Nile University

جامعة النيل

كلية الهندسة والعلوم التطبيقية

برنامج الهندسة المعمارية والتصميم العمراني

اللائحة الداخلية

لمرحلة البكالوريوس

٢٠١٨

بيانات أساسية للبرنامج:

- **اسم البرنامج** : الهندسة المعمارية والتصميم العمراني
- **الكلية / المعهد** : كلية الهندسة والعلوم التطبيقية
- **الجامعة** : جامعة النيل
- **عدد ساعات الاتصال** : ٣٧٥٠ ساعة (٢٥٠ أسبوعيا) مقسمة إلى:

  ١٣٨٧,٥ ساعة محاضرات (٩٢,٥ أسبوعيا)

  ٢٣٦٢,٥ ساعة تمارين ومعمل (١٥٧,٥ أسبوعيا)
- **عدد الساعات المعتمدة** : ١٦٠ ساعة
- **عدد المقررات** : ٥٣ مقرر شاملة ٢ مقرر (لغة إنجليزية مكثفة بدون ساعات) + ٢ مقرر مشروع تخرج + ١ مقرر تدريب عملي
- **منسق البرنامج** : أ.د./ دينا كمال الدين شهيب
- **تاريخ بدء البرنامج** :

Program Title	Architecture & Urban Design		
Specializations			
School	Engineering & Applied Sciences		
University	Nile University		
Contact Hours	Lectures	Tutorials	Labs
	92.5 /week	81 /week	76.5 /week
	1387.5	1215	1147.5
CH	160		
ECTS	280		
Number of Courses	53		

Distribution according to Course Levels

	CH	ECTS
University Requirements	16	25
School Requirements	38	65
Program Requirements	106	190
Specialization Requirements	--	--

Distribution according to Course Categories

	CH	ECTS
Humanities & Social Sciences	17	27
Business Administration	5	10
Mathematics & Basic Sciences	24.5	42.5
Engineering Culture	9	15
Basic Engineering Sciences	46.5	78.5
Engineering Applications & Design	49	86
Project & Practical Training	9	21

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Course Levels for Engineering Programs at NU (SCU)

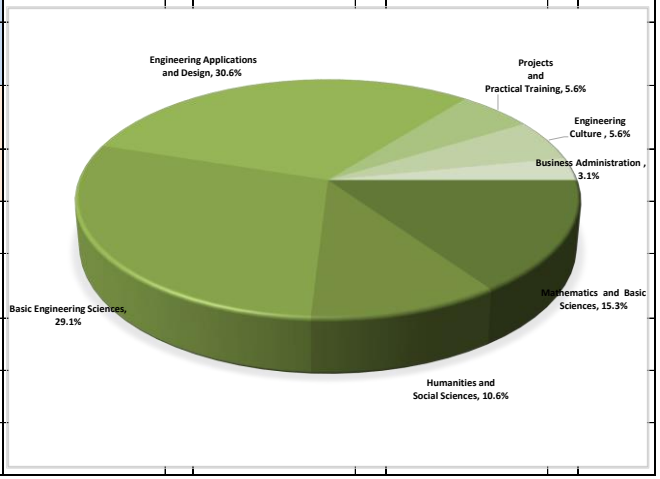
Requirements		NARS (min%)	NARS (max%)	ARUD
University	(%)	6%	10%	10%
	CH	10	16	16
	ECTS	16	27	25
School	(%)	22%	30%	23.75%
	CH	35	48	38
	ECTS	59	81	65
Program	(%)	30%	35%	66.25%
	CH	48	56	106
	ECTS	81	95	190
Specialization	(%)	20%	30%	
	CH	32	48	
	ECTS	54	81	
				100%

Course Categories for Engineering Programs at NU (NARS)

Course Category		NARS (min%)	NARS (max%)	ARUD
Humanities & Social Sciences	(%)	8%	12%	10.6%
	CH	13	19	17
	ECTS	22	32	27
Business Administration	(%)	2%	4%	3.1%
	CH	3	6	5
	ECTS	5	11	10
Mathematics & Basic Sciences	(%)	18%	22%	15.3%
	CH	29	35	24.5
	ECTS	49	59	42.5
Engineering Culture	(%)	4%	6%	5.6%
	CH	6	10	9
	ECTS	11	16	15
Basic Engineering Sciences	(%)	25%	30%	29%
	CH	40	48	46.5
	ECTS	68	81	78.5
Engineering Applications & Design	(%)	25%	30%	30.6%
	CH	40	48	49
	ECTS	68	81	86
Project & Practical Training	(%)	4%	6%	5.6%
	CH	6	10	9
	ECTS	11	16	21
				100%

