University of Benghazi
Faculty of Engineering
Benghazi –Libya

جـــامعة بنغـــازي
كـلـيـــة الهندســـة
بنغـــازي– لـيـبيـا

BACHELOR OF ARCHITECTURE AND URBAN PLANNING CURRICULUM
FACULTY OF ENGINEERING
UNIVERSITY OF BENGHAZI

Department of Urban Planning at University of Benghazi was founded in 1980 in co-operation with the Technical University of Helsinki, Finland. A few years later, in 1990, the department of Urban Planning became the department of Architecture and Urban Planning within the faculty of Engineering, University of Benghazi. The department offers professional undergraduate programs leading to the Bachelor degree in Architecture and Urban Planning, and a graduate program in Urban Planning leading to the professional of Master degree in Urban Planning. The undergraduate program normally takes five years to complete including a graduation thesis and final year design project leading to the Bachelor degree of Architecture and Urban Planning.

The Architecture program offers a rich and demanding mix of studio design, history and theory, and technology. The Urban Planning program brings together an active community of students to creatively confront the issues facing cities. Through instruction, participation in research, and community interaction, students explore the changing character and critical problems of modern urban development. The Bachelor degree in Architecture and Urban Planning will qualify graduates to pursue a career in any of a numbers of fields, such as construction, real estate development, public administration or historic preservation, or to continue in graduate work in professional field such as architectural, urban planning.

Tel: 22 29621, Fax: 22 29621
P.O. Box: 9476

هاتف: 22 29621، بريد مصور: 22 29621
صندوق بريد: 9476

FIRST YEAR

FALL SEMESTER

AC 111- BASES OF ARCHITECTURAL DESIGN STUDIO I

Course objective: Introducing students to basic principles of architectural design and composition.

Course description: Basic spatial concepts, from the basic human need for shelter to the need for an organized space, a framework for studying basic concepts of space composition such as single space and multi space organization. e.g., elements of space organization, locating a building on the site, explanation of scales, ways of drawing and presenting, modular grid and standardization, the awareness of the importance of function in the design process.

AC 121 - HISTORY OF ARCHITECTURE & FINE ARTS I

Course objective: Introduction to architecture; Study of the Ancient World architecture.

Course description: Introduction to architecture and history, Concepts of function, construction and beauty and the historical development and individual creativity, residential and public architecture, the origin of architecture in the prehistoric period. Ancient east architecture, Egypt, Mesopotamia and Crete, Ancient Greek architecture and Ancient architecture: its forms and expression, also the history of Roman architecture from the Republican period to the Late Antiquity and the principles of classical architecture.

AC 131 - DESCRIPTIVE GEOMETRY I

Course objective: The course covers geometry - based construction - graphic procedures by which objects in space and their relations are depicted in a plane

Course description: Geometry constructions, perspective collinear, second degree curves, orthogonal projections, projections of geometrical bodies.

Workshop program: auditory and construction workshop exercises. Students are expected to do exercises which serve as preparation for individual drawing projects.

AC 141 - FREE HAND DRAWING & VISUAL COMPOSITION I

Course objective: To enable students to use their mental ability and drawing skills in representing reality by developing their graphic and artistic predispositions.

Course description: Study of perspective: observation-based construction, points, straight lines, angles, shortenings, interpretation, definition, composition and organization of perspective. The graphic work, assignments on a large size paper: interior, studies including analysis, plan, elevation; perspective drawn in pencil and color. Bird's eye and worm's eye view. Complex composition of volumes: observation, visualization, color, meaning, symbolism, dynamic, psychological and tone value.

AC 151 - PROPERTIES OF MATERIALS

Course objective: Introducing students to materials as well as the course content.

Course description: Properties of materials, physical properties, structure, mechanical properties, stresses, the strength of materials and coefficient of safety, concrete, cement,

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aggregate, water, additives, water cement ratio, concreting, properties of hardened concrete, types of concrete, deflection flow under stress, lightweight concrete, cellular concrete, steel, aluminum, copper, zinc, lead and timber and their usage, glass and glass products, raw materials and additives. Students are provided with samples of materials as well as the latest information about the production of these materials. They also get an insight into illustrative examples of successful application of a particular material in building.

AL 101 - ARABIC LANGUAGE

Course objective: Acquiring linguistic competence as well as communicative competence in the field of Arabic for architectural profession.

Course description: Acquiring basic grammatical technical vocabulary in the field of architecture; sub technical vocabulary; widening students' perception about semantic aspects of vocabulary functioning; Acquiring important grammatical.

EL 101 - ENGLISH LANGUAGE I

Course objective: Acquiring linguistic competence as well as communicative competence in the field of English for architectural profession.

Course description: Acquiring basic technical vocabulary in the field of engineering together with their Arabic equivalents; sub technical vocabulary; widening students' perception about semantic aspects of vocabulary functioning; Acquiring important grammatical structures appropriate to the type of English discourse for engineering profession.

