Faculty of Civil Engineering and Architecture

Section of Architecture

Study Program

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|  | **TABULAR PRESENTATION OF** **CURRICULA BY ACADEMIC YEAR** |  |  |  |
|  | **SECTION OF ARCHITECTURE** |  |  |  |
|  | **VITI I** |  | **Semester I** | **Semester II** |
| Nr. | **Lenda** | S | L+U h/j | L+U h/s | L+U h/j | L+U h/s |
|  | Architectural Drawing | 1 | 1+3 | 15+45 |  |  |
|  | Descriptive Geometry | 2 | 3+3 | 45+45 | 3+3 | 45+45 |
|  | Hand Drawing I | 2 | 2+2 | 30+30 | 1+2 | 15+30 |
|  | The Fundamentals of Architectural Design I | 2 | 2+2 | 30+30 | 2+2 | 30+30 |
|  | Architectural Structures I | 2 | 2+2 | 30+30 | 2+4 | 30+60 |
|  | Mathematics | 2 | 2+3 | 30+45 | 2+2 | 30+30 |
|  | Construction Materials | 1 |  |  | 2+1 | 30+15 |
|  | The Fundamentals of GND and CSD I | 2 | 2+0 | 30+0 | 2+0 | 30+0 |
|  | The Fundamentals Marxist Philosophy | 2 | 2+0 | 30+0 | 2+0 | 30+0 |
|  | Total: | 16 | 31 | 465 | 30 | 450 |
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|  | **VITI II** |  | **Semester III** | **Semester IV** |
| Nr. | **Lenda** | S | L+U h/j | L+U h/s | L+U h/j | L+U h/s |
|  | Geometric Perspective | 1 | 2+3 | 30+45 |  |  |
|  | Hand Drawing II | 2 | 1+2 | 15+30 | 1+2 | 15+30 |
|  | The Fundamentals of Architectural Design II | 2 | 2+3 | 30+45 | 2+3 | 30+45 |
|  | Architectural Structures II | 2 | 2+3 | 30+45 | 2+3 | 30+45 |
|  | History of Architecture I | 2 | 2+3 | 30+45 | 2+3 | 30+45 |
|  | Mechanics | 1 | 2+2 | 30+30 |  |  |
|  | The Resistance of Materials | 1 |  |  | 2+2 | 30+30 |
|  | Geodesy | 1 |  |  | 2+1 | 30+15 |
|  | Sociology | 2 | 2+0 | 30+0 | 2+0 | 30+0 |
|  | The Fundamentals of GND and CSD II | 2 | 2+0 | 30+0 | 2+0 | 30+0 |
|  | Total: | 16 | 31 | 465 | 29 | 435 |
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|  | **VITI III** |  | **Semester V** | **Semester VI** |
| Nr. | **Lenda** | S | L+U h/j | L+U h/s | L+U h/j | L+U h/s |
|  | Design of Housing Buildings | 2 | 3+4 | 30+60 | 2+3 | 30+45 |
|  | Design of Public Buildings | 1 |  |  | 2+3 | 30+45 |
|  | Architectural Structures III  | 2 | 2+2 | 30+30 | 1+2 | 15+30 |
|  | The History of Architecture II | 2 | 3+0 | 45+0 | 2+0 | 30+0 |
|  | History of Art | 2 | 2+0 | 30+0 | 2+0 | 30+0 |
|  | The Fundamentals of Urban Design  | 1 |  |  | 2+3 | 30+45 |
|  | The Statics of Architectural Structures | 2 | 2+3 | 30+45 | 2+3 | 30+45 |
|  | Wooden Structures | 1 |  |  | 2+1 | 30+15 |
|  | Installations Water supply, Electric, Mechanical  |  |  |  |  |  |
|  | Water supply and waste water installations  | 1 | 2+1 | 30+15 |  |  |
|  | Electric Installations | 1 | 1+1 | 15+15 |  |  |
|  | Mechanical installations | 1 | 1+1 | 15+15 |  |  |
|  | Programming | 1 | 2+2 | 30+30 |  |  |
|  | Total: | 17 | 32 | 465 | 30 | 450 |
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|  | **VITI IV** |  | **Semester VII** | **Semester VIII** |
| Nr. | **Lenda** | S | L+U h/j | L+U h/s | L+U h/j | L+U h/s |
|  | Design of Housing Buildings | 1 | 1+4 | 15+60 |  |  |
|  | Design of Public Buildings | 2 | 2+3 | 30+45 | 2+4 | 30+60 |
|  | Design of Industrial Buildings | 2 | 2+3 | 30+45 | 2+3 | 30+45 |
|  | Urban Design I | 2 | 3+3 | 45+45 | 2+4 | 30+60 |
|  | Concrete Structures | 2 | 2+3 | 30+45 | 2+3 | 30+45 |
|  | Metal Structures | 1 | 2+1 | 30+15 |  |  |
|  | Spatial Structures | 1 |  |  | 2+1 | 30+15 |
|  | Foundation Structures | 1 |  |  | 2+0 | 30+0 |
|  | Organization and Construction Technology | 1 |  |  | 2+2 | 30+30 |
|  | Total: | 13 | 29 | 435 | 31 | 465 |
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|  | **VITI V** |  | **Semester IX** | **Semester X** |
| Nr. | **Lenda** | S | L+U h/j | L+U h/s | L+U h/j | L+U h/s |
|  | Design of Public Buildings | 1 | 2+4 | 30+60 |  |  |
|  | Design of Industrial Buildings | 1 | 2+4 | 30+60 |  |  |
|  | Urban Design II | 1 | 2+4 | 30+60 |  |  |
|  | Interior Design | 1 | 2+3 | 30+45 |  |  |
|  | Organization and Construction Technology | 1 | 2+4 | 30+60 |  |  |
|  | Diploma | 1 |  |  | 30 | 450 |
|  | Total: | 5 | 29 | 435 | 30 | 450 |
|  |  |  |  |  |  |  |
| L | - lectures |  |  |  |  |  |
| U | - exercises |  |  |  |  |  |
| h/j | - hours per week |  |  |  |  |  |
| h/s | - hours per semester  |  |  |  |  |  |
| S | - number of semesters per subject |  |  |  |  |  |

CURRICULA FOR EACH SUBJECT

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|  | **Architectural Drawing** |  |  |  |
| **One (1) Semester** | L+E h/w | L+E h/s | Total h |
| Semester I  | 1+3 | 15+45 | 60 |
| Semester I Discourses and Practical workGraphic language of architectural drawing instruments and drawing materials; Organization of working surfaces;Geometric constructions;Elements of architectural composition: line; surface; volume.Graphic symbols of architectural drawing.Anatomy of letters and numbers;Methods for the determination of architectural balance; surface: linear materialization; texture;Legends of materials; symbols and their application;Presentation of function, structure and form in architectural drawing.Drawing and communication; drawing and convention; drawing and presentation; presentation solution; presentation technique.EXERCISES:Analyse of structure and form of the letters and numbers. Methods for setting the visual balance;Letters and numbers as architectural message symbols and in architecture itself.Elements of architectural composition;Element analysis of the architectural composition; element presentation of the architectural composition.Architectural presentation techniques;The linear materialization of the architectural composition; simulations;Analog models. |
|  | **Descriptive Geometry** |
| **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
| Semester I  | 3+3 | 45+45 | 90 |
| Semester II | 3+3 | 45+45 | 90 |
| Semester I and IIIntroduction: Projective Methods Point. Point Projection. Quadrants. Octants.The line. Projection of oblique line; projection of lines on particular position. Line projection on particular point. Projection of two lines. Determining the line traces on projection planes. Plane.Plane Projection. Plane traces. The projection of the plane determined by a line and a point. Planes projections determined by two lines. Intersection of two planes. Intersection of line and plane.The transformation method.Transformation of a point, line, geometric shape and transforming of a geometric solids.Rotation method. Rotation of the point, line and a solid. Method of plane alignment.Alignment and affinityIntersection Intersection of polyhedron and revolved solids. Intersection of polyhedral solid with line.Intersection of polyhedral solids. Intersection of revolved solids. Incline axonometric.Roofs.Determining the intersection of ordinary and complex roof plains.Cast shadows in orthogonal and inclined projection.Roads. |

