



ENGINEERING DIPLOMA EXAMINATION ARCHITECTURE 2021/22

SCOPE OF EXAM ISSUES

HISTORY OF ARCHITECTURE AND URBAN PLANNING

1. Architecture of ancient Greece and Rome: types of buildings, materials and construction methods, principles of composition.
2. Early Christian architecture: construction traditions, functional and structural solutions - longitudinal and central projection.
3. Romanesque architecture in Europe and in Poland; schools, spatial and material layouts.
4. The gothic cathedral as a symbol of the spiritual life of the era and a structural experiment.
5. Gothic architecture in Poland: the sources of inspiration of architectural concepts and the impact of climate on architecture - examples.
6. Florence - works of early and late masters of Italian Renaissance architecture.
7. Renaissance in Poland: Wawel, palaces of magnates and houses of burghers.
8. The Italian Baroque - shaping the interior space and the dynamics of architectural forms - architects and their works.
9. Baroque reform of the communication system in Rome and its importance for urban planning.
10. Baroque churches in Poland. Investors, inspirations and opportunities.
11. Classicism in France.
12. Classicism in Poland: patronage of the royal court (Merlini, Kamsetzer, Corazzi).
13. 19th century buildings which "accustomed" the critics and the audience to the achievements of technology.
14. Art nouveau, jugendstijl, arts & crafts movement, stile floreale - protest against what?
15. Deutsche Werkbund and Bauhaus - similarities and differences; creators.
16. Modernism - ideological assumptions, trends, examples, creators.
17. Le Corbusier - ideas and projects.
18. Postmodernism as the philosophy of rebellion, its features and trends, creators and their works.
19. Hi-tech - genesis, the most important works and their creators.
20. Urbanism XIX: changes in old city centers (Vienna, Kraków, Poznań)
21. New trends in urban planning in the 20th century: "Athens Charter" and its spatial effects on cities.
22. List and discuss elements that are part of the cultural heritage.

ART-COLOR, LIGHT - THE RELATIONSHIPS BETWEEN THE FINE ARTS AND ARCHITECTURE

1. Organic and mineral painting techniques. Basic differences between easel and wall painting.
2. Types of perspectives, their features and application.
3. Types of painting compositions and genres?
4. The division of colors and the principles of mixing them.
5. Main trends and styles in painting which have a decisive influence on changes in the 20th-century art (Impressionism, Cubism, Expressionism).
6. Architectural motifs in paintings, drawings, graphics and sculptures, and paintings in architectural space - tendencies, examples, creators.

ARCHITECTURAL DESIGN

1. Designing single-family residential architecture.
2. Designing multi-family housing architecture.
3. Organic house architecture.
4. Connections between architecture and technology. Architecture of energy-efficient houses.
5. Local land management plans and land development decisions as design guidelines.
6. The organization of the investment process, and the specificity of architectural design.

HOUSE BUILDING AND CIVIL ENGINEERING STRUCTURES WITHIN THE SCOPE OF CIVIL ENGINEERING

1. Basic construction systems of buildings.
2. Foundations: general characteristics, types, levels and depths of foundations.
3. Walls in buildings: types, materials, types of bonds, wall thickness.
4. Types of ceilings in buildings. Balcony slabs.
5. Flat roofs: types, structure, layering, roof drainage.
6. Wooden roof structures: types, roof truss elements, spans.
7. Insulation in buildings: types, classification, conditions of use.
8. Basic principles of technical drawing: markings, dimensioning, lines.
9. Typization and prefabrication in construction: a building module.
10. Finishing elements of buildings: plasters, floors, floors.
11. Insulation of buildings and optimizing its thermal parameters: methods, materials, layer thicknesses.

URBAN PLANNING

1. Definitions and conceptual scope of urban planning, urbanization, spatial development, and urban planning concepts.
2. Basic elements of urban layout and structure - typology and characteristics of urban interiors.
3. Elements of urban composition according to the theory of flagship researchers on this issue.
4. Housing development as a basic urban material.
5. Spatial structure of the city and its changes throughout history.
6. Contemporary urban doctrines - the Athens Charter, the New Athens Charter (sustainable development), the Charter of the New Urbanism.
7. Characteristics of the basic elements that define urban space - square, street, quarter.
8. Issues, elements and methodological basis of the theory of urban design.
9. Basic instruments and tools for urban design.
10. Elements and parameters for shaping the urban complex.
11. Structure of the building-up of an area and its individual functions.
12. Parameters and types of green spaces and communication in the city structure and housing estate structure.
13. Basic assumptions of the city plan.
14. Urban indicators.