ES 101 - MATHEMATICS

Course objective: Training students to cope more easily with engineering-based mathematical courses in English language.

Course description: Vector algebra, a vector as a directed line segment, addition of vectors, multiplication of a vector by a real number, collinear and coplanar vectors, base vectors and resolution of a vector along the base vectors, coordinate systems and coordinates of the point, determinants of the second and the third order, systems of concentrated forces (equipollent systems, reduction of a system, central axis of a system); solid analytic geometry (a plane and a straight line), sequences and series, domain of the definition of a function defined by a formula, displacement and stretching of a graph of an elementary function.

SPRING SEMESTER

AC 112- ARCHITECTURAL DESIGN STUDIO II

Course objective: Introducing students to basic principles of architectural design and composition.

Course description: Study of space (spatial organizations, enclosure, qualities of different spatial definitions), units connected into a configuration (approach and entry, sequence of spaces, relationships). Identical units connected into a structure (activities within space, user requirements, principle of repetition). Various units connected by circulation (movement through space, path-space relationship).

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AC 122 - HISTORY OF ARCHITECTURE& FINE ARTS II

Course objective: Introduction to the medieval architecture.

Course description: early Christian and early Byzantine architecture, middle and late period of the Byzantine architecture, Islamic architecture, pre-Romanesque architecture, early, high and late Romanesque architecture, architecture of monasteries, Romanesque style in Europe, Gothic architecture and the rise of cities, The architecture of Gothic in the 12th and 13th century, Gothic Cathedral as an architectural system, Italian Gothic, European Gothic.

AC 132 - DESCRIPTIVE GEOMETRY II

Course objective: The course covers geometry - based construction - graphic procedures by which objects in space and their relations are depicted in a plane.

Course description: Central projection, linear perspective, construction methods for perspective drawings with horizontal axis of view made out of known orthogonal projections, free perspective, methods of constructing perspective drawings, shadows in perspective, mutual penetrations of surfaces with special regard to vaults, constructing shadows of basic elements and complex structures.

The workshop program is auditory and construction workshop exercises. Students are expected to do exercises which serve as preparation for individual drawing projects.

AC 142 - FREE HAND DRAWING & VISUAL COMPOSITION II

Course objective: To enable students to use their developed and mature drawing skill in representing objects and spatial relationships by developing their graphic and artistic predispositions.

Course description: Introduction to the course, systems of visualization, architectural design process (a project task, a preliminary sketch and working drawings), the significance of drawing; point, line, plane, volume, defining through measurement, geometric simplification of a subject, transparency, Construction, size and position of a drawing on paper.

AC 152 - STRENGTH OF MATERIALS

Course objective & description: The course is considered as a preliminary to understanding of the behavior of the construction components and of the internal elastic stresses, and also for the student to be able to analyze some of the simple components and champers and skeletons and frames and also to be able to find the geometric centers and the Centers of gravity and torque limitations inertia were the previous are considered the base to analyzing the most sophisticated installations and the to design the metallic and concrete installations.

AC 162 - WORKSHOP AND PHOTO LABORATORY

Course objective: Explanation of tools and its usage and explanation of the basic of photography and its rules.

Course description: Basic of models' execution, application is carried out in the workshop by executing of models of design tasks assigned to student followed by introduction to the invention of camera, the usage and the principles of copying and development films, photos geometry, their characteristics and colors, the application and usage the photography on

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architecture, such as filming the building and the architectural scene, perspective shots, photographing samples.

EL 102 - ENGLISH LANGUAGE II

Course description: The topics of this course correspond to the content of the course in ENGLISH LANGUAGE I EL 101.

SECOND YEAR

FALL SEMESTER

AC 211 - ARCHITECTURAL DESIGN STUDIO III

Training students to deal successfully with issues related to residential architecture by getting to know the elements of space organization, disposition, standard of housing units and the connection between the apartment and its immediate surrounding as well as the elements relevant for the design of residential buildings.
Course description: Students carry out the project assignments concerning their own apartment (housing) and are gradually introduced to more advanced housing issues.
Studio sessions cover analysis of type of houses and apartments, furniture and human body and its positions in an apartment with necessary dimensions scheme of a plan organization, space orientation and links, also the session cover a daily quick architectural design exercise aims to develop students design skills.

AC 221- ISLAMIC ARCHITECTURE

Course objective: General study of the Islamic architecture, physically and culturally, exploration of major themes in the past and present.
Course description: Introduction to the topic of Islamic Architecture, their characteristics, advantages and the historical stages, that effect the architectural and constructional elements, the buildings materials, the constructional methods used in Islamic architecture and delineation and design the spaces.

AC 231 -CONTEMPORARY ARCHITECTURE

Course objective: Review, analysis and interpretation of contemporary world architecture.
Course description: Introductory lecture on contemporary architecture in the world, modern architecture conceptions which emerged after the industrial revelation and its philosophy, review of the important architectural theories up to present days, world architectural school conceptions (functionalism, symbolism, organique, behaviorism and contemporaneous), also review the architectural work of distinguished architects.

