

„Budapest” Architecture and Construction

program offered for Exchange students
in the 2014/2015 academic year

Fall semester 2014/2015

proposal of 17st March 2014

RECOMMENDED PART / 23 credits by semester

recommended group of subjects where participation is possible without overlaps in the timetable / contains about 2 credits provided by all the departments of the Faculty

subjects	cr	code	limit	year in the curriculum
project unit /10 credits				
Departmental Project 3	8 pr	BMEEPLA.... BMEEPIP...		regular En4
<p>This is the design exercise in the seventh semester for the students. The aim of the course is to experiment the complexity of an architectural design exclusively within the boundaries of architecture. During the semester a smaller scale (600-1200 m2) public building is to be designed, focusing on three main principles, which are: conceptuality, spatial organisation and ornament. Thus the course is divided into three parts, each closed by a study plan. The focus of the first part is conceptuality, which means the relationship between the building and its surroundings. The motto for the second part is spatial organisation, the aim of this part is focusing on the function, its identity. The closing part of the semester deals with ornament, namely two aspect of this: structural ornament and the ornament of the surfaces.</p> <p>For further information see the websites: http://www.ipar.bme.hu/course.php?id=46</p>				
Drawing 7 Manual Present. Technics	2 pr	BMEEPRARAO702	100%	regular En4
Representation of several colours of spaces, streets, and building ensembles with surface textures and of building structures; designing in colour.				
Hungary unit /4 credits				
Budapest - Contemporary Transformations of the City	2 th/pr	BMEEPUI0103	100%	
<p>The goal of the course is to give foreign students coming to Budapest an overview of the current urban developments and at the same time help them to acquire a better understanding of the urban, architectural and cultural aspects of the city. The course starts with a short general overview of the historical development of Pest and Buda. Most in-class lectures nevertheless deal with current ongoing urban projects of the city, including urban renewal projects, housing estate renewals, new public spaces and new real estate developments. The lectures are followed by site visits, accompanied by specialists of various programmes. For fulfilling the requirements a small practical assignment has to be solved by the students individually.</p>				
History of Hungarian Architecture 2.	2	BMEEPETO901	100%	regular En4
<p>The course gives an overview of Hungarian architecture from the beginning of the 20th century up to now. While following the timeline, the classes concentrate on the main problems of the period: like the heritage of rural architecture, new technologies and structures of the early 20th century, the emerging modern movement in Hungary, the neo-styles in official architecture, the question of socialist realism in the 50s, technology and high-rise, and the problem of large scale and prefabrication during the socialist times, and the post-modernism in the 80s. As the problem of identity (national or regional architecture) was/is a recurrent theme through the whole period, the course pays a special attention to it. The last classes of the course are devoted to recent developments and trends in Hungarian architecture.</p>				
technical unit /9 credits				
Special Construction Projects	2 th	BMEEPEKS901	100%	
<p>The course's aim is to give up-to-date information on different special fields of construction in three blocks. 1nt he 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. 1nt he 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. 1nt he third block students get information 1nt he application of traditional construction technologies, restoration methods and the maintenance of monuments and historic buildings. Besides the theoretical lecturers many site visits are organized to present the practical aspects of the subject as well.</p>				
Building	2	BMEEPEGA501	100%	regular En3

ServiceEngineering1	th			
<p>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 equipment. 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.</p> <p>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.</p> <p>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.</p> <p>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.</p>				
Design of Reinforced Concrete Structures	2 th	BMEEPST0655	100%	
<p>Historical reinforced concrete constructions, their systems of reinforcement. Aspects of adoption of approximate dimensions, choice of the structural system. Possible floor constructions in function of loads and spans. Joint solutions of the thermal and acoustic insulation. Problems of fixings. Possibilities of strengthening of rc structures. Solutions of composite structures. Questions of documentation, technical presentation. Possible solutions of the foundation, impermeable space delimitations. Approximate design of dimensions of r.c. columns and walls, detailing of the reinforcement. Design and construction of the reinforced concrete structures of the Palace of Arts of Budapest (MÜPA). Bracing systems of reinforced concrete loadbearing structures. Design of tilted r.c. structures. Design and construction of the r.c. suspension pylons of the new northern M0-bridge of Budapest. Approximate design of dimensions of r.c. slabs and beams. Design and construction of great span flat slabs: Bubble deck slabs and prestressed r.c. slabs with bounded and unbounded tendons. R.c. cantilevers as architectural motifs. Joint solutions, catalogue design of prestressed and prefabricated r.c. structures.. Design and construction of the prefabricated r.c. structure of the Mercedes factory Kecskemét.</p>				
Constructive CAAD C or Constructive CAAD G	3 pr	BMEEPAG0243	50%	
		BMEEPAG0247	50%	
<p>Constructive CAAD C Advanced CAD modelling course for students who are already 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. (see: http://www.epab.bme.hu/en/?autocad/en/)</p> <p>Constructive CAAD G Architects from all around the world use Google SketchUp in nearly all phases of design, starting from solid modelling to photorealistic 3D rendering. Sketchup is a simple, but powerful tool to visualize ideas in 3D. Easy to learn, simple, fullz understandable, helps the user to evolve creativity. Needs less time to find the right tool enables to spend more time with what we learn for... to be an architect!</p>				