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|  | **Hand Drawing I** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester I  | 2+2 | 30+30 | 60 |
|  | Semester II | 1+2 | 15+30 | 45 |
|  | Semester I and IILecturing, drawing and sketching, correction.Surface, LineFormSimple still life, composed of geometric shapes and surfacesLinear compound, consisting of different elementsValeur and valeuristic rate TextureStill life, classic portrait (alq) and draperyStudy of volume with light and shadow. |
|  | **The Fundamentals of Architectural Design I** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester I  | 2+2 | 30+30 | 60 |
|  | Semester II | 2+2 | 30+30 | 60 |
|  | Semester I and IIIntroduction, What's architecture? Modem society developments and their impact in the architecture) Analytical review of the basic components of Architecture, understanding of multiple architectural creativity and analysis of architectural worksAnalysis, elements and function of the dwelling and physical environment factors of influence on architectural design.Language of Architecture (visual perception, Colors, Rhythm, Masses, Proportions, Sequences, Character/nature, Expression through Construction Materials) atmosphere and air movements, microclimate conditions, Insolation PRACTICAL WORK |

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|  | **Architectural Structures I** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester I  | 2+2 | 30+30 | 60 |
|  | Semester II | 2+4 | 30+60 | 90 |
|  | Semester IIntroduction, concept and short history of structuresStructural building elements: main structural elements, the buildings components, shape and structuresGround floor buildings. Multi-story buildingsLoad-bearing wall system: classical load-bearing wall system, contemporary load-bearing wall system**Skeleton structural system**: high-rise buildings; industrial buildings; tract housing, shear structures, core.Combined system.Spatial structural systems and high technology buildings**Foundations:** foundation design, types, materials, deep foundations, shallow foundations**Moisture and thermal protection**, groundwater and drainage**Movement and partition joints** in buildings. Joints: types, function, designSemester IIBrickwork- masonry, masonry materials and elements: stone, bricks, blocks, wood, steelMasonry types and materials, function, mortars, and binding elementsLoadbearing, partition and sandwich wallsChimneys and ventilation ductsModular design and structural grid: continuous and discontinuous grid and modular coordination.Suspending floor slab structures: division, types, featuresPitched and Flat roofs: layers, design, and warm/cold roofs, green and inverted roofs.EXERCISES: For each topic is envisaged a practical exercise with graphical presentation.  |

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|  | **Mathematics** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester I  | 2+3 | 30+45 | 75 |
|  | Semester II | 2+2 | 30+30 | 90 |
|  | Semester I**Real Numbers**. (Absolute value, Newton binominal formula) **Complex Numbers** (Algebraic Form, Trigonometric Form, exponent and cube root) **Matrices** (matrix - introduction, possible applications, types, multiplication and exponents, polynomial matrices) **Determinants** (introduction, calculations, Properties characterizing the determinant) **System of Linear Equations** (definition, Cramer's rule, Gaussian elimination, Matrix Equation Method) **Vector Algebra** (definition, main applications, vector diffraction in components and projections on axis and space) **Analytic geometry of space** (planar equation forms, angle between two planes, line equations in space, angle between two lines, line position and plane, spherical surface, elipsoid and hyperboloid, elliptical paraboloid and hyperboloid, paraboloid, cylindrical and conical spherical surfaces)**Fibonacci numbers** (definitions, properties, the limits, Euler's number) **Function** (definition, classifications, basic functions, restrictions and extensions, graphics, Boundary value and continuity of function. The infinitely small sizes and the infinitely large sizes etc) |
|  | Semester II**Differential calculus** (definition, geometric and cinematic definition, rules and tables, derivatives of basic elementary functions, tangent and normal line, higher derivatives, inflection point, Leibniz's notation, Lagrange's Rolle’s and Koch notation, undetermined forms, analyzing monotonicity of function and extreme values through the first derivatives test, Inflection points and function graph asymptotes, The general plan for reviewing the function and its graphical presentation) **Integral calculus** (definitions and properties, Indefinite Integral Table, integration methods, inequalities of integrals, integrals of different forms, Definite Integral, relation between indefinite and definite integral, approximating an definite integral, Integral application in geometry etc)**Differential equations** (definition, general and particular solution to differential equations, equations by separation of variables, homogenous equation, linear equation, Bernoulli’s equation, second order Differential equations, variation of parameters to solve differential equations) |
|  | **Construction Materials** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester II  | 2+1 | 30+15 | 45 |
|  | Semester IIImportance and knowledge of construction materialsExamination of construction materialsProperties of construction materialsPhysical Properties: Mass Volume, Specific Mass, Density, Porosity, Water absorption.Heat and Sound Conductivity, Mechanical Properties, Technological Properties, Chemical PropertiesStone Construction materialAggregateCeramic products (bricks, blocks, tilesBinding materials, Types of mortarsConcrete composition, basic requirements, mixing, properties, examination method, evaluation of the concrete class, casting, maintenanceMetalsSteel (processing, properties and examination, types of productsNon-ferrous (aluminum, copper, zinc, leadWood physical and mechanical properties, defects, maintenance and protection, productsThermal Insulating materials, vapor and moisture insulation materials. |

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|  | **The Fundamentals of GND and CSD I** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester I  | 2+0 | 30+0 | 30 |
|  | Semester II | 2+0 | 30+0 | 30 |
|  | Basic Definitions of the General National Defence (GND) and Community Self Defence (CSD) Organization of the General National defence (GND) and Community Self Defence (CSD) Mobilization and development of forces and means. Civil Protection: General overview in the terms of prevention and rescue. World contemporary views on prevention and rescue. Organization of Civil Protection. Survey and Alarming System. Sources and forms of risk to society. Carriers and self-defence forces. Organization of a country for self-defence. The self-defence war. Passive general resistance. Continuation of social-work life and passive resistance in education, science and culture. |
|  | **The Fundamentals Marxist Philosophy** |  |  |  |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester I  | 2+0 | 30+0 | 30 |
|  | Semester II | 2+0 | 30+0 | 30 |
|  | Semester I and II na |

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|  | **Geometric Perspective** |  |  |  |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester III  | 2+3 | 30+45 | 75 |
|  | Semester IIIIntroductionImportance of perspective and its roleDefinitionTypes of PerspectiveElements of perspectivePoint of sight, object, sight rays, image plane; ground plane, horizonPoint, line and planePoint figure, its first and second projectionLine figure, its intersection and vanishing pointIntersection and vanishing point of line with particular positionIntersection and vanishing point of line with arbitrary positionDesign of perspective figures of geometric shapesPlane infinityMethods of compiling shapes in perspectiveDetermination of Point of sight, angle and picture planeThe method of sight rays intersection using vanishing pointsDetermination of scale pointsCoordinate system methodCoordinate system method, introduction of new dropping planeThe perspective of the circleThe frontal perspective-interior Interior perspective, coordinate system methodDivision of segment and square into equal parts**Reflection in perspective figures**Horizontal and vertical reflection in perspective figures**Shadows in perspective figures**Parallel lighting;lighting rays parallel to the image plane;Inclined lighting rays to the image plane;Central lighting |

