



**Curso de Arquitetura e Urbanismo**  
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**COURSE DESCRIPTIONS – PROGRAM IN ARCHITECTURE AND URBANISM**  
CATHOLIC UNIVERSITY OF RIO DE JANEIRO

## ENGLISH VERSION

### **ARQ1000 – INTRODUCTION TO THE PRACTICE OF ARCHITECTURE**

Fundamental concepts of architecture, urbanism and the city. The cultural significance of architecture and preliminary notions of the built heritage. Different activities and opportunities present in the professional domains of the architect. Ethics and social responsibilities of architecture. The institutions, official governmental bodies for the supervision and regulation, and associations of architecture.

### **ARQ1001 – THEORY AND HISTORY OF ARCHITECTURE I**

This course aims at studying the development of the classical language in architecture through the recognition of its underpinnings. This study will be conducted by guided readings and individual analyses of some of the most significant works of western classic architecture, taking into consideration their cultural contexts.

### **ARQ1002 – THEORY AND HISTORY OF ARCHITECTURE II**

Investigation of the two main notions that support the development of architecture in modernity: form and space. The formation of the baroque image. The context of the emergence of the cultural, social and technical modern phenomena. The industrial revolution and the transformations in architecture. Study of the paradigmatic works and poetics of the protagonists of the modern movement. Presuppositions on the integration of the arts, from artistic vanguard movements, with issues in painting and sculpture linked to those in architectural form and space.

### **ARQ1003 – URBANISM**

The city as space of intervention and the role of the urban planner and designer. Different concepts on the city. Utopian concepts and urban plans. From punctual interventions to global planning. Metropolitan and regional planning. Notions of scale in the built environment. Collage city and strategic planning. Urban landscape, environmentalism and sustainable development. Urbanism and authoritarianism.

### **ARQ1004 – URBAN AND REGIONAL PLANNING**

Territory, region and the city. The different scales of planning. Metropolitan and regional planning. Theories of urbanism. Local development plans. Planning systems and development units. Legal, institutional and economical aspects of urban and regional planning. Planning and management. Information systems for planning (GIS, statistics, etc.).

### **ARQ1005 – THEORY AND HISTORY OF ARCHITECTURE III**

The debate on modernity and post-modernity. Conceptual grounds of contemporary architecture. Theories of contemporary architecture. Critical regionalism. Architecture and context. Deconstructivism, neorationalism and supermodernism. Architecture of foldings. The situationist international movement. Digital architecture.

#### **ARQ1006 – ENVIRONMENTAL CONTROL**

This course aims at filling a gap in the education of architecture generated by its relative detachment from environmental and sustainable concepts and their implication in the built environment. Synthesis of the systematization of knowledge on climates, which – for centuries – has institutively been followed with the aim of protecting and comforting men, with an emphasis on tropical climates.

#### **ARQ1101 – INTRODUCTORY DESIGN STUDIO**

Architectural context and architectural language. Scale, proportion, architectonic elements and graphic analyses. Volumes and three-dimensional modeling. Composition and intent. Architectural references. Introduction to architectural design.

#### **ARQ1102 – HOUSING DESIGN STUDIO I**

Analysis and design of the residential architectural space. Studies of form and volumes. Inhabiting and living. Resting, producing, entertaining in the space of the residence. Organization and structuring of space in the scale of the home. Study of the relationships among the housing unit, the site and the urban context, observing physical characteristics, typological conditions, proportion and scale. Flows, circulations and connections in interior spaces, among them and with the exterior. Continuity of the studies realized in the previous design studio, with added emphases on: form and volumetric studies of the architectural space, organization and structuring of space. The study of the spatial relationships and proportions among sectors, rooms and the exterior spaces of a residence. Studies of the dimensions of residential spaces, sectors and atmospheres through the critical use of precedents visited during the course. The relationships of the architectural artifact with the site and immediate surrounding context, observing its typologies, proportion, scale and physical and environmental features of solar orientation, topography, hydrography, vegetation, neighboring buildings, among others. Notions of design methodology and phasing. Notions of structural design.

