Students will also be involved in a closed competition held in parallel with students on the Hungarian course. The lecture course is to be broken down into individual study areas which are to be introduced by visiting academics, architects and interior designers over a course of 12 - 13 weeks as follows:

- General concept of space.
- General concept of architectural space.
- Sacred / Communal / Personal space.

- Use of space / Conversion of space.
- Visual communication. - Light / Sound / Surface.
- Application of subject / Form of subject.
- Design of University Spaces.

Successful candidates in the semester will be expected to attend lectures on a regular basis, complete written exams, practical tests and submit a valid entry to the closed competition. (2 credits)

The Form in Architecture

BMEEPRA0404

The course introduces the basic theory of form to students of Architecture and Industrial Design. It gives a brief summary of the general concept of form and its bounding surfaces, while it classifies the main components of forms and their possible connections and relations to other forms. The course describes the detailed articulation of forms: textures, decorations and ornaments, extensions, perforations and coloration. During the semester, students will be assigned individual projects, each based on the thematic classification of forms. In these projects, students will demonstrate the implementation of the acquired theory, through a digital collection of examples from different parts of the world and various periods of history. Submitted projects will be uploaded to the department's database, thus, this continually developing comprehensive 'encyclopedia of forms' shall enrich the knowledge of future students as well. (2 credits)

History of Theory of Architecture 1.

BMEEPET0407

The subject History of Theory of Architecture I. follows the structure of preliminary architectural history courses focusing on the determinant theories of architecture of different periods. The exploration of the most important tendencies and notions of theory of architecture is based on the preliminary history of architecture studies in an essentially chronological structure, evaluating them in critical analysis and searching their role in the history of ideas. Lecture topics include: Categories and concepts of theory in the history of architecture from antiquity to the rise of modernism in the beginning of the 20th century. Vitruvius and his interpretations. Architectural theory in the Middle Ages from early Christianity to late Gothic period. Humanism and the revival of antique architecture in the 15th. The column orders and commentaries on Vitruvius; the theory of the ideal city. Baroque in the reform of the catholic church. Academic movement in France and Classicism in Italy in the 17th. Theory of architecture in France in the 18th century. Enlightenment and revolutionary architecture. 19th century theories in England, France and Germany; the interpretation of medieval and classical heritage. The dilemma of eclecticism. Pioneers of modernism and their manifests. The pluralism in the interpretation of architectural space; architecture and philosophy. (2 credits)

Complex Design 2

BMEEPXST911

Students must develop a plan to the level requested for permit or for a large-scale project, to the depth of an investment program plan. Part of the building must be developed to the construction plan level. Students must also prepare dossiers of structural calculation, work details, mechanical installations and the organisation of the construction site and consult with staff members of various departments for assistance. Students can select their project as well as their Studio Master. (10 credits)



Theory of Design

BMEEPETO921

The course aims at awakening and strengthening the students' abilities, interest, to reflect on architectural design, in accordance with their own cultural background, in the original spirit of theorizing: thinking of, looking at, with freedom and criticism. Considering the special and unique position of this continuous reflective activity as an operative and constitutive part of the architectural design practice, the course not only picks up special themes of history and contemporary discourses, but also concentrates on mobilizing the students practical and theoretical skills, already acquired during their previous studies. (2 credits)

History of Architecture in Hungary 2

BMEEPETO901

The course gives an overview of Hungarian architecture from the end of the 18th century up to now. While following the timeline, the classes concentrate on the main problems of the investigated periods, like the question of historicism, international and national sources between the 2 Wars, socialist realism in the 1950s, technology and high-rise in the 1960s, built environment in the 1970s, post-modernism in the 1980s. As the problem of identity (national or regional architecture) is a recurrent theme through the whole period, the course pays a special attention to it. (2 credits)

Description of Integratedd MSc Elective Subjects

CAAD and Architects Informatics F

BMEEPAG0236

This course aims to expand the existing CAD knowledge of students to be able to create and modify complex CAD models easily. During the course, we use Archicad, so a basic knowledge of the program is expected. (3 credits)