AR 241 - ARCHITECTURAL EXPRESSION I

Course objective & **description**: Providing the student with the basics of architectural expression through theories, applications, and reflections of Theories of perspective and the roles of forming and processing , and the principles of shades and shadows and trims , also

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focusing over the various types of architectural expression like shades, touch, internal and external perspective angles of the architectural mass, and to develop the personal touch for each student in his presenting method of his designing work.

AC 251 - BUILDING TECHNOLOGY I

Course objective: Introducing students to basic structural elements of buildings.
Course description: Program of lectures; introduction, the analysis of structural elements of buildings, structural systems of buildings, structural concept of masonry structures, building elements made of clay, brick walls, concrete and light-concrete building elements, natural stone - building elements and cladding, partition walls, openings in the walls: arches and lintels, foundations and ventilation shafts, timber structures. Workshop program; architectural symbols and plan elements, drawing assignments and structural systems.

AC 261 - LIGHTING

Course objective: Lighting
Course description: lighting, types, installing, calculation methodology, installation layout in plans and schemes, lighting basis in buildings, the natural lighting formation, characteristics, and the calculating methods, artificial lighting sources, its formation, characteristics and the calculating methods, the electric supplies in buildings.

AC 271 - SANITARY

Course objective: Studying water supply system, sewage system.
Course description: Water supply system: supply and available sources of sanitary drinking water; consumption estimate; basic supply scheme; function, materials and execution of certain elements and cold water installation set. Warm water conditioning: individual and central conditioning systems; size of basic equipment and elements, dimensioning of water pipe network; selection and types of systems for increased pressure, building-in positions, fire protection of the building by water usage, hydrant network, and automatic sprinkler systems. Sewage system: types of liquid waste and sewage systems; basic schemes; function, materials and execution of particular elements and complexes, sanitary objects and equipment types.

SPRING SEMESTER

AC 212 - ARCHITECTURAL DESIGN STUDIO IV

Course objective: Training students to deal successfully with issues related to small architectural projects by getting to know the elements of space organization, disposition, standard of space units and the connection between different spatial functions.
Course description: Students carry out the project assignments for a small public space projects (bus station, restaurant and nursery).
Studio sessions cover analysis of type of these buildings including furniture and human body and its position standards with necessary dimensions scheme of a plan organization; space orientation and links, also the session cover a daily quick architectural design exercise aims to develop students design skills.

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AC 22 - LOCAL ARCHITECTURE

Course objective: specific study of Islamic architecture and its reflection on the local Libyan architecture.

Course description: Introduction to the topic a study of the local architecture from architectural and physical sides, the historical stages that effect the Libyan architecture, the effect of the Islamic architecture, its characteristics, advantages, construction methods, building materials, the properties of the coastal mountainous and desert architecture.

AC 232 -THEORIES OF ARCHITECTURE

Course objective: Insight into theoretical foundations of architectural creation.

Course description: Introduction to the topic, theory of architecture as a specific segment of the general theory of art, artistic creation as a mode of existence, creativity and evaluation, biological basis of a human being and the rule of artistic organization, autonomy of a work of art and the issue of utility, gestalt theory in architecture (form, color, light, sound, description), factors of psychological experience, relation of function, form and construction its complexity.

AC 242 - ARCHITECTURAL EXPRESSION II

Course objective & description: Providing the student with (output theories, architectural presentation, tools and methods of presentation, using various types of pencils and colors to direct and to present the horizontal projections and the facings, lines shades, flat surfaces and their applications over the general facings and work sites

AC 252 - BUILDING TECHNOLOGY II

Course objective: Introducing students to basic structural elements and their joining into a coherent whole, protection of structures.

Course description: Concrete and reinforced concrete walls, concrete walls, columns, beams, forms. Treatment of walls; plasters, coats and covers. Floors, the analysis of functions of various layers of floor structure, the work including drawings of a part of a building assignment.

AC 262 - ACOUSTICS

Course objective: Acoustics

Course description: Sound introduction, sound insulation, nature of sound, physical characteristics and concepts, indoor sound, reflection and absorption, sound field, sound and vibration transmission in building structures, air sound, impact sound, structural sound, limiting sound transmission by building barriers.

AC 272 - AIR CONDITIONING

Course objective: The analysis of the impact of the form of a building on energy consumption, air-conditioning processes, elements of the cooling system, elements of the air-conditioning chamber and equipment configuration for different air-conditioning systems.

Course description: Air-conditioning; application and classification of air-conditioning systems; basic schemes, elements of an air-conditioning unit, function, position, building-in technique and position, cooling plant, basic operating principles, its location, classification according to the type of condensation, heating pumps and possibilities of using renewable sources of energy.