#### **ARQ1103 – WORKSPACE DESIGN STUDIO**

This architecture design studio is concerned with the formal and informal spaces where production activities are carried out. The studio discusses functional activities in specialized areas, highlighting the necessary commitment of the design process with the concept of 'work production', and its formalization and integration in public and private space.

#### **ARQ1104 – COLLECTIVES SPACES DESIGN STUDIO**

This studio focuses on spaces dedicated to public and collective uses. It deals with the context that interrelates men and collective space. Analysis of spaces of common use, squares, parks, leisure areas, schools, stadiums, transportations hubs, concert halls, cultural spaces, markets, temples, etc. Discusses the role of cities as engines for the generation of public spaces in opposition to private ones, and the process of occupation and construction of identity that such spaces require within a given culture.

#### **ARQ1105 – PRESERVATION AND RESTORATION DESIGN STUDIO**

City, history and architectural heritage. From restoration to conservation, preservation and recovery of historical and cultural heritage. Notions of architectural restoration. Repurposing and reutilization of architectural spaces and of underused buildings. Recycling of constructive components. Coupling of new building techniques and materials with traditional ones. The recovery of historical centers. The design portion of this course deals with spaces of both symbolic and historical relevance in the city and their possibility of being repurposed for contemporary adequate uses. Verifies the possibilities for renovation of a given region through the intervention in a specific building in abandoned or deteriorated conditions. Different architectural programs are evaluated by confronting the possibilities for the integration of historical and contemporary components. Analysis of the action of time over architectural artifacts, where the transformation and adaptation of a given building to current conditions is realized through its preservation and renovation.

#### **ARQ1106 – URBAN DESIGN STUDIO**

Conceptualization. Urban morphology. Theories of urban form. Public and private spaces. Uses, functions and urban equipment. The interrelations among buildings, flows of transportation, infrastructure networks, vacant areas and public spaces. Plan and design. Urban parceling. Interventions in consolidated areas. Development of urban projects.

#### **ARQ1107 – UTOPIAN ARCHITECTURE DESIGN STUDIO**

The architecture design studio 'Utopian Architecture' proposes the use of the fantastic as the conceptual leverage to the critical realization of concrete architectural models. The studio highlights the necessary commitment of the design process to more creative and liberated modes of operation and prospective visions of the discipline. It invites students to elaborate hypothetical social-physical scenarios taking a projected imaginary reality as the background for it, and considering the implementation of new technologies. Theoretical and practical discussions on innovative themes in the fields of utopia, imagination, critical action, design, technology, among others, are cornerstones of the course.

#### **ARQ1108 – HOUSING DESIGN STUDIO II**

This studio focuses on collective housing complexes. Design of the private collective spaces of a given architectural complex. Emphasis on residential spaces. The metropolitan condition of dense spaces. The infrastructure of collective buildings. The study of different precedents of collective residential buildings from modernism to today. The relationships between the building and the city are verified considering aspects of time, society, among others. Throughout the design exercise of the studio, different questions on modes of conceptualization and occupation of the collective residential space are analyzed through participative and experimental research methods. Selection of abandoned and problematic areas of cities for housing developments with the aim of filling urban voids through residential use to create positive interferences in the urban tissue, consequently generating their valorization.

#### **ARQ1109 – DIPLOMA PROJECT PREPARATION**

Definition of the theme to be developed individually by students for their diploma project and the option of working with either architectural or urban scales. Research proposal. Conceptualization of the proposal, justification and theoretical arguments. Selection of the supervisor and reviewers, and of the physical and social contexts of the project. The proposal shall be submitted for approval.

#### **ARQ1110 – DIPLOMA PROJECT**

Individual work. Development of a project within the fields of either architecture or urbanism, or of a research of theoretical or experimental nature, under the supervision of a faculty member. Public presentation and defense of the diploma project.