Constructive CAAD F

BMEEPAG0246

Design and documentation with Revit Architecture - Introductory course. Design and basic CAD knowledge is recommended. (Architectural informatics 2) (3 credits)

Constructive CAAD CE

BMEEPAG0249

Advanced CAD modelling course for students who are familiar with AutoCAD. The course deals with modeling concepts and techniques, texture, lighting and rendering. In the second part of the semester students work more or less autonomously (with occasional one-on-one consultations) on a model of their choice. (3 credits)

Computer Aided Project Management

BMEEPEK5008

The aim of the subject is to give an overview about the IT tools, softwares and algorithms that can support the construction projects, let them be management or process related. We introduce the latest applications in theory and practice. (2 credits)

CM4. Controlling of Construction technologies

BMEEPEKK801

The goal of the subject is to present information on the controlling process of the whole construction activity and the applied technologies involving the legal environment, the quality management, the quality survey, the work safety and the fire protection. Site and company visits are integrated in the theoretical lectures. The main topics are: Regulations concerning construction; Building permission/building consent; Quality in construction; Fire protection; Dry construction systems; The work of the quality surveyor; Health and safety during building construction; Controlling activities in Construction Projects. (4 credits)

Special construction projects

BMEEPEKS901

The course's aim is to give up-to-date information on different special fields of construction in three blocks. In the first block the construction technologies of special, sub- and superstructures are shown, involving topics like metro tunnels, metro stations, special slurry walls, special reinforced concrete superstructures and formwork systems. In the second block traditional and modern materials and technologies are presented regarding to eco- and green architecture, like construction technologies of the passive buildings, or green facades. In the third block students get information on the application of traditional construction technologies, restoration methods and the maintenance of monuments and historic buildings. Besides the theoretical lectures many site visits are organized to present the practical aspects of the subject as well. (2 credits)

History of Theory of Architecture 2

BMEEPETO408

The course presents, exposes and explains the most important constituent facts, selected from the innumerable different intellectual reflections of the twentieth century and the second millennium, as a rich and simultaneous interplay of parallel stories, either promoting, or opposing each other. It doesn't interpret history as a homogeneously evolving story, emerging from the past, but at the same time, it doesn't deny the importance and operative function of creating histories. Instead of a simple, successive presentation of well-known historical facts, or a collection of fashionable notions, topics and themes, it rather concentrates on exploring their synchronic functional relationships and finding creative and relevant conclusions.

1. Introduction, theory and history in the 20th century.
2. Dominant modern reflections: Riegl, Loos Corbusier
3. Science, technology, art, future, constituent parts of the modern identity. Submission and discussion of first paper.
4. Great histories of modern architecture. History, or theory?
5. The destructions of modern technologies. Totalitarian regimes, and the war. Post war time, neo-technicism and total utopias of the sixties, Banham, Archigram.
6. Rediscovery of the operative function of history. Kahn, Venturi. Vulgar modernism and vulgar historicism. Submission and discussion of second paper.
7. The global, the regional, the rural, the archaic. Structuralism, accidentism.
8. Positive and negative side of modern urbanism.
9. Beyond modern histories. Critical theories anthologies. Presence and representation. Deconstruction, phenom-

enology, hermeneutics.

Submission and discussion of third paper. (2 credits)

Hungarian Settlements

BMEEPUI0423

The aim of the subject is to familiarize with the characteristics of Hungarian cities and urban development processes. The subject intends to combine the benefits of lectures and lessons; providing the opportunity for active involvement. With the participation of invited speakers, you can hear about the most important periods of Hungarian city history and urban planning features, especially in the context of today's processes. In the remaining classes we deal with the morphological (graphical) analysis of the selected Hungarian settlements. Morphology not only provides an excellent approach to understanding the history of urban development, but it is also worth exploring and learning from a methodological point of view. (2 credits)

Contemporary Urban Design

BMEEPUI0801

The course gives a stable theoretical background not only for understanding contemporary urban design theory but also to practice urban design. The semester divided into three main parts: the first focuses on contemporary housing neighborhood developments, new constructions and regenerations projects from Europe; the second is an introduction to the background of the notion of public space and how this notion requalified the use of the contemporary city; the third is about the re-use of historic urban cores in Europe, focusing Berlin, Amsterdam and Zurich. (2 credits)