Compliance of NU Program to the NARS for Architectural Engineering

NARS requirements	A Mathematics and Basic Sciences		B Humanities and Social Sciences		C Basic Engineering Sciences		D Engineering Applications and Design		E Project and Practical Training		F Engineering Culture		G Business Administration		Credit Hours
	18-22%		8-12%		25-30%		25-30%		4-6%		4-6%		2-4%		
NU	24.5		17		46.5		49		9		9		5		160
	15.31%		10.63%		29.06%		30.625%		5.625%		5.625%		3.125%		Percentage
	Math 103 Math I: Probability and Statistics	3	HUMA 003 Selected Topics in Humanities: Environmental Psychology (Uni. Req.)	2	ARUD 151 Construction I	3	ARUD 011 Design Thinking	3	ARUD 408 Grad. Project II	6	ARUD 031 History of Arch & Urban Form I	3	ARUD 457 Const. doc BOQ Tender Doc. -Site Supervision /Project Management	3	
	PHYS 002 Physics II	3	ARUD 121 Environmental-Behaviour Studies	3	ARUD 161 Visual I	3	ARUD 101 Design Studio I	4	ARUD 481 Internship	3	ARUD 132 History of Arch & Urban Form II	3	ARUD 212 Advanced Design Process Module on Particiaptory Design	1	
	CSCE 001 Computer & Information Skills	3	SSCI 002 Selected Topics in World Culture & Diversity: Contemporary City (Uni. Req.)	2	ARUD 363 Building Information Modeling (BIM)	3	ARUD 102 Design Studio II	4			ARUD 233 Theory of Arch & Urban Form I: Modernism	3	ARUD 325 Spatial and Urban Dynamics Module on social analysis in	1	
	ARUD 141 Building Physics I Module on Property of Materials	3	ENGL 002 English I (Uni. Req.)	0	ARUD 162 Visual II	3	ARUD 203 Design Studio III	6							
	ARUD 242 Building Physics II	3	ENGL 003 English II (Uni. Req.)	0	ARUD 253 Construction II	2	ARUD 204 Design Studio IV	6							
	MATH 003 Descriptive Geometry	2	HUMA 001 Introduction to Scientific & Critical Thinking (Uni. Req.)	2	ARUD 243 Building Systems Integration	3	ARUD 305 Design Studio V	6							
	ARUD 152 Structure I (50%) - Module on Property of Materials + Statics	1.5	HUMA 002 Introduction to Ethics (Uni. Req.)	2	ARUD 122 Dwelling and Neighbourhood Design	3	ARUD 306 Design Studio VI	6							
	ARUD 253 Construction II (30%) - Module on Property of Materials	1	ENGL 101 Writing Skills (Uni. Req.)	3	ARUD 344 Building Performance Computing	3	ARUD 407 Grad. Project I	3							
	ARUD 355 Construction III (30%) - Module on Property of Materials	1	ENGL 102 Communication & Presentation Skills (Uni. Req.)	3	ARUD 355 Construction III	2	ARUD 212 Advanced Design Process	2							
	ARUD 172 Elective II: Colour and Art	2			ARUD 356 Structure III	3	ARUD 374 Elective IV: Landscape Architecture and planning ARUD 375 Elective V: Informal Areas	2							
	SSCI 001 Selected Topics in Social Science: Research Methods (Uni. Req.)	2			ARUD 223 Building Types	3	ARUD 478 Elective VIII: Urban Planning II ARUD 479 Elective IX: Heritage Conservation	2							
					ARUD 224 People-centred Urban Design & Public Space	3	ARUD 476 Elective VI: Sustainable Develop. ARUD 477 Elective VII: Building Ecology	2							
					ARUD 325 Spatial & Urban Dynamics	2	ARUD 001 Basis for Design - Drawing / Modelling	3							
					ARUD 334 Theory of Arch & Urban Form II: Contemporary	3									
					ARUD 171 Elective I: Mapping Preferences ARUD 173 Elective III: Arch Photography	0									
					ARUD 152 Structure I	1.5									
					ARUD 254 Structure II	3									
					ARUD 426 Urban Planning process	3									



مادة (١) : رسالة البرنامج

إن رسالة برنامج بكالوريوس الهندسة المعمارية والتصميم العمراني بكلية الهندسة والعلوم التطبيقية بجامعة النيل هي إعداد خريجين من مهندسين معماريين قادرين على إحداث نقلة نوعية في ممارسة مختلف مجالات وتطبيقات الهندسة المعمارية والتصميم العمراني مع اهتمام خاص بالبعد الإنساني والتفاعل المتبادل بين الناس والبيئة المعمارية والعمرانية، فضلا عن تأهيل الخريجين لتوظيف التقنيات الحديثة وتكنولوجيا الاتصالات والمعلومات في البحث والتصميم وحل المشكلات وتمكينهم من استكمال الدراسة فى برامج الدراسات العليا بالجامعات المصرية والعالمية ، وذلك من خلال توافر بيئة تعليم وتعلم داعمة لتحقيق التميز، ومؤهلة لاكتساب المهارات العلمية والعملية فى التخصص ودعم القيم الأخلاقية للمهنة بالإضافة إلى توفير فرص التعليم الذاتي المستمر.

وتتمثل الرؤية في تطوير برنامج أكاديمي متميز وذلك من خلال التكامل بين التكنولوجيا والثقافة، والتوفيق بين الفنون والعلوم الاجتماعية والهندسة، باستخدام أحدث التقنيات لمواجهة التحديات التي تواجه بناء التجمعات البشرية التي تدعم وتحافظ على تحقيق القيم الإنسانية وترفع من مستوى المعيشة وتحقق الازدهار.