ELECTIVE PART

depending on the timetable, since many courses will overlap in time / see timetable in May

Architectural Research Vasáros Zsolt DLA	6	BMEEPIP0995 BMEEPUI0995 BMEEPLA0995 BMEEPKO0995 BMEEPAG0995 BMEEPEK0995 BMEEPEG0995 BMEEPES0995 BMEEPRA0995 BMEEPST0995 BMEEPET0995		Minimum of 4 semesters architectural and engineering studies, specified background during the registration. see the topic list proposal
<p>Similar to the international practice aims the course primary research activity on architecture and its documentation. The possible horizon of the research topics is determined by the course lists of the departments and the personal interest of the students. Beside the architectural topics will give the course an appreciation of interdisciplinary and special fields in international environment too. The project work demonstrating generic and specific skills and understanding of the open and synthetic character of the research.</p> <p>The objective of this course is to hone the skills of analysis and abstraction in order to develop a framework for research. The student should be able to draw from precedent in both art, architecture and engineering in the development of this framework, which will act as scaffolding for the theoretical, experimental and creative decisions. This course will consist of a series of consultations to the teachers, but the essay should be written by the student. The available topics are given by the Departments of the Faculty. The student can propose also a special topic for research during the course, but the teacher has to be agree with the proposal.</p>				
Introduction to Constructions	2 tp	BMEEPESA101	max:7	Construction Study En1
<p>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.</p>				
Building Constructions2	4 tp	BMEEPESA301	max 7	min. 1 semesters Const. Study En2
<p>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.</p>				
Building Constructions4	4 tp	BMEEPESA501	max 7	min. 3 semesters Const. Study En3
<p>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.</p> <p>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.</p> <p>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</p> <p>Principles of primary building engineering service systems and building constructions of sanitary block.</p>				
Building Physics	2 th	BMEEPEGA301	-	regular En2
<p>Heat and moisture transfer: Concept of conduction coefficient, thermal resistance, surface convection, overall heat transfer coefficient. Calculation of temperature distribution and overall heat transfer coefficient of multilayer walls. Calculation of the necessary insulation breath. Thermal bridges, two dimensional heat transfer. Concept of linear heat transfer coefficient. Calculation of temperature distribution of thermal bridges. Estimation of critical surface</p>				

<p>temperatures. Heat flow paths to the ground. Calculation of equivalent U-value. Radiant heat exchange. Spectral distribution of solar radiation, green house effect, energy balance of transparent and opaque elements. Sun path, sun path diagrams. Calculation of shading. Shadowing devices. Energy collecting walls. Mass walls, Trombe walls, transparent insulation, sunspaces, Heat storage capacity, heat loss, heat gain. Effective thickness. Calculation of a heat storage capacity. Air gaps. Concept of equivalent thermal resistance of air-gaps Psychometrics. Daltons's Law, moisture content, Relative humidity. Energy content of moist air. Dry and wet bulb temperature. Psychometric chart. Saturation-temperature diagram Vapour transfer through walls, the Glaser model. Distribution of saturation pressure and partial pressure distribution of multilayer walls. Capillary and surface condensation, mould growth, moisture balance of room, sorption isotherms. Design consideration, place of the moisture resistant and thermal resistant. Acoustics: External and internal noise sources. Radiation and propagation of sound, sound pressure level, sound power level, "level arithmetics", sound field around a point source, sound field around an infinite line source; The characteristics of environmental noise: A weighted sound pressure level, equivalent. A weighted sound pressure level; Sound insulation against airborne sound, sound reduction index, weighted sound reduction index, product data, field data; Sound insulation against impact sound, normalised impact, sound pressure level, weighted normalised impact sound pressure level; product data, field data; Sound insulation, requirements, analyse the plan of a multi-storey dwelling.</p>				
Cities of the World – Contemporary Responses to Development Challenges	2th	BMEEPUI 0893	-	
<p>The course engages students with contemporary planning challenges of larger metropolitan regions in different parts of the globe. We shall look at how European planning theory, especially in the 19th and 20th century has influenced the development of global industrial centres and what are contemporary reactions to the modernist (technocratic) planning and the resulting urban forms. Special attention will be given to the issues of urban sprawl, regeneration, sustainability, smart growth policies, the impact of technological innovation on how cities are managed and the interaction between spatial planning and local economic development.</p>				
History of Architecture 1. The Beginnings – Vernacular Architecture	3th	BMEEPETA101	-	regular En1
<p>Basics of architectural forms and structures – Architecture of Palaeolithic's – Architecture of Neolithic's – Architecture of bronze and iron age in the Middle East and in Europe - Vernacular architecture of Africa, Asia, America and Europe.</p>				
History of Architecture 3. Medieval Architecture	3th	BMEEPETA301	-	regular En2
<p>The architecture of the Late Roman Empire. The born of Christianity and its „Necessity architecture“. The born 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 interregional influences in Romanesque architecture. – Antique influences. Byzantine influences. The progressive interregional influences in Romanesque architecture – monastic movements: Benedictine and Cistercian, Norman „Imperial“ Romanesque architecture. Morphology of Medieval detailing. The Early Gothic cathedrals. – The flourishing period of the French cathedrals, and its influences in South-France, in England, in Germany and in Italy. Interregional 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.</p>				
History of Architecture 5. 19th Century Architecture	3th	BMEEPETA501	-	regular En3
<p>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 question 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. This subject surveys 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.</p>				

