



PART [C]: SPECIALIZED PROGRAMS

(8) Architectural Engineering and Technology Program (AET)

برنامج هندسة وتكنولوجيا العمارة



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كلية الهندسة
Faculty of
Engineering

(8) Architectural Engineering and Technology Program (AET)

برنامج هندسة وتكنولوجيا العمارة

VISION رؤية البرنامج

Leadership in the architecture and building technology education to achieve excellence and development of sustainable community and built-up environments.

الريادة في تعليم العمارة وتكنولوجيا البناء بهدف تحقيق التميز، والتطوير لمجتمع وبيئات مبنية مستدامة.

MISSION رسالة البرنامج

- Providing a comprehensive and holistic approach to learning. Architectural Engineering at Cairo University is situated to address the critical environmental and building design issues needed in the 21st Century with its unprecedented challenges.
- We are committed to providing education in architecture science and technology that stresses exploration of critical issues in a learning environment that is conducive to meaningful inquiry and creativity.
- The mission of the program is to pursue architecture as a humanistic and professional discipline, which synthesizes Art, Engineering Sciences and Technology through intellectual rigor, aesthetic judgment, and technical understanding. The program achieves its mission via teaching, scholarship, creative work, research, and service, and commits itself to the highest ideals of the global profession and culture of architecture.
- The value of the program is to support Excellence, Open Discourse activities, Inclusiveness, Equity, Cooperation, Inter-Disciplinary Experience and Responsibility towards community.

- توفير نهج شامل ومتكامل للتعليم. تتوجه الهندسة المعمارية في جامعة القاهرة لمعالجة القضايا البيئية الحرجة وتصميم المباني في القرن الحادي والعشرين وتحدياته غير المسبوقة. ونحن ملتزمون بتوفير التعليم في مجال العلوم والهندسة المعمارية والتكنولوجيا الذي يؤكد على استكشاف القضايا الهامة وذلك في بيئة تعليمية ملائمة لتحقيق القيمة والإبداع.
- وتتمثل مهمة هذا البرنامج في تناول العمارة كتخصص إنساني ومهني، والذي يجمع الفن، والعلوم الهندسية والتكنولوجيا من خلال الموضوعية الفكرية، والحكم الحمالي، والفهم التقني.
- وتحقق رسالة البرنامج من خلال التعلم والريادة العلمية، والعمل الإبداعي، والبحوث، والخدمات المجتمعية، ويلتزم البرنامج بأسمى المثل العليا للمهنة وثقافة الهندسة المعمارية.
- وتتمثل قيمة البرنامج في دعم التميز وأنشطة النقاش والتحاور، والشمولية، والإنصاف، والتعاون المشترك بين الخبرة متعددة التخصصات والمسؤولية تجاه المجتمع.



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GRADUATE ATTRIBUTES مواصفات الخريج

The architect/graduate of the AET must be able to:

1. Enhance the lives of individuals and communities through endeavors that stem from intellectual curiosity, critical thinking, and broad inquiry, rooted in the inter-relatedness of theory, history, and practice linked with the engineering sciences and the global technology.
2. Address issues of national and international importance in a meaningful and responsible manner, being not only future introspective practitioners, but also critical thinkers who will eventually be in significant leadership positions in the profession, who has the ability to understand, assemble, and coordinate all of the discipline to create a sustainable environment.
3. Examine the art of architecture and the science and technology within the building construction profession to be considered a multidisciplinary field that integrates architecture, engineering, technology and management of people and physical resources.
4. Carry out robust and successful design and to develop, construct and operate residential, commercial, and public properties with creativity and technical mastery.
5. Demonstrate investigative skills, attention to details, and visualize/ conceptualize skills and adopt a holistic problem-solving approach for complex, ambiguous, and open-ended challenges, and scenarios.
6. Demonstrate knowledge of cultural diversity, differences, and the impact of a building on community character and identity, and address urban issues, planning, and community needs through design work.

Specialized Tracks of Engineering Profession



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GRADUATE ATTRIBUTES مواصفات الخريج

- يتبنى البرنامج المعايير القومية الأكاديمية المرجعية (إصدار 2018) والمعدة من الهيئة القومية لضمان جودة التعليم والاعتماد وذلك للجدارات الخاصة بخريج كليات الهندسة على المستوى (A)، وكذلك للجدارات الخاصة بخريج برامج الهندسة المعمارية على المستوى (B).
- وكذلك يتبنى البرنامج بعض المعايير الأخرى الأكثر تخصصاً على المستوى (C)، وذلك نظراً لطبيعة البرنامج، وقد تم تبنيها من:

Fundamental objectives of the UNESCO-UIA Charter for Architectural Education

NARS 2018	LEVEL A	LEVEL B	LEVEL C	LEVEL D
	Totally Adopted p. A11	Totally Adopted	* Adopted from UIA Architectural Education Charter	NA

In addition to the basic Engineer competencies and the Architectural Engineer competencies of NARS 2018, the AET graduate must be able to:

LEVEL C COMPETENCIES

- Understanding of the structural design, constructional, and engineering problems associated with building design.
- Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against the climate.
- Adequate knowledge of the industries, organisations, regulations, and procedures involved in translating design concepts into buildings and integrating plans into overall planning.
- Adequate knowledge of the means of achieving ecologically sustainable design and environmental conservation and rehabilitation
- Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture.



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Credit Hours System



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SPECIALIZED COURSES CONTENTS توصيف المقررات

Code	Name	Credit Hours	Category	Pre-requisite
AETS280	Engineering Seminar - Introduction to Arch Theory	1	DR	30 CR.HRS. + AA APPROVAL
AETS281	Industrial Training-1	1	FR	60 CR.HRS. + AA APPROVAL
AETS381	Industrial Training-2	2	DR	AETS281 + AA APPROVAL
AETS481	Graduation Project-1	1	FR	110 CR.HRS. + SOPHOMORE + ARCS304 + ARCS208 + ARCS301 + ARCS302 + ARCS 305 + ARCS307 + ARCS380 + AA APPROVAL
AETS482	Graduation Project-2	3	DR	AETS481 + ARCS470 + AA APPROVAL
Total		2+6		

COURSES CONTENTS توصيف المقررات

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
Faculty Requirements										
AETS281	Industrial Training-1	1								
	Pre-requisites: 60 CR.HRS. + AA APPROVAL									
	Training on industrial establishments relevant to the program. Training lasts for a total of 90 hours, during a minimum period of three weeks. The program training advisor schedules at least one follow-up visit to the training venue and formally report on performance of trainee(s). A Mentor in the industrial establishment provides a formal report on the student's performance during training. The student submits a formal report and presentation to be evaluated by a panel of three members with one member being an external examiner appointed from industry or other colleges of engineering. The course is graded as Pass/Fail grade-system.									
AETS481	Graduation Project-1	1					3			3
	Pre-requisites: 110 CR.HRS. + SOPHOMORE + ARCS304 + ARCS208 + ARCS301 + ARCS302 + ARCS 305 + ARCS307 + ARCS380 + AA APPROVAL									



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Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total
	Students – in groups (or individually in some programs) - undertake a final project as part of the program. In GP1, students provide a clear identification of a real-life problem that represents an actual need for the industry or the community and reflects the mission and strategic objective of CUFE. Students are expected to survey the related literature, collect, and interpret market data, and propose an approach for the solution, using the engineering knowledge and skills acquired. The course is graded as Pass/Fail based upon a report/oral presentation stating the expected cost and required material, tools, and facilities as well as a timed list of deliverables.									
References	References are related to students' projects.									
Discipline Requirements										
AETS280	Engineering Seminar - Introduction to Arch Theory	1	1							1
	Pre-requisites: 30 CR.HRS. + AA APPROVAL									
	This course aims to introduce the students to concepts related to the principles of architectural design. It discusses concepts related to architectural form, and quality of space, structure, function, aesthetics, and the impact of the context on the production of architectural work. It also aims to identify the functional program, spatial distribution, human dimensions, scale and proportion, main activities, services, and the elements of horizontal and vertical circulations.									
	This course focuses on finding innovative solutions to elementary design issues associated with the definition of the architectural space, form generation, or the solution of spatial distribution. It also aims to develop the student's analytical skills to understand the complexities of the design problem and the different aspects affecting the design process. Moreover, this course develops the skill of critical reading of theories and architectural ideas and using case studies whenever possible.									
References	<p>على رافت (1996). ثلاثية الإبداع المعماري، مركز أبحاث انتركونسلت، القاهرة</p> <p>Norberg-Schulz, C. (1971). Existence, space & architecture. New York: Praeger.</p> <p>Hall, E. T. (1966). The hidden dimension. Garden City, N.Y: Doubleday.</p> <p>Grosz, E. A. (2001). Architecture from the outside: Essays on virtual and real space. Cambridge (Mass.: Massachusetts Institute of technology Press.</p> <p>Ching, F. (1996). Architecture: Form, Space, and Order, 4th Edition Wiley Pub. ISBN: 978-1-118-74508-3</p> <p>Krier, R. (1992). Elements of architecture. London: Academy Editions.</p> <p>Lawson, B. (2001). The language of space. Oxford: Architectural Press.</p> <p>Neufert, E., Neufert, P., Baiche, B., & Wall man, N. (2000). Architects' data. Oxford: Blackwell Science.</p> <p>Meiss, P., (1990). Elements of architecture: From form to place. London: Van Nostrand Reinhold.</p>									



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BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total
AETS381	Industrial Training-2	2								
	Pre-requisites: AETS281. + AA APPROVAL									
	Training on industrial establishments relevant to the program. Training lasts for a total of 180 hours, during a minimum period of six weeks. The program training advisor schedules at least two follow-up visits to the training venue and formally report on performance of trainee(s). A Mentor in the industrial establishment provides a formal report on the student's performance during training. The student submits a formal report and presentation to be evaluated by a panel of three members with one member being an external examiner appointed from industry or other colleges of engineering. The course is graded as Pass/Fail grade-system.									
AETS482	Graduation Project-2	3	1					4		5
	Pre-requisites: AETS481 + ARCS470 + AA APPROVAL									
	Graduation Project-2 is the second phase of the graduation project. The aim is to develop innovative solutions to problems encountered during the implementation process thus fulfilling the deliverables stated in Graduation Project-1. A dissertation on the project is submitted taking into consideration technical, economic, social, and environmental requirements while analysing the major results and presenting direct conclusions.									
References	References are related to students' projects.									