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THIRD YEAR

FALL SEMESTER

AR 311 - ARCHITECTURAL DESIGN STUDIO V

Course objective: Programming and designing educational institutions: primary schools, technical schools.

Course description: Educational institutions such as nurseries, primary schools and technical schools are a social standard for every urban environment. Urban planning requirements determine the conditions of dimensioning according to the number of children or the number of groups. The aim of investigating urban and architectural building conditions, building outlines as well as the possibilities for organizing exterior spaces - playgrounds. The work including preparing the following items, plans, cross-sections, facades, axonometric projections, scale models and technical description with sections referring to location, spatial and functional organization, structure, material and design. Also the session cover a daily quick architectural design exercise aims to develop students design skills.

AC321 -BASES OF URBAN DESIGN

Course objective: Introducing students to the fundamental concepts of urban sociology, basic parameters regarding rural and urban society; the role of a town in contemporary civilization as well as the causes and effects of urbanization as the essential component of current trends.

Course description: The course in urban sociology, planning aspects of the relationship between urban sociology and urban planning. General features of rural and urban society, the processes of urbanization and transformation of the rural environment in the context of modern trends, spatial aspects of basic social structures and main models of the relationship towards space, explores the economic systems in urban areas, examines similarities and differences in economic processes, emphasis given to appropriate role of the state in community and economic development.

AC 331 - HISTORY OF URBAN PLANNING

Course objective: Introducing students to planning history, exploration of major themes in planning theory, and analysis of the relationship of history and theory.

Course description: Introduction; definitions and types of historical towns, prehistoric settlements, towns of ancient Egypt and the east; ancient Greek towns, ancient Roman towns, European towns, town development in Europe in the 19th century, development of landscape architecture (landscape architecture as an integral element of a town image).

AC 341 - HOUSING I

Course objective: Critical appraisal for government housing policy and targets in terms of production and allocation of housing services.

Course description: Historical overview of technical methods, type of houses and residential complex with the local policy, followed by analysis of the organizational infrastructure around which housing is produce, economics, economical housing policy and general economical affects, review laws and regulation, building maintenance, investment in building.

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AR 351 - BUILDING TECHNOLOGY III

Course objective: Introduction to the building construction technology.

Course description: Review of historical and recent methods of executing basic structural systems, terminology and definitions, preliminary works, ground preparation, reinforcing and concrete work, foundations, carpentry, masonry structures. Systems of monolithic building of reinforced concrete structures, light reinforced concrete structures, laminated timber structures, space frame structures made of steel and timber, suspended structures, shell and folded structures, pneumatic membranes, micro reinforced concrete. Workshop program: defining basic structures of an apartment block regarding its building technology, choice of an appropriate building system.

AC 361 - ENVIROMENTAL CONTROL I

Course objective: Introduction to the methodology of outdoor climatic impact on microclimatic condition in the building depending on the position of the building, rambling facade and its orientation.

Course description: Outdoor climatic conditions in different climatic zones. Elements of heat saving (solar radiation, internal sources etc.) in summer, definitions of astronomic notions regarding the Sun motion in relation to the earth as well as determining of shadows, approximate calculation of heat gain in summer (transmission and ventilation).

AC 371 -THEORY OF STRUCTURES I

Course objective: Introducing students to the fundamental principles of calculation and structural design of concrete structures, structural design by ultimate limit states method and methods of working out details of concrete structures.

Course description: Program of lectures; introduction, concrete structures, the basic principles of analysis and design, material properties, limit state design: section design for ultimate limit states (flexure, compression, tension, eccentric compression, punching), checking according to serviceability limit state (cracking, deformations). Structural elements: slabs, beams, frame structures, trusses, arches, columns, walls, deep beams, folded structures, shells, suspension structures and tension membranes. Workshop program; the first assignment deals with drawing the plan of a formwork as well as designing a floor structure and a frame structure for a simple load-bearing structure.

AC 381 - COMPUTER AIDED DESIGN (AUTOCAD 2D)

Course objective: This course focuses on the interface of AutoCAD, The fundamentals of basic commands, Necessary Drawing & Editing tools, Basic Dimensioning, and The Importance of Accuracy.

Course description: This 2D course is tailored to students with little or no previous knowledge of CAD. This foundation course is structured to introduce students to the AutoCAD program and develop their skills.

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SPRING SEMESTER

AC 312- ARCHITECTURAL DESIGN STUDIO VI

Course objective: The aim of investigating urban and architectural building conditions, building outlines as well as the possibilities for organizing exterior spaces.

Course description: Programming and designing medium complexes institutions (such as cinemas, galleries, museums and cultural centers). The work including preparing the following items, plans, cross-sections, facades, axonometric projections, scale models and technical description with sections referring to location, spatial and functional organization, structure, material and design. Also the session cover a daily quick architectural design exercise aims to develop students design skills.

AC 322 - INTERIOR DESIGN

Course objective: Introduction to recognize the basic skills used in Interior Design and will emphasize the development of conceptual and technical skills.

