A. Program Planning Sheet

I. B. Sc. of Architectural Engineering and Environmental Design

YEAR ONE (Architectural Design, Interior Design & Urban Design Branches)

FIRST SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 111	Visual Studies 1	2	4	3	None
AR 130	History of Architecture & Technology	2	0	2	None
BA 113	Physics 1	2	2	3	None
BA 123	Mathematics 1	2	2	3	None
CC 111	Introduction to Computer	2	2	3	None
ME 151	Eng. Drawing & Descriptive Geometry	1	3	2	None
*Language Elective Course		1	3	2	
Total		**12**	**16**	**18**	
* Selection of 1 course from the following					
LH 131	ESP 1				None
LH 133	Langue Française 1				None

SECOND SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 114	Visual Studies 2 - Theory of Colors	2	4	3	None
AR 131	History of Architecture 1	2	0	2	None
BA 114	Physics 2	2	2	3	BA 113
BA 118	Chemistry	1	3	2	None
BA 141	Engineering Mechanics 1	2	2	3	None
CC 114	Introduction to Programing	2	2	3	CC 111
*Language Elective Course		1	3	2	
Total		**12**	**16**	**18**	
* Selection of 1 course from the following					
LH 132	ESP 2				LH 131
LH 134	Langue Française 2				LH 133

YEAR TWO (Architectural Design, Interior Design & Urban Design Branches)

THIRD SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 210	Architectural Drawing	2	6	4	ME 151
AR 215	Visual Studies 3 Shade & Persp.	2	2	3	ME 151
AR 232	History & Theory of Architecture 2	2	2	3	None
AR 251	Building Technology 1	2	4	3	None
AR 283	Computer Aided Drafting	2	2	3	ME 151
* Elective Course		1	3	2	
Total		**11**	**19**	**18**	
* Selection of 1 course from the following					
AR 221	Scientific Thinking				None
AR 223	Arch. of Egypt Time & Place				None
AR 226	Creativity & Innovation				

FOURTH SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 211	Architectural Design 1	2	6	4	AR 210 AR 114
AR 233	History & Theory of Arch. 3	2	2	3	None
AR 252	Building Technology 2	2	4	3	AR 251
AR 284	3D Modeling	2	2	3	AR 251 AR 283
CB 240	Theory of Structures	2	2	3	BA 141
* Elective Course		1	3	2	
Total		**11**	**19**	**18**	
* Selection of 1 course from the following					
AR 224	Workshops & Arch. Models				None
AR 225	Introduction to Painting				None
AR 322	Introduction to Arch. Photography				None

YEAR THREE (Architectural Design, Interior Design & Urban Design Branches)

FIVTH SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 312	Architectural Design 2	2	6	4	AR 211 AR 215
AR 334	History & Theory of Arch. 4	2	2	3	AR 131
AR 352	Building Technology 3	2	4	3	AR 252
CB 370	Surveying	2	2	3	BA 123
CB 350	Building Materials	2	2	3	CB 240
* Elective Course		1	3	2	
Total		**11**	**19**	**18**	
* Selection of 1 course from the following					
AR 324	Introduction to Sculpture				None
AR 327	Interior Design Principles				None
AR 325	Rendering and Animation				AR215 AR284

SIXTH SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 313	Architectural Design 3	2	6	4	AR 312
AR 335	History & Theory of Arch. 5	2	2	3	AR 334
AR 352	Building Technology 4	2	4	3	AR 353
AR 362	Environmental Studies 1	2	2	3	None
CB 351	Reinf. Conc.& Metallic Structures	2	2	3	CB 350
* Elective Course		1	3	2	
Total		**11**	**19**	**18**	
* Selection of 1 course from the following					
AR 323	Music & Civilization				None
AR 326	Comp. Graphic Design				AR 283
AR 328	Furniture Design				None

YEAR FOUR (Architectural Design, Interior Design & Urban Design Branches)

SEVENTH SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 414	Architectural Design 4	2	6	4	AR 313
AR 441	Int. to City & Regional Planning	2	2	3	None
AR 455	Execution Design 1	2	4	3	AR 354
AR 464	Environmental Studies 2	2	2	3	AR 362
CB 460	Soil Mechanics & Foundations	2	2	3	CB 351
* Elective Course		1	3	2	
Total		**11**	**19**	**18**	
* Selection of 1 course from the following					
AR 421	Architectural Criticism				None
AR 424	Functional Req. in Interior Env.				None
AR 427	Introduction to Web Design				AR 326

EIGHT SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 416	Interior Design 1	2	2	3	AR 312
AR 415	Architectural Design 5	2	6	4	AR 414
AR 442	Introduction to Urban Design	2	2	3	AR 441
AR 456	Execution Design 2	2	4	3	AR 455 AR464
AR 444	Intro to Management, Practice & Law	2	2	3	AR 455
* Elective Course		1	3	2	
Total		**11**	**19**	**18**	
* Selection of 1 course from the following					
AR 422	Mediterranean City, Urban & Architectural History				None
AR 423	Topics in Sustainability .				None
AR 425	Int. Env. Systems				None
AR 428	Computer Application in Architecture				AR 283

YEAR FIVE (Architectural Design Branch)

NINTH SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 516	Architectural Design 6	2	6	4	AR 415
AR 543	Introduction to Site Planning & Housing	2	2	3	AR 442
AR 546	Landscape Architecture	2	2	3	AR 313
AR 557	Execution Design 3	2	4	3	AR 456
CB 510	Project Management & Scheduling	2	2	3	AR 444
* Elective Course		1	3	2	
Total		**11**	**19**	**18**	
* Selection of 1 course from the following					
AR 521	Research & Programming				None
AR 522	Colors & Light in Landscapes				AR 114
AR 526	Vernacular Architecture				AR 334
AR 529	Computer Applications in Urban Planning. G.I.S.				AR 283 AR 441

TENTH SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 501	Architectural Design Graduation Project	6	18	12	AR 516
AR 541	Professional Practice	2	0	2	AR 444
AR 542	Regulations & Law	2	0	2	AR 444
* Elective Course		1	3	2	
Total		**11**	**21**	**18**	
* Selection of 1 course from the following					
AR 523	Historic Preservation and Conservation				None
AR 524	E.I.A. In Urban Planning				AR 441
AR 527	20th Century Interiors				None
AR 528	Comparative Style in Furniture				None

YEAR FIVE (Interior Design Branch)

NINTH SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 512	Interior Design 2	2	6	4	AR 415
AR 543	Introduction to Site Planning & Housing	2	2	3	AR 442
AR 544	Interior Landscape Architecture	2	2	3	AR 415
AR 553	Furniture Details	2	4	3	AR 456
CB 510	Project Management & Scheduling	2	2	3	AR 444
* Elective Course		1	3	2	
Total		**11**	**19**	**18**	
* Selection of 1 course from the following					
AR 521	Research & Programming				None
AR 522	Colors & Light in Landscapes				AR 114
AR 526	Vernacular Architecture				AR 334
AR 529	Computer Applications in Urban Planning. G.I.S.				AR 283 AR 441

TENTH SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 502	Interior Design Graduation Project	6	18	12	AR 512 AR 553
AR 561	Professional Practice	2	0	2	AR 444
AR 542	Regulations & Law	2	0	2	CB 444
* Elective Course		1	3	2	
Total		**11**	**21**	**18**	
* Selection of 1 course from the following					
AR 523	Historic Preservation and Conservation				None
AR 524	E.I.A. In Urban Planning				AR 441
AR 527	20th Century Interiors				None
AR 528	Comparative Style in Furniture				None