#### **ARQ1111 – LANDSCAPE ARCHITECTURE STUDIO**

This studio-based course introduces students to the discipline of landscape design through the elaboration of a project utilizing the appropriate graphic presentation techniques. The course provides students with introductory knowledge in the following subjects: history of gardens and landscape design; identification of vegetation species by family; performance measurement techniques and evaluation of the use of different vegetation species in their use in landscape design.

#### **ARQ1318 – SPECIAL TOPICS IN ARCHITECTURE III**

This course is dedicated to accommodating different educational activities related to academic exchanges of different natures organized by the program. Its specific content varies according to specific initiatives ranging semiannually or according to specific demands.

#### **ARQ1319 – SPECIAL TOPICS IN ARCHITECTURE IV – History of Photography for Architects and Urbanists**

Trajectory of photography, from its origins to the present day, with emphasis on the production of the photographers, art movements and government initiatives of particular interest to architects and planners. Photography and city. Photography and society. Photography and contemporary art. Photography and market.

#### **ARQ1324 – SPECIAL TOPICS IN ARCHITECTURE IX - Introduction to Architecture (for transferred students)**

Introduction to the world of architecture, its language and foundations. Development of observation and technical drawing as fundamental forms of expression in the discipline of architecture. Experimentation on modeling as a means of understanding of structural principles and construction techniques. Introduction to the discipline of urbanism by living in the city.

**ARQ1325 – SPECIAL TOPICS IN ARCHITECTURE X – Circulation, Mobility and Urban Transportation**

Develop notions about the importance of the phenomena related to urban traffic, the viability of the proposed interventions, both architectural and urban, in the formulation of public policy and decisions about investments. Discuss the strategic importance of movement in urban and regional economy, strengthening the participation of transport costs on the viability and efficiency of economic activities and urban administrations. Discuss transportation policies (public) involving the mobility for people and products, and accessibility to various locations of cities and circulation alternatives and their impacts. Present and discuss methodologies for the characterization of these phenomena, problem identification and formulation of diagnoses related to traffic and urban and regional transit. Discuss techniques to meet existing and future demands.

**ARQ1328 – SPECIAL TOPICS IN ARCHITECTURE XIII**

Variable content.

**ARQ1329 – SPECIAL TOPICS IN ARCHITECTURE XIV – Advanced Representation Techniques**

Project representation through digital technologies.

**ARQ1331 – SPECIAL TOPICS IN ARCHITECTURE XVI – Experimental Construction Site**

Study of structural models, using historical references, as design foundations. Experimentations starting from a base material proposed to be studied throughout the semester. Understanding the behavior of the material, through experimentation, and technical possibilities offered to the construction, by the experience of the construction site. Generating constructive models. The dialectic between design and construction. Employment of designs as tools approximation of the finished structure. Notions of security and organization of work on the construction site. Introduction to concepts of planning, phasing and control works through practical experience. Construction of a work designed and developed collectively from the experiments conducted. Use of electronic tools for structural design and analysis as an aid to technical development process. Exercise activities building practices that promote the recovery of critical knowledge and talents forgotten and popular techniques. Trials that demonstrate using empirical comparison (more popular) and scientific (technical knowledge) of appropriate design traditions.

**ARQ1342 – SPECIAL TOPICS IN ARCHITECTURE XXVII**

Through different workshops, this course provides the theoretical, conceptual and technical resources for the development of representation tools capable of building visual arguments consistent with the complexity required by design processes. The tools provided will allow a better grip on the different scales of operation of the architect, ranging from the territory to that of the artifact and their intermediate states.

**ARQ1342 – SPECIAL TOPICS IN ARCHITECTURE XXVII**

Variable content.

**ARQ1343 – SPECIAL TOPICS IN ARCHITECTURE XXVIII – Architectural 3D Modelling**

Three-dimensional modeling techniques for organic and orthogonal forms. The understanding of the project from the three-dimensional modeling. Summary of the project from 3D graphic development. Morphology and relationship with the surroundings. Reading the city and the urban in three dimensions. Sunpath, volume, full and empty, context, manipulation of plants. Introduction to the principles of computer graphics animation.