مادة (٢) : توصيف البرنامج الدراسي

أعد برنامج الهندسة المعمارية والتصميم العمراني بكلية الهندسة والعلوم التطبيقية بجامعة النيل اللائحة الداخلية لبرنامج جديد فى مجال العمارة والتصميم العمراني يتميز بالتكامل والتعدد فى التخصصات التي يكون فيها الإنسان ودراسة الأبعاد الاجتماعية والسلوكية له إضافة للقاعدة العلمية ومحور الدراسة والتطبيق بها لما لها من تأثير متبادل مع البيئة المعمارية والعمرانية ، فضلا عن استخدام تكنولوجيا الاتصالات والمعلومات كأداة هامة وداعمة للطالب لتمكينه من التطبيقات المختلفة لتصميم العمارة والعمران الملائم والمستدام.

البرنامج يؤهل للحصول على درجة بكالوريوس فى مجال الهندسة المعمارية والتصميم العمراني وهو يعتمد على نظام الساعات المعتمدة فى الدراسة، وحيث أن مجالات الهندسة تتسع إلى العديد من الموضوعات فقد تم تصميم عدد من المقررات الاختيارية لتغطى القضايا الملحة المتصلة بالمجال.

مادة (٣) : أهداف البرنامج

يهدف البرنامج الدراسي في برنامج الهندسة المعمارية والتصميم العمراني بكلية العلوم الهندسية بجامعة النيل إلى إعداد كوادر من المهندسين المعماريين القادرين على إحداث نقلة معرفية وإبداعية في ممارسة مهنة العمارة والتصميم العمراني في مصر بجعل العنصر البشري هو محور اهتمامها مما يجعلها محققة للاستدامة البيئية والاقتصادية والاجتماعية.

ويتم ذلك عن طريق إكساب الطلاب المهارات الأكاديمية والتقنية وتوفير علاقات قوية بين القطاعات المشاركة في عملية إنتاج وإعادة تأهيل المجتمعات العمرانية المحلية والعالمية مع خريجي البرنامج في المجالات المتعلقة بالبحث والتدريب العملي والأعمال لتصميم وتنفيذ مشروعات معمارية وعمرانية أكثر شمولية ومراعاة للبعد الإنساني مع استغلال التقنيات الحديثة.

بالإضافة لتدريب الطلاب على ممارسة المنهجية في التفكير وتوصيف المشكلات والمتطلبات التصميمية بأساليب علمية تضمن تلبية احتياجات الأجيال الحالية والمستقبلية من النواحي الاجتماعية والسيكولوجية والثقافية كمدخل لتحقيق التنمية العمرانية المستدامة وتحسين مستوى المعيشة بما يشمل من تحقيق السلامة وأمن المجتمع والتمكين للاستدامة البيئية والاقتصادية من خلال التخطيط السليم والعمل التشاركي.

ويتم تحقيق هذه الأهداف من قبل أعضاء هيئة التدريس في الهندسة المعمارية والتصميم العمراني ذوي الخبرة في إدارة الأنشطة الهندسية والتقنية.

مادة (٤) : مخرجات البرنامج ومواصفات الخريج

لتحقيق أهداف البرنامج يجب أن يكون الخريج :

١- مجهزاً علمياً وتقنياً لممارسة مهنة الهندسة المعمارية والتصميم العمراني لخلق تصميمات هندسية معمارية وعمرانية تلبي متطلبات المستخدمين بفئاتهم المختلفة بالإضافة إلى المتطلبات الجمالية والتقنية من خلال اكتسابه العلوم والمهارات التقنية في مجالات الثقافة المحلية والتراث والعلوم الإنسانية والتقنيات الحديثة في البناء والعمران.

٢- قادراً على التعامل مع البيئة العمرانية (المبنية والفراغات العامة)؛ سواء بتحسينها وتطويرها من خلال إعادة تأهيل العمران القائم أو بتصميم وإنشاء عمران جديد.

٣- قادراً على التعرف على المشاكل الهندسية المعمارية والعمرانية وكيفية تحليلها للوصول إلى موجهات حلول وتصميمات تحقق الاحتياجات المحلية للمجتمع وبما يتلاءم مع البيئة الاجتماعية والاقتصادية والمناخية المحيطة.

٤- مجهزاً للعمل في مجالات متعددة في العمارة والعمران من خلال اكتسابه العلوم والمهارات التقنية لإعداد وتنفيذ تصميمات معمارية وعمرانية تحقق الاستدامة البيئية والاقتصادية والاجتماعية باستخدام البرامج والتقنيات الهندسية الحديثة وأحدث ما توفره تكنولوجيا المعلومات والاتصالات في مجالات البحث والتصميم والتنفيذ.

٥- ملماً بالمناهج العلمية لإدارة المشروعات المعمارية والعمرانية وهندسة القيمة وقادراً على إعداد مخططات ملبية للكودات المصرية وإصدار الشهادات المطلوبة للمشروعات.

٦- قادراً على العمل بكفاءة وتكامل في فريق متعدد التخصصات سواء في نفس تخصصه أو في تخصصات هندسية مساندة أو في تخصصات غير هندسية (اجتماعية – اقتصادية – ....) مكملة لتقديم الخدمات المهنية والنتاج المعماري والعمراني الكفء.

٧- قادراً على التواصل شفهياً وكتابةً بمهنية مع المشاركين في العمل ومتمكناً من إجراء المقابلات والاستبيانات الشفهية وتحليلها ولديه مهارات الإشراف على مجموعة من الفنيين والقيام بإشراك الأطراف المعنية والمستفيدين في عملية وضع متطلبات التصميم وموجهات الحلول والتصميم.