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Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

PROGRAM REQUIREMENTS متطلبات البرنامج

Category		No. of courses	Course Credit Hour	Total Credit Hours
Discipline Requirements (DR)	core/ compulsory	5	2	10
		13	3	39
		4	4	16
Total DR courses		22		65
Program Requirement (PR)	core/ compulsory	5	2	10
		3	3	9
		1	4	4
	Elective	2	2	4
		5	3	15
Total PR courses		16		42
Total Elective courses (DR & PR)		7		19

▪ Discipline Requirements (DR) core/compulsory courses list

Code	Name	Credit Hours	Pre-requisite
ARCS101	Introduction to the History of Architecture	3	---
ARCS201	History of Structures	2	---
ARCS203	Architecture and Humanities	2	ARCS107
ARCS107	Architectural Design-1	3	GENS009 + INTS001
ARCS105	Introduction to Building Construction and Environmental Design	3	INTS001
ARCS106	Digital Representation for Architects	3	INTS005 + INTS001
ARCS108	Visual Perception and Art	2	INTS001
ARCS109	Introduction to Design Computing	2	ARCS106
ARCS202	Building Construction-1	3	ARCS105
ARCS304	Urban Design and Landscape	3	ARCS206
ARCS205	Building Technologies-1	2	ARCS105
ARCS206	Architectural Design-2	3	ARCS107
ARCS207	Architectural Design-3	3	ARCS107



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Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name	Credit Hours	Pre-requisite
ARCS208	Site Planning and Development	3	ARCS107
ARCS301	Architectural Design-4	3	ARCS206 + ARCS207 + ARCS109
ARCS302	Building Construction-2	3	ARCS202
ARCS305	Building Construction-3	4	ARCS202
ARCS307	Architectural Design-5	4	ARCS206 + ARCS207 + ARCS109
ARCS402	Building Construction-4	4	ARCS302 + ARCS305
ARCS406	Architectural Design-6	4	ARCS304 + ARCS301 + ARCS307 + ARCS380 + ARCS302 + ARCS0305
STRS213	Engineering Materials	3	EMCS002 + PHYS001
STRS111	Structural Analysis-1 and Mechanics of Materials	3	EMCS002
Total		65	

▪ **Program Requirements (PR) core/compulsory courses list**

Code	Name	Credit Hours	Pre-requisite
ARCS240	Thermal Properties & Energy in Buildings	3	ARCS105
ARCS403	Integrated Building Systems	3	ARCS240 + ARCS308
ARCS308	Architectural Acoustics and Daylighting	2	ARCS105
ARCS380	Architecture and Design Theory	3	ARCS201 + ARCS101 + AETS280
ARCS405	Building Construction-5	4	ARCS302 + ARCS305
STRS311	Concrete Structures	2	STRS111
STRS312	Steel Structures	2	STRS111
CVES402	Surveying and Foundation Design	2	STRS111
ARCS470	Thesis Writing for GP	2	110CR.HRS+ SOPHOMORE + ARCS304 + ARCS208 + ARCS301 + ARCS302 + ARCS305 + ARCS307+ ARCS380+ GENS001+ COREQUISITE WITH AETS481
Total		23	



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Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

▪ Program Requirements (PR) elective courses list

▪ مجموعة المقررات الاختيارية PE1 يختار الطالب عدد 2 مقرر

Code	Name	Credit Hours	Pre-requisite
ELECTIVE (ARCS2XX / ARCS3XX) 2 CREDITS/ 3/4 CONTACT HRS			
ARCS209	Building Technologies-2	2	ARCS205
ARCS230	Contemporary Architecture: 20th Century and Beyond	2	AETS280 + ARCS101 + ARCS201
ARCS231	History of Islamic Architecture	2	ARCS101
ARCS232	Graphic Design	2	ARCS108 + ARCS109
ARCS332	Special Problems in Construction	2	ARCS205 + ARCS202
ARCS339	Advanced Structural Systems and Design	2	STRS111 + ARCS202
Total		4	

▪ مجموعة المقررات الاختيارية PE2 يختار الطالب عدد 1 مقرر

Code	Name	Credit Hours	Pre-requisite
ELECTIVE (3 CREDITS / 4 CONTACT HRS)			
ARCS330	Ecologies of Construction	3	ARCS105 + ARCS240
ARCS336	Architecture, Culture & Heritage	3	ARCS203 + ARCS304
ARCS436	Independent Studies: Global Trends in Urban Planning	3	ARCS208
ARCS441	Professional Practice	3	ARCS305 + ARCS302 + ARCS301 + ARCS307
Total		3	

▪ مجموعة المقررات الاختيارية PE3 - Design Based يختار الطالب عدد 2 مقرر

Code	Name	Credit Hours	Pre-requisite
ELECTIVE (3 CREDITS / 4 CONTACT HRS)			
ARCS331	Knowledge Based Systems	3	ARCS109
ARCS333	Building Technologies-3: Energy in Building Design	3	ARCS240
ARCS334	Selected Topics in Architecture & Urban Design	3	ARCS304 + ARCS206 + ARCS207
ARCS335	Community Design & Social Development	3	ARCS203 + ARCS304 + ARCS208
ARCS337	Housing Design and Real Estate Development	3	ARCS304 + ARCS208



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name	Credit Hours	Pre-requisite
ARCS430	Interior Design	3	ARCS108 + ARCS301 + ARCS307
ARCS432	Geometric Modeling	3	ARCS109
ARCS440	Landscape Architecture	3	ARCS304 + ARCS208
Total		6	

مجموعة المقررات الاختيارية PE4 - Art and Creativity - يختار الطالب عدد واحد مقرر

Code	Name	Credit Hours	Pre-requisite
ELECTIVE (ARCS35X) 3 CREDITS/ 4 CONTACT HRS			
ARCS351	Art, Creativity and Design	3	ARCS108
ARCS352	History of Art	3	ARCS108
Total		3	

مجموعة المقررات الاختيارية PE5 - GP Independent Studies Elective - يختار الطالب عدد واحد مقرر

Code	Name	Credit Hours	Pre-requisite
ELECTIVE (ARCS48X) 3 CREDITS/ 5 CONTACT HRS			
ARCS481	GP Independent Studies: Architecture Theme	3	AETS481 + ARCS470 + COREQUISITE WITH AETS482
ARCS482	GP Independent Studies: Urban Theme	3	AETS481 + ARCS470 + COREQUISITE WITH AETS482
ARCS483	GP Independent Studies: Technology & Environment Theme	3	AETS481 + ARCS470 + COREQUISITE WITH AETS482
Total		3	



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Proposed Study Plan - 8 semesters - Including Freshman Level

S	Code	Name	Credit Hours	Contact Hours							
				Lec	Tut (2)	App Tut	Lab	Stud	Off Tut	OffHr	Total
SEMESTER 1	PHYS001	Mechanical Properties of Matter and Thermodynamics	3	2		2	1				5
	MTHS002	Calculus I	3	2	2						4
	EMCS001	Engineering Mechanics - Dynamics	3	1	2	1					4
	CHES001	Chemistry for Engineers	2	1	2						3
	INTS001	Engineering Graphics	3	2			3				5
	INTS005	Information Technology	2	1		3					4
	E-A (GENS009)	Elective E-A (Introduction to Design Thinking)	2	2							2
	GENS004	Proficiency and Capacity Building	2	2							1
		Sub-Total		19	13	6	2	4	3	0	0

S	Code	Name	Credit Hours	Contact Hours							
				Lec	Tut (2)	App. Tut	Lab	Stud	Off Tut	OffHr	Total
SEMESTER 2	MTHS003	Calculus 2	3	2	2						4
	EMCS002	Engineering Mechanics - Statics	2	1	2						3
	PHYS002	Electricity and Magnetism	3	2		2	1				5
	ARCS107	Architectural Design-1	3	1				4			5
	ARCS105	Introduction to Building Construction and Environmental Design	3	2				3			5
	ARCS106	Digital representation for Architects	3	2			2				4
	GENS001	Critical & Creative Thinking	2	2							2
		Sub-Total		19	12	4	2	3	7	0	0



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

S	Code	Name	Credit Hours	Contact Hours							
				Lec	Tut (2)	App Tut	Lab	Stud	Off Tut	OffHr	Total
SEMESTER 3	ARCS101	Introduction to the History of Architecture	3	2	2						4
	ARCS205	Building Technologies-1	2	1	2						3
	ARCS206	Architectural Design-2	3	1				4			5
	ARCS108	Visual Perception and Art	2	1				2			3
	ARCS109	Introduction to Design Computing	2	1			3				4
	AETS280	Engineering Seminar- Introduction to Arch Theory	1	1							1
	STRS111	Structural Analysis-1 and mechanics of materials	3	2	2						4
	MTHS005	Introduction to Probability and statistics	3	2	2						4
		Sub-Total	19	11	8	0	3	6	0	0	28