**ARQ1345 – SPECIAL TOPICS IN ARCHITECTURE XXX – Theater Cenography**

The evolution of the architecture and types of theater spaces. The theatrical set design in time and modalities of contemporary spectacles. The theatrical space, technical resources scenography and its logistics. The team and their theatrical skills. Elements and tools of scenographic design and its technical project.

**ARQ1347 – SPECIAL TOPICS IN ARCHITECTURE XXXII – Introduction to Parametric Modelling**

Introduction to specific architectural design and computer-aided applications like CAAD (computer aided architectural design). Introduction to modeling complex surfaces and parametric systems for exploiting the digital model as the support of the design process of architectural form. Exercise the students in the choosing strategies for thinking parametric design as a tool for

creation, assessment, understanding, communication and representation of projects. Import and export of design and design in 2D and 3D media presentation in different projects. Start the student in the field of digital fabrication. Basics for making prototypes of complex surfaces.

#### **ARQ1348 – SPECIAL TOPICS IN ARCHITECTURE XXXIII – Study Trip**

This course is reserved for educational activities related to study trips undertaken as part of the ongoing academic initiatives of the program. Study trips organized in the context of this course are supervised by the competent teaching staff and its program vary according to specific demands.

#### **ARQ1355 – SPECIAL TOPICS IN ARCHITECTURE XL – Forms and Structure in Architecture**

Technological and formal experiments in architecture and the interrelationships with the continuous social, urban and environmental in shifts in history and different cultures. Nature and the human aesthetic in Nervi's thesis. The phenomenological process inherent to structural and formal architectural construction activity. The industrialization of construction: prefabrication and serial reproducibility. Industry and society. Artificial materials and methodological processes of design and construction. Major engineering works of the late nineteenth and early twentieth century. The rationalization of materials and construction systems and the interrelations with the arts and society. Reproducibility serial and suggestions of large-scale collective dwellings. The Brazilian specifications. Aspects of the transition from industrial societies to post-industrial: the new design and construction techniques and new aesthetic paradigms. Study of precedents.

#### **ART1020 – OBSERVATION DRAWING I**

Drawing as the means of expression of visual thinking, as analytical process of the constitutive elements and composition laws of the structures being subject to visual perception and representation methods.

#### **ART1027 – DESCRIPTIVE GEOMETRY**

Basics of descriptive geometry. Mongian representation. Studies of points, lines and planes. Edges and surfaces. Intersection of planes. Analysis of descriptive methods. Introduction to the study of polyhedrons. Architectural surfaces. This is a fundamental course that aims at developing the perception of space through graphic representation and spatial three-dimensional thinking.

#### **ART1028 – ARCHITECTURAL DRAFTING I**

Graphic thinking as communication process: graphic reasoning applied to architecture. Introduction to projection systems: orthographic, oblique and conical; orthographic projection: plans, sections and elevations. Scales of representation and graphic conventions used in architectural design. Drafting instruments, techniques and norms of representation.

#### **ART1029 – ARCHITECTURAL DRAFTING II**

Cylindrical perspective: isometric, cavalier and military. Conical perspective, the process of three scales and measuring point for shadow studies.

#### **ART1030 – ARCHITECTURAL DRAFTING III**

Introduction to computer aided design (CAD) through specific software. This course prepares students to use different digital methods for the creation, evaluation, comprehension, communication and presentation of projects of architecture and urbanism. Basic concepts of digital representation and three-dimensional modeling. Digital representation and design process. Two-dimensional drafting (plans) and three-dimensional modeling (virtual models). Distribution and organization of the different information layers of drawings. Building a reference library for CAD. Three-dimensional visualization. Presentation and animation tools. Computation and multimedia applied to the simulation of built environments.

#### **ART1052 – THE PHOTOGRAPHIC IMAGE**

Theoretical notions of photography. Photographic composition as means of expression and representation of ideas. Traditional and digital photographic processes. Cameras, lensed, films and chemicals. High-resolution computing for photography and cinematography.