٨- متفهماً لدور المهندس المعماري في إنتاج البيئة العمرانية الملائمة وقادراً على المشاركة في إعداد مستندات طرح العطاءات الهندسية والاشتراك في وضع البرامج المكملة فيما يخص إدارة العمران لتحقيق النتائج المستهدفة.

٩- مقدراً للتعلم والتطور المستمر واكتساب المهارات الجديدة والمستحدثة والإلمام بالمستجدات في مجال العمارة والعمران على الساحتين المحلية والعالمية.

وسيكون الخريج من هذا التخصص مؤهلاً للعمل في:

١- المشروعات المعمارية.

٢- مشروعات التخطيط العمراني والتصميم الحضري.

٣- مشروعات التطوير وإعادة التأهيل.

٤- أعمال الهندسة البيئية.

٥- أعمال تنسيق المواقع.

مادة (٥) : المعايير الأكاديمية للبرنامج

يلتزم البرنامج بالمعايير الأكاديمية المقترحة من قبل الهيئة القومية لضمان جودة التعليم والاعتماد كحد أدنى، والمعايير الأكاديمية لبرنامج الهندسة المعمارية والتصميم العمراني المقترح يحدد المستوى والإمكانيات والقدرات المتوقعة للخريج كالآتي:

A. Competencies for Engineering Graduates

The Engineering Graduate must be able to:

A.1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics

A.2. Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.

A.3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.

A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.

A.5. Practice research techniques and methods of investigation as an inherent part of learning.

A.6. Plan, supervise and monitor implementation of engineering projects.

A.7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.

A.8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

A.9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.

A.10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.

B. Competencies for ARCHITECTURE Engineering Graduates

In addition to the above Competencies for All Engineering Programs the BASIC ARCHITECTURE Engineering graduate must be able to:

1.. Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies and human sciences.

2.. Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.

3.. Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology and engineering problems associated with building designs.

4.. Transform design concepts into buildings and integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations and procedures involved.

5.. Prepare design project briefs and documents, and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.

مادة (٦) : تفاعل البرنامج مع احتياجات السوق

من الأهداف الرئيسية للبرنامج المقترح هو التفاعل المستمر مع سوق العمل حيث معرفة الاحتياجات والممارسات الإيجابية والسلبية والثغرات التي يجب العمل عليها، فإن مخرجات البرنامج لابد وأن تتوافق مع متطلبات المستخدم وعليه فإن الجامعة ملتزمة بالتواصل مع المجتمع المحلي وسوق العمل للتعرف على الاحتياجات الحقيقية لهم وبالتالي للخريجين من البرنامج وكذلك لتشكيل قنوات مستمرة لتدريب الطلاب. وقد تم تصميم البرنامج ليتوافق مع ما يشهده العصر من ضرورة فهم وتلبية إحتياجات كافة الفئات من المستخدمين لتفادي ردود الأفعال غير المخططة وغير المنظمة التي تعاني منها البلاد.

هذا مع تنامى تحديات المدينة المعاصرة المتزايدة خاصة في الدول مثل مصر مما يساهم فى ضرورة توافق تخصص الخريجين مع احتياجات السوق الفعلية.

١. يجب تخصيص مدة كافية من الوقت وتصميم برنامج لإدارة الأنشطة العملية والتعرف على حقيقة أنساق إنتاج العمران المختلفة والتعرض لمواقف حقيقية في سوق العمل ومعرفة كيفية

التعامل معها. وإدراج التدريب العملي كجزء من الحصول على الدرجة العلمية ليس فقط في مقرر واحد بل كوحدة مكملة في العديد من المقررات.

٢. إشراك أصحاب الخبرة في ممارسة المهنة بسوق العمل؛ كأعضاء في هيئة التدريس بالجامعة.

٣. الإلتحاق بمؤسسات وجمعيات للمعماريين المحترفين متصلة بأنشطة بالجامعة.

٤. إدراج الطلبة في نظام الاستوديو المستخدم في سوق العمل (القائم على حل المشكلات والوعي المجتمعي) من خلال تفعيل ثقافة الـ٢٤ ساعة استوديو مفتوح.

٥. الاشتراك مع جامعات أخرى محليا ودولياً في الأنشطة العلمية لتطوير المهارات الفكرية والتقنية المستخدمة والمطلوبة في سوق العمل.

٦. تبني فكر "التعلم من خلال المشروع" بالشراكة مع سوق العمل في التعامل مع مشروعات وتحديات عمرانية حقيقية.

٧. تشجيع الحملات القياسية (measurement campaigns) لدراسة المظاهر العمرانية والبيئية.

٨. تبادل الطلبة محليا ودوليا للاطلاع على سوق العمل في ظروف مختلفة.

