INTERDISCIPLINARY PROJECT BASED DESIGN 1

Department of Mechanics, Materials and Structures and
Department of Industrial and Agricultural Building Design

COURSE DESCRIPTION

Theme of the course

We propose to explore the interaction between geometry and mechanical behaviour of structural systems where the shape of the structure has strong effect on its efficiency. In particular, we will study the basic construction principles of cables, arches and other structures, which are carry their loads via normal forces (tension or compression).
We will apply this knowledge in an architectural design project. The students will design an open-air theatre in Budapest (close to the University on 'Kopaszi' dam) with emphasis on the interplay between attractive form, functional values and efficient structural behaviour.

Progress throughout the semester

The course will be held in a workshop style. Students' work will be accompanied by consultants of both departments. Students will have to complete their tasks in groups of 2-3 students.
Thus in the beginning of the course students will get familiar with the tasks and the site in form of presentations and site visits. They also get acquainted with examples, possible structural systems, technologies and possible solutions.

The development/progress of their projects will be presented by the students in form of three open presentations during the seminars. These presentations will be immediately evaluated by the consultants who will discuss the work in public. As the design process goes on students have to document related inspiring buildings, conceptual layout of the environment of the building and its interior and detailed plans of the building with emphasis on the applied structural systems and their geometry.

The seminars not only provide space to collective consultations and presentations but also contain the consultant's phase-specific presentations which shall improve the development of the work.

The classroom K 222 is available for the students all day on Monday and Wednesday. Note that the door is not locked and other students use the class room on other days. Please arrive no later than at is in the schedule. You will listen to each other's presentations on every Wednesday. Monday is for consultations, lectures and workshops.

Four main phases form the basic structure of the course:
Analysis – discovering the characteristics of the site: history, layers, development plans, etc. Each group will get a specific topic and will prepare a short presentation.
Architectural program: sketch of suggested new functions of the whole area, and detailed program for the building.
Architectural plans – architectural behaviour, interpreting the context: building and landscape design. A full documentation of an architectural intervention will be developed in scale 1:200 or 1:100.
Structural plans – the loadbearing structures will be developed without performing detailed calculations. Nevertheless, approximate dimensions will be determined through simple calculations, and the geometric arrangements of structural elements will be designed carefully in scale 1:200 or 1:100.

Participants
The course Project Design is run by two departments: the Department of Mechanics, Materials and Structures and the Department of Industrial and Agricultural Building Design. Students' work will be accompanied by consultants of both departments.

Lecturers responsible: István BARTÓK DLA, DrPéter VÁRKONYI

Consultants: Department of Industrial and Agricultural Building Design – István BARTÓK DLA, Dávid SZABÓ
in cooperation with: Department of Mechanics, Materials and Structures – DrPéter VÁRKONYI, DrTamás THER, Orsolya GÁSPÁR

HALF SEMESTER COURSE 1 FORM FOLLOWS FORCE	Credits: 8	in cooperation with Dept. of Industrial and Agricultural Building Design and Dept. of Mechanics, Materials and Structures
Tutors: István BARTÓK DLA DrPéter VÁRKONYI DrTamás THER Dávid SZABÓ	Responsible: István BARTÓK DLA	
Way of training:	Practical interdisciplinary design course – Lectures, team consultations, common presentations and evaluation in English – according to the timetable	

TIMETABLE AND TOPIC SCHEDULE

Mondays 9:15 AM - 5 PM, Wednesdays 9:15 PM - 5 PM in room K 222

week	MONDAY	WEDNESDAY
8. 22. and 24. Oct.	Day off	11:15 INTRODUCTION, SITE VISIT Students' short introduction Introductory lectures by instructors. Setting up the teams with 2-3 students and topics of preliminary study.
9. 29. and 31. Oct.	12:15STUDENTPRESENTATION of preliminary study of site analysis and motivating examples consultation with both departments	11:15 STRUCTURAL DESIGN WORKSHOP + FORM FINDING LECTURE organized by T. Ther& O. Gáspár
10. 05. and 07. Nov.	12:15CONSULTATIONwith both departments	11:15STUDENTPRESENTATION of concept design
11. 12. and 14. Nov.	12:15REFERENCESlecture consultation with both departments	Day off
12. 19. and 21. Nov.	12:15CONSULTATIONwith both departments	11:15 STUDENT PRESENTATION of structuralform finding
13. 26. and 28. Nov.	12:15CONSULTATIONwith both departments	11:15CHECKPOINT consultation with both departments
14. 03. and 05.Dec.	12:15CONSULTATIONwith both departments (please show uswork-in-progressstate ofyourfinalpresentationmaterials)	10:15FINAL STUDENT PRESENTATION of completed projects

Program

The design task is to plan an open air theater at Kopaszi dam, near the bay. The middle scale building's capacity is 150 person. The auditoria, lobby, circulation and service areas need to be calibrated for these capacity. The theater can be entirely or just partly (stage) covered by roof structure, it will depend on the architectural concept. The goal is to design a well functioning layout with an expressive covering structure.

entrance / lobby	100m2
pay-desk	15m2
cafeteria	20m2
lavatories	50m2
auditoria	for 150 person
stage	100m2
backstage	100m2
lobby	20m2
changing room	50m2
changing rooms	4x 20m2

storages	3x 20m2
scenery storage	60 m2
kitchenette	30 m2
rest room	20 m2
cleaning room	15 m2
electrical room	15 m2
technical room	15 m2
controller room	15 m2

Conditions:

- accepted presentation of preliminary study of site analysis and inspiring examples

- accepted presentation ofconcept design(architectural program, architectural floor plans, section, 1:200, mock-up and perspective view of the structural system with materials and approximate dimensions)

-- accepted presentation of structural form finding

- accepted presentation of final design project plans, (architectural floor plans, section, elevations 1:200/100, structural floor plans, sections 1:200/100, site plan 1:1000/500, and mock-up illustrating structural systems and architectural form 1:200/100/50)

-active presence during the semester (70% of classes)

Deadline: Wednesday, 5th of December, Presentation starts at 10:15 AM

Grading:
The final grade will be established as the result of the personal and team work of the student in class and at home. The submissions, presentations and class work will be graded according to the following:

concept design:	15 %
structural plans:	20 %
activity during semester workshops:	15 %
final submission and presentation:	50 %

Grades:	0-49 %	failed	(1)
	50-62 %	passed	(2)
	63-75 %	satisfactory	(3)
	76-89 %	good	(4)
	90-100 %	excellent	(5)

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Materials and Structures

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