YEAR FIVE (Urban Design Branch)

NINTH SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 515	Environmental Design	2	6	4	AR 415
AR 543	Introduction to Site Planning & Housing	2	2	3	AR 442
AR 546	Landscape Architecture	2	2	3	AR 415
AR 557	Execution Design 3	2	4	3	AR 456 AR 444
CB 510	Project Management & Scheduling	2	2	3	AR 444
* Elective Course		1	3	2	
Total		**11**	**19**	**18**	
* Selection of 1 course from the following					
AR 521	Research & Programming				None
AR 522	Colors & Light in Landscapes				AR 114
AR 526	Vernacular Architecture				AR 334
AR 529	Computer Applications in Urban Planning. G.I.S.				AR 283 AR 441

TENTH SEMESTER					
Course Code	**Course Title**	**L**	**T**	**Credit Hour**	**Pre. Req.**
AR 503	Urban Design Graduation Project	6	18	12	AR 512 AR 557
AR 561	Professional Practice	2	0	2	AR 444
AR 542	Regulations & Law	2	0	2	AR 444
* Elective Course		1	3	2	
Total		**11**	**21**	**18**	
* Selection of 1 course from the following					
AR 523	Historic Preservation and Conservation				None
AR 524	E.I.A. In Urban Planning				AR 441
AR 527	20th Century Interiors				None
AR 528	Comparative Style in Furniture				None

B. Courses Summary Description

I- Architectural Engineering and Environmental Design Department Courses

1. **AR 111 - Visual Studies 1** (Prerequisite: None / Credit : 3 hours)

This course is an introduction to the techniques of graphic representation in pencil, pen and ink, and charcoal. Students begin by studying visual properties of form and space: definition, organization; basic principles of architecture, proportion and scale and ordering principles. An Introduction to architectural photography techniques and methods of forming poster compositions through using Adobe Photoshop Program are included in the course. Finally, students reach a better visual comprehension of architecture.

The course aims to:

- Provide the student with knowledge of architectural design principles and architectural vocabularies.
- Develop the students' abilities to visually express their own thoughts and ideas through both architectural drawing and freehand sketching using pencil.
- Provide the student with knowledge of rendering techniques, which enable him to express and represent the visual effects of shading tones and textural expressions.

2. **AR 114 - Visual Studies 2** (Prerequisite: None / Credit : 3 hours)

This course intends to teach principles underpinning the theories of color, providing knowledge and skills in the field of visual communication and representation. An Introduction to study techniques and methods of forming color schemes for interior designs through using Adobe Photoshop Program is included in the course. Students learn how to identify varying color schemes and present drawings displaying an awareness of visual properties.

The course aims to:

- Emphasize an understanding of the factors of visual perception and vision systems; the nature of colors and the optical system; and color properties including hue, value and saturation.
- Enhance the student's practical skills to develop the awareness of the theory of color organization (Faber, Munsell and Chevreul organization) and principles of color schemes: chromatic harmony, monochromatic harmony, triadic harmony and complementary harmony.

3. **AR 130 – History of Architecture and Technology** (Prerequisite: None / Credit : 2 hours)

This course includes definitions of architecture, character, and style with a chronological overview of the different architectural styles. The study begins with the first traces of prehistoric buildings and settlements in the Ancient World and covers:

- Egypt: The Archaic period, the Old Kingdom, the Middle and New Kingdoms until the Ptolemaic and Roman periods.
- Mesopotamia: Summer, Akkad, Babylon, Assyria and Persia.

The course aims to:

- Develop an understanding of the interrelation and influence between the organizations of the built environment and the social, political, cultural and technological aspects that shape the architectural character in the Ancient World period.
- Provide the student with knowledge of environmental responsiveness via underlining materials and techniques used in varied types of architecture from prehistory up to the conquest of Alexander the Great.

4. **AR 131 - History & Theory of Architecture 1 (**Prerequisite: None / Credit : 2 hours)

The course provides a survey of the Classical Civilization focusing on the architecture, art and formation of cities in the Greek and Roman periods, including the Aegean, Greek and Hellenistic cities as well as Etruscan and Roman periods.

The course aims to:

- Develop an understanding of the interrelation and influence between the organization of the built environment and the social, political, cultural and technological aspects that shape the architectural character in the classical period.
- Provide the student with knowledge of the concept of contextual responsiveness via underlining materials and techniques used in varied types of architecture from the beginnings of the Minoan civilization up to the fall of the Roman Empire.

5. **AR 210 – Architectural Drawing** (Prerequisite: ME 151 / Credit : 4 hrs.)

The studio is structured around sequential drawings inquiries that address in depth methods of exploring descriptive, analytical and abstractive skills as means to understand and represent formal spatial conditions of the built environment. Students are taken progressively to study spatial criteria through weekly drawing submissions.

The course aims to:

- Provide students with knowledge of architectural representation conventions and techniques.
- Enhance students' architectural representation and presentation skills.

6. **AR 211 – Architectural Design 1** (Prerequisites: AR 210 /AR 114 / Credit : 4 hrs)

This course is an introduction to the fundamentals of architectural design through the design process, analyses, concepts, development and presentation. Students are introduced to functional, spatial, environmental, structural, conceptual and aesthetic design requirements. This is accomplished through simple small-scale projects that address the aforementioned relationships. By the end of the course, students should be able to present their different design concepts using different presentation techniques.

The course aims to:

- Provide students with main knowledge about the fundamental requirements of architectural design.
- Provide students with hand on experience about architectural design as a process of creative problem solving, at an elementary level.

7. **AR 215 – Visual Studies 3** (Prerequisite: ME151 / Credit : 3 hrs)

The course intends to teach the principles of architectural representation and develop the student's skills in drawing perspective for a better understanding of the three-dimensional form and space.

Students study simple forms, graphically, by transforming visual information into a two-dimensional image with shade and shadow. The course also examines the language of architectural form and deals with the techniques of analyzing and representing it by different means of rendering. Students learn how to form architectural 3D forms manipulating the shade and shadow of architectural elevations emphasizing an environmental approach. Topics include:

(a) **Shade and Shadow**: Fundamentals; shade of points, lines, planes, volumes. Exercises on shade and shadow of different architectural elements; arches, stairs, curves and other architectural elements.

(b) **Perspective**: Fundamentals of perspective; plane of image, position of the observer (station point), cone of vision, angles of vision, vanishing points (one point, two points), architectural perspective. Shade and shadow in perspective, reflection in perspective and presentation skills.

The course aims to:

- Provide the student with the main knowledge of architectural representation.

8. AR 221 – Scientific Thinking (Prerequisite: None / Credit : 2 hrs)

This course is concerned with the nature of thinking, covering different types of thinking such as Scientific Thinking, Critical Thinking and Creative Thinking. Topics covered include: the elements of scientific thought, universal intellectual standards in scientific thinking, the traits of a scientific mind, challenges and generation of alternatives, creative problem solving techniques, linear and intuitive techniques; morphological analysis and operations. Students are given a series of exercises to produce ideas using both the linear and intuitive techniques. This is to enhance creative & active thinking. In the final project, Students are asked to apply those learnt skills and techniques to a realistic simple architectural challenge in order to produce ideas and breakthroughs.