Course description: An over view of the principles and elements of Residential Interior Design. This interior design course will vouch the creation of an artistic point of view on the part of the student.

AC 332 - THEORYS OF URBAN PLANNING

Course objective: Introducing students to the development and transformation of a town as well as town planning concepts from the end of the 19th century until today, urban planning issues, and emphasis is which laid on the role of architecture in the town development, functioning as an integral component of the urban configuration

Course description: The origin of modern urban planning, the analysis of town development and reconstruction in the period of the second half of the 19th century until the beginning of the 20th century, definitions and types towns' development, trends of the seventies and eighties and the postmodern concept of a town; public town area, a critical review of functionalism and zoning, perception theories of a town area and its analysis, humane aspects of urban form.

AC 342 - HOUSING II

The topics of this course correspond to the content of the course in HOUSING I AC 341.

AC 352 - IMPLEMENTATION DRAWINGS

Course objective: To develop an understanding to the building construction technology and integrate construction into the Design Studio to teach standards of drawing technique, 'technical' drawing, lettering, layout etc.

Course description: The same as for the course in BUILDING CONSTRUCTION III AC 351 with a special emphasis on prefabrication systems.

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AC 362 - ENVIROMENTAL CONTROL II

Course objective & **description**: the analysis of the impact of the form of a building on energy consumption, various possibilities of protection against solar radiation by using suitable structures and materials for window panes, possibilities of using renewable sources of energy.

AC 372-THEORY OF STRUCTURES II

The topics of this course correspond to the content of the course in THEORY OF STRUCTURE I AC 371.

AC 382 - COMPUTER AIDED DESIGN (AUTOCAD 3D)

Course objective: AutoCAD in 3D course is designed for the advanced AutoCAD user. This course will cover creation of 3D models using wire frame, surface and solid modeling techniques.

Course description: This course is structured to meet the growing needs of complex 3D scaling and presentation tools; used in many CAD-Based environments. Learn many time saving techniques and gain the upper hand when designing 3D complex drawings.

FOURTH YEAR

FALL SEMESTER

AC 411 - ARCHITECTURAL DESIGN STUDIO VII

Course objective: Theoretical understanding and hands-on training in the methodology of architectural design, especially the methods of designing building with a special and distinguish features.

Course description: Placing buildings in the environment, organizing the design process, culturally relevant technical and symbolic architectural design of large-scale office or large complexes for transportation uses (such as Passenger terminal at Airport or Train station), the work including research and analysis of architectural topic appropriate to the design project.

AC 421 - URBAN PLANNING I

Course objective: Introduction to the theories of urban planning and methodology of developing master plans.

Course description: Working out a detailed urban plan proposal for a housing development on an undeveloped and a built area of simple spatial organization and design conditions. Content of the project assignment, site survey, urban structure, compositional and functional elements of an urban area, Analysis and the concept solution., working out a detailed urban plan consisting of: a land use plan, a construction plan, traffic plan and landscape design, detailed design of a children's playground, quantifying indicators of the plan as well as a three-dimensional representation of the suggested design solution.

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AC 431 - QUANTITIES AND SPECIFICATIONS

Course objective: Topic includes doing quantity take-off, using standards and specifications.
Course description: An introduction to the standard methods used in measuring and calculating land area and earthwork quantities. Area and volume formula; prepares students to take-off quantities from construction drawings in order to prepare bills of quantities from design drawings and specifications, and to establish a base for costing, detailed explanation of the construction methods involved, use the contract documents and specifications.

AC 441 - ARCHITECTURAL EXPRESSION USING COMPUTER

Course objective: Providing students with the ability to design any expressional architectural project, declaration or research cover, also giving the ability to present the work in a scientific manner to be readable and attractive to reach the specific objective of the design.
Course description: Giving theoretical lectures about the principles and elements of graphic design and present some researches for discussion, as well as giving a practical part includes some programs such as Photoshop and other software.

AC 451 -INDIVIDUAL STUDIES

Course objective: Studying theoretical researches.
Course description: Students do research on a current topic that is related to their field of studies, with the support of research groups to which they are assigned.
The research group, called the Laboratory, to which a student is assigned, becomes his/her home base in the university life. Participation in research activities by belonging to a specific Laboratory is a very important part of his/her undergraduate experience. This is the arrangement where the students form life-long friendship and future close relations.

AC 461 - LANDSCAPE ARCHITECTURE

Course objective: Introducing students to the development of landscape design including the basic principles of landscape architecture as well as natural and architectural elements relevant for the design of a garden or a park.
Course description: Introduction to landscape architecture, landscape architecture in a town, composition and design in landscape architecture, aesthetics of trees and the use of plants in landscape architecture, natural and ecological factors of landscape architecture, tree in a town, materials, equipment, water and sculpture in landscape architecture.
Through studio work students are introduced to the principles of designing a garden next to the house (such as single family houses with gardens, a park next to an apartment block).