مادة (٧) : التشابه والتمايز عن البرامج المناظرة

يتميز البرنامج بكونه يقدم للدارسين نموذجاً للأسلوب المنهجي فى التعليم الجامعي ورؤية شاملة ومتكاملة في مجال الهندسة المعمارية والتصميم العمراني من خلال التركيز على أساليب التصميم والبحث والتطوير المختلفة فى مجال عمل المعماري والمصمم العمراني ودعم ذلك بالنظريات العلمية والخبرة الميدانية ونظم وتكنولوجيا المعلومات الحديثة؛ حيث يستفيد البرنامج من الخبرات المتراكمة فى البرامج المناظرة على المستوى المحلى والمستوى الدولي لتقديم منهج دراسي متكامل يعتمد على:

- توفير الأساس النظري والعملي المناسب للتخصص بما يواكب ما يتم تدريسه فى الجامعات العريقة محلياً وعالمياً وللبرنامج مكونان أساسيان:
- تقديم الأساس النظري المتكامل والذي يشمل قاعدة علمية مكملة عن العلوم الإنسانية يخدم فئة المعماريين بصفة عامة لتكوين الأرضية الثابتة للتقدم فى مجالات عمل المعماري في السوق المحلية والعالمية.

- تقديم المادة العلمية والعملية التي ترتفع بمستوى الطلاب إلى مستوى الفعالية في دور المعماري في المدينة المعاصرة مستنداً على دراسة ما يتم تدريسه بالبرامج المتميزة فى مصر وخارجها والتي تتسم بالشمولية والتكاملية بين القاعدة النظرية الواسعة والتطبيق في التصميم.
- توفير نظام الساعات المعتمدة والذي يتيح للطلبة الاختيار من مجموعة من المقررات.
- توفير معامل متكاملة للتطبيقات العملية المصاحبة للدراسة النظرية ومنها معمل Virtual Reality.
- توفير خطة تدريب عملي داخل وخارج الجامعة لتتماشى مع متطلبات المقررات الدراسية والتطور المستمر فى احتياجات السوق والقضايا العمرانية الملحة.
- استخدام طرق البحث العلمي لتشجيع الطلاب للاطلاع على الجديد فى مجال الهندسة المعمارية والتنمية العمرانية وتقنيات التصميم وتكنولوجيا الاتصالات والمعلومات.
- وضع الطلاب فى بيئة مشابهة لبيئة العمل أثناء الدراسة من أجل اكتساب المهارات العملية.

مادة (٨): مخرجات البرنامج المستهدفة Program Competencies

لقد تم تصميم برنامج الهندسة المعمارية والتصميم العمراني المقترح في جامعة النيل لكي يتميز خريج القسم بخصائص تمكنه من تحقيق طفرة إبداعية في مجال العمارة والتصميم العمراني بالإضافة إلى تكامله مع أقرانه في مجال العمل المهني والأكاديمي.

C. Competencies for ARUD Graduates

In addition to the above Competencies for All BASIC ARCHITECTURE Engineering Programs the ARUD program graduates must be able to:

C1. Address urban issues, and human aspects into design projects, taking into consideration cultural diversity, social differences and the impact of a built form on people's daily life and community identity.

C2. Demonstrate knowledge and understanding of public spaces; their dynamics, significance, and multi-dimensional impact drawing upon understanding the interaction between people and their built and natural environment.

C3. Achieve desirable experience of place through integrating different scales of intervention (architecture, urban design, landscape, city planning, regional planning), and understanding the complexity of cities.

C4. Assimilate different forms of knowledge from other disciplines into the knowledge base of architecture and urban design formulating them into integrative design criteria to inform and evaluate design solutions.

C5. Conduct and utilize scientific research, apply explanatory and normative theory, in a highly conscious and deliberate design process of architecture and urban design.

C6. Reflect and discern lessons learnt from practical experience in real professional environments; through internships, knowledge exchange workshops, and project-based, blended learning pedagogies.

C7. Demonstrate knowledge and understanding of a range of ICT-based and digital design tools to enhance the documentation, analysis, production and presentation of architectural and urban design projects.

مادة (٩): مطابقة مخرجات البرنامج المستهدفة مع المعايير الأكاديمية طبقاً لمتطلبات (NARS)

الجدول التالي يستعرض مدى تحقيق مخرجات البرنامج المستهدفة (Competencies) للمعايير الأكاديمية له طبقاً لمتطلبات (NARS 2018):

Nile University
جامعة النيل

COURSE MAPPING (NARS 2018)

Course Code	COURSE Title	A-level competencies (Engineering)										B-level competencies (Architecture)					C-level competencies (Integrated People-centred Architecture and Urban Design)						
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	C7
CSCE 001	Computer & Information Skills	x				x					x												
MATH 003	Descriptive Geometry	x	x						x														
MATH 103	Math I: Probability & Statistics			x	x		x		x	x													
PHYS 002	Physics II	x	x		x	x	x			x													
ARUD 141	Building Physics I	x	x	x					x					x					x				
ARUD 242	Building Physics II	x	x	x					x					x					x				
ARUD 243	Building Systems Integration			x	x	x								x	x				x				x
ARUD 344	Building Performance Computing						x		x	x						x					x		x
ARUD 152	Structure I	x	x	x										x						x			
ARUD 254	Structure II	x	x	x	x		x							x						x		x	
ARUD 356	Structure III	x	x	x	x		x							x						x		x	
ARUD 457	Const. doc BOQ Tender Doc - Site Supervision /Project Management				x		x		x						x	x						x	
ARUD 363	Building Information Modeling		x		x		x		x						x	x				x			x
ARUD 001	Basis for Design - Drawing / Modelling	x								x								x	x				x
ARUD 101	Design Studio I				x	x						x	x	x			x	x					x
ARUD 102	Design Studio II				x	x						x	x	x			x	x					x
ARUD 203	Design Studio III				x	x						x	x	x			x	x	x	x	x		x
ARUD 204	Design Studio IV				x	x					x	x	x	x	x		x	x	x	x	x		x
ARUD 305	Design Studio V				x	x					x	x	x	x	x		x	x	x	x	x		x
ARUD 306	Design Studio VI				x	x					x	x	x	x	x		x	x	x	x	x		x
ARUD 407	Grad. Project I					x		x	x		x	x	x	x		x				x	x	x	x
ARUD 408	Grad. Project II				x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x		
ARUD 011	Design Thinking			x		x							x						x		x		x
ARUD 212	Advanced Design Process		x	x		x					x			x					x		x		x
ARUD 121	Environment Behaviour Studies		x					x				x	x	x					x	x			