The course aims to:

- Develop an understanding of the nature of scientific thinking and its main concepts and procedures.
- Explore the methodology scientific thinkers apply as they develop the traits of a scientific mind.
- Stress on the importance of identifying problems and converting them into specific challenges to be solved using different techniques.
- Develop problem-solving skills using various techniques (Linear and Intuitive thinker toys).
- Apply these skills and techniques to a realistic simple architectural challenge in order to produce ideas and breakthroughs.

9. AR 223 – Architecture of Egypt: Time & Place (Prerequisite: None / Credit : 2 hrs.)

This summer course introduces students to the architecture of Egypt, covering keystone buildings and sites ranging from antiquity to the 21st century. The course depends mainly on site excursions. Accompanied by lecturers throughout the course, students are encouraged to sketch, take photographs and have on-site arguments and discussions. The course also includes visits to museums and exhibitions, as well as a number of meetings with guest lecturers, conservation architects and design professionals. Finally a studio work is held on the light of the lessons learned throughout the trip. Each student is required to prepare and submit a portfolio that comprises his/her sketches and photographs. Attendance on excursions is mandatory.

The course aims to:

- Provide the student knowledge of the main characteristics of architecture in Egypt.
- Enhance the students' practical skills in on-spot freehand sketching and photography of buildings and landscapes.
- Introduce students to design approaches based on historical precedents and expose them to design problems in historical contexts.

10. AR 224 – Workshops & Architectural Models (Prerequisite: None / Credit : 2 hrs.)

Architectural Models are one of the main means by which an architect invents and develops his design. They serve as a bridge between the idea and its realization and they are clear and comprehensible examples of how design ideas can be skillfully translated into models. This course encompasses the definitions, analyses, concepts, development and presentation of fundamentals of architectural models. Students learn how to build abstract and architectural forms using different materials such as wood, paper, plaster ….etc.

The course aims to:

• Enhance the student with practical skills of architectural volumes and shape presentation.

11. AR 225 – Introduction to Painting (Prerequisite: None / Credit: 2 hrs.)

This course is based on the observation of color and its effect on lighting, shadow, composition, and the relationship between the figure and its environment. Trial is encouraged through studio sessions, evaluations and group discussions. The workshop is held under the supervision of a professional academic assistant.

The course aims to:

- Develop the student's sense of creation through painting.
- Enhance the student's practical skills in the field of painting.

12. AR 226 – Creativity & Innovation (Prerequisite: None / Credit : 2 hrs.)

This course presents an outlook to the process of creativity in design and to the innovative concepts influencing the process. It introduces the various theories and models of creative thinking increasing student's awareness of creativity and innovation. The course helps students to enhance their ability to develop inspirational concepts, explore different medias to discover solutions to problem solving tasks. Students are encouraged to work individually and in groups to develop brain-storming skills groups. The course involves practical application for different approaches and techniques enhancing valuable design skills as well as modeling skills.

The course aims to:

- Increase students' awareness to modeling techniques.
- Enhance students' practical skills in creating 3-Dimensional models.
- Stimulate creativity and imagination.
- Develop design skills and problem solving methods

13. AR 232 – History & Theory of Architecture 2(Prerequisite: None / Credit : 3 hrs.)

(a) History:

The course provides a synopsis for architecture, art and formation of cities in the Early Christian, Byzantine, Romanesque and Gothic eras. The course begins at the end of the Roman era and the rise of Christianity. After this introduction, the four historical periods are presented and analyzed in depth.

The course aims to:

- Provide the student with the main knowledge regarding the interrelation and influence of the built environment and the social, political, cultural and technological aspects that shape the architectural character in the ancient eras.
- Develop an understanding and ability to analyze selected examples of religious, civic and residential architecture in chronological order.

(b)Theory:

This class of architectural design fundamentals studies form and space and their manipulations as the essential elements of architecture. Various formal and spatial ideas are explored through architectural solutions developed over time to clarify the development of design concepts.

The course aims to:

• Introduce architecture students to the fundamental vocabulary of architecture elements, the different components of buildings and their relations in design, spatial qualities and order in architecture.

14. AR 233 – History & Theory of Architecture 3 (Prerequisite: None / Credit : 3 hrs.)

(a) History:

This course is meant to introduce the students to the history of Islamic art and architecture. Students begin by examining the formation and development of architectural, artistic, and urban traditions of the Islamic World. They are then introduced to the underlying forces that shaped the characteristics of every studied Era. Students learn from selected examples of religious, civic and residential Islamic buildings in a chronological order.

The course aims to:

- Provide students with knowledge about the characteristics of the Islamic art and architecture, as well as an understanding of the forces and factors that have shaped them.

(b)Theories:

The course is primarily designed to introduce students to design process and approaches. It starts by familiarizing students to the nature and approaches of creative problem solving. Afterwards, the course explains in detail the major phases and constraints in design process, including analyses, typology, and analogy.

The course aims to:

- Develop students' ability to understand the different approaches to design problems and the significant design methodologies and strategies, to realize sound architectural solutions.

15. AR 251 – Building Technology 1(Prerequisite: None / Credit : 3 hrs.)

The course introduces the student to the principles and fundamentals of building construction. Topics include the basic concepts of structural systems and foundations according to building loads and soil characteristics. In addition, the course presents the basic units of wall construction systems and clarifies the different methods of building insulation.

The course aims to:

- Teach students the main principles and fundamentals of building construction.
- Teach students the principles for the sound construction of a simple basic structure.
- Equip the student with practical skills for preparing technical and professional working drawings using engineering tools.

16. AR 252 – Building Technology 2 (Prerequisite: AR 251 / Credit : 3 hrs.)

The course focuses on the relation between the used building materials and the related adequate construction systems. Students study the basic elements of a building (roofs, floors and walls) and are introduced to different materials (reinforced concrete, wood and steel) for both prefabricated and on-site construction and finishing of these basic building elements.

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17. AR 283 – Computer Aided Drafting (Prerequisites : ME 151 / Credit : 3 hrs.)

This course focuses on basic computer aided drafting skills using the latest release of AutoCAD software. The course includes file management, the Cartesian coordinate system, drawing set-ups, drawing aids, layer usage, drawing geometric shapes, editing objects, text applications, basic dimensioning and help access. Students learn how to develop the necessary Knowledge and skills for using the computer in drafting.

The course aims to:

• Provide the student with knowledge to improve their skills of computer presentation in the design phase.
• Enhance the student's practical skills in the field of computer aided design applications.

18. AR 284 – 3D Modeling (Prerequisites: AR215 – AR283 / Credit : 3 hrs.)

This course is an introduction to the world of 3D modeling. Through the course, students study the basics and go through the process of building a visual model. Students learn how to produce a professional model and to express their own designs using different tools and techniques.

The course aims to:

• Assist the student to use 3D tools and using them in his/her daily work.
• Assist the student to interact with the built model, and to view it in all directions.
• Develop the student's practical skills and professional tools.

19. AR 312 – Architectural Design 2 (Prerequisite: AR 211- AR215 / Credit : 4 hrs.)

This course intends to help students further develop their architectural design abilities through the solution of moderately complex multi-functional programs. Emphasis is placed on the use of context (site characteristics, climate, and urban and architectural context) and program functional and spatial requirements as a basis for the generation of design solutions as well as the appropriate solution of circulation and integration of structure in design development.