AC 471 -REINFORCED CONCRETE I

Course objective: Introducing students to basic structural elements (concrete and reinforced concrete)
Course description: Introduction, the analysis and calculation of reinforced concrete walls, columns, beams, forms, multi-layered external reinforced concrete composite walls, the analysis of functions of various layers of floor structure, reinforced concrete semi-prefabricated and prefabricated floors, disposition of load bearing floor elements.

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SPRING SEMESTER

AC 412 - ARCHITECTURAL DESIGN STUDIO VIII

Course objective: Testing students' inventiveness and reactions to large-scale projects.
Course description: Large-scale office and commercial design projects or large complexes for mixed uses (such as hospital). The essential feature of the assignment is a high quality complex project which needs to be systematically worked out and architecturally successfully conceived.

AC 422 - URBAN PLANNING II

Course objective: Introduction to the theories of urban planning and methodology of developing master plans.
Course description: Master plan, its definition and objectives, components of a master plan, defining its scope, its classification, city boundaries and the structure of a town area, building area and program analysis: anticipated demographic trends, economic development, social needs and possibilities of space use. Land use plan, location criteria, the structure of an area and land use summary. Estimate of housing density and the density of a built-up area, housing, centers, industry urban details, traffic network and plan, public city transport and commuter services, inner and outer city terminals, green areas in a town, detailed urban plan of an industrial.

AC 432 - RESEARCH METHODS

Course objective: Theoretical research related to the final design project.
Course description: Lectures given by the regular teaching staff of the Department of Architecture and Urban Planning or visiting experts on topics aimed at widening knowledge and perspective of complexity and pluralism in architecture; suggested reading: recommended by lecturers (depending on the topics).
The research for one architectural topic appropriate to student's interest and present a final paper that demonstrates a structural argument and is complete with full bibliographic references.

AC 442 - PROJECT PROGRAMMING

Course objective: Students are expected to acquire knowledge in the field of planning and organizing the investment with the emphasis on topics not dealt within other courses (such as estimates, sequence of construction works, time schedule and network diagrams).
Course description: Investment, design and construction, historical aspects and modern relations, contemporary meaning of the terms investor - designer - architect and builder. Organization of work: historical development, trade, manufacture and industrial organization of work; characteristics and organizing principles of building production. Project management: defining basic terms; methods of group work organization, control and management. Construction management: methods of planning the building process; time schedule and network diagrams. Marketing: significance within the industrial production (planning - design production - marketing - usage - outdating); marketing of building components, materials and technology; marketing of building units. Workshop program, working out charts and network diagrams.

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AC 452 - BUILDING RESTORATION

Course objective: Teaching students the basic trades that are used to preserve and restore historic structures.

Course description: Understand the materials and the basic concepts behind the techniques used in the preservation of historic buildings.

AC 462 - SURVEYING

Course objective: surveying is concerned with the survey and representation of the earth's surface, getting an insight into geodetic methods and measurements, geodetic methods related to data gathering include a range of procedures such as orthogonal method, the polar method or tachometry, terrestrial and aerial photogrammetric , remote sensing, leveling, trigonometric height determination, global positioning systems by means of satellites (GPS) etc.

Course description: Development of survey and geodesy, position of geodesy within the field of science and technology; systems of units and coordinate systems in geodesy, the theory of errors and adjustment computation; geodetic instruments, review; geodetic measurements, tachometry, triangulation, , leveling, engineering geodesy, remote sensing.

AC 472 - REINFORCED CONCRETE II

The topics of this course correspond to the content of the course in REINFORCED CONCRETE II AC 471.

FIFTH YEAR

FALL SEMESTER

AC 511 - ARCHITECTURAL DESIGN STUDIO IX

Course objective: Ability to incorporate relevant precedents into architecture and urban design projects.

Course description: The course is based on familiarizing students with the skill set required to submit a large scale public building along with re-developing the urban surroundings. Each semester a failing urban environment in Benghazi, Libya will be assigned as the site. Within the urban area an empty plot will be given for students to design a new building/complex with a complete program. The aim is to get students to address neighboring buildings, urban street patterns, social and political relationships and parking for staff, visitors and services, as well as redesign the urban landscape to establish it as a proper functioning asset to the city. The project should contain mixed-use, public and private spaces, so that students are challenged by a full-range of code, accessibility, constructional types, egress and fire separation issues.

AC 521 -PROJECT PRELIMINARY STUDIES

Course objective: Theoretical research related to the final design project. As a primary design for the final project, each student is encouraged to develop a design to their own brief as knowledge and skills they have acquired during their undergraduate studies.

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Course description: Within this primary design the student is required to demonstrate a design that integrates knowledge of the ways analysis, research, context, preparation and development of a brief inform a design proposal, the regulatory frameworks, Architectural histories and theories, of physical artistic and cultural contexts, and their use in informing the design process.
Within the semifinal project the student is required to demonstrate an ability to use visual, verbal and written communication methods and appropriate media to clearly and effectively convey and critically appraise design ideas and proposals. Research, writing, and three-dimensional representation using a variety of appropriate media culminating in a display of work that communicates critical skills the student has acquired over the last four years.