Cities of the World

BMEEPUI0893

Course on current challenges of global urbanization with special focus on small scale & network interventions in cities and suburban areas. Topics discussed: (1) how theoretical thinking on urban development is transformed in the context of global urbanization; (2) how deindustrialization is reflected in the changing urban development dynamics; (3) what are the impact of political and market forces on city development; (4) the impact of sustainability and resilience on urban planning; (5) possible ways to enhance the overall quality of urban life. (2 credits)

Urban housing

BMEEPUI0901

The seminar is related to the Urban Housing LAB and Urban Design Studios of the BME Department of Urban Planning and Design. The objectives of this course are to introduce students to critical thinking about contemporary mass housing issues and solutions, to have an international comparison about the urban housing conditions, and to make them understand the complexity of mass housing developments. As students arrive from different countries, the seminar uses the opportunity to learn from each other, to discover and compare several case studies. The lessons are differentiated by geopolitical position and key topics: Introduction / urban housing terminology, comparative research method - Post-Socialist Central European Countries / urban heritage, homeownership - Western European Countries / contemporary alternative solutions, social housing - Post-Soviet Countries / large housing estates, mass housing - USA / high-rise, affordable housing - Presentations and discussion of the team-work (2 credits)

Landscape Architecture

BMEEPUI0904

The lecture series analyzes the transformation of green spaces along the three sides of "positions, visions, concepts" that can be understood as a model of landscape theory, through which the viewpoints of the different disciplines (landscape architect, garden designer, urban designer, architect, etc.) can be used to examine the urbanized landscape and the green spaces appearing in the urban environment. Contemporary gardening and landscape architecture projects are presented during short on-site study trips with special regard to the practical experience in creative work.

The motto of the subject assumes the active participation of the students also, and in connection with the lectures topics, a presentation of a case study based on a personal experience has to be done once during the semester. Each occasion ends with a common debate, discussing the different points of view on the topics. (2 credits)

Participation, simulation, activism: new methods in urban design

BMEEPUI0906

The elective course aims to teach students the practice of participatory design, focusing on urban public space design involving local communities. Students – after analyzing the European best practices – will get experience in involving different social groups and interest-groups into the design process of a public space. Students will get an extensive knowledge on the international practice of participatory design, reading much of its English literature, analyzing completed European public spaces designed with this method. During the practical classes the students will make a design proposal or activity process simulation for a selected public space in Budapest, either in a dense urban context or on the spaces of a housing estate, or in a suburban situation. (2 credits)



Description of MSc Subjects

Drawing 7

BMEEPRAO702

The course examines the relationship between colour and colour, colours and humans, and between colours and the built environment. Technical introduction of pigments, behaviour of colours when mixing pigments, the basic techniques of painting. The role of colours in the creative character and in the thoughtfully built environment. Presentation of the exterior architectural colour design, colour preferences and theories in the different historical periods. The concept and conditions of colour harmonies, guide to the effective use of the different harmony-theories. The use of colour design in everyday projects (authentic colouration in historic renovation, aesthetic urban rehabilitation, etc.) Students learn the architectural use of colour design through a series of projects, from the manual techniques of painting to digital colouration (2 credits).

Basics of Design Theory

BMEEPIPM101

The Basics of Design Theory is an obligatory theoretical design theory course of the first semester of the MSc Curriculum of the Faculty of Architecture. The introductory design theory course is the cooperation of the Department of Industrial and Agricultural Building Design, the Department of Public Building Design, the Department of Residential Building Design and the Department of Urban Planning and Design. It showcases the complexity of architectural design and gives basic design knowledge for the Comprehensive Design course starting in the second semester of the curriculum. Tutors of the different departments show the specialities of their departments in short thematic blocks of lectures and all together they present the multifaceted and complex characteristics of architecture. The course on one hand gives basic knowledge for design courses of the oncoming semesters, and on the other hand raises awareness for the specific topics of the different departments. (3 credits)