**ART1210 – FOUNDATION STUDIES IN VISUAL LANGUAGE I**

Basic elements of visual language and their possibilities, strategies and techniques. Stimulus to the development of spatial and representational thinking.

**ART1420 – MODERN AND CONTEMPORARY CULTURES**

The artistic and cultural revolutions of the 20th century: innovative experiences in the domains of art and culture.

**ART1844 – FORM IN ARCHITECTURE**

Development of formal thinking and vocabulary through practical exercises and visual readings of aesthetic objects. The dimension and plasticity of perceived space; development of spatial perception. Experimentations in representation and creative interpretation.

**CIV1111 – ARCHITECTURAL STRUCTURAL SYSTEMS I**

Provide the students with an overview of structural systems as well as the most commonly used materials aiming at using such alternatives in the design phase of various structural systems for architecture. Give a general view of the most commonly used types of structures for each type of material so that the architect can actively take part in their selection. Demonstrate advantages and disadvantages of the most commonly used structural materials.

**CIV1112 – ARCHITECTURAL STRUCTURAL SYSTEMS II**

Basic concepts in structural analysis: structural models, balance and compatibility. Principles of the superimposition of effects and linear behavior. Principles of virtual works. Usage of computer software of structural analysis. Simplifications for symmetrical structures. Designing in limit conditions. Actions and reactions of forces in general. Physical and mechanical properties of wood. Building systems and structural materials for steel constructions. Dimensioning and verification of single or composed-section components. Binds. Building details.

**CIV1113 – ARCHITECTURAL STRUCTURAL SYSTEMS III**

Introduction to structural design. Design of structural systems for architecture. Principles for safety verification: last liminal and service states. Concepts of prestressed concrete. Properties of concrete: resistance, deformation, retraction and thermal effects. Processes and equipment for prestressing, anchorage, cable binds, prestressing degrees, injections. Losses in prestressing. Dimensioning of the main structural components of a building.

**CIV1301 – TOPOGRAPHY IN ARCHITECTURE**

Prepare students to understand the topographic surveys required for architecture, urban planning and design, regional planning and landscape architecture. Geomorphology and topographic surfaces. Measurements of angles and distances with land survey instruments. Planimetrics and altimetrics. Method for land surveys with high, medium and low precisions. Geometric, trigonometric and tacheometric surveys. Topographic charts. Magnetic declination and true north in topographic charts. Basics of aerophotogrammetry, photographic interpretation and remote surveys.

**CIV1305 – CIVIL CONSTRUCTION**

Construction technology for buildings and other types of construction. Preliminary works and implementation of the construction site. Construction site location. Execution of foundation works. Building systems. Structures in masonry, concrete, steel and wood: materials, equipment and building processes. Execution of formworks. Execution of building infrastructures. Roofs: waterproofing. Coverings: painting, thermal and acoustic insulation. Windows, metallic components and glassworks. Construction planning and control. Techniques or quality control. Heavy construction. Prefabrication.

**CIV1324 – ARCHITECTURAL AND URBAN INFRASTRUCTURES**

Hydraulios infrastructure for cold and hot water, sewage systems, drainage systems and fire control. Gas piping. Notions of electrical current and resistance. Principles of electrotechnics. Electrical infrastructure. Telephone, TV and data networks. Waste management. Technical norms, regulation and specific documentation. Notions of urban infrastructure: water, sewage, drainage, electricity, telecom, IT, and fiber optics networks.

#### **CIV1581 – GEOTECHNICS IN ARCHITECTURE**

Introduction to geotechnics. Physical indexes. Classification of soils. Notions of soil sampling and surveys. Soil tensions. Involving resistance. Compression. Resistance against rupture. Stability analysis: retaining walls, landfills and excavations. Thrust in active and passive stationary conditions. Soil stabilization structures. Gravity walls. Direct and deep foundations: criteria for the selection of foundation types. Drainage and lowering of water tables.