S	Code	Name	Credit Hours	Contact Hours							
				Lec	Tut (2)	App. Tut	Lab	Stud	Lec	Off. Hrs	Total
SEMESTER 4	ARCS201	History of Structures	2	1	2						3
	ARCS240	Thermal Properties & Energy in Buildings	3	2			2				4
	ARCS202	Building Construction-1	3	2				3			5
	ARCS203	Architecture and Humanities	2	1	2						3
	ARCS207	Architectural Design-3	3	1				4			5
	ARCS208	Site Planning and Development	3	2				2			4
	STRS213	Engineering Materials for Architects	3	2			2				4
		Sub-Total	19	11	4	0	4	9	0	0	28



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

S	Code	Name	Credit Hours	Contact Hours							
				Lec	Tut (2)	App Tut	Lab	Stud	Off Tut	OffHr	Total
SEMESTER 5	ARCS304	Urban Design and Landscape	3	2				2			4
	ARCS301	Architectural Design-4	3	1				4			5
	ARCS302	Building Construction-2	3	2				3			5
	ARCS2XX/ 3XX	Major Elective Course - PE1	2	1	2						3
	ARCS3XX/ 4XX	Major Elective Course - PE2	3	2	2						4
	ARCS35X	Art and Creativity Elective - PE4	3	2				2			4
	STRS311	Concrete Structures	2	1	2						3
	Sub-Total		19	11	6	0	0	11	0	0	28

S	Code	Name	Credit Hours	Contact Hours							
				Lec	Tut (2)	App. Tut	Lab	Stud	Lec	Off. Hrs	Total
SEMESTER 6	E-A (GENS120)	Elective E-A (Fund. of Economics and Accounting)	2	2							2
	ARCS380	Architecture and Design Theory	3	2	2						4
	ARCS307	Architectural Design-5	4	2				4			6
	ARCS305	Building Construction-3	4	2				4			6
	ARCS308	Architectural Acoustics and Daylighting	2	1	2						3
	ARCS2XX/ 3XX	Major Elective Course - PE1	2	1	2						3
	STRS312	Steel Structures	2	1	2						3
	Sub-Total		19	11	8	0	0	8	0	0	27



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

S	Code	Name	Credit Hours	Contact Hours							
				Lec	Tut (2)	App Tut	Lab	Stud	Off Tut	OffHr	Total
SEMESTER 7	GENS002	Societal Issues	2	2							2
	ARCS403	Integrated Building Systems	3	2	2						4
	ARCS406	Architectural Design-6	4	2			4				6
	AETS481	Graduation Project-1	1				3				3
	ARCS402	Building Construction-4	4	2			4				6
	ARCS470	Thesis Writing for GP	2	1			2				3
	ARCS3XX/ 4XX	Major Elective Course - PE3	3	2			2				4
	Sub-Total		19	11	2	0	0	15	0	0	28

S	Code	Name	Credit Hours	Contact Hours							
				Lec	Tut (2)	App. Tut	Lab	Stud	Lec	Off. Hrs	Total
SEMESTER 8	GENS110	Fundamentals of Management, Risk and Environment	2	2							2
	GENS2XX	UR Free Elective	2	2							2
	AETS482	Graduation Project-2	3	1			4				5
	ARCS48X	GP Independent Studies Elective - PE5	3	1			4				5
	ARCS3XX/ 4XX	Major Elective Course - PE3	3	2			2				4
	ARCS405	Building Construction-5	4	2			4				6
	CVES402	Surveying and Foundation Design	2	1			3				4
	Sub-Total		19	11	0	0	3	14	0	0	28

* AET STUDENTS SHOULD CHOOSE EITHER GENs201 OR GENs204 OR GENs209



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

COURSES CONTENTS توصيف المقررات

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
Discipline Requirement										
ARCS101	Introduction to the History of Architecture	3	2	2						4
	Pre-requisites: NONE									
	Provides an outline of the history and theory of architecture and urbanism from Ancient Egypt to the 19th century. Analyzes buildings as the products of culture and in relation to the special problems of architectural design.									
References	Sir B. Fletcher, (1924), A History of Architecture in the Comp. Method. Spiro Kostof, (1985), A History of Architecture, Settings and Rituals. Doris Abu Seif, (1992), An Introduction to Islamic Architecture in Cairo, AUC Press									
ARCS201	History of Structures	2	1	2						3
	Pre-requisites: NONE									
	Technical and historical study of structures in architecture and engineering. Focuses on the design and assessment of historic structures in masonry, timber, concrete, and metal. An emphasis on the impact of the 20th century and beyond; modern technology is also introduced.									
References	Kenneth Frampton, 1992, "Modern Architecture A critical history" Kultermann, U., 1993, "Architecture in the 20 th century", Van Nostrand Reinhold, New York. Siegfried Giedion, "Space, time and architecture: The Growth of a new tradition", Fifth Revised and Enlarged Edition (The Charles Eliot Norton lectures) Nikoulas Pevsner, "Pioneers of Modern Design: From William Morris to Walter Gropius; Revised and Expanded Edition". Henry Russell Hitchcock, "Architecture: Nineteenth and Twentieth Centuries (The Yale University Press Pelican History of Art) Jencks, C.,1991, "The language of Post-Modern Architecture" Academy Editions, London. - Jencks, C., 1997, "The Architecture of the Jumping Universe", Revised edition by Academy Editions, Wiley & Sons, Chichester.									



جامعة القاهرة
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University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
ARCS203	Architecture and Humanities Pre-requisites: ARCS107 This course is designed for students of architecture to understand the human aspects in design. The course tends to deal with the question of why in architecture with respect to people's needs, motivations, and style of life. Students will explore several issues pertaining man-environment relation and its reflections on architecture. During the course students conduct critical reports, and practice design preliminary stages for creating responsive Architecture.	2	1	2						3
References	<ul style="list-style-type: none"> -Gifford, R. (2007) Environmental psychology: principles and practices, fourth edition, optimal books, Canada. -Deasy C.M., Thomas E. Lasswell (1990). Designing Places for People: A Handbook on Human Behavior for Architects, Designers and Facility Managers. Watson-Guption Publications, Incorporated -Groat; L. and Wang; D. (2002). Architectural Research Methods. Wiley, John & Sons, Incorporated. -Hall, E.T (1966) the hidden Dimension. London, Bodley Head . -Lawson, Bryan (2006). The language of space, Elsevier, Oxford, UK -Wolfgang F.E. Preiser, Harvey Z. Rabinowitz and Edward T. White. 1988. Post-Occupancy Evaluation. Van Nostrand Reinhold. 									
ARCS105	Introduction to Building Construction and Environmental Design Pre-requisites: INTS001 The course discusses the fundamentals of building construction and the environmental control systems dealing specifically with heat gain and sun shading in buildings. The course illustrates an introduction for the building components and the construction process. Moreover, it places an emphasis on both wall bearing and skeleton structures. Furthermore, it integrates some environmental aspects in the building construction.	3	2				3			5
References	<ul style="list-style-type: none"> McKay's Building Construction, by W.B. McKay Building Construction Illustrated - 4th Edition, by Francis D.K. Ching. 									
ARCS106	Digital Representation for Architects Pre-requisites: INTS004 + INTS001 The course introduces different forms of digital representation in architecture including architectural drawings, 3D-modeling, rendering, sheet layout design and fundamentals in animation and image editing. The course explores current CAD technologies and develop skills in the use of specialist CAD software to produce 2D and 3D design specifications, to transform CAD drawings into photo realistic virtual products and to gain an awareness of CAD data and how such information can be transformed to engineering drawing. Further, introduction to Building Information Modeling (BIM) and graphical representation software aims to enhance the skills of students in their first years. Such tools equip the student for proper communication with various stakeholders within the profession.	3	2		2					4
References	<ul style="list-style-type: none"> Stine, J D (2022) Design Integration Using Stine, Autodesk Revit 2023 Architecture, Structure and MEP, SDC publications Kensek, K et al (2020) Building Information Modeling: BIM in Current and Future Practice, Wiley 									



جامعة القاهرة
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BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours								
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ARCS107	Architectural Design-1	3	1					4			5
	Pre-requisites: GENS004 + INTS001										
	<p>This course is meant to direct the students throughout the process of design starting from deriving the concept and conceptual thinking based on HUMAN BEHAVIORAL GIVENS; and reaching to fully developed multi-layered design allowing students preliminarily understand the different aspects incorporated with the design process covering simply: Socio-cultural, Utilitarian, Structural, Environmental and Economic aspects .</p> <p>Also, the course aims to train the students to effectively use various illustration media to express their work and express themselves including manual, digital, and mixed media as well as the written word. Those skills are introduced through a dwelling project, where students are required to express verbally their dream home, write a script for the scenario of using this home, and fulfilling this scenario in an architectural form.</p> <p>Following that, a secondary project is given, which is a small-scale public-use project, a simple client-oriented one, to acquire the conceptual and technical skills for dealing with a public building</p>										
References	<p>Francis D. K. Ching; Architecture: Form Space, and Order, 4th Edition Wiley Pub. ISBN: 978-1-118-74508-3</p> <p>Francis D.K. Ching, Building Construction Illustrated, ISBN: 978-0-470-08781-7 Edition / Copyright: Fourth edition, Publisher: John Wiley & Sons, Inc</p> <p>Don Hanlon, Compositions in Architecture, ISBN: 978-0-470-05364-5, Edition / Copyright: latest Publisher: John Wiley & Sons, Inc</p> <p>Simon Unwin, Analysing Architecture, ISBN: 978-0-415-48928-7, Edition/Copyright: Third edition, Publisher: Routledge</p> <p>Geoffrey H. Baker, Design Strategies in Architecture, ISBN: 0-419-16130-9, Edition/Copyright: Second edition, Publisher: Routledge.</p> <p>Geoffrey H. Baker, Design Strategies in Architecture, ISBN: 0-419-16130-9, Edition/Copyright: Second edition, Publisher: Routledge.</p> <p>Pierre von Meiss, Elements of Architecture, ISBN: 978-0-419-15940-7, Edition/Copyright: latest Publisher: Spon Press.</p> <p>Pfeiffer, Bruce Brooks, Frank Lloyd Wright on Architecture, Nature, and the Human Spirit: A Collection of Quotations, ISBN: 978-0764959561, Pomegranate</p> <p>Steele, James, Architecture for People: The Complete Works of Hassan Fathy, ISBN: 978-0823002269, Watson-Guptill</p> <p>Pfeiffer, Bruce Brooks, Frank Lloyd Wright Selected Houses, ISBN: 978-4871405485, A.D.A. Edita.</p>										