Urbanism

BMEEPU10805

The goal of the course is to get students acquainted with the multidisciplinary characteristics of Urban Studies. The semester is divided into two blocks dealing with: urbanisation processes in the world, in Hungary and Budapest; the issues of contemporary urbanity; related fields of science and planning tools in various field of the profession. In the series of lectures professors of the Department of Urban Planning and Design and some invited experts of various fields are presenting lectures on various topics. On the end of the semester, you have to present a specific urban topic of your home city. (2 credits)

City Design 1

BMEEPUIM1V1

Theoretical course of the second semester of City Design specialization. The goal of the course is to introduce students to the theoretical background of Urban Planning and Design with specially focusing on the knowledge and skills necessary for the successful participation in the courses later on in the curriculum and to give a stable knowledge and vocabulary for professional work with focusing on the basic notions of the profession. Covered topics: Definitions,

context, procedural types; Scales, typologies, basic tools of planning and design; Origins and history, the very basis of urban history, Future and possibilities – scenarios and possibilities for the future (2 credits)

Drawing 8

BMEEPRAQ80_

'Identity Design' has become unavoidable in the self-management of today's architects. It determines the entire character, the image of a business and affects its efficiency. Identity Design symbolises the integrity, the personality of the author and at the same time reflects the quality of the work. During the course, students will have the opportunity to design their own logo, business card and graphic portfolio. The different parts of the project are to be unified by a thorough graphic layout which also reflects the designer's identity and personality. A wide range of different visual techniques and graphical tools will be introduced to help achieve the best outcome (2 credits).

Cities of The World

BMEEPU10893

Course on current challenges of global urbanization with special focus on small scale & network interventions in cities and suburban areas. Topics discussed: (1) how theoretical thinking on urban development is transformed in the context of global urbanization; (2) how deindustrialization is reflected in the changing urban development dynamics; (3) what are the impact of political and market forces on city development; (4) the impact of sustainability and resilience on urban planning; (5) possible ways to enhance the overall quality of urban life. (2 credits)

Environmental Design

BMEEPUIM1V2

A special urban design course focusing mainly on urban public space design with the help of invited lecturers and landscape designer consultants.

The course is a partly theoretical and partly practical where students get acquainted with special issues and problems of public space definition, basic notions and tools of public realm and public space design. In the design assignment students deal with a smaller spatial entity, where they start from the analysis of the urban problem and provide a possible solution for the publicly attainable zones in between buildings. (4 credits)

Urban Research

BMEEPUIM1V3

The aim of the course is to deepen the knowledge acquainted in BSC about research methodologies used in urban studies and planning. The first part of the course is integrated with the project of Complex Design and aims to analyze the urban environment of the project. In the second part of the semester, students have to elaborate an essay about the housing situation of their home cities and a presentation of a contemporary project on this field. (6 credits)

Sociology For Architects

BMEGT43A044

The course aims at giving an insight for the students into the nature of major social phenomena by demonstrating their main characteristics and their key interpretations in social sciences through the standard as well as the most up-to-date frameworks, methods and results with a clear and distinct focus on urbanisation and urban affairs. Major themes discussed during the course are Modernisation, Society and People, The Social Perspective, The Foundation and Construction of the Society, Social Stratification, Economy and Society, Community and identity, Social Institutions, Transformations of the Society, Globalisation, Urbanisation and Society, Metropolis and urban changes, Urban space and place. (2 credits)

Hungarian Cities

BMEEPUI0423

The aim of the subject is to familiarize with the characteristics of Hungarian cities and urban development processes. The subject intends to combine the benefits of lectures and lessons; providing the opportunity for active involvement. With the participation of invited speakers, you can hear about the most important periods of Hungarian city history and urban planning features, especially in the context of today's processes. In the remaining classes we deal with the morphological (graphical) analysis of the selected Hungarian settlements. Morphology not only provides an excellent approach to understanding the history of urban development, but it is also worth exploring and learning from a methodological point of view. (2 credits)