The course aims to:

- Enhance students' abilities for design concept generation and for architectural design development.
- Introduce students to contextual design and develop their ability to design for specific physical contexts based on the analysis of climate, site characteristics, and urban and architectural character.

20. AR 313 – Architectural Design 3 (Prerequisite: AR 312 / Credit : 4 hrs.)

This course targets designing projects at an intermediate level, focusing on the ways in which the nature of structural systems and building materials affect and influence architectural design. Students begin by researching basic structural systems. The students should be able to select building materials as well as design projects with sound structural systems, to satisfy the requirements of building programs as an integral part of the design.

The course aims to:

- Deepen the student's awareness of structural systems and building materials and their role in stimulating forms and design ideas enabling the translation of concepts into built form.
- Allow the student to enhance and express their knowledge of the different structure systems used in buildings.
- Assist the student to develop his/her concept into a structural form.

21. AR 322 – Int. to Arc. Photography (Prerequisite: None / Credit : 2 hrs.)

This course explores the practical and creative interplay between photographic practice and theory in the field of visual representations of urban space. It aims to encourage an innovative approach to architectural and urban photography by adopting a critical approach to the way we perceive, relate and respond to the physical realm of architecture.

The course aims to:

- Develop an understanding of the sense of creation through photography.
- Enhance the student's practical knowledge in the field of photography with all its branches & photographers.

22. AR 323 – Music & Civilization (Prerequisite: None / Credit : 2 hrs.)

This course provides a tour through the world of music. Students start by studying the elements of music (melody, harmony, rhythm, timbre, texture, etc.) and building a comprehensive vocabulary with which to understand and evaluate musical expression. After this introduction, seven historical periods of music are presented: Medieval, Renaissance, Baroque, Classical, Romantic, Modern and Post - modern.

Composers of the various periods are presented within the context of their era relating it to the civilization as well. Students learn how architecture has common terms with music such as harmony, texture, rhythm, and module according to the characteristics of the era- emphasis on music as a part of general culture.

The course aims to:

• Provide the student with the knowledge of musical vocabulary and common architectural terms.
• Enhance the students' practical skills in the field of identifying classical music.
• Enhance the student's understanding of the different eras of classical music.

23. AR 324 – Introduction to Sculpture (Prerequisite: None / Credit : 2 hrs.)

The course introduces the students to the fundamentals of art in three-dimensional form. Students learn relevant terminologies and are introduced to basics of shape, volume, light, texture, color and value. During the course, they are introduced to materials: clay, plaster, wood, stone, metal …etc., techniques, tools and their selection, proper usage and finishing.

The course aims to:

• Develop a sense of creation through sculpting.
• Increase the student's awareness of the art of sculpting and of the importance of malleable materials.

24. AR 325 – Rendering & Animation (Prerequisites :AR 215-AR 284 / Credit : 2 hrs.)

This course is an advanced 3D modeling course that aims to develop students' computer skills by giving them the ability to be professional in architectural rendering and animation.

The course aims to:

- Encourage students to create professionally rendered architectural forms.
- Provide the students' knowledge of advanced 3D Studio Max and plug-ins.

25. AR 326 – Computer Graphics Design (Prerequisite: AR 283 / Credit : 2 hrs.)

This course develops the students' capacity to handle all the tools, techniques, software and media that are available in the vast world of graphics. The course focuses on developing critical and creative thinking processes to prepare the students for any professional setting.

The course aims to:

- Provide the student knowledge of graphic design history, principles and practices.
- Provide the student with skills of editing, refining, adjusting, presenting, and building virtual objects…etc.
- Encourage students to develop and present their architectural designs and creative ideas.

26. AR 327 – Interior Design Principles (Prerequisite: AR 283 / Credit : 2 hrs.)

Space is the essential element in interior design. This space gives life to the architecture which houses it. This course is a visual study of the nature of this interior setting. It is a fundamental element which makes up our interior environments. Emphasis is placed on basic design principles and how design relationships determine the functional, structural, and aesthetic qualities of interior spaces. It is a study of the design process.

The course aims to:

- Enhance the student's practical skills and ways of thinking which are based on knowledge of the basics of design that include the study of the form, space and movement.
- Provide the student with the main knowledge of dealing with and integrating interior design elements.

27. AR 328 – Furniture Design (Prerequisite: AR 283 / Credit : 2 hrs.)

This course is an introductory course on furniture design that makes the architectural space useful and reliable for the different types of human activities and functional spaces. An Introduction to the concepts, function, materials and techniques of furniture. Review of historical background and design theory development two and three-dimensional forms of a basic furniture concepts or design.

The course aims to:

- Provide the student with the main knowledge of concepts, functions, materials and techniques of furniture.

28. AR 334 – History & Theory of Architecture 4 (Prerequisite: AR 131 / Credit : 3 hrs.)

(a) History:

The course covers the Early, High, and Late Renaissance, as well as the Baroque and Rococo eras. It also covers the developments of the nineteenth century which led to key architectural movements. Innovations, in the use of materials such as iron and glass, are investigated through the eclectic and classical revival styles.

The course aims to:

- Provide students with the knowledge of the characteristics of the architecture of the Renaissance, Baroque, and Rococo periods and of the architectural movements of the 19th century as well as an understanding of the forces and factors that have shaped them.

(b)Theory:

The course provides a general overview of the different structural systems used in buildings. It also investigates the relationships between structure and architectural form exploring the potential impact of structure on building aesthetic qualities and function.

The course aims to:

- Provide students with a general understanding of the different structural systems used in buildings.
- Provide students with an understanding of the potential impact of structure on building aesthetic qualities and function.

29. AR 335 – History & Theory of Architecture 5 (Prerequisite: AR 334 / Credit : 3 hrs.)

(a) History:

This course provides an overview of the history of the built environment from 1900 AD to the present. The scope of coverage is panoramic, in both geographical and cultural terms, although the primary emphasis is on the Mediterranean basin and the West in general.

The course aims:

This course aims at developing an awareness of the diverse architectural traditions that developed from 1900 AD till today; at examining the cultural, economic, and technological principles expressed through the processes and products of construction and how these have changed over time; at familiarizing the role of the architectural profession in systematizing building theory and practice; at explicating how methods of historical inquiry shape our conception of the past; and at instilling in students the verbal and formal vocabulary of contemporary architecture..

(b) Theory:

This course covers human and social factors in design by investigating the interplay between space, behavior and ethnography from a cross cultural perspective. Spatial settings might facilitate, address and express cultural and social norms, ideals, codes/conventions, practices and behaviors, but also serve to exclude or include different social groups. This course serves as an introduction to examine how people's actions and behaviors both shape and are shaped by the physical and social environments. The course subjects students to interior and exterior spaces in different spatial settings within buildings and in urban space.

The course aims to:

- Involve students into social and behavioral aspects of physical environments from a cross cultural perspective.

30. AR 353 – Building Technology 3 (Prerequisite: AR 252 / Credit : 3 hrs.)

This course deals with the main complementary elements of a building (openings and stairs). Students begin by studying different materials of construction, finishing materials and accessories. Students also learn the different design considerations and architectural treatments of building joints.

The course aims to:

- Provide students with knowledge regarding the complementary elements of any building using different materials for construction and finishing.