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|  | **Hand Drawing II** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester III  | 1+2 | 15+30 | 45 |
|  | Semester IV | 1+2 | 15+30 | 45 |
|  | Semester III and IVLecturing and Exercises:One-color toning (still nature) Methodical explanation of Valeur of colours; Use of solid coloursPaintings techniques in:gouache, aquarelle, tempera; Painting of human figure in the interiorLandscape study Technique painting in: tempera or aquarelle; Perspective, relationships of architectural buildings with the human body. |
|  | **The Fundamentals of Architectural Design II** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester III  | 2+3 | 30+45 | 75 |
|  | Semester IV | 2+3 | 30+45 | 75 |
|  | Semester III and IVHousing and dwellingHousing in a wide and narrow sense of the meaning; the function of the dwelling; planning of dwelling by functionsGroups of living roomLiving room premises: day room, sizing, orientation, lighting and dispositionFunctional groups in living room premises, correlation in between, disposition and arrangement. Dining room: sizing, disposition and arrangement. Working areas: space, disposition and arrangement.Sleeping units: **T**he contents of the sleeping units, basic definitions for its function. Size and shape of a sleeping room.The necessary furniture, their dimensions and layout, position within the dwelling.Children sleeping room: additional functions and specific requirements. Safety in dwellings.Toilets and wardrobesGroup of utilities and auxiliary spacesKitchen: equipment and layout, sizing and position in the dwelling. OrientationEntrance: lobby, closet, wardrobe, sizing, furnishing, position in the dwelling.**Circulation in residential buildings**Horizontal circulation outside and inside the dwelling, function, sizing and disposition.Vertical circulation: staircases, elevators, ramps, sizing, position and function.Natural daylighting in architectural buildingsThe importance of daylighting in work and dwelling premises and illumination.Window. Historical development and sizing.Basic terms in lighting.The daylighting factors determining the level of lighting in premisesUrban and Architectural conditions. Shading deep premises.Lighting of particular purpose premises.PRACTICAL WORK |

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|  | **Architectural Structures II** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester III  | 2+3 | 30+45 | 75 |
|  | Semester IV | 2+3 | 30+45 | 75 |
|  | Semester III and IVVertical communicationStaircase’s types, design, structure, materials and design rulesPrecast staircasesWood and steel staircases, ramps, escalators and elevatorsRoofs - timber structure roofTypes of roofs, roof elements and geometric roof solutionSimple roofs: Wood rafter framed structure roofs, Roof with post structure, common roofs on the reinforced concrete slabCollar and purlin roof with ridge and under purlin beams; roof props: single, double and triple props; vertical and inclined props.Trusses: king and queen post roof truss, fixing on reinforced concrete slab, wood floor framing, - hanging combination.Mansard roofs, saw-tooth roof.Tensile roof structures, towers, bent arches and roofs - the layouts, elements of complex roof structures.Contemporary wooden structures.C**raftworks:** Roof covering works: covering with wood, with straw, with stone tiles; tiled, flat and corrugated tiles covering; glass and translucent covering material.Sheet metal worksWood worksWooden frame windows: single, double leaf framed windows etc.; window specification, sliding windows, joinery metal fittings, wood shutters and louversDoors of carpentry, panels, sliding doors etc.EXERCISES: For each topic is envisaged a practical exercise with graphical presentation.  |

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|  | **History of Architecture I** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester III  | 2+3 | 30+45 | 75 |
|  | Semester IV | 2+3 | 30+45 | 75 |
|  | Semester III **Ancient History of Architecture**IntroductionElements of the architectural work, the architectural expression language, the principles of architectural composition, tectonics and stereotomy, the understanding of architectural style, the review of architectural stylesThe beginnings of architectural creativity in Neolithic , megalithic monumentsHistory architecture in MesopotamiaHistory of architecture in EgyptHistory of architecture in PersiaHistory of architecture in the Aegean, Crete, Mycenaean, Asia minor.History of architecture in GreeceHistory of Etruscan and Roman architectureEach chapter includes social, economic and other circumstances of birth and development of architecture, division of artistic eras, bilateral influence of architecture, architectural composition characteristics, types and analysis of architectural monumentsEXERCISES:A combined task from stylistic classical orders, Latin letters and sketches of architectural monuments and their details - pencil, colour, and ink or colour pen. The purpose of the exercises is to develop proportional sensitivity, visual memory and skill in drawing |
|  | Semester IV**Medieval History of Architectural** IntroductionTransition from antiquity to medieval times, social circumstances and history of medieval architecture, typological and stylistic divisionsPost Antiquity Architecture, Early Christian Architecture in Mesopotamia, Syria, Egypt, Asia Minor, North Africa, Armenia, and Georgia.Byzantine ArchitectureIslamic architectureProtoromanic architecture in Western EuropeRomanesque architecture in EuropeGothic architecture in EuropeBuilding heritageIntroduction, conduct of harmonization, types, values, risks and devastating causes, protection of building heritage and its history and periodization of historical backgroundEXERCISES: A task that deals with the solution of the spatial characteristics of medieval architectural building – thick paper, ink and the appearance of coloured shades. |

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|  | **Mechanics** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester III  | 2+2 | 30+30 | 60 |
|  | Semester IIIDefinitions, axioms and junktionsDefinitions of general notions; Static axioms; Junctions and axioms on Junctions.System of competitive forcesGraphical and analytical presentation of force; Composition of competitive forces. Resolution of force into components; The system equilibrium of the competitive forces; Three-Force Theorem; Static determined and undetermined tasks. Resolution of static tasks.Systems of coplanar forcesDefinition; The Net Force of coplanar system forces. The static momentum of force at a point; Theorem on the moment of the Net Force; Pair of Forces and Momentum of pair of forces. Reduction of system forces at one point; The equilibrium of the arbitrary system forces on the plane.Elements of graphic staticsUnderstanding the forces polygons and cables polygon; Determining the arbitrary coplanar net system forces; Equilibrium graphic conditions; Resolution of force in three directions; Determining of force reaction on junction.Equilibrium of the solid body on the planeDegrees of Freedom of the Solid Body and its support links; Braces and their types; Brackets and their types; Load types, Linear bearings, Determining of force reaction on junctionEquilibrium of solid bodies system in the planeDegrees of Freedom of the Solid Bodies System; Reactions of junctions of bodies system. Equilibrium of kinetic systems.**The elements of theory of trusses** General notions; Methods of assigning force to the truss braces; Complex trusses.System of arbitrary forces on space Force momentum on point as vector; Force momentum on axis; The momentum vector of pair forces and its theorem; Composition of the pairs system; Reduction of the system forces; The equilibrium of system forces; Degrees of Freedom of the Solid Body and its support links; determination of reactions in the body's joints; Stability of equilibrium position; stability from overturningCentre of GravityCentre of parallel forces in space; The Centre of Gravity of the body, shape and material line; The methods determining the Centre of Gravity |

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|  | **The Resistance of Materials** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester IV  | 2+2 | 30+30 | 60 |
|  | Semester IVStrengthening and cutting forcesThe main meanings and assumptions in Material Resistance, type of Force, Cutting Methods, Meaning of strains, and Relationship between Load Intensity, Transverse Force, and Bending Momentum.Axial stressGeneral notions, constrains and deformations in the case of axial stress Hooke’s and Poisson's law, some mechanical properties of materials, thermal stress, statically undetermined system, and sizing.Some geometric features of plane shapesThe static momentum of the surface, the momentum of inertia, the momentum of inertia to parallel axes, the main momentum of inertia, momentum of inertia of complex figures.DeflectionGeneral understanding, constrains in the case of pure bending, constrain stresses in the case of transverse force bending, beam deformation due to bending, Mohr's method determining the deflection and rotation angle, statically undetermined tasks.Complex StressTensile and compression eccentric stress, inclined bending.Column BucklingEuler's formula for critical constrain forces, Euler's formula application boundaries and empirical formulas.Sizing different stress momentumsSizing in the case of axial stress, sizing in the case of deflection, sizing in case of eccentric tensile and compression stress and sizing in the case of buckling.EXERCISES: Exercises in groups of round 20 students where are applied formulas solving practical numeric problems, students are instructed on task solving issues and interactively take place on task solving issues; each student will conduct two numerical practical task compiling: static diagrams for a frame or complex beam, main inertia momentum for a plane figure. |

