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| General Information | Subject name, code and number of credits | ARCH311, Architectural Construction 3, 6 ECTS |
| | Department | Architecture and Design Department |
| | Program (Bachelor's degree) | Bachelors |
| | Academic semester | Fall 2025 |
| | Subject teacher(s) | Sevinj Hasanova |
| | E-mail: | Hasanova.sevinj@khazar.org |
| | Lecture room/Schedule | Khazar University, Neftchilar campus |
| | Counseling hours | At times agreed upon with students |
| Prerequisites | - | |
| Language of instruction | English | |
| Type of subject (compulsory, elective) | Compulsory | |
| Textbooks and additional literature | <ol style="list-style-type: none"> 1. "Structure As Architecture" A Source Book For Architects And Structural Engineers /Andrew W. Charleson/2005 2. "Precedents In Architecture" Analytic Diagrams, Formative Ideas, And Partis/Roger H. Clark Michael Pause/fourth edition/2012 3. "Design of Steel Portal Frame Buildings."/J.R.Henderson/ 2015 4. "Design Of Single-Span Steel Portal Frames To BS 5950-1:2000" 5. "Best Practice in Steel Construction – Industrial Buildings" 2008 6. "Structural Architecture for Large Roofs: Concepts and Realizations" M.Majowiecki /2005 7. "Overview on Space Frame Structures" — Hussam Ali Mohammed /2018 8. "Folded Structures in Modern Architecture" /Shekularac/November 11, 2011 9. "Folded Plate Structures Final" /Scribd 10. "Single-Storey Steel Buildings"/ Part 4: /Detailed Design of Portal Frames /Steel Construction Institute/2010 11. "Catenary Cables and Arches" Anahita Khodadadi/chapter-4 12. "The Truss Structure System" Article in International Journal of Civil Engineering and Technology · November 2018 | |
| Course description | <p>Construction is a general term meaning the art and science of forming objects, systems, or organizations. Structural elements are considered in the design of architectural buildings according to their purpose. Single module system. By developing the structural perception of architect students during design, mastering knowledge about constructive connections and constructive elements, which are an integral element of architecture, and applying free and correct solutions in constructive requirements at the design stages.</p> | |
| Course objectives | <p>The course objectives for architectural designing vary based on the specific program and educational institution. However, here are common objectives that many architectural design courses aim to achieve:</p> <ol style="list-style-type: none"> 1. To acquire theoretical and practical knowledge on the use of modern constructions along with traditional and advanced technologies during the general design methodology of buildings and in this process to get | |

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| | <p>acquainted with construction norms and rules and constructive elements of the project and their purpose, role and requirements.</p> <p>2. Develop Projecting Skills: To cultivate the ability to think creatively, critically, and spatially, enabling students to develop design solutions for various architectural challenges.</p> <p>3. Acquire Building Technology Knowledge: To impart knowledge of construction materials, structural systems, and building technologies, enabling students to design structures that are functional, safe, and sustainable.</p> | |
| Results of teaching (learning). | <p>Studying the structural elements of a building and knowing the purpose and purpose of each architectural element is essential for every architectural student. Some of the key outcomes expected from a successful architectural design course are:</p> <ol style="list-style-type: none"> 1. To get acquainted with the theoretical and practical foundations of architectural constructions. 2. Technology-based knowledge of construction, materials and structures. Construction technology includes various technical knowledge, methods, materials, systems and practices used in the design, construction and maintenance of buildings and other built structures. 3. Understand the main structural systems, technologies, and methods which are being used in building construction. 4. Be familiar with the factors impacting the choice of the structural system; physical properties, cost and durability, and materials characteristics responding to the sustainability issues. 5. Ability to design architectural projects that meet both aesthetic and technical requirements. It involves the application of engineering principles, architectural practice, and advances in materials science, construction techniques, and sustainable practices to create safe, functional, efficient, and aesthetically pleasing spaces. 6. Concepts about the architectural - constructive elements of the building. Students acquire knowledge about architectural and structural elements (foundations, walls, columns, beams and girders, trusses, arches and covering panels, etc.) to be considered during design, and become free, confident, and accurate in space planning, structural integrity, and material selection during design. they will be able to find solutions. | |
| Teaching methods | Lecture | A lecture is given to the students about the topic. |
| | Group discussion | For students to better understand and remember the topics covered, discussions are held regularly. |
| | Practical exercises | Practical exercises are done to improve the knowledge and skills students have learned during lectures. |
| | Analysis of a practical issue | Discussions are held periodically based on question-and-answer, quick-solve small-scale tasks to understand the extent to which students have mastered the topics theoretically and at what level they can practically perform the task given by thinking like an architect. |