31. AR 354 – Building Technology 4 (Prerequisite: AR 353 / Credit : 3 hrs.)

The course introduces students of architecture to the fundamental principles of the finishing systems and materials for both external envelope and internal spaces of buildings. The main objective of this course is to familiarize students with different finishing systems of buildings, including: facing, cladding and curtain walls for external finishing, besides the suspended ceilings, light partitions and internal wall treatments of internal spaces. Each finishing system is described in terms of its use, types, materials, design considerations and execution techniques.

The course aims to:

• Provide the student with the main knowledge to strengthen their vocabulary of both external and internal treatments and finishing through the use of different materials.
• Provide the student with the basics of sustainable practices and an endeavor to use sustainable materials and techniques.

32. AR 362 – Environmental Studies 1 (Prerequisite: None / Credit : 3 hrs.)

This course introduces students to the field of environmental design placing a strong emphasis on the importance of sustainability and the need to minimize the negative impact of buildings on the natural environment through climate-sensitive architectural design.

The course aims to:

• Provide students with an understanding of the impact of buildings upon the global environment through the consumption of non-renewable and polluting forms of energy.
• Provide students with an understanding of traditional and contemporary environmental design strategies to achieve indoor thermal comfort with minimum energy consumption.
• Introduce students to such topics as passive and active uses of solar energy, natural and artificial lighting, noise control in buildings, and room acoustics.

33. AR 414 – Architectural Design 4 (Prerequisite: AR 313 / Credit : 4 hrs.)

This studio course extends students' understanding of how buildings are generated from a specific location and address diverse user needs and specific socio-cultural contexts. The course aims to enrich students with a greater understanding of physical context (character and style) and cultural context (social and behavioral environment) and the relationship between them.

In this course, the design process is initiated through:

a. Research involving a contextual analysis of the site

b. A socio-cultural analysis involving questionnaires to investigate user needs.

The course aims to:

- Enhance students with an ability to design for specific physical contexts through an understanding of the site, its constraints and existing building character and style.
- The course aims to enrich students with an understanding of how to design for a specific target group by addressing health related concerns (e.g. design for disabilities, mentally challenged, elderly) and/or cultural diversity (e.g. ethnicity, minorities, youth).
- Encourage students to interact with the function of the project, local architectural character and

identity.

34. AR 415 – Architectural Design 5 (Prerequisite: AR414 / Credit : 4 hrs.)

This course is a continuation of design, but with more complex projects that have to be oriented to one of the modern architectural trends. Students should create new ideas, concepts, forms, and thinking methodologies using computer skills.

The course aims to:

- Encourage the student to deal with the complexity of the design projects and themes through higher levels of projects to be designed, where they have to be oriented to one of the modern architectural styles.

35. AR 416 – Interior Design 1 (Prerequisite: AR312 / Credit : 3 hrs.)

This course is concerned with design principles as presented through graphic rendering techniques. Topics covered include: interior spaces, interior design, design vocabulary. Studio projects cover commercial and residential interiors. The course stresses the planning and construction of interior space and the coordination of furnishing and accessories. Problem solving studio involves the understanding and application of color, fabrics, lighting, interior materials, paints, floor coverings, wall coverings, ceilings and lighting.

The course aims to:

- Enhance the student's practical skills of shaping contemporary interior space in private and public buildings.
- Provide the student with the main knowledge of dealing with and integrating interior design elements including, furniture, lighting, flooring and contemporary finishing materials.

36. AR 421 – Architectural Criticism (Prerequisite: None / Credit : 2 hrs.)

This course is an introduction to the basics and fundamentals of architectural criticism. It reviews contemporary architectural movements and the various directions of criticism they engendered. Particular emphasis is placed on the conceptions and directions of criticism, with a view to develop the student's ability to understand, analyze and interpret architectural works, as well as the meanings and intentions associated with them. Ideological and philosophical trends underlying the current movements are cross-examined, through selected examples highlighting various means utilized by architects to achieve such values as originality and innovation.

The course aims to:

- Provide students with knowledge about the vocabulary of architectural criticism, its nature, function, and importance in the architectural appraisal
- Provide students with knowledge about awareness of definitions, qualities and movements in criticism is sought, as well as understanding techniques in order to compare and evaluate different works of architecture.

37. AR 422 – A Mediterranean City: Urban & Arch. History (Prerequisite: None / Credit : 2 hrs.)

This course is an introduction to the development of urban and architectural design of Mediterranean cities. It concerns the spatial organization and its changing character through time. Geographical, historical, social, political and cultural factors are studied as determinants shaping the city. Architectural development and the relationship between economic growth and urban development are also addressed.

The course aims to:

- Understand the fundamental physical, social and temporal aspects that have shaped the different common characteristics of Mediterranean cities.
- Analyze one Mediterranean city as a case study. The analysis will include the different geographic, historical, social, political and cultural factors that have shaped the physical aspects of the city.
- Understand the relationships between economic growth and urban development.

38. AR 423 – Topics in Sustainability (Prerequisite: None / Credit : 2 hrs.)

The course reviews concepts and theories of sustainability and how the term has developed and embraced change and shift in policies and global commitment. Students are encouraged to think of developing principles and consider the design process with sustainable principles at the forefront. Innovative ideas and international examples are explored.

The course aims to:

- Provide students with knowledge about concepts and theories of sustainability.
- Enhance the student's engagement with practical implications on various scales and levels of sustainability.
- Encourage the student to suggest local contextual interpretations in the field of sustainability.

39. AR 424 – Functional Requirements in Interior Environment (Prerequisite: None / Credit : 2 hrs.)

This course is Methods for Design of the interior spaces. The purpose of interior design is the functional improvement, aesthetic enrichment, and psychological enhancement of interior spaces. The purpose of this course is the study of the relationship between users' activity, furnishing requirements and design.

The course aims to:

- Enhance the student's practical skills of shaping contemporary interior space in private and public buildings. Before commencing any interior space,we should ask ourselves some questions and then try to find the answers. The questions could be categorized as the thinking process of design. These questions are like (What? Who? Where? Why? How?) And to know the sources of information for space requirements in Interior.

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40. AR 425 – Introduction to Environmental Systems (Prerequisite: None / Credit : 2 hrs.)

This course aims to:

- Enable the student to understand the various elements that affect human thermal comfort located in a certain building with the use of measurement tools & simulation software. The course will assess a proposed architectural mass, based on a parametric study using simulation software, located in various locations according to the surrounding climatic elements.

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41. AR 427 – Introduction to Web Design (Prerequisite: AR326 / Credit : 2 hrs.)

Multimedia is expected to be the form of architectural presentation used in the future. This course provides hands on experience to students seeking the use of advanced multimedia techniques to produce a simple and enhancing website. Student will develop their skills and apply new skills in multimedia production. They will study how to design their website, story boarding, creating and making flash intros and flash site, special effects. This will be in the form of a website or CD application. Students will work with different multimedia packages and study how to put them altogether. .

The course aims to:

- Enhance the student's knowledge of websites.
- Enhance the student's practical skills to design websites with simple animation or CD application.
- Assist the student to interact with Information Communication Technology (ICT) skills.