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|  | **Geodesy** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester IV  | 2+1 | 30+15 | 45 |
|  | Semester IVIntroduction The shape and dimensions of the earthCartographic projectionsEarth Coordinate SystemThe notion of size and measurementState triangulation (triangulation)Measuring the lengths with the toolsInstrument for the measurement of angles-theodoliteTools for building a right angle on the groundSurveying (recording) the terrainLevelling; Geodesic plans and mapsDrafting of plans and their graphic accuracyScaling of topographic plansEngineering GeodesyIntroductionGraphic assignment of coordinates of the points projected in the geodetic plan.Marking the project on the groundTargeting of a projected object facilityProject mapping of the urban planPhotogrammetryIntroductionEarth photogrammetry (terrestrial)Shooting the buildingPhotogrammetry of a photographThe accuracy of the topographic layout obtained with photogrammetryApplication of photogrammetry in architectureEXERCISES:Compiling an geodesic elaborate |
|  | **Sociology** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester III  | 2+0 | 30+0 | 30 |
|  | Semester IV | 2+0 | 30+0 | 30 |
|  | Semester III and IVSociologyThe ratio of sociology and other social sciences; specific sociologies;Methods in sociology; Categories and sociological issues; Human society and its various interpretations; The social phenomenon types and the relationship of social and individual phenomenon; Social groups and their types; ethnic groups and interethnic tolerance; The social character of the marriage, family, and their historical features; Divorce and its consequences; women and society; Social stratification and different views on it; classes, social strata and occupations; Social awareness and its forms;Political parties and their origins; pluralityGroup and individual interactions and interaction of social groups; forms of interactions; interaction of individuals and social groups;**Urbanization and its social reflexes**Automation and its social reflections;Sociology of industryOrganization of production and transformation of the work; education and professional development;Enterprise psycho-sociology; Ethics and social system of the enterprise;Individual and professional motivations; wages and motivations; working group and productivity; leadership with the working group.Social psychology of organization, venture communication and distribution of responsibility in decision making; Sociology of unionism and labor conflicts (strike). |

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|  | **The Fundamentals of GND and CSD II** |  |  |  |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester III  | 2+0 | 30+0 | 30 |
|  | Semester IV | 2+0 | 30+0 | 30 |
|  |  |  |  |  |
|  | **Design of Housing Buildings** |
|  | **Three (3) Semesters** | L+E h/w | L+E h/s | h/s |
|  | Semester V | 3+4 | 45+60 | 105 |
|  | Semester VI | 2+3 | 30+45 | 75 |
|  | Semester VIII | 1+4 | 15+60 | 75 |
|  | Semester V**Housing issues**.Historical view of collective housingTypology of individual family buildingsDetached Housing; Semidetached Housing; Terraced Housing; L shaped Housing with courtyard, Villas**Multi dwelling residential buildings**The typology of multi-dwelling residential building in the dwelling - mobility relationshipHousing building in sections; Housing building with central corridor; Housing building with gallery; High-rise housing buildings; The housing building in cascade - steep terracesThe building with two or more floors (duplex, triplex)Arrangement of dwelling areasDwelling classification on layout composition The elements of influence in the dwelling layout composition multi-dwelling buildingsCharacteristic dwelling areas; Perception of dwelling layout compositionSocial life in dwellings; Children distribution by gender.Adaptability (flexibility) of dwellingsRecreation areas and facilitiesTechnical conditions and design norms for multi-residential buildings and dwellingsDisables physical barriers in multi-residential buildings and dwellingsWaste discharge from dwellings and buildingsStructural components in the design of multi-residential buildings and single family housingArchitectural shaping and building materialsEXERCISES: Detached House G; Detached House G + I, Semidetached house,Terraced house, L shaped house, House with atrium; Single family housing block with urban design;Residential housing block with sections; Housing block with central corridor - gallery;High-rise buildings, buildings with two or more floors; Buildings in the cascade |
|  | Semester VIProvisional residenceHotelsCity hotels; Transit hotels; Hotels for recreation; Seasonal hotels; Resort Hotels; Recovery Hotels.Touristic resort compounds.EXERCISES:5 star Hotel |
|  | Semester VIIMotels; suits; Camps.Dormitory- houses. Student dormitories;Primary school students’ dormitory; High school students’ dormitory;House for the elderly; Homes for orphans; Homes for children with disabilities; Mountain homes; Combined Preschool Institutions; Clubs; Moving facilities; ships; airplanes; Sleeping wagons;EXERCISES:Motel; Preschool Institutions; Student Dormitory; House for the elderly |

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|  | **Design of Public Buildings** |
|  | **Four (4) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester VI | 2+3 | 30+45 | 75 |
|  | Semester VII | 2+3 | 30+45 | 75 |
|  | Semester VIII | 2+4 | 30+60 | 90 |
|  | Semester IX | 2+4 | 30+60 | 90 |
|  | Semester VI**Commercial and administrative buildings** Introduction and development Working place, development and composition of spatial systems, room characteristics by number of working places Types of commercial buildings Open space buildings (working premises and auxiliary premises, cell development in open systems) Buildings with meeting rooms (meeting room composition, communal buildingsand municipal departments) Buildings with counters' halls (teller services, post and bank offices, basic organizing principles) Aspects of architectural shaping of development trendsSchool BuildingsIntroduction - development, status and goals of social and institutional education (planning, location and school role in settlements) Location of the school building, content and landscaping. School development and school buildings development (content, from basic to complex structural characteristic) Educational and social content of contemporary schools. Architectural interpretation of contemporary principles in education, the educational process and didactics in the concepts of professional schools. Open-space areas contents of physical and social education in schools. Spatial and structural systems.Secondary education - architectural aspects of integration of subjects Aspects of architectural forms in the design of school buildings  EXERCISES:During the 6th semester, students shall conduct conceptual design of public buildings among commercial, municipal community buildings, bank and post offices. In addition shall conduct particular groups of educational buildings.  |
|  | Semester VIIFacilities for physical culture, recreation and sportsIntroductionReview of the development of physical education and sport from antiquity to the presentFacilities and sports culture: Open facilities (planning, pitches, auxiliary premises, athletic stadiums, football and other sports).The elements of the stadiumCenters for physical education and sportsSport halls for physical sport activities and sports manifestations (development, types and their division in gyms for general service and halls for sports and manifestations). Spas and poolsDevelopment of spas from the antique terms to the spas sports pools, planning and regulations. ·Open spas (spas with natural waters springs, spas with open-air swimming pools).Indoor pools, combined pools and pools for any weather condition.EXERCISES: During the 7th semester students shall conduct the conceptual design of school building (primary, secondary) with elements of main design. |
|  | Semester VIII Healthcare buildingsIntroduction, review on the development of health care and medicine, planning and building of health facilities networks.Types and division by destinationPrimary healthcare buildings outside of hospitalsDiagnostic services, therapeutic premises, intervention and animation premisesHospitals (development, division and planning)General hospitals, specialistic hospitalsCharacteristics of the development of the structure and provision of the basic contents of the hospitalsFunctional groups of hospitals:Stationary premises, other premises emergency unit, reception unit, diagnostics, Surgery units, birth giving unit, endoscopy, physiatrist, pathologic anatomical premises, autopsy unit, and chapel. Hygienic services and supply servicesEnergy services, traffic, security measures and ensuring permanent funktionality.Concepts of architectural, functional spatial forms.EXERCISES: During the 8th semester students shall conduct the conceptual design of sport facility (stadium, sport hall, open-air or indoor pools). |
|  | Semester IXTheatres Introduction, review of theatre development, auditorium, shapes, sizing, principle of visuals and acoustics: scenes, public premises, performers’ premises, contemporary concepts of the auditorium for contemporary performances.Cultural and Social CentresIntroduction (reflections on the development of cultural centres, planning, content, spatial structures of spatial structures of social centres, social cultural centres and development trends in the context of democratization of society in general.LibrariesIntroduction, reflections on its role in social cultural life, type of libraries, planning of library network by destination, organization of characteristic content of closed and public libraries, specific organization of premises of some types of libraries: district libraries, municipal, regional, national and university libraries).Museums Development overview, planning and types of objects, contents of the museum building, architectural principles of the spaces in terms of museum principles, types of objects according to their destination etc.EXERCISES: During the 9th semester students shall conduct the conceptual design of health care building or cultural building. |