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
ARCS108	Visual Perception and Art Pre-requisites: INTS001 Visual perception develops tools of visual analysis and interpretation. Students examine topics ranging through three main sectors. Sector 1: Freehand Sketching & Perspective: Understanding the art of perceiving different shapes & forms in environment and interpretation of proportions. Developing Free-hand sketching skills using pencils as a media and introduction to shade and shadow and perspective viewing of basic geometric forms. Sector 2: Science & Theory of Color: The development of an awareness of the science of color. This theme explores the properties, composition, and interaction of colors as related to architecture. It also opens up new dimensions of colors as a presentation media in art and through architectural applications . Sector 3: Composition & Creativity: The development of creativity, perception, drawing and composition skills to express the students' thoughts and ideas. This is achieved by providing artistic activities that allow the student to express his/her skills, thoughts, and creativity freely and to learn about art sketching, abstraction, and perception in architecture.	2	1				2			3
References	<p>Hannah, G., 2002 Elements of Design- Rowena Reed Kostellow and the Structure of Visual Relationships: exercises in three-dimensional design, Hannah, G., Princeton Architectural Press, NY.</p> <p>Ching, F.D.K. 1995, Architecture: Form, Space, and Order, 2nd edition, John Wiley and Sons.</p> <p>Ching, F.D.K. 2018, Design Drawing, 3rd edition, John Wiley and Sons.</p> <p>Goethe, J. W. v. (1970). Theory of colours. M.I.T. Press.</p>									
ARCS109	Introduction to Design Computing Pre-requisites: ARCS106 Introduces students to architectural design and computation through the use of computer modeling, rendering, and digital fabrication. Focus on the exploration of space- and place-making through the use of computer rendering and design construction through CAD/CAM fabrication. Students design a small building using computer models leading to a full package of physical and virtual materials, from computer generated drawings.	2	1			3				4
References	<p>Architects' data / 3rd ed. Ernst and Peter Neufert. Edited by Bousmaha Baiche and Nicholas Walliman. Blackwell Science, 2000.</p> <p>3ds Max 2012 bible, Kelly L. Murdock, John Wiley & Sons publisher, 2011</p> <p>3ds Max 9 essentials, Autodesk Inc.,</p>									



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours								
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total	
ARCS202	Building Construction-1 Pre-requisites: ARCS105 The course provides a comprehensive overview on how an architect writes, interprets, enforces, or manages construction documents. Project architects, contractors, contract administrators, material suppliers, and manufacturers' representatives are all realizing the advantages of being Construction Documents Technologists.	3	2					3			5
References	McKay's Building Construction, by W.B. McKay .Building Construction Illustrated - 4th Edition, by Francis D.K. Ching										
ARCS205	Building Technologies-1 Pre-requisites: ARCS105 Introduction to the elements of architectural structures. Topics in mechanical static are addressed as they relate to major contemporary structural systems. The study of forces and the achievement of equilibrium is the framework in which structural morphologies are studied and structural design is used as a primary determinant of building form. A variety of methods for discovering structural form and calculating limit capacities are introduced and used to complete several structural design projects.	2	1	2							3
References											
ARCS206	Architectural Design-2 Pre-requisites: ARCS107 Within this course the student develops his knowledge of the structural system and its relation to form and function. The structural form is seen as a main generator of more responsive, and creative design solutions. The relation between STRUCTURE, FUNCTION AND FORM and the ways in which the nature of the structural system, method of construction and building materials affect and inform the process of design and the final form are investigated. By means Of EXPERIMENTAL MODELLING, the students are able to develop a deeper understanding and evaluation of the structural system and its interaction with functional characteristics and the form of the building.	3	1					4		1	5
References	Standard reference books like Time Savers Standards, Neufert. Building Structures Illustrated: Patterns, Systems, and Design, 2nd Edition Francis D. K. Ching. Structure as Architecture: A Source Book for Architects and Structural Engineers 2nd Edition, Andrew Charleson. The Language of Architecture: 26 Principles Every Architect Should Know 2014 Andrea Simitch. Designing Architecture: The Elements of Process Andrew Pressman. Basics Design Methods 1st Edition Kari Jornakka. Basics Architecture 01: Representational Techniques Lorraine Farrelly.										



جامعة القاهرة
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BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
ARCS207	Architectural Design-3 Pre-requisites: ARCS107 Design Three introduces to students the basic principles of design and the main elements of the design process. The students are to explore through their projects the qualitative aspects of the FORM-FUNCTION relationship and their interaction with ENVIRONMENTAL ASPECTS. The student learns to integrate functional requirements with basic environmental considerations in his design inception and form generation.	3	1				4			5
References	Standard reference books like Time Savers Standards, Neufert. Building Structures Illustrated: Patterns, Systems, and Design, 2nd Edition Francis D. K. Ching. Structure as Architecture: A Source Book for Architects and Structural Engineers 2nd Edition, Andrew Charleson. The Language of Architecture: 26 Principles Every Architect Should Know 2014 Andrea Simitch. Designing Architecture: The Elements of Process Andrew Pressman. Basics Design Methods 1st Edition Kari Jormakka. Basics Architecture 01: Representational Techniques Lorraine Farrelly.									
ARCS208	Site Planning and Development Pre-requisites: ARCS107 This course aims for planning studies to apply technical knowledge to social problems: the problems of cities of the developing world; problems of the environment and the design of spaces. The purpose of the course is to develop the knowledge and skills to make one capable of analyzing and planning a site, or a group of urban sites, for design intervention and development. The course will discuss the theoretical and practical matters involved in planning sites within the context of natural systems	3	2				2			4
References	Urban Planning & Design criteria, by: Jcseph De Chiara Time-Saver Standards for Housing and Residential Development, by: De Chiara & others دلائل أعمال التخطيط العمراني (تقسيم الأراضي)، مركز الدراسات التخطيطية والمعمارية، د. عبد الباقي إبراهيم									



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BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total
ARCS301	Architectural Design-4 Pre-requisites: ARCS206 + ARCS207 – ARCS109 Architecture informed by its Context is the emphasis of Design 4. Architectural design is viewed as a form of creative and comprehensive investigation demonstrated through a rigorous process and production of architectural models and graphic documentation - informed by contextual, formal, cultural, theoretical, technological, practical, and historical issues and is heavily underscored by the various phases of architectural process. This pedagogical approach is the thrust of these two studios. Design 4 adopt the policy of one long term, group/individual work project to employ in depth research, analysis, and design and to foster teamwork, self-criticism, and exchange of knowledge. Design 4 Main Theme: Community Design & Development Design 4 (group/individual work project) addresses local issues related to community design & development in terms of education, culture, work, health, and residence, emphasizing the synthesis of complex, mixed-use and multi-story buildings within variety of urban contexts. Students primarily learn how to develop the design brief & program based on micro and macro site studies considering functional, administrative requirements as well as those of the community needs, availability, appropriateness, and sustainable development. Students learn how to interpret the context, explore how design of a building can be inspired by the physical, environmental, cultural, and historical characteristics of its site as much as the building's functional needs.	3	1				4			5
References	<p>Gooney, Yasmin (2007): Type and Typology in Architectural Discourse, BAU FBE Dergisi, Volume 1, pp, 3-18</p> <p>Lawson, Bryan, How Designers Think: The Designing Process Demystified, ISBN: 978-0750660778, Routledge.</p> <p>Lawson, Bryan, What Designers Know, ISBN: 978-0750664486, Routledge.</p> <p>Lee, Christopher & Jacoby, and Sam9 (2011): Typological Urbanism and the Idea of the City, Architectural Design, Volume 81, No 1 January/February.</p> <p>Smith, P. (2005). Architecture in a Climate of change: a guide to sustainable design. Architectural Press. Oxford 2ndEdition</p> <p>Steadman, Philip, (2014). Building Types and Built Forms, Matador</p> <p>Voordet, Theo and Wegen, Herman, (2005). Architecture in Use: An Introduction to the Programming Design and Evaluation of Building, Architectural Press, Oxford.</p> <p>http://archrecord.construction.com/projects</p> <p>http://www.archdaily.com/search/projects/categories</p> <p>Time Saver standards</p> <p>http://www.designboom.com</p> <p>http://www.educause.edu/eli/publications;7</p> <p>http://www.mcarchitects.it/studio</p>									