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Nile University
جامعة النيل

مادة (١٠): المقررات الدراسية ومدى ملاءمتها لمخرجات البرنامج المستهدفة

	Course Code	Course Title	CH	ECTS	SWL	No. of hours /week			Competences
						Lec.	Tut.	Lab.	
University Requirements	ENGL 001	Intensive English	0	0	0				
	ENGL 002	English I	0	0	0				
	ENGL 101	Writing Skills	3	5	125	4.5	0	0	
	ENGL 102	Communication & Presentation Skills	3	5	125	4.5	0	0	
	ENGL 003	English II	0	0	0	0	0	0	
	HUMA 001	Introduction to Scientific & Critical Thinking	2	3	75	3	0	0	
	HUMA 002	Introduction to Ethics	2	3	75	3	0	0	
	HUMA 003	Selected Topics in Humanities: Environmental Psychology	2	3	75	2	1	0	
	SSCI 001	Selected Topics in Social Sciences: Research methods	2	3	75	0	0	0	
	SSCI 002	Selected Topics in World Culture & Diversity: Contemporary City	2	3	75	2	1	0	
Engineering Requirements	CSCE 001	Computer & Information Skills	3	5	125	2	1	0	A1,A5,A10
	MATH 003	Descriptive Geometry	2	4	100	1.5	0	4.5	A1,A2,A8
	MATH 202	Math I: Probability & Statistics	3	5	125	1.5	1.5	0	A3,A4,A6,A8,A9
	PHYS 002	Physics II	3	5	125	3	1.5	0	A1,A2,A4,A5,A6,A9
	ARUD 141	Building Physics I	3	5	125	3	1.5	1	A1,A2,A3,A8,B3,C3
	ARUD 242	Building Physics II	3	5	125	2	2.5	0	A1,A2,A3,A8,B3,C3
	ARUD 243	Building Systems Integration	3	5	125	2	2.5	0	A3,A4,A5,B3,B4,C3,C7
	ARUD 344	Building Performance Computing	3	5	125	2	2.5	0	A6,A8,A9,B5,C5,C7
	ARUD 152	Structure I	3	5	125	2	1.5	1	A1,A2,A3,B3,C4
	ARUD 254	Structure II	3	5	125	2	2.5	0	A1-A4,A6,B3,C4,C6
	ARUD 356	Structure III	3	5	125	1	3.5	0	A1-A4,A6,B3,C4,C6
	ARUD 457	Const. doc BOQ Tender Doc - Site Supervision /Project Management	3	6	180	1	3.5	0	A4,A6,A8,B4,B5,C6
	ARUD 363	Building Information Modeling	3	5	125	1	3.5	1	A2,A4,A6,A8,B4,B5,C4,C7
Program Requirements	ARUD 001	Basis for Design - Drawing / Modelling	3	6	150	1	2.5	1	A1,A9,C2,C3,C7
	ARUD 101	Design Studio I	4	7	175	1.5	0	5	A4,A5,B1-B3,C1,C2,C7
	ARUD 102	Design Studio II	4	7	175	1.5	0	5	A4,A5,B1-B3,C1,C2,C7
	ARUD 203	Design Studio III	6	10	250	1.5	0	5	A4,A5,B1-B3,C1-C5,C7
	ARUD 204	Design Studio IV	6	10	250	1.5	0	6.5	A4,A5,A10,B1-B4,C1-C5,C7
	ARUD 305	Design Studio V	6	10	250	1.5	0	6.5	A4,A5,A10,B1-B4,C1-C5,C7
	ARUD 306	Design Studio VI	6	10	250	1.5	0	6.5	A4,A5,A10,B1-B4,C1-C5,C7
	ARUD 407	Grad. Project I	3	6	180	1.5	0	6.5	A5,A7,A8,A10,B1-B3,B5, C4-C7
	ARUD 408	Grad. Project II	6	16	480	1.5	0	5	A4-A8,A10,B1-B5,C1-C5
	ARUD 011	Design Thinking	3	5	125	1.5	0	15.5	A3,A5,B2,C3,C5,C7
	ARUD 212	Advanced Design Process	3	5	125	2.5	2	0	A2,A3,A5,A10,B3,C3,C5,C7