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|  | **Architectural Structures III**  |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester V  | 2+2 | 30+30 | 60 |
|  | Semester VI | 1+2 | 15+30 | 45 |
|  | Semester VGeneral notions of Building PhysicsPhysical laws during the process of heat exchange; Heat conductivity through materials; Heat transfer; Heat exchange by radiation; Heat transfer over building elements; Homogeneous construction elements; Composite construction elements; Heat conductivity - the heat conductivity coefficient of construction materials and structural elements; Heat impact; Moisture impact; Heat transfer coefficient; Coefficient of heat radiation; Thermal protection through air strata; Calculation of thermal protection; thermal insulation and heat transfer through building elements; Heat transfer resistance; U – Value; Heat accumulation; Heating and Cooling; Exterior temperature oscilations; Heat losses; Thermal insulation of the building envelope; Moisture protection; Dew in building materials; Water vapour through structural elements and internal condensation; Calculation of water vapour in structural elements; Calculation of moisture; Minimum thermal insulation avoiding of dew formation; Thermal bridges in building structure; Slope roofs; Flat roofs; Cool / warm roofs insulation;EXERCISES:Individual exercises conduction calculation of thermal insulation, analysing and computing the amount of condensate in the external building elements such as walls, flat roofs, pitch roofs, floors above external areas, floors on ground, walls on ground etc.   |
|  | Semester VINoise InsulationGeneral occurrences, Sound level, sound pitch, frequency; Airborne and mechanical noise; Minimum Requirements for noise Protection of buildings; Structural elements due to noise insulation; Noise insulation in multi-storey Residential dwellings, attached dwellings and other buildingsAirborne Insulation Definitions; Homogenous structural elements; Mass and voids Impact in noise insulation;Composite structural elementsAirborne noise through air layer; Airborne noise through the layers; Partition walls; Homogenous partition walls; Composite partition walls; Composite partition walls between two dwellings; Ceiling protection from airborne noise impact; Homogenous ceilings; Composite ceilings; Improvement of sound insulation through floors; Doors and windows; Openings and ventilation; Noise insulation from mechanical impact; Ceilings; Floating floor; Solid ceilings; Wood Floors; Floor layers; Calculation of Noise insulation from mechanical impact; Noise insulation from other dwellings; Noise insulation of movable walls partition walls; Noise from installations; Traffic Noise insulation; Noise insulation from absorbing materials;Acoustics in Architectural General notions; Human ear acoustic properties; Sound analysis; Acoustic properties of materials and absorbent structures; Porous Absorber; Membrane absorbers; Resonator Absorbents; Spatial acoustics; Volume, shape, echo, reverberation and calculation of reverberation time; Hall acoustics; Acoustics of music halls; Classroom acoustics; Lecturing premises; Concert Hall; theatres; Some acoustic issues for halls. EXERCISES:The elaborate dealing with thermal and acoustic insulation calculation issues on multi dwelling housing building, including floor and section layouts in scale of 1:50 with appropriate details of 1:10 drawing scale containing thermal improvements and noise reduction. |

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|  | **The History of Architecture II** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester V  | 3+0 | 45+0 | 45 |
|  | Semester VI | 2+0 | 30+0 | 30 |
|  | Semester VThe history of the architecture in the new eraConcept of renaissance in architecture, in space as society Architectural expression language, elements and relationshipQuattrocento’s architects and their works.Italian and French renaissance in xvi century; Architects and their worksMannerisms, Michelangelo, PalladioBaroque architecture, Maderno, Bernini, Borromini, Guarini, Longena, MansariRococo in architecture and direction in eclecticism of the XIX centuryThe theory and practice of XVIII century rationalists Laugier, Lodoli, LedouxNew materials, programs and orientations in the XIX centuryEclecticism of the XIX centuryThe architecture of world exhibitions experimental fieldsMovements on the eve of XX century, preparatory stage in architectureSemester VIContemporary ArchitectureIntroductory analysis in contemporary architecture. Style 1900Jugendstil, Secession, Glasgow School, Art NouveauChicago School and the development of the theory of functionalism, Luis Sullivan and his works.Organic architecture. Frank Lloyd Right Application of reinforced concrete in contemporary architecture. Bauhaus and Walter GropiusMiss Van Der Rohe; Works and its impact on the contemporary architectureLe Courbusier, Works and its influence on contemporary architecture and urbanism. The Athens Charter (fr. Charte d'Athènes )Alvar Aalto; Synthesis of regionalism and modernity in ArchitectureRussian constructivism, contribution, and permanent professional valuesJapanese architecture, tradition and contemporary in the example of Kenzō Tange, the metabolism and the newest research of Japanese young architects.The modern architecture crisis of the 1960s, Venturi's theory and the researches and theories of Aldo RossiNew architects and their ideas: Stirling, Kurokawa, Isozaki, Krier brothers, Graves etc. |
|  | **History of Art** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester V  | 2+0 | 30+0 | 30 |
|  | Semester VI | 2+0 | 30+0 | 30 |
|  | Semester V and VIEach chapter includes the economic, social, ideological, cultural, other technicalities of artistic creativity, the appearance of epochs and directions in particular, artists and works of art.Prehistoric Art Egypt, Mesopotamia, Persia, Aegean, Greece, Etruria and RomeMedieval Art, Byzantium, IslamRomanesque, Romanic and Gothic artThe Early, Great Renaissance and Renaissance In Western EuropeBaroque, Classicism and RomanceRealism and ImpressionismContemporary Art, Architecture, Sculptures and Paintings. Expressionism, Fauvism, Regionalism, Futurism, AbstractionismSuprematism, Constructivism, Dadaism, Purism, Neo-Renaissance Neoplasticism and "De Stil"Socialist Realism, Neohumanism, Naive Art, Pop Art, Optical Art, New Realism, new trends, StructuralismKosovar art in the twentieth century: XX |

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|  | **The Fundamentals of Urban Design**  |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester VI  | 2+3 | 30+45 | 75 |
|  | Semester VI**Housing Block**Historical overview of the Housing Block developmentHousing Block creationContent of Housing BlockSizing and types of Housing BlockHousing AreaStructure of the housing areaThe size of the territory of the housing areaDetermination Criteria of housing territoryTopography Analysis of housing areaInsolationAuxiliary facilities in the housing areaRoads As Urban ElementsGeneral traffic characteristicsRoad profilesStreet’s and squares’ elementsTraffic flowsRoads in dynamic terrainArcades, passages, colonnades, fencesEXERCISES:Design of urban elementsThe conceptual design of the urban housing block on flat terrain |