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
ARCS302	Building Construction-2 Pre-requisites: ARCS202 The major areas of study will be: 1) exterior and interior finishing materials and specifications, 2) common exterior and interior finishing materials and specifications, 3) basic carpentry mathematics related to exterior and interior finishing, 4) insulation installation and specifications, 5) drywall installation and finishing, 6) interior doors and running trim installation. Credits will be awarded upon competency completion.	3	2				3			5
References	Fundamentals of Building Construction: Materials and Methods, Edward Ellen & Joseph Iano									
ARCS304	Urban Design and Landscape Pre-requisites: ARCS206 A design studio. Introduces skills needed to build within contemporary cities, extending from the historical center to expanding edges. Students analyze an existing environment and design a built structure that fosters relationships between its intended activities and the larger urban territory and redefines the urban environment. The course also introduces skills needed to build within a landscape establishing continuities between the built and natural world. Students learn to build appropriately through analysis of landscape and climate for a chosen site and conceptualize design decisions through drawings and models.	3	2				2			4
References	Gordon Cullen, (1961), The Concise Townscape, Architectural Press. Kevin Lynch, (1960), The Image of the City, MIT press. Cliff Moughtin, (2003), Urban Design: Methods and Techniques, Architectural Press. Adam Ritchie and Randall Thomas, (2009), Sustainable Urban Design: An Environmental Approach, Taylor and Francis. Tim Waterman, (2009), The Fundamentals of Landscape Architecture, Ava Publishing.									
ARCS305	Building Construction-3 Pre-requisites: ARCS202 The course goal is to introduce the students to the construction process. Construction contract types, Modifications and substitution procedures, Contractual relationships Rights, duties, and responsibilities, Contract provisions, Relationship and organization of construction documents, Use of construction documents, Organizational formats, Interpreting construction documents. Addresses advanced structures, exterior envelopes, and contemporary production technologies. Continues the exploration of structural elements and systems, expanding to include more complex determinate, indeterminate, long span, and high-rise systems.	4	2				4			6
References	Liebing, Ralph W, Architectural Working Drawing, John Wiley & Sons, 1998 . Ching Francis D.K, Building Construction Illustrated, Van Nostrand Reinhold, 1975. Ramsey / Sleeper, Architectural Graphic Standards for Architectural Design Data, McGraw-Hill, 1983. William, Spence, Architectural Working Drawings, Residential and Commercial Buildings, N.Y., Wiley, 1993. Keith, Styles, Working Drawings Handbook, 3rd Ed., Oxford, Butterworth, Heinemann, 1995. Osamu, Wakita A., The Professional Practice of Architectural Working Drawings, 2nd Ed, N.Y, Wiley, 1994. Dickinson, Duo, Expressive Details, Materials, Selection, Use, New York, McGraw-Hill, 1997. Nashed, Fred, Time-Saver Details for Exterior Wall Design, New York, McGraw-Hill, 1996.									



جامعة القاهرة
Cairo
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BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours						
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs
ARCS307	Architectural Design-5 Pre-requisites: ARCS206 + ARCS207 + ARCS109 Architecture informed by its Context is the emphasis of Design 5. Architectural design is viewed as a form of creative and comprehensive investigation demonstrated through a rigorous process and production of architectural models and graphic documentation - informed by contextual, formal, cultural, theoretical, technological, practical, and historical issues and is heavily underscored by the various phases of architectural process. This pedagogical approach is the thrust of these two studios. Design 5 adopts the policy of one long term, individual project to employ in depth research, analysis, and design and to foster teamwork, self-criticism, and exchange of knowledge. Students will be working individually to address themes of a local/ global, physical/ conceptual nature such as climatic change, densification, tacit knowledge, co-working spaces, democracy/ public participation, justice, identity. Selecting one of those themes the studio proposes variety of urban settings as well as a preliminary program that suits the proposed theme, each student/group selects an urban setting and then investigates the implications of both the context and the theme for the design brief and the building typology. The studio explores different design approaches of contextual design including theoretical, metaphoric, and pragmatic approaches to inform the students how to infer guidelines from both; the physical / social& historical aspects of the context, as well as the proposed theme, which instruct the design in terms of program, space, form, structure, order, character, and tectonics . The studio provides the opportunity for students to develop appropriate conceptual and theoretical agendas and to challenge preconceptions related to the notion of building typology. Students are also encouraged to develop written statements of 500-1000 word explaining their design motivation, deriving ideas, theme, or topic of the project as well as their design approach and methodology.	4	2			4			6
References	Anderson, J. (2010). Basics Architecture 03: Architectural Design. AVA Academic, Lausanne . King, A. (2004). Spaces of Global Cultures: Architecture Urbanism Identity. Routledge: London . Weston, R (2011) 100 Ideas that changed Architecture. Laurence King Publishing Schonfield, K. (2000). Walls Have Feelings. Routledge: London . Miles, M. and Hall, T. with Borden, I. (eds). (2000). The City Cultures Reader. Second Edition. Routledge: London . Hill, J. (1999). Occupying Architecture: Between Architecture and the User. Routledge Alexander, C. (1987). A New Theory of Urban Design. Oxford Uni. Press								



جامعة القاهرة
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BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
ARCS402	Building Construction-4 Pre-requisites: ARCS302 + ARCS305 Introduces building construction as a computational enterprise in which rules are developed to compose and describe Construction designs and other designs. Discusses issues related to practical applications of construction management. This course introduces advanced computing tools such as advanced construction modeling and CAD/CAM fabrication	4	2				4			6
References	Nur, T. (2017). Advanced Building Construction and Materials Handbook, Arcler Press LLC Martineau, J. (2016). Advanced Building Ccnstruction: A Manual for Students, Forgotten Books. Huth, M. (2014). Understanding Construction Drawings, 6th Edition, Delmar Cengage Learning.									
ARCS406	Architectural Design-6 Pre-requisites: ARCS304 + ARCS301 + ARCS307 + ARCS380 + ARCS302 + ARCS0305 The studio explores design solutions that address real issues facing the local/regional community driven by IDENTITY & THE PUBLIC. Students should learn how to build upon and integrate all themes of knowledge acquired in previous design studios and how to develop their own philosophies/approaches and learn to transform abstract ideas and concepts to design proposals instructing space and form. Students focus on the spatial experience and spatial qualities integrated into the design process. Students are encouraged to develop and write their design statement. Projects include a broad range of project types, including individual buildings, urban districts, and landscapes.	4	2				4			6
References	Oxman, Rivka, and Robert Oxman. The New Structuralism: Design, Engineering and Architectural Technologies. Hoboken, NJ: Wiley, 2010. Print.									
STRS111	Structural Analysis-1 and Mechanics of Materials Pre-requisites: EMCS002 Types of structures, loads, supports and reactions. Internal forces in plane structures. Analysis of statically determinate structures such as beams, frames, and trusses. Governing differential equation for beam deflections. Deformations by virtual work. Analysis of statically indeterminate structures by consistent ceformations and moment distribution. Properties of plane areas. Stresses and strains for axial loading. Normal stresses due to normal forces and bi-axial moments. Shear stresses due to shear forces and torsion. Principal stresses".	3	2	2						4
References	R.C. Hibbeler ' STRUCTURAL ANSLYSIS ', Prentice Hall, Eighth edition in SI units, ISBN 13 978-981-06-8713-7. Beer, Ferdinand P., Dewolf, John T. Johnston, JR. E. Russell. (2006). Mechanics of Materials (4th). [New York]: IMC Video Ltd. Abdel-Aziz, M. A.; Structural Mechanics.									



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
STRS213	Engineering Materials for Architects Pre-requisites: EMCS002 + PHYS001 Materials for construction, Different properties of materials and definitions, Masonry units: Main properties, testing and local code requirements. Concrete: Definition and types, advantages and disadvantages, Constituents, Manufacturing, Mix design, Main properties of fresh and hardened concrete, Testing, and local code requirements. Mechanical properties: Definitions, application to reinforcing and structural steel under axial tension, testing and local code requirements.	3	2			2				4
References	Neville, A.M. (2012). Properties of Concrete, Pearson Education India; 5th edition. Ashby, M.F. (2012). Engineering Materials 1: An Introduction to Properties, Applications and Design, Butterworth-Heinemann									
Program Requirement										
A. Compulsory Courses										
ARCS240	Thermal Properties & Energy in Buildings Pre-requisites: ARCS105 Application of heat transfer and air dynamics to airflows within buildings. Analytic models of coupled flow and heat transfer for wind- and buoyancy-controlled natural ventilation. Analysis of displacement ventilation, jet flows and diffusers. Multi-node and multi-zone models, and computational air dynamics. Measurement techniques within real buildings. Introduction to energy fundamentals important to buildings. Conservation of energy. Air-water vapor mixtures. Thermal comfort. Solar energy and refrigeration cycles, limiting thermodynamic performance. Heat transfer within buildings and major components. Energy simulation tools. Integration of Building Information Modelling. Several creative design projects are assigned.	3	2			2				4
References	American society of heating, refrigerating and air-conditioning engineers (2006) ASHRAE Green Guide: The Design, Construction, and Operation of Sustainable Buildings, Butterworth-Heinemann, USA. Egyptian Code for Energy Efficiency in Buildings LEED for building construction Passive House Criteria for Ultra-Low Energy Buildings									



جامعة القاهرة
Cairo
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BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
ARCS308	Architectural Acoustics and Daylighting Pre-requisites: ARCS105 Describes interactions between people and sound, indoors and outdoors, and uses this information to develop acoustical design criteria for architecture and planning. Principles of sound generation, propagation, and reception. Properties of materials for sound absorption, reflection, and transmission. Provides the tools necessary for an efficient integration of daylighting issues in the overall design of a building. Fundamentals of day-lighting and artificial lighting are introduced: physics of light propagation and solar radiation, photometry, and colorimetry (visual perception, photometric quantities, chromatic systems), sun course, physics of windows (light and heat transfer, glazing types), electric lighting (lamps and luminaires characteristics). More advanced and design-oriented topics are presented and practiced through the design project: benefits and availability of daylight, visual and thermal comfort, primary and advanced lighting design strategies, design, and assessment tools for lighting management.	2	1	2						3
References	Long, M. (2014). Architectural Acoustics, 2nd Edition, Academic Press. Descottes, H., & Ramos, C. E. (2011). Architectural lighting: Designing with light and space. New York: Princeton Architectural Press. Jukanovic, A. (2018). Architectural Lighting Design: A Practical Guide, Crowood Press Ermann, M. (2015). Architectural Acoustics Illustrated (2nd ed.), Wiley.									
ARCS380	Architecture and Design Theory Pre-requisites: ARCS201 + ARCS101 + AETS280 This course is an advanced architectural theory class that addresses selected topics in theory including regionalism, phenomenology, structuralism in general and the Traditionalist approach in specific as a means of linking traditional and modern architecture. The issues introduced in the course act as eye opener for the theoretical problem that is also reflected in the architectural output of how to relate contemporary designs to ones' own tradition, heritage, and identity. Accordingly, the course integrates with the design studios and helps the students enhance their ability to relate their projects to its context at all multilayers.	3	2	2						4
References	Amos Rapoport, "House, Form and Culture," Foundations of cultural geography series, 1969 Khaled S. Asfour "New Architecture with old Ideas: An Egyptian Acculturation," Archnet-IJAR, Volume 5 - Issue 1 - March 2011 Frishman, M., Khan, H.-U., Al-Asad, M., Frishman, M., Khan, H.-U., & Al-Asad, M. 2001. "The Mosque: History, Architectural Development & Regional Diversity." Cairo: The American University in Cairo Press . Vincent B. Canizaro, (2007). "Architectural Regionalism: Collected Writings on Place, Identity, Modernity, and Tradition," Princeton Architectural Press.									