City Design 2

BMEEPUI02V1

The theoretical and practical course of the third semester of City Design specialization. The goal of the course is to deepen the knowledge of students in the field of Urban planning and design through theoretical lectures and practical tasks. The semester is organized around an actual urban planning assignment, where real planning skills will be developed, but the task will be followed by theoretical lectures that will provide the background of the skills. The course deals with issues of sustainability, smart cities and is based on the practicalities of professional practices. (6 credits)

Studies For Chief Architects

BMEEPUI02V2

During the course the students are introduced into the theoretical basics of politics, political-governmental decision making, as well as into the socio-political and institutional framework of sustainable local/urban development. We will examine the economic, political-governmental, institutional and cultural factors, their effect on local decision making, relations between the various levels of territorial/regional levels as well as examine the most important policy areas in EU context. The course is also testing this background in a real Hungarian municipality decision making context, where students through practical tasks will face real urban development problems. (5 credits)

Digital Cities

BMEEOFTMEP1

The course provides an in-depth practical experience of the methods, data and information available to urbanists through investigation of live projects in the built and natural environment. The students will learn how to use the spatial modelling and analysis techniques and identify new data and technologies platforms and apply to design, plan and manage a contemporary city. (3 credits)



Description of MSc Elective Subjects

CAAD and Architects Informatics F

BMEEPAG0236

This course aims to expand the existing CAD knowledge of students to be able to create and modify complex CAD models easily. During the course, we use Archicad, so a basic knowledge of the program is expected. (3 credits)

Constructive CAAD F

BMEEPAG0246

Design and documentation with Revit Architecture - Introductory course. Design and basic CAD knowledge is recommended. (Architectural informatics 2) (3 credits)

Constructive CAAD CE

BMEEPAG0249

Advanced CAD modelling course for students who are familiar with AutoCAD. The course deals with modeling concepts and techniques, texture, lighting and rendering. In the second part of the semester students work more or less autonomously (with occasional one-on-one consultations) on a model of their choice. (3 credits)

Real-Estate Development A

BMEEPEK0626

Basics of RE development: The RE Cycle. Contributors and actors in the process. Real estate Market. Descriptive figures of market segments. RE Market, presentation of different markets. Market Valuation, Definition of the Market Value. Other valuation bases: RICS, TEGOVA. Valuation methodology. Development Process: the process and the Developer. Main international development companies. Feasibility Study, legal, technical and economic analysis. Sensitivity analysis. Development Parameters: GBA, GLA, lot coverage ratio, green area. Functional mix. Potential rental and other revenues. Development Cost, elements of the building costs, structure of the operation costs, yearly CF calculation. RE Marketing: Sales methodology, traditional and new marketing tools. RE Agencies and their activities. Contracting, contract types, contracting process. RE Financing. (2 credits)

Computer Aided Project Management R

BMEEPEK5008

The aim of the subject is to give an overview about the IT tools, softwares and algorithms that can support the construction projects, let them be management or process related. We introduce the latest applications in theory and practice. (2 credits)

CM4. Controlling of Construction technologies

BMEEPEKK801

The goal of the subject is to present information on the controlling process of the whole construction activity and the applied technologies involving the legal environment, the quality management, the quality survey, the work safety and the fire protection. Site and company visits are integrated in the theoretical lectures. The main topics are: Regulations concerning construction; Building permission/building consent; Quality in construction; Fire protection; Dry construction systems; The work of the quality surveyor; Health and safety during building construction; Controlling activities in Construction Projects. (4 credits)

Special construction projects R

BMEEPEKS901

The course's aim is to give up-to-date information on different special fields of construction in three blocks. In the first block the construction technologies of special, sub- and superstructures are shown, involving topics like metro tunnels, metro stations, special slurry walls, special reinforced concrete superstructures and formwork systems. In the second block traditional and modern materials and technologies are presented regarding to eco- and green architecture, like construction technologies of the passive buildings, or green facades. In the third block students get information on the application of traditional construction technologies, restoration methods and the maintenance of monuments and historic buildings. Besides the theoretical lectures many site visits are organized to present the practical aspects of the subject as well. (2 credits)