42. AR 428 – Computer Applications in Architecture (Prerequisite: AR283 / Credit : 2 hrs.)

This course introduces students to computer applications in architecture that go beyond drawing and design presentation. It explores how the information and technological revolution influences architecture and other related fields. The course also investigates how architecture itself will change to accommodate new modes of working and communicating.

The course aims to:

- Enhance the student's knowledge of intelligent 3D models and extracting quantities and bills of materials from such models.
- Enhance the student's practical skills tin the production of technical systems and facilities management.

43. AR 441 – Introduction to City and Regional Planning (Prerequisite: None / Credit : 3 hrs.)

This course is an introduction to the field of planning. Students begin by studying planning and its different levels, concepts and related physical, social and economic phases. Subsequently, students learn about the role of the planner in creating sustainable environments for social, economic and cultural requisites of the society on a local, regional, and national level with application on Egypt.

The course aims to:

- Provide the student with the main knowledge of the discipline of "Planning".
- Enhance the student's practical skills regarding the levels, concepts, physical, social and economic phases of planning.
- Assist the student to create sustainable environments designed for the social, economic and cultural requisites of the society.

44. AR 442 – Introduction to Urban Design (Prerequisite: AR 441 / Credit : 3 hrs.)

This course is designed to provide an overview of the design of urban areas. Students learn theories and principles of urban design and issues concerning process and practices.

The course aims to:

- Develop an understanding of the different theories, principles, processes and procedures of urban design.
- Enhance the student's practical skills in urban design in a variety of functional categories, such as housing, central business districts and other activity centers.

45. AR 444 – Introduction to Management, Practice & Law (Prerequisite: AR 455 / Credit : 3 hrs.)

The course consists of four main parts covering its overall aims. Part one, of three weeks duration, is introductory to the main characteristics of building project management: its phases, disciplines, processes, and tools, participants and documents with particular of design phase. Part two, of three weeks duration, discusses the specification writing of different building items with concentration on architectural aspect of building. Part three, of four weeks duration, concentrates on Quantity survey, price breakdown and cost estimate of different building items. For three weeks duration, part four ends the course with introduction to bidding documents, contract types, building permits, conceptual total cost estimate of a project, and tender evaluation. This end prepares student to a separate detailed courses of professional practice and building regulations.

The course aims to:

- Provide the student with the main knowledge of the principles of architectural project management, different participants, documents and project phases.
- Design phase is the main theme.
- The role of architect in coordination between different disciplines to prepare tender documents is the main core.
- Specification writing and quantity survey for different items of building, the different factors controlling them and their effect on project quality, scheduling, and budget would be covered.
- The professional relationship between different participants of building project is introduced to prepare student to understand his profession.

46. AR 455 – Execution Design 1 (Prerequisite: AR 354 / Credit : 3 hrs.)

This course introduces the student to the fundamentals of execution design drawings based upon the wide range of vocabulary taught through the previous courses of Building Technology. Students start by learning

about the concepts of execution design and how detailing is mainly a design exercise. Then direct application is conducted in which the student applies basic execution instructions and previously earned knowledge of execution details into a small project. This includes arranging the information into easy, readable & complete set of execution documents. Execution basic documents are presented in the form of site plans and landscape, plans, partial and complete sections, elevations, schedules, and types of the different components of a building.

The course aims to:

• Emphasize an understanding of a wide-range of different building elements and their execution design aspects; construction materials and fixation methods.

47. AR 456 – Execution Design 2 (Prerequisite: AR 455-AR 464 / Credit : 3 hrs.)

This course deals with preparing execution design drawings for more sophisticated projects, taking into consideration the different technical systems and their installation. Advanced technical systems, as well as sanitary electromechanical ducts (HVAC, lighting & electrical power) and spatial requirements are introduced through the study of the course. Students practice how to develop design concepts into real projects.

The course aims to:

• Enhance the student's practical skills in dealing with relatively sophisticated buildings, including different workable technical systems and installations.

48. AR 464 – Environmental Studies 2 (Prerequisite: AR 362 / Credit : 3 hrs.)

This course is an extension of the course Environmental Studies I. The course introduces the students to the environmental science, in which basic equations are used as a quantitative approach of environmental design. Topics covered include ecological design principles, indoor environmental quality, energy conservation in buildings, and water systems and preservation.

The course aims to:

• Create a student who has the required critical skills to fluently discuss and absorb the environmental building design, the implementation of the Egyptian Energy code, Energy Conservation and the integration between passive and mechanical means to provide acceptable conditions for human comfort.

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49. AR 501 – Architectural Design Graduation Project (Prerequisites: AR 516– AR 557 / Credit : 12 hrs.)

The studio revolves around a proposed general theme which addresses a number of fundamental issues of local, regional or/and global nature. A preliminary program and a number of existing urban contexts of variable socio/cultural and environmental conditions are also proposed.

Through research and a series of seminars and discussion, students come to identify the specific themes and issues to be addressed, develop the detailed brief, select and study the appropriate context and site. Students work in groups of 4-6 during research and programming (3-4weeks), then individually during concept formation and design development.

Design cycles proceed through desk criticism as well as general critiques where all students and staff members are involved. Students are encouraged to communicate and present their ideas in various ways which include verbal and written statements, use of study models, schematic drawings as well as scaled drawings.

The project is finally presented in a series of drawings, images and models as well as design portfolio which documents the design evolution, methods and tools employed.

The course aims to:

- Emphasize the integration and assimilation of all types of knowledge gained in previous years; theory, history, structure, construction and environment.
- Develop an understanding of sustainable design (socially, economically and environmentally), and its implications for the project's program, design and urban/planning setting.
- Encourage students to interact with the built and natural environment, investigate the interrelationship between social, urban and natural patterns , develop their own vision and concepts and translate them into guidelines that instruct design and challenge the notion of building typology..
- Provide graduates equipped to analyze and define design parameters and undertake a selected architectural design project comprehensively showing principles and methods employed in their selection, and management of design, landscape and planning.

50. AR 516 – Architectural Design 6 (Prerequisite: AR 415 / Credit : 4 hrs.)

This course is a continuation of design studios dealing with projects of increasing complexity with a special emphasis on environmental issues and concerns. The course integrates various issues of space and form requirements, structural and mechanical systems with environmental constraints. Studio work includes projects and lectures.

The course aims to:

- Approach complex design problems that require functional, structural and aesthetic consideration, and address physical and cultural environmental issues.
- Integrate knowledge acquired in previous design studios as well as theoretical and other courses.
- Enhance the student's representation skills and visual, verbal and presentation techniques.
- Develop students' ability to create solutions to complex architecture problems taking into consideration environmental requirements and landscaping.

51. AR 521 – Research & Programming (Prerequisite: None / Credit : 2 hrs.)

This course is an introduction to the basic methods of research development and programming, with particular emphases on architecture and environmental design disciplines. It introduces various approaches, methods and techniques for conducting research work, and producing research documents. This includes topic selection and assessment, data gathering techniques, common research approaches and methods, and the principal skills for technical and creative writing. The course practically employs 'research proposals' as a vehicle through which students are introduced to different research approaches, methods and techniques.

The course aims to:

- Provide basic knowledge of research fundamentals and methods.
- Introduce appropriate means of data collection and documentation in research contexts.
- Address technical and ethical considerations in regard to appropriate academic research.