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Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

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	<p>Mackay B., (2015). "Local Architecture, Building Place, Craft & Community." Princeton Architectural Press.</p> <p>Kenneth Frampton, (1983). "Towards a Critical Regionalism: Six Points for an Architecture of Resistance", "In the Anti-Aesthetic. Essays on Postmodern Culture" edited by Hal Foster, Bay Press, Seattle.</p> <p>Alex Tzonis and Liliane Lefaivre, (1981) "The Grid and the Pathway. An Introduction to the Work of Dimitris and Suzana Antonakakis", Architecture in Greece 15, Athens.</p> <p>Thorsten Botz-Bornstein, (2010). "Is Critical Regionalist Philosophy Possible? Some Meta-Philosophical Considerations" in Comparative and Continental Philosophy 2:1.</p> <p>Thorsten Botz-Bornstein, (2015), "Transcultural Architecture: Limits and Opportunities of Critical Regionalism", Ashgate.</p> <p>Jabi, Wassim (2013). "Parametric Design for Architecture." London: Laurence King .</p> <p>Woodbury, Robert (2010). "Elements of Parametric Design." Routledge.</p> <p>Frazer, John (2016). "Parametric Computation: History and Future". Architectural Design (March/April) .</p> <p>Schumacher, Patrik (2009). "Parametricism - A New Global Style for Architecture and Urban Design". AD Architectural Design. 79.(4)</p>									
ARCS403	<p>Integrated Building Systems</p> <p>Pre-requisites: ARCS240 + ARCS308</p> <p>This course introduces some main issues of buildings performance and optimization. It focuses on two main topics. The first one is the smart building information systems. The second topic is about building control and diagnostics. It concentrates on the assessment of the built environment (building components and systems, interactions between building, occupants, and environmental conditions) in view of multiple performance criteria (thermal, visual, and acoustic performance) within a constrained carbon and energy budget. All this will be achieved through various case studies and practical experiences from the market regarding all processes of building design, construction and operating.</p>	3	2	2						4
References	<p>Retrofitting Measures to Enhance Energy Performance — The Case of AASTMT Business Management School Building, Egypt, ISBN 978-3-319-30745-9, publisher: Springer – Switzerland, January 2017</p> <p>Sustainability at the Cutting Edge: Emerging technologies for low-energy buildings, Peter F. Smith, second edition, ISBN .978-0-7506-8300-5, Academic Press, an imprint of Elsevier, UK, 2013.</p> <p>Sustainability, Energy and Architecture: Case Studies in Realizing Green Buildings, A. Sayigh, 1st Edition - ISBN: 978-0-12-397269-9, Academic Press - an imprint of Elsevier, UK, 2013</p> <p>Smart Buildings Systems for Architects, Owners and Builders, 1st edition, ISBN-13: 978-1856176538, Jim Sinopoli, 2010, Elsevier, UK</p> <p>Smart Building in a Changing Climate, Andy van den Dobbelsteen (Editor), Island Press, 2009</p>									



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

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			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
ARCS405	Building Construction-5 Pre-requisites: ARCS302 + ARCS305 Course subject delivers the information, skills, and techniques necessary to create the physical products of real estate and manage the process of real estate development and urban development economics. Exposes students to the general skills, techniques and process associated with each of the functional areas involved in real estate development so that they may organize and lead the development process that is economically valid. Students work in teams to create a development proposal for a particular development opportunity within certain economic criteria.	4	2				4			6
References	Crowder, J., Carbone, J., Demijohn, R. (2016). Multidisciplinary Systems Engineering: Architecting the Design Process, Springer. Leonides, C. (2012). Multidisciplinary Engineering Systems: Design and Optimization Techniques and Their Application: Advances in Theory and Applications, Academic Press									
ARCS470	Thesis Writing for GP Pre-requisites: 110 CR.HRS. + SOPHMORE + ARCS304 + ARCS208 + ARCS301 + ARCS302 + ARCS 305 + ARCS307 + ARCS380 + E-A (GENS005) + COREQUISITE WITH AETS481 The thesis writing course is a capstone project, presenting a well-argued piece of research on a precise architectural/engineering theme or topic independently selected by the student. The student acquires the main scientific writing skills of typical dissertations through the course to finally submit a scientific paper of 10,000 words. The student goes through the formulation of the different phases of writing starting from having an argument, writing an abstract, developing methodologies and then going through literature review, together with critical analysis of information and relevant case studies to end with developing empirical/ applied studies.	2	1				2			3
References	References are related to students' projects.									
STRS311	Concrete Structures Pre-requisites: STRS111 Introduction; Material properties; Structural systems and Load distribution; Behavior of beams and Design methods; Design any type of R.C. sections; Reinforcement details of beams; Design and reinforcement details of R.C. solid slabs; Design and reinforcement details of R.C. columns, Structural systems, and reinforcement details of R.C. stairs, Structural systems of R.C. Halls .	2	1	2						3
References	الكود المصري لتصميم وتنفيذ المنشآت الخرسانية - كود رقم ٢٠٣									
STRS312	Steel Structures Pre-requisites: STRS111 Introduction to structural steel design – Design criteria (materials, loads, and systems) – General layout – Design of tension members – Design of compression members – Design of beams – Design of beam-columns.	2	1	2						3
References	Steel Construction for Architects, by Maheeb Adel-Ghaffar, 2016. Egyptian Code of Practice for Steel Construction and Bridges, 2008. Design of Lateral Load Systems, by Prof. Bahaa Machaly. Egyptian Code for Loads and Forces.									



جامعة القاهرة
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BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

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CVES402	Surveying and Foundation Design Pre-requisites: STRS111 Introduction to surveying, Leveling, Heights, datum and benchmarks, calculating reduced - levels (rise and fall) and (HPC method) , Leveling Applications, Angles and Bearings, Electronic Distance Measurement, Using Total station & Introduction to GPS Introduction to Soil prosperities; Soil classification, Field compaction, Compressibility, Bearing capacity & Footings.	2	1			3				4
References	Das, B.M. (2008), "Introduction to Geotechnical Engineering," Thomson Learning, Toronto, Ontario, Canada lectures prepared by Dr. Mohamed Kamal - Cairo University, lectures prepared by Dr. Kamal Mustafa - Cairo University									

A. ELECTIVE COURSES – PE1

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
ARCS209	Building Technologies-2 Pre-requisites: ARCS205 Introduction to the elements of architectural structures. Topics in mechanical statistics are addressed as they relate to major contemporary structural systems. The study of forces and the achievement of equilibrium is the framework in which structural morphologies are studied and structural design is used as a primary determinant of building form. A variety of methods for discovering structural form and calculating limit capacities are introduced and used to complete.	2	1	2						3
ARCS230	Contemporary Architecture: 20 th Century and Beyond Pre-requisites: AETS280 + ARCS101 + ARCS201 This course provides an outline of the history and theory of architecture and urbanism of Contemporary Architecture: 20 th Century Architecture & Beyond. It analyzes buildings as the products of culture and in relation to the contextual circumstances, particular problems of architectural design and design thinking. The course aims at enabling the students to realize, discuss and criticize contemporary architectural movements.	2	1	2						3
References	Tschumi, B., et al, 2003, "The state of architecture at the beginning of the 21 st cent.," The Monacelli Press. Ibelings, H., 2002, "Supermodernism, Architecture in the Age of Globalization," enlarged edition, Nai Publishers, Amsterdam. Auge, M., 1995, "Non-places, Introduction to an Anthropology of Supermodernity," translated by John Howe, Verso-London, New York.									



جامعة القاهرة
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BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credi: Hours	Contact Hours							
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total
	Smith, K. ed. "Introducing Architectural Theory, Debating a Discipline," Routledge, 2012. Jencks, C., 1997, "The Architecture of the Jumping Universe," Revised edition by Academy Editions, Wiley & Sons, Chichester Jencks, C., 2002, "The New Paradigm in Architecture: The Language of Postmodernism," Yale University Press, New Haven & London. Pallasmaa, J., 2008, "The Architecture of Image: Existential Space in Cinema", Rakennustieto, Helsinki. Mallgrave, H. and Goodman D., 2011, "An Introduction to Architectural Theory: 1968 to the Present", John Wiley & Sons, UK ثلاثية الإبداع المعماري - أ.د. علي رافت									
ARCS231	History of Islamic Architecture Pre-requisites: ARCS101 Critical review of literature on Islamic architecture and analyzes its historical and theoretical frameworks. Challenges the tacit assumptions and biases of standard studies of Islamic architecture and addresses	2	1	2						3
References	Islamic Architecture, Robert Hillenbrand Islamic Architecture: form, function, and meaning. Robert Hillenbrand The mosque: History, Architectural development, and regional diversity. Martin Frishman and Hasan-Uddin Khan									
ARCS232	Graphic Design Pre-requisites: ARCS108 + ARCS109 The course emphasizes the relationship between architecture and graphic communication. It focuses on the role of graphic design as a channel of information and communication. The course will allow the students to understand and learn how to visually represent their work, starting from the initiation of an idea to the finished graphic profile. Information gathering, systematic analysis, experimentation and representation are essential parts of this course. Through lectures and in-class workshops, methods and techniques in architectural representation will be discussed. The student will also gain his/her own experiences through various exercises.	2	1		2					3
References	Arntson, A. (2012). Graphic Design Basics 6 th Edition. Boston, MA: Wadsworth, Cengage Learning. Lewis, K. (2015). Graphic Design for Architects: A Manual for Visual Communication. New York, NY: Routledge. Meggs, P. (1992). Type and Image: The Language of Graphic Design. New York, NY: John Wiley & Sons, Inc. Poulin, R. (2012). Graphic Design and Architecture, a 20 th Century History: A Guide to Type, Image, Symbol, and Visual Storytelling in the Modern World. Beverly, Massachusetts: Rockport Publishers.									