History of Theory of Architecture 1 A

BMEEPET0407

The subject History of Theory of Architecture I. follows the structure of preliminary architectural history courses focusing on the determinant theories of architecture of different periods. The exploration of the most important tendencies and notions of theory of architecture is based on the preliminary history of architecture studies in an essentially chronological structure, evaluating them in critical analysis and searching their role in the history of ideas. Lecture topics include: Categories and concepts of theory in the history of architecture from antiquity to the raise of modernism in the beginning of the 20th century. Vitruvius and his interpretations. Architectural theory in the Middle Ages from early Christianity to late Gothic period. Humanism and the revival of antique architecture in the 15th. The column orders and commentaries on Vitruvius; the theory of the ideal city. Baroque in the reform of the catholic church. Academic movement in France and Classicism in Italy in the 17th. Theory of architecture in France in the 18th century. Enlightenment and revolutionary architecture. 19th century theories in England, France and Germany; the interpretation of medieval and classical heritage. The dilemma of eclecticism. Pioneers of modernism and their manifests. The pluralism in the interpretation of architectural space; architecture and philosophy. (2 credits)

History of Theory of Architecture 2

BMEEPET0408

The course presents, exposes and explains the most important constituent facts, selected from the innumerable different intellectual reflections of the twentieth century and the second millennium, as a rich and simultaneous interplay of parallel stories, either promoting, or opposing each other. It doesn't interpret history as a homogeneously evolving story, emerging from the past, but at the same time, it doesn't deny the importance and operative function of creating histories. Instead of a simple, successive presentation of well-known historical facts, or a collection of fashionable notions, topics and themes, it rather concentrates on exploring their synchronic functional relationships and finding creative and relevant conclusions.

1. Introduction, theory and history in the 20th century.
 2. Dominant modern reflections: Riegl, Loos Corbusier
 3. Science, technology, art, future, constituent parts of the modern identity
- Submission and discussion of first paper.
4. Great histories of modern architecture. History, or theory?
 5. The destructions of modern technologies. Totalitarian regimes, and the war. Post war time, neo-technicism and total utopias of the sixties, Banham, Archigram.
 6. Rediscovery of the operative function of history. Kahn, Venturi. Vulgar modernism and vulgar historicism.
- Submission and discussion of second paper.
7. The global, the regional, the rural, the archaic. Structuralism, accidentism.
 8. Positive and negative side of modern urbanism.
 9. Beyond modern histories. Critical theories anthologies. Presence and representation. Deconstruction, phenomenology, hermeneutics.
- Submission and discussion of third paper. (2 credits)

Contemporary Architect Offices A

BMEEPIP0893

This subject is about contemporary Hungarian architecture. The course is set up of weekly lectures or a site visits by a famous/talented Hungarian architects. The lectures are Hungarian language, for the international students it will be translated by an interpreter. For execution of the subject an essay is to be written about one of the lectures. The topics will be personalized for everyone during the last lecture. (2 credits)

Architectural Interiors A

BMEEPKO0905

The primary object of the Interior Architecture course is to examine the range of theories behind development of this spatial type, undertaken in the form of a lecture course and practical exams. Students will also be involved in a closed competition held in parallel with students on the Hungarian course. The lecture course is to be broken down into individual study areas which are to be introduced by visiting academics, architects and interior designers over a course of 12 - 13 weeks as follows: general concept of space, general concept of architectural space, sacred, communal, private spaces. Use and conversion of spaces. Visual communication by light, sound and surfaces. Application and form of subjects. Design of university spaces. Candidates in the semester will be expected to attend lectures on a regular basis, complete written exams, practical tests and submit a valid entry to the closed competition. (2 credits)



Residential Design and Contemporary Competition Applications A

BMEPLA0897

Through the study of actual, current public commissions, this class provides a perspective on contemporary Hungarian residential building design praxis. Also, through past projects, it presents the main changes over recent years. The aim is to complement lectures in the Residential Building Design 1 course by acquainting students with as many concrete examples as possible – of contemporary Hungarian architectural creations and, primarily, of the bubbling, fertile, and often controversial world of public commissions. The highlighted standpoint and aim is for students to observe architectural praxis in today's Hungary, even if that is through more or less successful answers to questions that are posed. Another goal is for students to develop a routine of following public commissions, as well as an understanding of the procurement system, where to find such opportunities, and the rules and methodology regarding tenders. The hidden aim, by engaging with the given public tenders within the course, is to develop an active discourse among pupils on the basis of the evaluation and 'judgment' that follows. (2 credits)