| Assessment | Components | Date/deadline | Components |
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| | Task | | 10 |
| | Quiz-1 | | 5 |
| | Quiz-2 | | 5 |
| | Attendance | | 5 |
| | Activity | | 10 |
| | Midterm exam | | 30 |
| | Final exam | | 35 |
| | Conclusion | | 100 |
| Rules (Teaching policy and conduct) | <p>Lecture, seminar, presentation</p> <ul style="list-style-type: none"> - The student should search based on the topics surrounding the topic, and the topic should be analyzed in depth. A presentation should be prepared based on the conducted research. Sources cited in the analysis should be listed accordingly in the reference list. The presentation should be in the Word program, and the tasks related to the project should be prepared in the AutoCAD program or with hand graphics. <p>The assignment must be submitted by the student.</p> <p>The purpose of this task is to form and develop the skills of future architects to conduct small studies, and design and present architectural and construction projects taking into account the main architectural elements and basic architectural solutions to be considered during the design.</p> <p>Quiz:</p> <ul style="list-style-type: none"> - During the semester, students will be tested based on questions prepared by the department, and each quiz (Quiz 1 - before the Midterm exam, Quiz 2 - before the final exam) will be evaluated on a 5-point system. <p>Duration:</p> <ul style="list-style-type: none"> - Presentations must be made during each training session. Each student is given 10 minutes for the presentation. <p>Midterm exam</p> <ul style="list-style-type: none"> - Test questions and graphic assignments based on the topics taught during the semester. <p>Exception:</p> <ul style="list-style-type: none"> - If the student informs the dean of the faculty in advance that he/she will not be able to participate in the exam due to valid reasons (related to family status and health) or submits any related documents (application or reference), only in this case the student can take the exam again. <p>Attendance</p> <ul style="list-style-type: none"> - The maximum score for class attendance is 5 points. The number of points is based on: if the student attends all classes in the subject during the semester, he is given 5 points. If the total number of lessons missed during the semester for the subject exceeds the prescribed limit of 25% (illness, family situation, etc.), the student is not admitted to the exam session and a certain decision is made about it. | | |

The procedure for completing the course

- The student's knowledge is evaluated with a maximum of 100 points. an overall success rate of 60% and above is considered to complete the course. A student with a deficit can take this subject again in the next semester or the next year.

Violations of examination rules

- During mid-term and final exams, students are prohibited from disrupting the course of the exam and making transfers. The exam work of the student who does not follow this rule will be canceled and the student will be excluded from the exam with a grade of 0 (zero).

Rules of conduct of the student

- It is not allowed to disrupt the learning process or engage in unethical actions, as well as students' unauthorized discussions and use of mobile phones.

Note: - The topic will be held in the form of lectures and exercises. In each lesson, students will be given theoretical information about design theory, types of buildings and facilities, types of buildings, etc. - architectural construction, and architectural elements in project design, and discussions will be held on the topic.

- Each student is required to submit a research and project according to the assignment discussed in the lecture, based on which he will be evaluated, and at the end of the semester he will receive full - 10 points as an activity score. Otherwise, the student is given 0 points for each unprepared class day.

Table (subject to change)

| Week | Date | Topics of the subject | Tutorial/Assignments |
|------|---------------|--|---|
| 1. | ---.---. ---- | <p>The Potential For Structure To Enrich Architecture.</p> <p><u>Overview of Long-Span, Large-Volume and Industrial Buildings</u></p> <ul style="list-style-type: none"> • Definition of Large-Span Buildings: • Definition of Industrial Buildings: . • Importance in Modern Construction: • Key Characteristics Of Large-Span And Industrial Buildings • Structural Systems In Large-Span Buildings • Classification of Industrial Buildings <hr/> <p>Prepare a short visual analysis</p> | <p>1. "Structure As Architecture" A Source Book For Architects And Structural Engineers /Andrew W. Charleson/2005 p 1-18</p> |
| 2. | | Checking Analyses, Practical Work | |