AC 531 - PROFESSIONAL PRACTICE

Course objective: Introducing students to all relevant subjects in local laws providing information on planning approaches, building and environment protection.
Course description: Design documents, structure and scope, law on building and other related laws and regulations, basic techniques for regulating the use and appearance of land, legal framework, social implications, planning approaches, communicating land use information, survey of the urban legal environment. Issues of planning, zoning, eminent domain, land use controls, housing codes, historic preservation, and related tax provisions, the impact on design of legislation, codes of practice and health and safety both during construction and occupation of a project.

AC 541 - STEEL STRUCTURES

Course objective: This course teaches the engineering thought process through the design of steel structures; the course synthesizes the fundamentals of static, mechanics of materials, and structural analysis and applies them to the design of structural members
Course description: Introduction to the design of structural systems, design of steel tension and compression members, design of beams and beam-columns, and an introduction to connection design. All design is performed in accordance with codes and specifications used in current engineering practice. A comprehensive design problem requires development of a design methodology, consideration of alternative solutions, and design of an optimal steel structure to meet stated functional requirements.

SPRING SEMESTER

AC 522 -GRADUATION PROJECT

Course objective: As a conclusion to the course, each student is encouraged to develop a design to their own brief as knowledge and skills they have acquired during their undergraduate studies. Also student is required to submit a thesis at the end of the final year and to deliver a seminar on the topic of the thesis.
Course description: Within this final project the student is required to demonstrate a design that integrates knowledge of:

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- The ways analysis, research, context, preparation and development of a brief inform a design proposal, the regulatory frameworks.
- Architectural histories and theories, of physical artistic and cultural contexts, and their use in informing the design process.
- The principles of building technologies, environmental design and construction methods, in relation to consideration of a sustainable environment, use of materials, process of assembly and structural principles.

Within this final project the student is required to demonstrate an ability to form considered judgments about the spatial, aesthetic, technical and social qualities of their design within the scope and scale of a wider environment.
Within this final project the student is required to demonstrate an ability to use visual, verbal and written communication methods and appropriate media to clearly and effectively convey and critically appraise design ideas and proposals.
Within this final project the student is required to demonstrate an ability to manage and appraise their own working practices.
Final Year Dissertation: Thesis is a requirement for graduation and students conduct the final year project under the guidance of their supervisors.
Skills: The ability to take responsibility for a building design of moderate complexity, and to develop the brief in writing, and to incorporate all relevant information (including site selection, spatial planning, structure, construction, environment, etc.) into a coherent building proposal. Research, writing, and three-dimensional representation using a variety of appropriate media culminating in a display of work that communicates critical skills the student has acquired over the last four years.

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SUMMER TRAINING PROGRAMME

TRAINING CONCEPT

DURATION: One month each curriculum year.

FIRST YEAR: site visits during the summer including building under construction**,** students will be introduced to the technological features of the project as well as the profile of the construction company involved. The practice lasts four weeks full time training students to be able to make specifications of activities and materials concerning construction and finishing works, students are expected to hand in a report on the practice done.

SECOND YEAR: site visits during the summer including building under construction**,** training students to be able to make specifications of activities and materials concerning architectural details, type of structure and construction procedures, students are expected to hand in a report on the practice done.

THIRD YEAR: an office training offers students the opportunity to experience a range of employment in architectural practices, or in other activities that are related to the academic and professional nature of architectural and engineering, skills; integration of design and professional skills with the workplace. Group working with other trades and professions, students are expected to hand in a report on the practice done.

FORTH YEAR: within an architectural practice, students do research work and gathering information of particular project as first step of the fifth year final design project**.**

TRAINING PROGRAMME GUIDELINES

- A competent supervisor shall be appointed for a group of students during summer training for support and guidance in the preparation of applications.
- Students shall hand in a report on the practice done with endorsed letter by a competent supervisor.
- Students are expected to hand in a report about the practice followed by a discussion in order to check their understanding of the activities described in the report.

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University of Benghazi
Faculty of Engineering
Benahazi –Libva

جـــامعة بنغـــازي
كـلـيـــة الهندســـة
بنغـــازي– لـيـبيـا

BACHELOR OF ARCHITECTURE AND URBAN PLANNING CURRICULUM
FACULTY OF ENGINEERING
UNIVERSITY OF BENGHAZI

FIRST YEAR

FALL SEMESTER

Course Code	Credit Hours	Course Name	Units
AC 111	8	Bases of Architectural design Studio (I)	(8+8) 16
AC 121	2	History of Architecture & Fine arts (I)	(2+2) 4
AC 131	4	Descriptive Geometry (I)	(0+4) 4
AC 141	4	Freehand-Drawing & Visual Composition	(0+4) 4
AC 151	2	Properties of Materials (I)	(2+2) 4
ES 101	4	Mathematics	(8+4) 12
EL101	3	English Language (I)	(6+3) 9
AL 101	3	Arabic Language	(3+3) 6
المجموع	30		59