52. AR 522 – Colors & Light in Internal Spaces (Prerequisite: None / Credit : 2 hrs.)

Color is an inherent visual property of all form .The colors we attribute to objects find their source in the light that illumines and reveals form &space .Without light, color doesn't exist .The course focuses on lighting design for interior spaces. Students gain knowledge of the perception and psychological aspects of light as well as technical information related to current fixture types and appropriate application.

The course aims to:

- Provide basic knowledge of colors and light in interior spaces.
- Illustrate uses of light as a design element in interior spaces.

53. AR 523 – Historical Preservation & Conservation (Prerequisite: None / Credit : 2 hrs.)

The course provides a link between theories and practice of heritage conservation. It presents an overview of history, ethics and philosophies of conservation coupled with an introduction of conservation practice.

The course aims to:

- Link principles and practice in the context of a values-based approach to heritage conservation.
- Become familiar with the standards and guidelines for the conservation of historic places.
- Demonstrate the importance of survey skills in the development of a conservation plan.
- Provide an overview of the administrative and regulatory context for the rehabilitation of buildings.

54. AR 524 – Environmental Impact Assessment in Urban Planning (Prerequisite: None / Credit : 2 hrs.)

The course aims to:

- Explore the importance of Environmental Impact Assessment (EIA) in environmental management.
- Develop an introductory understanding of EIA processes and methodologies; Apply techniques to implement EIA.

55. AR 526 – Vernacular Architecture (Prerequisite: None / Credit : 2 hrs)

This course will provide an introduction to the field of vernacular architecture, research in different countries, describing and defining basic building types, focusing on interpretive concerns such as how to read a building, the social functions of architecture and the hidden intentions in the built form.

Also, demonstrating how material, culture can be analyzed to provide a broader, richer account of the human past, while reaching out for cross cultural comparisons, the course will concentrate on African and Arabian countries vernacular architecture with particular intention to regional formation.

The course aims to:

- Provide basic knowledge of vernacular architecture in Arabian region and Africa.

56. AR 527 – 20th Century Interior (Prerequisite: None / Credit : 2 hrs.)

This course offers a history of the 20th Century Interiors including architectural elements and influences, furnishings and accessories. Slide lecturers emphasize trends, revivals, innovations and reveal pertinent

influences & trends, architects, interior designers, furniture & accessories in both traditional and contemporary themes. The course includes discussions on some movements like Art Nouveau, Bauhaus, the Modern Movement, Art Deco, Hi-Tech and Green. All types of interiors are explored and placed within their social, political, economic and cultural contexts.

The course aims to:

- Provide basic knowledge of history of the 20th Century Interiors.

57. AR 528 – Comparative Styles in Furniture (Prerequisite: None / Credit : 2 hrs.)

The course is an introduction to the history of furniture design , decoration ,and interior design inclusive of the ancient World period , Classical World period , and Middle Ages . The student explores design choices and critically analyzes existing designs based on historical information . This course prepares students to participate in designing in a broader context.

The course aims to:

- Identify the characteristics of models of different furniture through the ages.

58. AR 529 – Computer Applications in Up and GIS (Prerequisite: AR 283 – AR 441 / Credit : 2 hrs.)

Teaching the students the (GIS, 9.3) program as a tool used to support the decision-maker (Urban planner) in applying a methodology to allocate the different activities in the researched area taking into consideration the spatial resources in the area of interest and the constrains of each activity.

The course aims to:

- Create criteria to build up a site analysis system using GIS taking into consideration different spatial resources and constrains.
- Use an accumulative co-relation matrix between different activities and constrains.
- Make a matrix library of quires to use it to allocate different activities for different areas of interest taking into consideration the constrains and site potentials.

59. AR 541 – Professional Practice (Prerequisite: CB 410 – AR 444 / Credit : 2 hrs.)

The course is divided into three main topics: the first topic is background to practice that deals with the construction industry, the main basics needed for the architect, employment and organizations. The second topic is running a project that deals with different inputs that allow the architect to run a project through managing these inputs, such as fees, markets and the client needs. The third topic is general office matters which concerns with many processes such as the management process, insurance and advertising. This course is meant to inform the student of all the parties, duties and responsibilities they will face in the professional world. Students begin by studying the rights and duties of the architect. Then, they learn the different professional relationships between involved parties in the profession. Students learn how to make economic decisions through practical applications

The course aims to:

- Acknowledge the students to the responsibilities, rights and duties of the architect while practicing the profession.
- Provide the student with the main knowledge about the different relationships with clients, other consultants and contractors.

• Emphasize an understanding of the ethical and legal responsibilities for public health, safety & welfare, property rights, accessibility and other factors affecting design, construction and architectural practice.

60. AR 542 – Regulations & Law (Prerequisite: CB 410 – AR 444 / Credit : 2 hrs.)

The course is divided into two parts: the first part deals with the building law and regulations concerning terminology, lighting, ventilation, courts, stairs, heights, projections, fire protection, and license obligations.

The second part deals with urban planning law and coordination of civilization law, concerning terminology, general plan, implementation and detailed plan, land subdivision, planning regulations of city center, industrial zones and crafts, areas of re-planning and unplanned areas.

The course aims to:

• Introduce architecture students to the building and planning laws and regulations and its application on architectural design.
• Develop the student's knowledge of different urban planning rules and laws.
• Produce graduates equipped to tackle law related obstacles, in a professional and legal manner.

61. AR 543 – Introduction to Site Planning & Housing (Prerequisite: AR 442 / Credit : 3 hrs.)

The course deals with the different concepts and principles of Housing & Site planning. It furnishes a wide background of the field of Housing and its related physical, social and economic influencing factors. The course first defines the general concepts of planned unit development inside neighborhoods and different housing level, and then it briefly illustrates the history of urban development inside Egypt. The course also presents an outline of prototypical site planning analysis stages and different steps in developing housing project

The course aims to:

- Provide a general idea about site planning & housing methodology
- introduce critical thinking on the urban concept & physical/ psychological needs
- Give a detailed explanation about different housing regulations, road design and road hierarchy
- Present the neighborhood definition and concept, planned unit development and different housing prototypes and models
- Trace the evolution of housing and urban development inside Egypt & exacerbate the problem of slums during the past decades

62. AR 546 – Landscape Architecture (Prerequisite: AR 313 / Credit : 3 hrs.)

This course is aimed towards the integration of both the building and the environment through the theories and principles of landscape design. Students with an in-depth understanding of how the two disciplines can be combined to produce integrated sustainable solutions. This is followed by the theoretical and historical backgrounds of landscape studies, site analysis, plant materials and landscape elements.

The course aims to:

• Provide the student with the main knowledge & the principles, processes, media, tools and skills necessary for practice of landscape design

63. AR 557 – Execution Design 3 (Prerequisites : AR 456 / Credit : 3 hrs.)

This course masters execution documents for buildings' functional spaces and sophisticated structural, environmental, interior, and outdoor/landscape elements. Environmental awareness, sustainability and their applications are also addressed throughout different stages of the course. The course then concentrates on advanced architectural detailing and execution problem-solving concepts and on the coordination between passive and technical systems on one hand, and execution documents and drawings. Students learn the theories and principles of advanced structural systems, construction materials and technologies and solving execution design problems using various techniques. Developments of various and advanced execution design methods, tools, and techniques available for building's structural and environmental design elements are also covered thoroughly.