	ARUD 121	Environment Behaviour Studies	3	5	125	1	2	1.5	A2,A7,B1-B3,C3,C4
	ARUD 122	Dwelling and Neighbourhood Design	3	5	150	2.5	2	0	A3,A4,B1-B4,C1-C3,C5
	ARUD 223	Building Types	3	5	125	1	3.5	0	A3,A4,B1-B3,C1,C2,C4,C5
	ARUD 224	People-centred Urban Design & Public Space	3	5	150	2	2.5	0	A9,B1-B3,C1-C4
	ARUD 325	Spatial & Urban Dynamics	3	5	150	1	3.5	0	A4,A5,A7-A9,B2,B3,B4, C1-C6
	ARUD 426	Urban Planning process	3	6	150	1	3.5	0	A3,A4,A7-A9,B2,B3, C1,C2,C4,C7
	ARUD 031	History of Arch and Urban Form I	3	5	125	2	3.5	0	A10,B1,C1-C3,C6
	ARUD 132	History of Arch and Urban Form II	3	5	125	2.5	2	0	A10,B1,C1-C3,C6
	ARUD 233	Theory of Arch and Urban Form I	3	5	125	2.5	2	0	A10,B1,C1-C3,C6
	ARUD 334	Theory of Arch and Urban Form II	3	5	125	2.5	2	0	A10,B1,C1-C3,C6
	ARUD 151	Construction I	3	5	125	2.5	2	0	A4,B3,C3
	ARUD 253	Construction II	3	5	125	1	3.5	0	A4,A6,B3,B4,C4,C6
	ARUD 355	Construction III	3	6	150	1	3.5	0	A3,A4,A6,B3,B4,C4,C6
	ARUD 161	Visual I	3	5	125	1	2.5	2	A8,B1,C3,C7
	ARUD 162	Visual II	3	5	150	1	2.5	1	A8,B1,B2,B4,C3,C7
	ARUD 171	Elective I: Mapping Preferences	2	4	100	1	1		A2,A10,B2,C2,C3,C7
	ARUD 172	Elective II: Colour and Art						1	A8,B1,C4,C7
	ARUD 173	Elective III: Arch. Photography							A8,A10,B4,B6,B7
	ARUD 374	Elective IV: Landscape Architecture and planning	2	4	100	2	1	0	B1,C1-C3
	ARUD 375	Elective V: Informal Areas							A5,A7,B1,B2,C1-C3,C5
	ARUD 476	Elective VI: Sustainable Development	2	4	100	2	1	0	A5,A7,A9,B1,B2,C1-C5
	ARUD 477	Elective VII: Building Ecology							A2-A5,B1,B3,C2,C4,C5
	ARUD 478	Elective VIII: Urban Planning II	2	4	100	2	1	0	A5,A7-A9,B1,C1-C4
	ARUD 479	Elective IX: Sustainable Heritage Conservation							A5,A7,A8,B1,C1-C3
	ARUD 481	Internship	3	5	125				A4-A6,C1,C4-C6
	Totals		**160**	**280**	**7240**	**92.5**	**81.0**	**76.5**	

University and Engineering Requirements Courses (ARUD)

Course Code	Course Title	University Core		Engineering Core	
		CH	ECTS	CH	ECTS
ENGL 001	Intensive English	0	0	X	
ENGL 002	English I	0	0		
ENGL 003	English II	0	0		
ENGL 101	Writing Skills	3	5		
ENGL 102	Communication & Presentation Skills	3	5		
HUMA 001	Introduction to Scientific & Critical Thinking	2	3		
HUMA 002	Introduction to Ethics	2	3		
HUMA 003	Selected Topics in Humanities: Environmental Psychology	2	3		
SSCI 001	Selected Topics in Social Sciences: Research methods	2	3		
SSCI 002	Selected Topics in Culture & Diversity: Contemporary City	2	3		
CSCE 001	Computer & Information Skills	X		3	5
MATH 003	Descriptive Geometry			2	4
MATH 103	Probability & Statistics			3	5
PHYS 002	Physics II (for architects)			3	5
ARUD 141	Building Physics I			3	5
ARUD 242	Building Physics II			3	5
ARUD 243	Building Systems Integration			3	5
ARUD 344	Building Performance Computing			3	5
ARUD 152	Structure I			3	5
ARUD 254	Structure II			3	5
ARUD 356	Structure III (Practicum BIM)			3	5
ARUD 457	Const. doc BOQ Tender Doc - Site Supervision /Project Management			3	6
ARUD 363	Building Information Modeling			3	5
		16	25	38	65

Nile University
جامعة النيل

ARUD Course Mapping to Subject Categories (NARS)