Theory of Design	2 th	BMEEPETO921	max 10	regular En4
The course gives an overview of theory of design from 1968 to the present. It picks up specific themes of architectural design and puts them into broader cultural context. Themes include but not limited to: 1. history, memory, tradition, 2. autonomy, pleasure, deconstruction, 3. place, material, experience, 4. Tectonics, ornament, image, 5. City, metropolis, pragmatism, 6. practice, production, diagram, 7. digital technology, 8. landscape, topography, 9. responsibility, sustainability. To bring the theoretical problems of design closer to practice the course uses the writings of leading practicing architects as case studies. The aim of the course is to emphasize the importance of thinking on design, and to enrich the students' vocabulary of architectural discourse.				
History of Art	2 th	BMEEPETT721	-	regular En4
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, Post-Impressionism. Bibliography: Ernst H. Gombrich: The Story of Art, Phaidon, 1995; Michael Levey: A History of Western Art; and other (selected) books of WORLD OF ART series: Thames and Hudson, Oxford University Press; etc.				
History of Theory of Architecture	2 th	BMEEPET0408	max 10	
Categories and concepts of theory in the history of architecture from antiquity to the raise of modernism in the beginning of the 20 th 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 15 th . 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 17 th . Theory of architecture in France in the 18 th century. Enlightenment and revolutionary architecture. 19 th 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.				
Public Building Design 1	2 th	BMEEPKOA301	-	regular En2
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 analyse 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.				
Urban Design 1	2 th	BMEEPUA501	-	regular En3
The subject is the theoretical course of the fifth semester, with 2 hours lecture weekly. Man during historical times has always lived in communities, so his life has been determined by his relation to the rest of the community, while at the same time a house erected is also determined by its built environment. The same way as a man cannot be separated from his community, a building cannot be separated from its urban environment. The architectural quality can be well described by relation of the building to its environment. The main scenes of the lives of communities are the settlements, where the most developed examples are cities. Why are settlements formed or deserted, why are they developing or declining? What should be the ratio of planned and unplanned elements in a settlement? What is the role of private and public interests, of private and public properties in the development of a settlement? How is a city functioning and what are the most efficient means of its operation? We are looking for the answers to these - sometimes philosophical - questions and looking for the relation between the inseparable categories of building and city, architecture and urban development.				
Departmental Project 2 Interior Design	3 pr	BMEEPRAT701	max 10	regular En4
The course is in strong relationship with the sixth semester's other course "Department's Design I". There are three small exercises in this term, based on the theme of: modeling, construction, visuality. All three of these exercises are based on the exercises made during "Department's Design I", by solving or developing some parts of those. Thus the student has the opportunity to experience more the richness of the design process. The first exercise deals with the question of creating a model and its role in the architectural praxis and in the experience in the human cognition. The second exercise is construction, this one is examining the relationship between the already made model and the main space-structure of the ongoing design "small complex". The third small exercise is called visuality, during which the student makes a detailed drawing of an ornament chosen by the consultant and the student together.				