#### **CIV1715 – ENVIRONMENT AND SUSTAINABLE DEVELOPMENT**

Historical evolution of the environmental question. Environmental problems in global scale. The concept of sustainable development and future perspectives. Destruction of the ozone layer, acid rain and greenhouse effect. Conservation of biodiversity. Desertification.

#### **LET1920 – ANALYSIS AND PRODUCTION OF ACADEMIC TEXTS**

Production of argumentative text centered around requisites of clarity, precision and unity. Descriptive texts. Scientific writing. Rhetorics.

#### **FIL1815 – AESTHETICS**

Theory of art; the problematics of the production of art; nature of creativity; characteristic concepts of the different conceptions of art. Relationship between art and society. The concept of art.

#### **ENG1226 – CONSTRUCTION PLANNING AND MANAGEMENT**

Calculation of ares: Brazilian technical norms. Documents for approval in real-estate registries and for public financing. Building and contracting contracts. Budget planning. Cash flows and aggregation curves of resources. The financial system for housing. Financing possibilities. Planning: time planning and budget control. PERT-CPM planning techniques. Quality control systems for construction. Total quality. Productivity. The use of computer in the quality control systems of construction and in budget planning: software for planning and management of constructions. Management information systems. Notions of legal engineering, supervision and reports. Labor regulations. Notions of hygiene and workplace safety; risk control and prevention; the work environment and its disease; specific legislation and technical norms.

#### **HIS1430 – HISTORY OF ARCHITECTURE IN BRAZIL**

Civil and religious architecture in the colonial period. The origins and development of modern architecture in Brazil, engaged from the French Artistic Mission and its subsequent steps. Neoclassicism, Eclecticism, Neocolonial, Modern and Contemporary Architecture in their more significant centers, Rio, Sao Paulo, Recife and Belo Horizonte.

#### **HIS1850 – HISTORY OF CITIES**

The emergence of the design ideology of the city, in other terms, the Urbis as a design theme, from the first designs of the Renaissance's ideal city, through the Baroque capital, to the functional modern city and the postmodern collage city. Historical origins and historical specificities of the Brazilian city.

#### **MAT1071 – MATHEMATICS, SPACE AND FORM**

Understanding of geometric concepts in the context of architecture. Basic elements: points, lines and planes. Spatial positioning: scale, rotations, translations and reflections. Perspective. Representation of geometric two- and three-dimensional forms. Solids.

#### **MAT1072 – CALCULUS IN ARCHITECTURE**

Sequences. Limits. Functions. Continuity. Derivatives. Derivatives of higher order. Implicit functions and their derivatives. Maximums and minimums. Geometric interpretation of the derivative (curve tangents and normals). Integers: concept and properties. Defined and undefined integers. Calculation of areas volumes through integers. Differential and elementary equations.

#### **ECO1103 – ECONOMICS FOR ARCHITECTURE, INDUSTRIAL DESIGN AND ENGINEERING**

Microeconomics: market forces, offer and demand in competitive markets, international commerce, market failures and market with imperfect competition.

**SOC1139 – SOCIAL-ANTHROPOLOGICAL STUDIES**

City and citizenship: social inequality and zoning; political participation and activism; slums; social housing; and public policies. Sociability and space: territorial identities and urban culture. City and globalization: reorganization of the urban tissue; downtown and periphery.

**FIS1011 – PHYSICS IN ARCHITECTURE I**

Physical measuring units and precision. Notions of kinematics and dynamics. Conservation of mechanical energy. Balance and movement of bodies. Center of mass. Statics. Main topics: dynamics (force and quantity of movement); kinematics (movement, energy and work); balance (momentum and torque); statics.

**FIS1210 – PHYSICAL ASPECTS OF ENVIRONMENTAL CONTROL**

Waves. Basics of acoustics and optics. Propagation. Applications: reflection and absorption of waves, resonance, sound levels, lighting intensity, solar energy, calorimetry and dilation. Basic notions in thermal diffusion.