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|  | **The Statics of Architectural Structures** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester V  | 2+3 | 30+45 | 75 |
|  | Semester VI | 2+3 | 30+45 | 75 |
|  | Semester V and VIStatically determined SystemsDetermination of cutting forces mtn to Statically determined SystemsStructural Analysis MethodsClassification of structures LoadsFundamental PrinciplesTerms of compatibilityKinematic structure analysisGeometrically variably systemsThe arch with three hingesLanger bearingsImpactive linesDetermining the most disadvantaged location of kinetic loadStatically determined trussesThe basics of the kinematic mechanismKinematic impactive method Displacement determination by unit force methodPrinciple of Virtual Force Principles for Calculation of Structural DeformationsNumerical principles for calculating generalized displacementsImpactive lines for displacementDisplacement diagramsStatically undetermined SystemsStatically determined and undetermined Structural Systems ComparisonMethods of calculating Statically determined and undetermined Systems – force methodBase system and excessive sizesConstruction of elastic equationsControl of statically undetermined diagramsThe rational solution of the base system Simplifying of base system selection by forces methodElastic deformations of Statically undetermined SystemsImpactive lines for Statically undetermined Systems - deformation methodsKinematic Determination RateRelationship between deformations and static dimensions of basic system elementsRelationships between deformations and static sizes in basic system elementsDesigning canonical equations with the deformation methodDetermining the system stiffness matrix by means of the element stiffness matricesExploitation of system code to form the system stiffness matrix by means of the element stiffness matricesEXERCISES: Numerical tasks. |

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|  | **Wooden Structures** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester VI  | 2+1 | 30+15 | 45 |
|  | Semester VIIntroduction to wooden structures.Basics of calculations; definitions and classifications, calculation theories - linear theory, boundary condition. Short load analysis, load grouping.Material properties; the parameters of hardness and stiffness, the characteristic values and the relationship between the stresses and deformations, the rheological calculation patterns; wood classification, wood types.Monolithic wood**S**orting, permissible stresses, characteristic strength values, volume, cross-sectional dimensions. The stability of wood structural elements according to permissible stresses; compression, tensile, bending and shear stresses. The theory of boundary condition use; partial safety coefficients for materials and loads, displacement of joints, boundary limit values. The theory of boundary bearing condition; tensile compression, bending, shear and torsion.Binding meansBolts, thorns, nails, gusset plates, hinges and adhesives.Connections and extensions of timber structures; the extension of compression and tension stressed bracings, the connection of the bars under the right angle, connection of compressed and tensile inclined bracings.RoofsRoof structure in general, general treatment. Laminated wood structures. Technological production process, structural features, types of cross sections, glued lamination beam.Bracket sizing and designing; straight with constant height, inclined with constant height, and arc shaped. Connections and extensions to the laminated structures; Bonding with look like hinges, modular bracket extension, Gerber hinges, the rigid links between the ridge and post. Spatial Stability of wood structure. Additional structural reinforcement from horizontal impacts in two orthogonal directions. Supply of bracket with greater height than its buckling. Side and gable reinforcements.EXERCISES: Papers with numeric examples and a building disposition layout. Each numeric task for each student, shall be of same topics with different input data.  |
|  | **Installations Water supply, Electric, Mechanical**  |
|  | **Water supply and waste water installations**  |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester V  | 1+1 | 15+15 | 30 |
|  | Semester VIntroduction: Water, water demands, quality, quantityResources, groundwater, surface and storm water; Filtration of drinking waterWater elevating, buster pumps, reservoirs; Hydraulic calculation of the water supply network; Internal water supply network fittings and sanitary fixtures;Water supply diagrams and works; Network testingWater supply – firefighting networkWastewater, type and content. Sanitary fixtures, floor drains, sanitary premisesPiping, type, materialHydraulic calculation of sewerage network. Household sewage axonometric drawings schemes, connection to city public network; Drainage and drains in buildings; Works on the sewerage network;Testing of the sewerage network, maintenance, waste water dischargeEXERCISES: On the dwelling layout or similar, schematically develop the conceptual piping network, of water supply and waste water network pipe sizing with sanitary fixtures.  |

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|  | **Electric Installations** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester V  | 2+1 | 30+15 | 45 |
|  | Semester VFundamental knowledge of the physical light properties and colors. Photometric units. Light sources. Incandescent bulbs. Halogen bulbs. Fluorescent bulbs. Mercury lamps. Sodium lamps. Chandelier. Lighting of interior premises. External public lighting.Definition and division of electrical installations. Power Consumption appliances. Design of electrical installations. Basic components of electrical installations. Selection, installation and connection of components in electrical installations. Calculation of electric intensity and drop voltage. Connection of the building into the public distribution network. Earthing in electrical installations. Protection against electric shock. Protection against direct and indirect contact. Protection of the building on the ground from atmospheric discharges. Lightning protection installation.EXERCISES: On the dwelling layout or similar, schematically develop the conceptual electric cabling network of electric, photometric calcualtions and lighting fixtures |
|  | **Mechanical installations** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester V  | 1+1 | 15+15 | 30 |
|  | Semester VGeneral part. Heating and thermal comfort. Temperature and metering units. Exterior design temperature. Heat lossesHeat transfer coefficient; data for calculation of the heat demand, room temperature of not heated premises; infiltration heat losses; overall heat demand; introduction measures during the building design. Annual consumption of heating energy. Heating system equipmentLocal heating, central heating systems. Heating appliancesRadiators. Tubular heaters. Panel heating fixtures. Plate heaters. Heaters with forced air circulation.Central heating systemsHeating with warm water. Steam heating. Heating with warm air. Radiation heating. Piping networkHeating with gravitation. Heating with pump operation. Ventilation Wet air. Elements of air pollution. Natural ventilation. Ventilation. Mechanical ventilation. Basic equipment of ventilation and air conditioning systemsFans. Air purification. Air heating. Cooling the air. Moisture and drying of air.EXERCISES: On the dwelling layout, schematically develop the conceptual heating network, and sizing of heating fixture, heating demand, heat losses, etc. |
|  | **Programming** | 1 | 30+30 |  |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester V  | 2+2 | 30+30 | 60 |
|  | Semester V Problem solving with computerProgramming languages; Numerical systemsData Types; AlgorithmsFortran programming language; Fortran formsReading and writing commands; Logical and rational expressionsSub programs; Work with the external memoryOpening and closing data filesSTOP, END, IF, GO TO, DO, CONTINUE, EXTERNAL, INSTRINCIC and DATA commandsEXERCISES:Solving the tasks as following the topics during the lectures. |
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|  | **Design of Industrial Buildings** |
|  | **Three (3) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester VII | 2+3 | 30+45 | 75 |
|  | Semester VIII | 2+3 | 30+45 | 75 |
|  | Semester IX | 2+4 | 30+60 | 90 |
|  | Semester VIIIntroductionDevelopment and economic activity in contemporary conditions as well as their structure that gives overall technological result. Functional elements and research methods in the future as well as the role of Architecture and Architect during research. The architectural education issues in the rapid social, technological and scientific development in general.Public parking and garagingOpen parking; Garage facilities; The importance of these facilities in the modern structure of the city; Mechanical garages; Garage with ramps; Elements of Garage parking; Construction and Architecture of Garage FacilitiesEXERCISES: During 7th semester will be carried out a methodical exercise, afterwards will be conducted a conceptual design with elements of the main design for Garage Building.  |
|  | Semester VIIIIntroductionStorehouseGrain Warehouses; Storage of rough products; Silage storage facility;Storage of disposable materials (manure, juice, etc.)StallsCattle stalls, Tie Stall Sheds, Free Stall Sheds, Milking system and their types; Maternity stalls; Stall for young cattle; Principles Compounds and examplesPig stalls; Poultry stalls LightingIndustrial BuildingCharacteristic types and structural elements in industrial facilities; Architectural and structural characteristics of concrete structures; Industrial buildings in storeys and their structural features; Equipment and processing of working spaces; Buildings and premises in the Industrial Compound; Garages and firefighters; Energy facilities; Daily lighting calculationsEXERCISES: During 8th semester each student will compile a conceptual design of a particular agricultural facility.  |
|  | Semester IXCommercial PremisesShopping mallsShopping centreStationary public transport facilitiesAirport TerminalsRailway StationsBus StationsCombined StationsIndustrial facilitiesIntroduction and historical overview of the construction of industrial buildingsCriteria for selecting the location for industrial complexesIndustrial areasIndustrial compoundsAnalysis of technological requirements Organizing of the traffic in industrial complexes and production hallsEXERCISES:During 9th semester each student will compile a design of a particular commercial and industrial facility  |