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

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			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total
ARCS332	Special Problems in Construction	2	1	2						3
	Pre-requisites: ARCS205 + ARCS202									
	Supplementary work on individual or group basis on special problems in building construction and the life cycle of the building to gain a sustainable Architecture.									
References	Feilden, B. M. (1982). Conservation of historic buildings. London: Butterworth Scientific. Historic England (2012). Practical Building Conservation: Stone, Routledge Grantham, M. (2011). Concrete Repair, A Practical Guide, CRC Press									
ARCS339	Wide Span Structures	2	1	2						3
	Pre-requisites: STRS111 + ARCS202									
	This course discusses the wide span structures and arenas. This includes shell structures; folded plates; tensile structures, canopies, space truss ... etc. Moreover, this course explains the relationship between the wide span structure and any other adjacent structures.									
References	MacDonald, A. J. (2001). Structure and architecture. Oxford: Architectural Press. Hadrovic, A. (2009). Structural Systems in Architecture, BookSurge Publishing. Charleson, A. (2014). Structure as Architecture A source book for architects and structural engineers.									
A. ELECTIVE COURSES – PE2										
Code	Name/Content	Credit Hours	Contact Hours							
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total
ARCS330	Ecologies of Construction	3	2	2						4
	Pre-requisites: ARCS105 + ARCS240									
	Examines the material and energy networks currently utilized to transfer resources from the natural world to the built environment. Theories and tools of industrial ecology are used to reveal opportunities for creating ecologies of construction; that is, mutually beneficial relationships between distinct components of the industry of construction that may be made to act symbiotically. Both the production and consumption of the architectural artifact is reviewed using tools of analysis that physically account for the flow of materials into and out of various spatial and temporal scales and boundaries.									
References	Berge, B. (2001) Ecology of construction materials, Architecture Press, UK. Dramstad, W. E., Olson, J.D., Forman, R. T. (1996), Landscape ecology principles in landscape architecture and land-use planning, Harvard University Graduate School of Design, Cambridge, MA.									



جامعة القاهرة
Cairo
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Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

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			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
ARCS336	Architecture, Culture & Heritage Pre-requisites: ARCS203 + ARCS304 The course introduces students to the importance of culture and heritage in architectural design and development process. It develops students' analytical and descriptive skills in order to understand the meaning and significance of Human Heritage as a product of Culture and Civilization, with special reference to Egyptian Architectural Heritage. It also enhances the students design skills to deploy the layers of conceptions, beliefs, values, and architectural products in the different Egyptian historic periods while addressing contemporary Architectural and Urban Design problems.	3	2	2						4
References	<p>Hassan Fathy, Architecture for the poor, American University Press, Cairo, Egypt, 1989. Bianca, The urban Form in the Arab World Choay, F., L'allegorie du patrimoine. - أنطونيو، القاهرة تاريخ حاضرة. - إسماعيل سراج الدين، التجديد والتأصيل في عمارة المجتمعات الإسلامية، 2007. Cynthia C. Davidson, Serageldin. Architecture beyond Architecture, Aga Khan Award for Architecture 10th Award Cycle, 1995. James Steele, Architecture for a Changing World, Aga Khan Award for Architecture 10th Award Cycle, 1992. I.B. Tauris & Co Ltd, Intervention Architecture, Building for Change, Aga Khan Award for Architecture 10th Award Cycle, 2007. Theorizing a New Agenda for Architecture. K. Nesbitt, Ed., 1989 Agha khan technical report, Ramses Wissawassef art centre, 1983. Agha khan technical report, new Gourna village, Luxor west bank, 1946. Agha khan technical report, Culture Park for children, 1992. Cairo Revitalizing a Historic Metropolis. S. Bianca and p. Jodido, Ed. for the Agha Khan, 2004.</p>									
ARCS436	Independent Studies: Global Trends in Urban Planning Pre-requisites: ARCS208 This course introduces some new global issues in urban planning including the emergence of strategic planning and all its related concepts. In addition, the course will be dealing with some vital issues including understanding the diversity of urban contexts, the institutional and regulatory framework for planning, planning in relation to participation and politics, planning and informality, planning in relation to spatial structure of cities and provision of infrastructure, the monitoring and evaluation of urban plans, etc.	3	2	2						4
References	References are related to student's top cs.									



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

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ARCS441	Professional Practice Pre-requisites: ARCS305 + ARCS302 + ARCS301 +ARCS307 This course aims to discuss current professional practices context and issues. Through a seminar setting, the course explores types of architecture practices. It studies design process management, business management of architecture firms, procurement of architectural services, real-estate investment concepts, architects' administrative role and practice stakeholders. In addition, it reviews building contracts and legal aspects as well as building codes and regulations.	3	2	2						4
References	Building Law Egyptian Codes Sears, S. K., Clough, R. H., & Sears, G. A. (2008). Construction project management: A practical guide to field construction management. Hoboken, N.J: John Wiley & Sons. Newitt, J. (2008). Construction Scheduling: Principles and Practices 2 nd Edition, Pearson.									
A. ELECTIVE COURSES – PE3 – Design Based										
Code	Name/Content	Credit Hours	Contact Hours							
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total
ARCS331	Knowledge Based Systems Pre-requisites: ARCS109 This course has two subjects to focus on. The first one is the application of knowledge-based expert system methodology in CAE. Topics include knowledge-based programming methodologies, knowledge-based engineering techniques, expert system development environments and representative expert system applications in CAE. Each student develops a prototype expert system for an application of his/her choice. The second subject discusses issues related to practical applications of shape grammar: shapes, shape arithmetic, symmetry, spatial relations & shape computations. The study focuses on issues related to practical applications of shape grammars as a computational enterprise.	3	2		2					4
References	Woodbury, Robert (2010). Elements of Parametric Design. Routledge. Knowledge-Based Systems, Four-Volume Set: Techniques and Applications Cornelius T. Leondes http://www.designpatterns.ca/ http://buildz.blogspot.com/eg/2010/12/parametric-design-patterns.html http://dynamoprimer.com/en/									



جامعة القاهرة
Cairo
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BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							Total
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	
ARCS333	Building Technologies-3: Energy in Building Design Pre-requisites: ARCS240 Explores aspects of climate relevant to building design and applies concepts & methods to energy-efficient and environmentally responsible building design. Topics include climate and comfort parameters, energy systems, and environmental implications of buildings. Emphasizes practical applications/ software for environmental and structural design and performance assessment.	3	1		2	2				5
References	Introduction to Architectural Science - The Basis of Sustainable Design- Steven V. Szokolay(2004) Optimization modelling a practical approach by Ruhul Amin Sarker, Charles S. Newton Cost-Effective Energy Efficient Building; Retrofitting: Materials, Technologies, Optimization and Case Studies(2017) Modelling, Design, and Optimization of Net-Zero Energy Buildings(2015)									
ARCS334	Selected Topics in Architecture & Urban Design Pre-requisites: ARCS304 + ARCS206 - ARCS207 A studio-based course that focuses on different topics in architecture and urban design through project-based learning. These topics include the study and analysis of relationships between place and space, and urban realms. The course discusses how architecture, landscape architecture, and urban design have explored those issues and how the Design process relates to architecture through hands-on projects involving interactive design process.	3	2				2			4
References	THE LEARNING GENERATION, The International Commission on Financing Global Education Opportunity, report, 2017. Aga Khan Architecture Award. Architecture for the poor, Hassan Fathy, 1973. The Sustainable Development Goals (SDGs), UNDP. UNESCO /UIA for Architectural Education, revised edition 2017. "Mega projects. Do they realize dreams of the future owners?" Hamdy EL-Setouhy, next magazine, May 2017. "The word needs a new sparkle"· Hamdy EL-Setouhy, next magazine, Feb. 2017. "Architectural globalization & non-spatial identity"· Hamdy EL-Setouhy, next magazine, dec. 2016. "Three questions to achieve a sustainable museum journey," Hamdy EL-Setouhy, next magazine, may. 2016.									