SPRING SEMESTER

Course Code	*Credit Hours*	*Course Name*	*Units*
AC 112	8	Architectural Design Studio (II)	(8+8) 16
AC 122	2	History of Architecture & Fine arts (II)	(2+2) 4
AC 132	3	Descriptive Geometry (II)	(0+4) 4
AC 142	3	Freehand-Drawing &Visual Composition(II)	(0+4) 4
AC 152	2	Properties of Materials (II)	(2+2) 4
AC 162	3	Workshop& Photo Laboratory	(3+3) 6
EL 102	3	English Language (II)	(6+3) 9
المجموع	25		47

Summer training

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SECOND YEAR

FALL SEMESTER

Course Code	*Credit Hours*	*Course Name*	*Units*
AC 211	8	Architectural Design Studio (III)	(8+8) 16
AC 221	2	Islamic Architecture	(2+2) 4
AC 231	2	Contemporary Architecture	(2+2) 4
AC 241	4	Architectural Expression (I)	(0+4) 4
AC 251	5	Building Technology (I)	(5+5) 10
AC 261	2	Lighting	(2+2) 4
AC 271	2	Sanitary	(2+2) 4
المجموع	25		46

SPRING SEMESTER

Course Code	*Credit Hours*	*Course Name*	*Units*
AC 212	8	Architectural Design Studio (IV)	(8+8) 16
AC 222	2	Domestic Architecture	(2+2) 4
AC 232	2	Theories of Architecture	(2+2) 4
AC 242	4	Architectural Expression (II)	(0+4) 4
AC 252	5	Building Technology (II)	(5+5) 10
AC 262	2	Acoustics	(2+2) 4
AC 272	2	Air- conditioning	(2+2) 4
المجموع	25		46

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THIRD YEAR

FALL SEMESTER

Course Code	*Credit Hours*	*Course Name*	*Units*
AC 311	8	Architectural Design Studio (V)	(8+8) 16
AC 321	2	Principles of Urban design	(2+2) 4
AC 331	2	History of Urban Planning	(2+2) 4
AC 341	2	Housing (I)	(2+2) 4
AC 351	5	Building Technology (III)	(5+5) 10
AC 361	2	Environmental Control (I)	(2+2) 4
AC 371	4	Theory of Structures (I)	(4+4) 8
AC 381	2	Computer Aided Design (AutoCAD)	(2+2) 4
المجموع	27		54

SPRING SEMESTER

Course Code	*Credit Hours*	*Course Name*	*Units*
AC 312	8	Architectural Design Studio (VI)	(8+8) 16
AC 322	4	Interior Design	(2+2) 4
AC 332	2	Theories of Urban Planning	(2+2) 4
AC 342	2	Housing (II)	(2+2) 4
AC 352	5	Implementation drawings	(5+5) 10
AC 362	2	Environmental Control (II)	(2+2) 4
AC 372	2	Theory of Structures (II)	(4+4) 8
AC 382	2	Computer Aided Design (AutoCAD 3D)	(2+2) 4
المجموع	27		54

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FOURTH YEAR

FALL SEMESTER

Course Code	Credit Hours	Course Name	Units
AC 411	10	Architectural Design Studio (VII)	(10+10) 20
AC 421	6	Urban Design (I)	(6+6) 12
AC 431	2	Quantities & specifications	2+2) 4
AC 441	2	Architectural Expression Using Computer	2+2) 4
AC 451	2	Individual Studies	(2+2) 4
AC 461	4	Landscape Architecture	(4+4) 8
AC 471	2	Reinforced Concrete (I)	(2+2) 4
المجموع	28		56

SPRING SEMESTER

Course Code	Credit Hours	Course Name	Units
AC 412	10	Architectural Design Studio (VIII)	(10+10) 20
AC 422	6	Urban Design (II)	(6+6) 12
AC 432	2	Methodology	(2+2) 4
AC 442	2	Project Programming	(2+2) 4
AC 452	2	Building Restoration	(2+2) 4
AC 462	4	Surveying	(4+4) 8
AC 472	2	Reinforced Concrete (II)	(2+2) 4
المجموع	28		56

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FIFTH YEAR

FALL SEMESTER

Course Code	*Credit Hours*	*Course Name*	*Units*
AC 511	12	Architectural Design Studio (IX)	(12+12) 24
AC 521	8	Project Preliminary Studies	(8+8) 16
AC 531	2	Professional Practice	(2+2) 4
AC 541	4	Steel Structures	(4+4) 8
المجموع	26		52

SPRING SEMESTER

Course Code	*Credit Hours*	*Course Name*	*Units*
AC 522	50	Graduation Project	50
المجموع	50		50

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