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|  | **Urban Design 1** |
| U | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester VII  | 3+3 | 45+45 | 90 |
|  | Semester VIII | 2+4 | 30+60 | 90 |
|  | Semester VIIThe purpose of the subject - knowledge of the typology of settlements, the understanding of the local community, the principles of local community design, introduction of the fundamental urbanistic category, population as a factor in urban design, human needs, zooning orientation and functional areas as well as urban planning concepts and spatial planning.Typology of settlementsLocal communityFundamental urban categorizationPopulation as a factor in urban design Human needsValuable orientationsFunctional zoning and functional urban areasHousing Urban planning and spatial planningEXERCISES:Design of the local community for 5,000 people |
|  | Semester VIIIObjective – introduction of industrial zoning, warehouse and service areas, urban centres, sports and recreation areas, mobility and urban elements.Urban design of industrial areas warehouse and service areasUrban social centresSquares ParksThe sport and recreation area of trafficUnderground UrbanismUrban elementsEXERCISES:Design of the regional social centre for 50,000 Residents |

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|  | **Concrete Structures** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester VII  | 2+3 | 30+45 | 75 |
|  | Semester VIII | 2+3 | 30+45 | 75 |
|  | Semester VII and VIII The reinforced concrete attributesBackground of the development of reinforced concrete Fields of use of reinforced concreteAdvantages and disadvantages of reinforced concretePhysical and mechanical properties of concreteReinforcementMethods of calculation of reinforced concrete Permissible stress design methodSizing method of bending structuresStructural stress controlBoundary condition design method Sizing of bending elements with rectangular cross section and T-shaped sectionSizing of elements that work in axial compressive stress and axial compressive stress without bucklingSizing of the elements that work on axial compressive stress reinforced with longitudinal rebar, stirrups and elements reinforced with spiral reinforcement Sizing of the elements that work axial tensile stress Sizing of elements working in eccentric compression- the case of minor eccentricity and the case of major eccentricitySizing the elements that work in eccentric tensile stress – the case of minor eccentricity and the case of major eccentricitySizing the elements that works on shear stress (tangential)Sizing of elements that work in torsion and bending with torsionDesigning, sizing and reinforcement of structural elementsFormwork and PositioningSlabs and cantilever beamSimple beam, Continuous Beam, Anchored beam, Two way reinforced slab,Staircases, Slab with concrete joist system: monolithic and semi precast joists Foundations, Isolated footing, Strip footing, Raft foundation,Flat slab, Waffle slabEXERCISES: Numerical tasks shall be performed for each topic.Graphical presentation of the calculations, design sizing and reinforcement of cantilever beam, simple beam, staircases, a building with two way slab reinforcement, continuous beam, columns and foundations. |

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|  | **Metal Structures** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester VII  | 2+1 | 30+15 | 45 |
|  | Semester VIIIntroduction. The field of use of metal structure and their main characteristics.Fundamentals of sizing and designing of Metal Structures.Degree of safety, Permissible stress design method.Boundary condition design method Steel production assortments.Tools for joining and fittings elements in metal structures.Tools for forging and welding**Designing and making of extensions**Partial and universal extensions.Possible positions of two beams connected an angle.Designing and making of rod joints on truss nodes.Centring the polesTube (pipe) trusses.Designing and making of structural rodsCompression stresses rods Designing and making structural beamsConstruction of lamina beamsWelded beams, shapes and ways of constructionSizing of beam cross section.Introduction. Types of metal structure buildings, the construction methodology in general.Building covering, types of coverings.Braces, sizing and designMain girdersMain linear spatial girder, three dimensional trusses, suspended roofsDistribution of main girdersJoints in metal structure buildings **Metal poles**The connection of the pole with truss shaped girderBearings in generalSurface bearings, tangential bearings, Spherical and cylindrical bearingsBuilding envelope structureEnclosing massive brick wall, corrugated sheets, autoclaved masonrySorting of vertical longitudinal joints and movement joints.Bridge crane runway Mobile cranes, cantilever and revolving cranes, under girders beamEXERCISES: It is foreseen a task to: Compile a deposition of industrial hall facility. The elaborate on industrial hall shall contain: Technical Specification and considered solution variants with detailed description and final rationale of the adopted variant. Design disposition on appropriate scaling with general details of beam and pole, pole and foundation.  |

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|  | **Spatial Structures** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester VIII  | 2+1 | 30+15 | 45 |
|  | Semester VIII Structural Systems:General notation ; Classification of structural systems: Classification by load transmission, Classification by geometric form, Classification by storeys.Plain load bearing structure: History; Beam shaped structure; Frame shaped structures; Arc shape structures; Combined shape structures.Spatial Load bearing structures ShellsGeneral notation; Types of shell structures; Revolving shells; Surface of Translation:Cylindrical shells: Longitudinal Cylindrical shells, short Cylindrical shellsConoidal shellsDouble arched shells: revolved Paraboloid; elliptical paraboloid; Hyperboloid; Hyperbolic paraboloids; Shells in the form of domes; Wavy domes.Calculation of internal forces:Hypothesis and shell calculations; Cutting Forces and momentum; The internal forces in the revolving shell according to the theory of no momentum.Folded structures: Operating of folding structures; Static function of elements; parallel folding structures; non parallel folding structures; structures with intersection folded plates.Suspended structures:One directional curved suspended structures; Bi directional curved suspended structures; Combined rope and rod structures; TentsStructural details of suspended coverings.Spatial frame structures:Basic elements of spatial trusses; Planar Flat Structures; Curved structures; Making of bearing joints.Completion of coverings on spatial structuresCoveringThermal Insulation; Storm water discharge; Expansion joints; Lighting; Monolithic concrete casting: Formwork, reinforcement and casting concrete.EXERCISES:Seminar Paper on spatial structures |

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|  | **Foundation Structures** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester VIII  | 2+0 | 30+0 | 30 |
|  | Semester VIIIEngineering classification of soils.Research workPhysical-mechanical properties of soils (specific weight, volume, water content, granularity, plasticity limits and porosity).Water is soilSoil resistance on sliding.Soil settlement, soil consolidation, Pore water pressure and time flow settling.Strain distribution on soil and its evaluation.Soil bearing capacity on the basis of laboratory and in site findings "in situ"Soil pressure on the retaining wallsLoads which acts on the foundations, basic foundation design requirements, determination of the foundation depthShallow foundations.Foundations protected by lagging lumber, curtains and diaphragmsFoundation on piles (wooden, concrete, reinforced concrete and metal piles; cantilever pile load baring pile capacity, actual loads on piles).Well foundation (construction of the well, types and potential use of wells; well protection from flooding) and kesoniEXERCISES:During the semester, it is foreseen combined lecturing in combination with the practical narration in the geotechnical lab.Regarding foundation topics it is foreseen a site visit in a particular construction site.Also, regarding the foundation topics, shall be compiled a numerical task. |