جامعة القاهرة
Cairo
University

BYLAWS 2023
Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

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ARCS335	Community Design & Social Development	3	1					4		5
	Pre-requisites: ARCS203 + ARCS304 + ARCS208									
	This elective course introduces the student to community development concepts, and techniques, providing students an opportunity to obtain "a theoretical and practical field" experience. This is done through:									
	<ul style="list-style-type: none"> -In depth exploration of social aspects of various urban contexts. -Debating the various roles and responsibilities of the architect in the design/planning process -Conducting and utilizing social research in designing/ planning. -Acquiring basic skills in facilitating between different stakeholders and their various needs. 									
References	<p>Maser, C. (1996) Sustainable Community Development: Principles and Concepts, CRS Press .</p> <p>Ward; K. (2014) Researching the City, ed., Sage Publications Ltd, London.</p> <p>Medoff; P. & Sklar; H. (1999) Streets of Hope: The Fall and Rise of an Urban Neighborhood, South End Press</p> <p>Robinson; Jerry W. jr. & Green; G.P. (2011) Introduction to Community Development: Theory, Practice, and Service-Learning, SAGE publications Inc .</p> <p>Attia, S. and Khalil, H. (2015) Urban Metabolism and Quality of Life in Informal Areas, in M. Schrenk, V. V. Popovich, P. Zeile, P. Eisei, C. Beyer, eds., Proceedings REAL CORP 2015: Plan Together – Right Now – Overall, 5-7 May, Ghent, Belgium, pp. 661-674. http://www.corp.at/archive/CORP2015_19.pdf</p> <p>Khalil, H. and Alahwal, A. (2017) Re-Understanding Cairo Through Urban Metabolism: Formal Vs Informal Districts Resource Flow Performance, Ecocity World Summit 2017, Melbourne, Australia.</p> <p>Khalil, H. & Ron, D. (2015) Citizen-led Mapping of Urban Metabolism in Cairo. UCCRN's Case Study Docking Station (CSDS), ARC3-2 report, Second Assessment Report of the Urban Climate Change Research Network, UCCRN, Earth Institute, Columbia University.</p> <p>Khalil, H., Ibrahim, A., ElGendy, N., and Makhlof, N. (2018) Could/should Improving the Urban Climate in Informal Areas of Fast-Growing Cities be an Integral Part of Upgrading Processes? Case study, Cairo, Urban Climate, 24, pp. 63-79.</p> <p>Khalil; H. (2007) Community Development in Informal Areas: Defining Effective Development Units and Participatory Evaluation Methods, PhD Thesis, Cairo University, Egypt.</p> <p>Khalil; H. (2003) Characteristics of The Community: An Approach to Comparison of Community Development in Urban and Rural Areas, MSc. Thesis, Cairo University, Egypt</p>									



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Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

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ARCS337	Housing Design and Real Estate Development Pre-requisites: ARCS304 +ARCS208 This course aims to study and analyze housing architecture and Egyptian real estate development from different perspectives. It deals with defining characteristics of housing, different approaches to housing design, housing demand analysis, price functions and housing delivery systems. It also deals with housing finance and housing policy in Egypt and other developing countries, studying different aspects of formal and informal housing. Students will gain knowledge in housing design and typology, provision, policies, finance, legislation, housing architecture psychology and the effect of health crises such as COVID 19 pandemic on housing design.	3	2				2			4
References	-site design for multifamily housing 2014 -URBAN STREET DESIGN GUIDE -The beginner's guide to real estate investing 1984 في تصميم وتخطيط المناطق السكنية: د. نسيمات عبد القادر، د. سيد التوني. القاهرة:									
ARCS430	Interior Design Pre-requisites: ARCS108 + ARCS301 + ARCS307 Introduction to modern art and theories of modernism and postmodernism. Focuses on the way artists use the tension between fine art and mass culture to mobilize a critique of both. Examines objects of visual art, including painting, sculpture, architecture, photography, and video. The course will focus also on the concept of designing public space environments that are compatible with the architecture envelope, context and structure of the building as well as accommodating human needs. Graduate-level requirements include producing individual projects for assignments and the responsibility for broader solutions to the assigned projects.	3	2				2			4
References	Time saver: standards for interior design and space planning Furniture: world styles from classical to contemporary (Judith Miller) A history of interior design (John Pile & Judith Gura)									
ARCS432	Geometric Modeling Pre-requisites: ARCS109 Introduces the theories of three-dimensional geometric modeling and associated computer-aided design as well as visualization applications in architecture, urban design, and computer graphics production. Provides a theoretical foundation to a selection of current hardware and software tools. Extensive opportunities to develop practical skills through lab sessions and regular practical exercises. Background in computational skills is an advantage, but not required. The students acquire the skills necessary to undertake independent CAD projects in the design studios or other professional settings.	3	2				2			4
References	Hoschek, J. et al. (2002) Handbook of computer aided geometric design, Elsevier, Netherlands. Woodbury, R. (2010) Elements of Parametric Design, Rutledge, UK									



جامعة القاهرة
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Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours								
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total	
ARCS440	Landscape Architecture Pre-requisites: ARCS304 + ARCS208 This course introduces the principles of LANDSCAPE architecture. It aims to establish knowledge and skills about site investigation, functional concepts, preliminary design, and master planning. It covers both hardscape and softscape components of landscape projects. In addition, it should apply the basics of Environmental design and building technologies in the field of landscape design.	3	1					4			5
References	Booth, Norman & Hiss, James, Residential Landscape Architecture, Pearson Prentice Hall, USA, 2005. Gao Xuemei Ed, Classics of Landscape Design in China V1 V2, Pub. SML, Hong Kong, 2006. Group Han, Landscape Architect, Arch world, 2003. Harris, W. & Dines, N., Time-Saver Standards for Landscape Architecture, Mc Graw Hill, USA, 1998. James Grayson Trulove, 40 Landscapes, Rockport Publishers, USA, 2003. Kim, Min-hye Ed, Indoor Landscape, Pub. Capriessco, Seoul Korea, 2006. Lee Yun-Jung, Landscape Design Park, Pub. ARCHI World, Korea, 2006. Marsh, William M., Landscape Planning: Environmental Applications, 3rd edition, Welly, NY, 1998. Reid, G.W.L., Landscape Graphics, Whitney Library of Design, 1987. Simonds, John O., Landscape Architecture, 3rc edition, McGraw Hill, USA, 1998. Simonds, John O., Garden Cities, McGraw Hill, USA, 1994. The Garden Book, The Garden Book, Phaidon, London, 2000. Walker, Peter & Partners, Defining the Craft, Thames & Hudson, China, 2005.										
A. ELECTIVE COURSES – PE4 – Art & Creativity											
Code	Name/Content	Credit Hours	Contact Hours								
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total	
ARCS351	Art, Creativity and Design Pre-requisites: ARCS108 This course will provide entry level visualization, communication, and design skills for a wide variety of fields including architecture, interior and furniture design, graphic design, package design, marketing, visual arts, ...etc. It will help produce innovative creative and artistic projects. To develop basic thinking, visualizing and problem-solving skills, in order to apply these skills to a realistic simple creative project ex. exhibit design, landscape design, furniture design, ... etc.	3	2					2			4
References	Mess: The Manual of Accidents and Mistakes-Keri Smith-Penguin Books, Limited, 2010. The Imaginary World of..., Keri Smith, Perigee Books 2014 Thinkertoys: A Handbook of Creative-Thinking Techniques (2nd Edition). Michael Michalko, Ten Speed Press; 2 nd edition (June 8, 2006) Steal Like an Artist: 10 Things Nobody Told You about Being Creative, Austin Kleon, Workman Publishing Company, 2012										



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Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours							
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ARCS352	History of Art Pre-requisites: ARCS108 The history of Art introduces students to a chronological study of art and its development, from its origins until the present day, from ancient antiquity to modern and contemporary periods; including masterpieces created of art, artefacts, and to see how it influences the future and delivers the past through a series of movements, styles, and periods . This course focuses on objects for any number of spiritual, narrative, philosophical, symbolic, conceptual, documentary, decorative, and even functional and other purposes, with a primary emphasis on their aesthetic visual form. Examining different media such as architecture, sculpture, painting, film, photography, and graphic arts. In recent years, technological advances have led to video art, computer art, performance art, animation, television, and videogames.	3	2	2						4
References	Janson, H. W., Davies, P. J. E., & Janson, H. W. (2011). Janson's history of art: The western tradition. Upper Saddle River, NJ: Prentice Hall. Arnason, H. H., & Mansfield, E. (2010). History of modern art: Painting, sculpture, architecture, photography. Upper Saddle River, NJ: Pearson Prentice Hall. Gombrich, E. H. (1966). The story of art. New York: Phaidon Publishers; distributed by Oxford University Press.									
A. ELECTIVE COURSES – PE5 – GP Independent Studies										
Code	Name/Content	Credit Hours	Contact Hours							
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total
ARCS481	GP Independent Studies: Architecture Theme Pre-requisites: AETS481 + ARCS470 – COREQUISITE WITH AETS482 Within an Architectural Theme: This course is a continuation of GP1 & thesis writing course, offering a comprehensive individual architectural design demonstrating an understanding of the different conceptual and technical aspects of architecture differentiated by themes. In depth analysis and design study for specific aspects of the graduation project.	3	1					4		5
References	References are related to students' projects.									



جامعة القاهرة
Cairo
University

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Bachelor of Science Degree
Credit Hours System



كلية الهندسة
Faculty of
Engineering

Code	Name/Content	Credit Hours	Contact Hours								
			Lec	Tut (2)	App. Tut	Lab	Stud	Off. Tut	Off. Hrs	Total	
ARCS482	GP Independent Studies: Urban Theme	3	1					4			5
	Pre-requisites: AETS481 + ARCS470 + COREQUISITE WITH AETS482										
	Within an Urban Theme: This course is a continuation of GP1 & thesis writing course, offering a comprehensive individual architectural design demonstrating an understanding of the different conceptual and technical aspects of architecture differentiated by themes. In depth analysis and design study for specific aspects of the graduation project.										
References	References are related to students' projects.										
ARCS483	GP Independent Studies: Technology & Environment Theme	3	1					4			5
	Pre-requisites: AETS481 + ARCS470 + COREQUISITE WITH AETS482										
	Within a Technological and Environmental Theme: This course is a continuation of GP1 & thesis writing course, offering a comprehensive individual architectural design demonstrating an understanding of the different conceptual and technical aspects of architecture differentiated by themes. In depth analysis and design study for specific aspects of the graduation project.										
References	References are related to students' projects.										

Specialized Tracks of Engineering Profession