The course aims to:

- Emphasize the use of a wide-range of different building-elements and their execution design aspects; construction materials and fixation methods.
- Encourage the student to interact with a number of advanced execution design related topics, such as structural systems, construction materials and technologies, special interior furniture, indoor fittings and equipment, lighting and acoustic systems.

B- Courses Provided by other Departments

1. BA 113 – Physics 1 (Prerequisite: None / Credit : 3 hours)

(Electricity and Magnetism) Electrostatics, coulomb's law, gauss' law, potential, capacitors, Electric current, Resistors, Kirchhoff's law. Electromagnetism, Magnetic field and forces, Induction. Light, wave nature of light, interference and polarization.

2. BA 114 – Physics 2 (Prerequisite: BA 114 / Credit : 3 hours)

(Heat and Sound) Introduction (Heat work and the system, reversible work), the first law of thermodynamics (non-flow and flow equations), the working fluid (liquid, vapor and gas), Reversible non – flow processes, the second law of thermodynamics, Heat transfer (conduction, convection, radiation), (slabs, cylinders and spheres), Standing waves, superposition, Air columns, Doppler Effect

3. BA 118 – Chemistry (Prerequisite: None / Credit : 2 hours)

(Engineering Chemistry) State of matter, Electrochemistry, corrosion and Protection, fuel and combustion – fuel & oil analysis, Lubrication oils analysis, water treatment and water analysis, Building materials, Polymerization & polymers.

4. BA 123- Mathematics 1 (Prerequisite: None / Credit : 3 hrs.)

(Calculus 1) Definition of a derivatives, Properties of derivatives, differentiation of algebraic, trigonometric, Inverse trigonometric, exponential, Logarithmic, hyperbolic functions, Impicit differentiation, applications: Tangent line, Maxima and minima, Curve sketching, L'Hopital's rule, Velocity & acceleration. Complex numbers: definition and algebra. Complex plane, polar and exponential form. Demoivre's theorem. Conic sections: Circle, Ellipse parabola. Solid geometry

5. BA 141- Engineering Mechanics 1 (Prerequisite: None / Credit : 3 hrs.)

(Introduction to mechanics). Plane and space force analysis, projection and synthesis. Moments. Couples and wrenches. Static equilibrium. Technique of free body diagrams. Applications of static equilibrium of machines, Method of virtual work and its application to solution of problems of static equilibrium.

6. CB 240- Theory of Structures (Prerequisite: BA 141 / Credit : 3 hrs.)

Basic concept of structural analysis, types of structures, forces, supports and reaction. Free – body diagram, equations of equilibrium. Analysis of statically determinate structures, internal force diagrams for beams, frames, arches and trusses. Stress analysis, properties of areas, normal stress distribution, shear stress distribution, torsional stresses, stresses and strains in two dimensions, strain rosette. Elastic deflections of structure, deflection of beams by the double integration method, method of conjugate beam. Analysis of statically indeterminate beams. Method of superposition. Method of three moments equation.

7. CB 350- Building Materials and Testing (Prerequisite: CB 240 / Credit : 3 hrs.)

This course introduces students to the various types of building materials. Starting with the basics of mechanical, chemical and physical properties of construction materials. This course will cover all the fundamentals of building materials testing, types, properties and usage.

8. CB 351- Reinf. Concrete and Metallic Structures (Prerequisite: CB 350 / Credit : 3 hrs.)

Reinforced concrete: Behavior and design of reinforced concrete beams, one – way and two – way slabs considering deflection, flexural, shear and anchorage. Behavior and design of columns including slenderness effects, design of lateral load resisting frames.

Metallic Structures: Allowable stress design of tension members, compression members, beams, beam – column, and connections. Approximate design of frames and trusses.

9. CB 370- Surveying (Prerequisite: BA 123 / Credit : 3 hrs.)

Standards ; Unit calibration ; Measurement of distance ; Linear surveying technique ; Bearing calculation and measurement ; Compass Traversing ; Rectangular coordinates calculation ;Application of practical surveying problems ; Measurement of horizontal and vertical angles ; The odolite Traversing ; Profile levelling ; Contouring ; Computation of earthwork ; Layout of construction engineering projects .

10. CB 460- Soil Mechanics and Foundations (Prerequisite: CB 351 / Credit: 3 hrs.)

Soil formation and identification. Physical and mechanical properties of soils. Soil classification methods. Exploration, sampling and in situ soil measurement. Bearing capacities of soils. Types of foundations. Foundation settlements. Improving site soils for foundation use. Water-table fluctuation. Lateral earth pressures on structures. Sheet-pile walls.

11. CB 510- Project Management & Scheduling (Prerequisite: AR 410 / Credit : 3 hrs.)

Introduction to construction management, relationship and responsibilities of project participants, project life cycle and management functions. Principles of economics, decision making and law applied to company and project management. Introduction to the principles of time analysis and scheduling practices in the project planning and control process, including network planning, CPM scheduling, resource leveling, cash flow analysis, project life cycle, design construction interface, and computer program applications. The course is organized around a series of exercises geared to simulate the management of the various stages of an architectural project.

12. CC 111- Introduction to Computer (Prerequisite: None / Credit : 2 hrs.)

Data processing concepts, digital computer components, computer classifications, Numbering systems 7 logic gates, Problem solving methodology, Operating PC's using DOS (lab), Basic: Introduction. Data types, I/O and assignment, Transfer of control, Loops, arrays, Functions, Subprograms.

13. CC 114- Introduction to Programming (Prerequisite: CC 111 / Credit : 3 hrs.)

This course is an introduction to programming using the Visual Basic programming language. It will involve studying elementary programming techniques using Visual Basic. Students and instructor will work together to create a structured, yet stimulating, environment in which to learn the Fundamental concepts of GUI computer.

By the end of the course students will have an understanding of programming and how to write some basic computer programs using Visual Basic. Also, they will have the tools to continue learning more advanced programming concepts and other programming languages.

14. LH 131- ESP 1 (Prerequisite: None/ Credit: 2 hrs.)

The objective of this course is to revise the vocabulary and structures of common core English and to pave the way for the students to be involved into technical engineering English . The course is functional in orientation, and intensively communicative. Writing skill is addressed on the paragraph and short essay levels.

15.LH 132- ESP 2 (Prerequisite: LH 131 / Credit: 2 hrs.)

The objective of this course is to develop the students proficiency in reading and writing technical engineering English. The course comprises authentic technical English texts extracted from textbooks, manuals, and engineering material. Comprehension exercises are supplemented by written exercises within the field of technical specialization .

16.ME 151- Engineering Drawing & Projection (Prerequisite: None / Credit: 2 hrs.)

Drawing practices and techniques (exercises on geometrical construction) – Methods of object projection (exercises on geometrical construction - exercises on geometrical construction) – Orthogonal Projections (exercises on orthogonal projections) – Missing views, dimensioning and freehand sketching (exercises on projections and freehand sketching) – Sectioning ad conventions (exercises on sectional views) – Intersection of geometrical surfaces and development (exercises on intersection of geometrical surfaces and development) – standard metal sections and metal structures (exercises on metal structures) – Compound metal sections and welds (exercises on metal structures) – Isometric projections and surface intersections (exercises on isometric projections and surface intersections) – Perspective projections (exercises on perspective projections) – Computer aided drafting using AutoCAD (general introduction) – Drawing and editing commands in AutoCAD – writing texts, dimensioning and viewing commands.