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|  | **Organization and Construction Technology** |
|  | **Two (2) Semesters** | L+E h/w | L+E h/s | Total h |
|  | Semester VIII  | 2+2 | 30+30 | 60 |
|  | Semester IX | 2+4 | 30+60 | 90 |
|  | Semester VIIIArt of construction and the nature of constructionNotions of work organizationOrganizational sciences (organization, administration, management, terminology) Construction management Site preparatory worksConstruction TechnologyThe notion of technologyConstruction Mechanization Machinery EconomicsPlanning and Programming MethodsStatic Programme and Dynamic ProgrammeTime scheduling technique PricingUnit Price CalculationOther Methods of Calculation.PRACTICAL WORK:Use of norms and standards in different calculationsTeamwork in small working groups. |
|  | Semester IXConstruction Project management (CPM)Investment project and its elementsStages of investment project,Parties involved and their relationshipPaper work and DocumentationProject financingContracting of works Planning and Project implementation control,Interpersonal relationship within the Project,Preparatory workSummary of CPM PRACTICAL WORK:Construction Project management as follows:Bill of quantityPrice Analysis and resourcesSpecification of the materialTechnological analysisSelection of machineryConstruction planning and programmingSite arrangement |

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|  | **Urban Design II** |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester IX  | 2+4 | 30+60 | 90 |
|  | Semester IXUrban and spatial planning, notion and meaningShort overview of urban and spatial developmentDevelopment of urban planning in our environment What is urban planning?What is the urban design?Approach Researching and drafting of Urban PlanningWorkload in spatial planning relationship between knowledge and its application Timing factor in urban planningPlanning and spatial structures of the cityUrban FunctionsFunctionality in the cityUrban economic aspects of spatial organization of the city theoretical models of the spatial structure of the cityMethodological Complex in Urban and Spatial PlanningFundamentals of Analytical documentingGoals / TargetsMathematical models in planningPlan ImplementationPRACTICAL WORK:Spatial and Urban city Planning |
|  | **Interior Design**  |
|  | **One (1) Semester** | L+E h/w | L+E h/s | Total h |
|  | Semester IX  | 2+3 | 30+45 | 75 |
|  | Semester IXIntroductory lecturePrimary Entrance Entries: Walls, Floors, CeilingsSecondary elements in the interior: Fixed furniture, Mobile furnitureTertiary elements in the interior: Paintings, Curtains, PlantsDecorating elements: Colours, Colour Circle, Impact of coloursInterior Lighting: Direct, Indirect, and Half-Indirect LightingEXERCISES:Each student will compile Interior design of a particular premise  |
|  | **Diploma**  |
|  | **One (1) Semester** |  |  | Total h |
|  | Semester IX  |  |  | 450 |

Tabular view of Subjects

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Semester | **I** | **II** | **III** | **IV** | **V** | **VI** | **VII** | **VIII** | **IX** | **X** |
|  |  | S | L+U | L+U | L+U | L+U | L+U | L+U | L+U | L+U | L+U | L+U |
| 1 | Architectural Drawing | 1 | 1+3 |   |   |   |   |   |   |   |   |   |
| 2 | Descriptive Geometry | 2 | 3+3 | 3+3 |   |   |   |   |   |   |   |   |
| 3 | Hand Drawing I | 2 | 2+2 | 1+2 |   |   |   |   |   |   |   |   |
| 4 | The Fundamentals of Architectural Design I | 2 | 2+2 | 2+2 |   |   |   |   |   |   |   |   |
| 5 | Architectural Structures I | 2 | 2+2 | 2+4 |   |   |   |   |   |   |   |   |
| 6 | Mathematics | 2 | 2+3 | 2+2 |   |   |   |   |   |   |   |   |
| 7 | Construction Materials | 1 |   | 2+1 |   |   |   |   |   |   |   |   |
| 8 | The Fundamentals of GND and CSD I | 2 | 2+0 | 2+0 |   |   |   |   |   |   |   |   |
| 9 | The Fundamentals Marxist Philosophy | 2 | 2+0 | 2+0 |   |   |   |   |   |   |   |   |
| 10 | Geometric Perspective | 1 |   |   | 2+3 |   |   |   |   |   |   |   |
| 11 | Hand Drawing II | 2 |   |   | 1+2 | 1+2 |   |   |   |   |   |   |
| 12 | The Fundamentals of Architectural Design II | 2 |   |   | 2+3 | 2+3 |   |   |   |   |   |   |
| 13 | Architectural Structures II | 2 |   |   | 2+3 | 2+3 |   |   |   |   |   |   |
| 14 | History of Architecture I | 2 |   |   | 2+3 | 2+3 |   |   |   |   |   |   |
| 15 | Mechanics | 1 |   |   | 2+2 |   |   |   |   |   |   |   |
| 16 | The Resistance of Materials | 1 |   |   |   | 2+2 |   |   |   |   |   |   |
| 17 | Geodesy | 1 |   |   |   | 2+1 |   |   |   |   |   |   |
| 18 | Sociology | 2 |   |   | 2+0 | 2+0 |   |   |   |   |   |   |
| 19 | The Fundamentals of GND and CSD II | 2 |   |   | 2+0 | 2+0 |   |   |   |   |   |   |
| 20 | Design of Housing Buildings | 3 |   |   |   |   | 3+4 | 2+3 | 1+4 |   |   |   |
| 21 | Design of Public Buildings | 4 |   |   |   |   |   | 2+3 | 2+3 | 2+4 | 2+4 |   |
| 22 | Architectural Structures III  | 2 |   |   |   |   | 2+2 | 1+2 |   |   |   |   |
| 23 | The History of Architecture II | 2 |   |   |   |   | 3+0 | 2+0 |   |   |   |   |
| 24 | History of Art | 2 |   |   |   |   | 2+0 | 2+0 |   |   |   |   |
| 25 | The Fundamentals of Urban Design  | 1 |   |   |   |   |   | 2+3 |   |   |   |   |
| 26 | The Statics of Architectural Structures | 2 |   |   |   |   | 2+3 | 2+3 |   |   |   |   |
| 27 | Wooden Structures | 1 |   |   |   |   |   | 2+1 |   |   |   |   |
| 28 | Installations Water supply, Electric, Mechanical  |   |   |   |   |   |   |   |   |   |   |   |
|   | Water supply and waste water installations  | 1 |   |   |   |   | 1+1 |   |   |   |   |   |
|   | Electric Installations | 1 |   |   |   |   | 2+1 |   |   |   |   |   |
|   | Mechanical installations | 1 |   |   |   |   | 1+1 |   |   |   |   |   |
| 29. | Programming | 1 |   |   |   |   | 2+2 |   |   |   |   |   |
| 30. | Design of Industrial Buildings | 3 |   |   |   |   |   |   | 2+3 | 2+3 | 2+4 |   |
| 31 | Urban Design 1 | 2 |   |   |   |   |   |   | 3+3 | 2+4 |   |   |
| 32. | Concrete Structures | 2 |   |   |   |   |   |   | 2+3 | 2+3 |   |   |
| 33. | Metal Structures | 1 |   |   |   |   |   |   | 2+1 |   |   |   |
| 34. | Spatial Structures | 1 |   |   |   |   |   |   |   | 2+1 |   |   |
| 35. | Foundation Structures | 1 |   |   |   |   |   |   |   | 2+0 |   |   |
| 36. | Organization and Construction Technology | 2 |   |   |   |   |   |   |   | 2+2 | 2+4 |   |
| 37. | Urban Design II | 1 |   |   |   |   |   |   |   |   | 2+4 |   |
| 38. | Interior Design  | 1 |   |   |   |   |   |   |   |   | 2+3 |   |
|   | Diploma  | 1 |   |   |   |   |   |   |   |   |   | 5+25 |

L-lectures hours per week U-exercises hours per week S-number of semesters per subject