The Form in Architecture

BMEEPRA0404

The course introduces the basic theory of form to students of Architecture and Industrial Design. It gives a brief summary of the general concept of form and its bounding surfaces, while it classifies the main components of forms and their possible connections and relations to other forms. The course describes the detailed articulation of forms: textures, decorations and ornaments, extensions, perforations and coloration. During the semester, students will be assigned individual projects, each based on the thematic classification of forms. In these projects, students will demonstrate the implementation of the acquired theory, through a digital collection of examples from different parts of the world and various periods of history. Submitted projects will be uploaded to the department's database; thus, this continually developing comprehensive 'encyclopedia of forms' shall enrich the knowledge of future students as well. (2 credits)

Basics of Structural Design

BMEEPST0151

The subject is suggested for student on MSc course to refresh the structural studies of the different BSc courses. The typical structural problems are presented: beams, slabs, columns, walls, trusses and bracings. All the typical structural materials are presented too: reinforced concrete, steel, timber and brick. The structural analysis is on the focus: loads, the hierarchy of structural elements, equilibrium, internal forces, stresses. The resistance of the structural elements is the other topic: elastic and plastic resistance, buckling resistance. The Eurocode is the base of the resistance calculations, but the subject tries to be "code free", the knowledge can be used all over the world. After all the students pass this subject can be ready for the advanced courses of our MSc: Special Loadbearing Structures, Comprehensive Design and Diploma Design. (2 credits)

Design of Reinforced Concrete Structures A, S

BMEEPST0655

The subject introduces students into the way of design of approximate dimensions, joints and structural solutions of reinforced concrete structures. Invited lecturers expose some

of the most significant recent investments in reinforced concrete in Hungary. The aim of the course is to develop the ability of students - on the basis of EUROCODE 2 - to adopt architectural dimensions and to evaluate the effect of the chosen architectural lay-out onto the structural solution. (2 credits)

Hungarian Settlements C

BMEEPU10423

The aim of the subject is to familiarize with the characteristics of Hungarian cities and urban development processes. The subject intends to combine the benefits of lectures and lessons; providing the opportunity for active involvement. With the participation of invited speakers, you can hear about the most important periods of Hungarian city history and urban planning features, especially in the context of today's processes. In the remaining classes we deal with the morphological (graphical) analysis of the selected Hungarian settlements. Morphology not only provides an excellent approach to understanding the history of urban development, but it is also worth exploring and learning from a methodological point of view. (2 credits)

Contemporary Urban Design

BMEEPU10801

The course gives a stable theoretical background not only for understanding contemporary urban design theory but also to practice urban design. The semester divided into three main parts: the first focuses on contemporary housing neighborhood developments, new constructions and regenerations projects from Europe; the second is an introduction to the background of the notion of public space and how this notion requalified the use of the contemporary city; the third is about the re-use of historic urban cores in Europe, focusing Berlin, Amsterdam and Zurich. (2 credits)

Urbanism A, C, R

BMEEPU10805

The goal of the course is to get students acquainted with the multidisciplinary characteristics of Urban Studies. The semester is divided into two blocks dealing with: urbanisation processes in the world, in Hungary and Budapest; the issues of contemporary urbanity; related fields of science and planning tools in various field of the profession. In the series of lectures professors of the Department of Urban Planning and Design and some invited experts of various fields are presenting lectures on various topics. On the end of the semester, you have to present a specific urban topic of your home city. (2 credits)

Cities of the World A, C

BMEEPU10893

Course on current challenges of global urbanization with special focus on small scale & network interventions in cities and suburban areas. Topics discussed: (1) how theoretical thinking on urban development is transformed in the context of global urbanization; (2) how deindustrialization is reflected in the changing urban development dynamics; (3) what are the impact of political and market forces on city development; (4) the impact of sustainability and resilience on urban planning; (5) possible ways to enhance the overall quality of urban life. (2 credits)