RURAL PLANNING, GREENERY

1. Name and discuss the shapes of rural settlements.
2. Spatial systems of buildings in specialist rural farms.
3. Name and discuss functional parts of the manorial and court estates.
4. Classification of urban green areas.
5. List the characteristics of the Renaissance and Baroque gardens (plant material, landscaping elements). Provide examples.
6. Enumerate the characteristics of English parks, romantic and naturalistic gardens. Provide examples.
7. Discuss the process of greenery design in open spaces.
8. Factors affecting the spatial and artistic planning of the park.
9. Functions of urban greenery.

RECREATION

1. Structure of recreational development in agglomerations.
2. Origins and development of recreational functions in urban planning.
3. Evolution of sports and recreation facilities from antiquity to the present day.
4. Typology and distribution of recreational areas and facilities in the city.
5. Factors determining the suitability of areas for recreational functions.
6. Recreational development of urban water areas (ports, marinas, harbours).

MECHANICS OF BUILDING, CIVIL ENGINEERING AND BUILDING CONSTRUCTIONS, BUILDING PHYSICS, ACOUSTICS, ENERGY-SAVING CONSTRUCTION

1. Strength characteristics of basic construction materials.
2. Acoustic comfort of rooms - requirements depending on the function of the room.
3. The influence of interior design, cubature and finishing materials on acoustics.
4. Protection against noise.
5. Requirements for thermal insulation of walls, floors and flat roofs in buildings intended for human occupancy.
6. Energy savings and thermal performance in buildings.
7. Heat transfer coefficient "U" for space dividing elements - definition and calculation method.
8. Heating devices in buildings. Conventional and alternative energy sources.
9. Rules for ventilation of rooms in residential buildings.
10. Dimensional coordination in construction. Building module.
11. Types of foundations, general characteristics, depth of foundation in buildings.
12. Methods of laying bricks in walls (brick bonding), thickness of brick walls. Curtain walls.
13. Reinforced concrete in ceiling structures. The advantages and disadvantages of reinforced concrete, the basis for designing the thickness of reinforced concrete ceiling.
14. Wood in covering structures, advantages and disadvantages. Roof trusses – types
15. Smart building. Definition, building management system (basic elements of the system and their functions), with particular emphasis on energy savings.
16. Smart city. Definition, basic characteristic.
17. Renewable energy sources. Definition, types. Ways of using renewable energy in architecture.
18. Present the conditions of equilibrium for statically determinate systems. Discuss principles of calculating reactions in statically determinate systems. Specify types of external forces acting on the construction system.
19. Discuss methods of truss analysis – methods of joints and method of sections.
20. Present types of internal forces of beams and frames, define each of them and explain sign convention of internal forces. Characterise normal stress. Characterise shear stress.

21. Explain pure bending of beams. Describe the phenomenon of column eccentricity. Provide the definition of the core of a section. Discuss elastic and non-elastic buckling of columns. Present the manner of determining the degree of static indeterminacy.
22. Discuss the method of forces.

BUILDING PHYSICS - LIGHTING, LIGHTING DESIGN AND ELECTRICAL INSTALLATIONS

1. Criteria and principles of lighting.
2. Lighting equipment - lighting fittings.
3. Lighting equipment - light sources.
4. Illumination of architectural objects.

BEZPIECZEŃSTWO POŻAROWE I UŻYTKOWANIA

1. Fire safety - basic terminology.
2. Categories of hazards for people and fire zones in residential buildings.
3. Escape and fire routes in residential buildings.
4. Fire protection requirements for doors and staircases.
5. Fire resistance in residential buildings.
6. Location of buildings (due to fire safety in residential buildings).
7. Parameters of vertical and horizontal communication in buildings: corridors, stairs, elevators. Evacuation in residential buildings.

MATERIALS

1. Thermal insulation.
2. Stone for construction.
3. Ceramic materials.
4. Steel products.