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| 3. | | <p><u>Portal Frames and Their Applications</u></p> <ul style="list-style-type: none"> • Introduction & Motivation • Definition and Structure of Portal Frames • Structural Behavior and Load Response • Materials and Fabrication • Key Design Considerations in Portal <hr/> <p>Frames: Selection of an industrial building (domestic or international) using a portal frame system, preparation of a short presentation on its materials, structure and load response (include images).</p> | <p>1. “Design of Steel Portal Frame Buildings.”/J.R.Henderson/ 2015</p> <p>2. “Design of single-span steel portal frames to BS 5950-1:2000” Published by: The Steel Construction Institute./ p-1:10</p> |
| 4. | | Presentations and discussions on the investigation of buildings using the portal frame system. | |
| 5. | | <p><u>Functional Planning in Industrial and Large-Span Public Buildings</u></p> <ul style="list-style-type: none"> • Planning Principles in Industrial Buildings • Characteristics of public buildings with large spans <hr/> <p>Selecting one of the types of industrial or public buildings and preparing a plan based on functionality indicators. Based on this, research and presentations.</p> | <p>1. “Best Practice in Steel Construction – Industrial Buildings” 2008 p-1-15</p> |
| 6. | | Presentation of research and plan preparation on the acquisition of functionality indicators | |
| 7. | | <p><u>Structural Systems for Long-Span Roofs</u></p> <ul style="list-style-type: none"> • Key challenges: covering large areas with minimal internal support, load-bearing capacity, and stability. • Truss Systems <hr/> <p>Discussion Questions</p> | <p>1. “The Truss Structure System” Article in International Journal of Civil Engineering and Technology · November 2018 p- 1:8</p> |
| 8. | | Midterm exam | |

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| 9. | <p><u>Space Frames:</u> <u>Structural Innovation for Long-Span Architecture</u></p> <ul style="list-style-type: none"> • Introduction. • Formation of Space-Frame Structures. • Support System of Space-Frame Structures. • Classification of Space-Frame Structures. • Advantages of Space-Frame Structures. • Application of Space-Frame in Architecture <hr/> <ul style="list-style-type: none"> - Definition and understanding of the Structural Configuration of a Space Frame Structure. - Description of the geometric formation of a Space Frame Structure. - Applications of Space Frame Structures in Architecture. | <p>1. “Structural Architecture for Large Roofs: Concepts and Realizations”M.Majowiecki/ 2005/ p-1:7</p> <p>2. “Overview on Space Frame Structures” — Hussam Ali Mohammed /2018/ p- 1:10</p> |
| 10. | <p>Choosing a well-known building with a space frame roof (e.g. Beijing Olympic Stadium, Kansai Airport), analyze</p> <ul style="list-style-type: none"> - Span length - Material - Why was a space frame chosen? | Practical work |
| 11. | <p><u>Folded Plate Structures</u></p> <ul style="list-style-type: none"> • What is a Folded Plate? History and Development • Structural Principles , Form and Geometry • Material Selection • Main Advantages,Application Areas • Structural Integration • Limitations and Challenges • Famous Examples <hr/> <p>Paper Folding Exercise (Origami Model)- Students fold paper into simple “V” or “W” shaped plates and test their strength by placing small weights on top.To visualize how folded plates gain structural strength through geometry. Each student briefly (1 min) presents their folded plate form idea—explaining its purpose, geometry, and how it works structurally.</p> | <p>1. “Folded Structures in Modern Architecture” / Shekularac/November 11, 2011 P – 1:10</p> <p>2. “Folded Plate Structures Final” /Scribd p-1:5</p> |

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| 12. | | Sketch on A4 or A3 (hand-drawn or digital), show the main folded plate structure and how it is used. Short description (3–5 sentences): Why this form? How is it suitable? | Practical work |
| 13. | | <p><u>Arches, Cables, and Suspension Systems</u> Historical Overview: Roman aqueducts, Gothic cathedrals. Definition, Structural and Principles The Elegance of Tension – Cable Structures in Architecture</p> <hr/> <ol style="list-style-type: none"> 1. Comparing Romanesque and Gothic arches 2. Sketching the basic cable structure 3. Identification of the main load-bearing components in the suspension system. | <p>1. “Catenary Cables and Arches” Anahita Khodadadi/chapter-4</p> |
| 14. | | Comparison Table: Prepare and present a table comparing Trusses, Space Frames, and Folded Plate Structures (advantages, disadvantages, applications). | Practical work |
| 15. | | Acceptance of the semester assignment based on the covered topics – its presentation and submission. | |
| Final exam | | | |

Təsdiq edir: Dos. Abbasova Ş.A.
Memarlıq və dizayn departamentinin müdiri