Urban housing

BMEEPU10901

The seminar is related to the Urban Housing LAB and Urban Design Studios of the BME Department of Urban Planning and Design. The objectives of this course are to introduce students to critical thinking about contemporary mass housing issues and solutions, to have an international comparison about the urban housing conditions, and to make them understand the complexity of mass housing developments. As students arrive from different countries, the seminar uses the opportunity to learn from each other, to discover and compare several case studies. The lessons are differentiated by geopolitical position and key topics: Introduction / urban housing terminology, comparative research method - Post-Socialist Central European Countries / urban heritage, homeownership - Western European Countries / contemporary alternative solutions, social housing - Post-Soviet Countries / large housing estates, mass housing - USA / high-rise, affordable housing - Presentations and discussion of the teamwork (2 credits)



Landscape Architecture

BMEEPU10904

The lecture series analyzes the transformation of green spaces along the three sides of “positions, visions, concepts” that can be understood as a model of landscape theory, through which the viewpoints of the different disciplines (landscape architect, garden designer, urban designer, architect, etc.) can be used to examine the urbanized landscape and the green spaces appearing in the urban environment. Contemporary gardening and landscape architecture projects are presented during short on-site study trips with special regard to the practical experience in creative work.

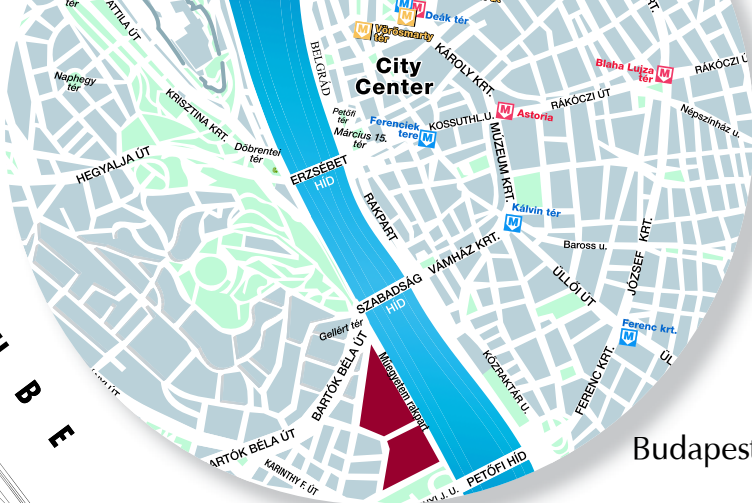
The motto of the subject assumes the active participation of the students also, and in connection with the lectures topics, a presentation of a case study based on a personal experience has to be done once during the semester. Each occasion ends with a common debate, discussing the different points of view on the topics. (2 credits)

Participation, simulation, activism: new methods in urban design

BMEEPU10906

The elective course aims to teach students the practice of participatory design, focusing on urban public space design involving local communities. Students – after analyzing the European best practices – will get experience in involving different social groups and interest-groups into the design process of a public space. Students will get an extensive knowledge on the international practice of participatory design, reading much of it’s English literature, analyzing completed European public spaces designed with this method. During the practical classes the students will make a design proposal or activity process simulation for a selected public space in Budapest, either in a dense urban context or on the spaces of a housing estate, or in a suburban situation. (2 credits)

Szabadság Bridge



Budapest

Petőfi Bridge

- Administration Block A
- Fluid Mechanics Building Ae
- Chemistry Building Ch
- Mechanical Engineering Building D
- Building Construction Laboratory El
- Physics Building F
- Production Engineering Building G
- Informatics Buildings I, Q
- Vehicle Engineering Building J
- Central Building K
- Central Library Kö
- Hydraulic Machinery Laboratory L
- Mechanics Building Mm/Mg
- Mechanical Technology Building Mt
- Classrooms R, T, H, E
- Electrical Engineering and Informatics
- Buildings St, V1, V2
- Nuclear Training Reactor TR

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