Course Code	Course Title	Hum. & Social Sci.		Business Admin.		Math & Basic Sci.		Eng. Culture		Basic Eng. Sci.		Eng. App. & Design		Project & PT	
		CH	ECTS	CH	ECTS	CH	ECTS	CH	ECTS	CH	ECTS	CH	ECTS	CH	ECTS
	University Requirements														
ENGL 001	Intensive English	0	0												
ENGL 002	English I	0	0												
ENGL 003	English II	0	0												
ENGL 101	Writing Skills	3	5												
ENGL 102	Communication & Presentation Skills	3	5												
HUMA 001	Introduction to Scientific & Critical Thinking	2	3												
HUMA 002	Introduction to Ethics	2	3												
HUMA 003	Selected Topics in Humanities: Environmental Psychology	2	3												
SSCI 001	Selected Topics in Social Sciences: Research methods					2	3								
SSCI 002	Selected Topics in World Culture & Diversity: Contemporary City	2	3												
	Total University Requirements	**14**	***22***	**0**	***0***	**2**	***3***	0	0	0	0	0	0	0	0
	Engineering Requirements														
CSCE 001	Computer & Information Skills					3	*5*								
MATH 003	Descriptive Geometry					2	*4*								
MATH 103	Probability & Statistics					3	*5*								
PHYS 002	Physics II (for architects)					3	*5*								
ARUD 141	Building Physics I					3	*5*								
ARUD 242	Building Physics II					3	*5*								
ARUD 243	Building Systems Integration									3	*5*				
ARUD 344	Building Performance Computing									3	*5*				
ARUD 152	Structure I					1.5	*2.5*			1.5	*2.5*				
ARUD 254	Structure II									3	*5*				
ARUD 356	Structure III (Practicum BIM)									3	*5*				
ARUD 457	Const. doc BOQ Tender Doc - Site Supervision /Project Management			3	6										
ARUD 363	Building Information Modeling									3	5				
	Total Engineering Requirements	0	0	**3**	***6***	**18.5**	***31.5***	0	0	**16.5**	***27.5***	**0**	***0***	**0**	***0***

Course Code	Course Title	Hum. & Social Sci.		Business Admin.		Math & Basic Sci.		Eng. Culture		Basic Eng. Sci.		Eng. App. & Design		Project & PT	
		CH	ECTS	CH	ECTS	CH	ECTS	CH	ECTS	CH	ECTS	CH	ECTS	CH	ECTS
	Program Requirements														
ARUD 001	Basis for Design - Drawing / Modelling											3	*6*		
ARUD 101	Design Studio I											4	*7*		
ARUD 102	Design Studio II											4	*7*		
ARUD 203	Design Studio III											6	*10*		
ARUD 204	Design Studio IV											6	*10*		
ARUD 305	Design Studio V											6	*10*		
ARUD 306	Design Studio VI											6	*10*		
ARUD 407	Grad. Project I											3	*6*		
ARUD 408	Grad. Project II													6	*16*
ARUD 011	Design Thinking											3	*5*		
ARUD 212	Advanced Design Process			1	2							2	*3*		
ARUD 121	Environment Behaviour Studies	3	*5*												
ARUD 122	Dwelling and Neighbourhood Design									3	*5*				
ARUD 223	Building Types									3	*5*				
ARUD 224	People-centred Urban Design & Public Space									3	*5*				
ARUD 325	Spatial & Urban Dynamics			1	2					2	*3*				
ARUD 426	Urban Planning process									3	*6*				
ARUD 031	History of Arch and Urban Form I							3	*5*						
ARUD 132	History of Arch and Urban Form II							3	*5*						
ARUD 233	Theory of Arch and Urban Form I							3	*5*						
ARUD 334	Theory of Arch and Urban Form II									3	*5*				
ARUD 151	Construction I									3	*5*				
ARUD 253	Construction II					1	2			2	*3*				
ARUD 355	Construction III					1	2			2	*4*				
ARUD 161	Visual I									3	*5*				
ARUD 162	Visual II									3	*5*				
ARUD 171	Elective I: Mapping Preferences														
ARUD 172	Elective II: Colour and Art					2	4								
ARUD 173	Elective III: Arch. Photography														
ARUD 374	Elective IV: Landscape Architecture and planning														
ARUD 375	Elective V: Informal Areas											2	*4*		
ARUD 476	Elective VI: Sustainable Development											2	*4*		
ARUD 477	Elective VII: Building Ecology														
ARUD 478	Elective VIII: Urban Planning II														
ARUD 479	Elective IX: Sustainable Heritage Conservation											2	*4*		
ARUD 481	Internship													3	5
	Total Program Requirements	**3**	***5***	**2**	***4***	**4**	***8***	**9**	***15***	**30**	***51***	**49**	***86***	**9**	**21**
	Total ARUD	**17**	***27***	**5**	***10***	**24.5**	***43***	**9**	***15***	**46.5**	***79***	**49**	***86***	**9**	***21***
	Course Category %	10.63		3.1		15.31		5.62		29		30.6		5.62	

ARUD Sample Study Plan

ARUD Study Plan (Year 1)

Course Code	Course Title	CH	ECTS	SWL	Lec.	Tut.	Lab.	Prerequisites
			Semester 1					
HUMA 002	Introduction to Ethics	2	3	75	3	0	0	
HUMA 003	Selected Topics in Humanities: Environmental Psychology	2	3	75	2	1	0	
SSCI 002	Selected Topics in World Culture and Diversity: Contemporary City	2	3	75	2	1	0	
MATH 003	Descriptive Geometry	2	4	100	1.5	1.5	0	
MATH 103	Math I: Probability & Statistics	3	5	125	3	1.5	0	
CSCE 001	Computer & Information Skills	3	5	125	1.5	0	4.5	
ENGL 101	Writing Skills	3	5	125	4.5	0	0	ENGL 103
Total		**17**	**28**	**700**	**17.5**	**5**	**4.5**	
			Semester 2					
ARUD 001	Basis for Design - Drawing / Modelling	3	6	150	1.5	0	5	
HUMA 001	Introduction to Scientific & Critical Thinking	2	3	75	3	0	0	
ARUD 011	Design Thinking	3	5	125	2.5	2	0	
PHYS 002	Physics II	3	5	125	3	1.5	1	
ARUD 031	History of Arch and Urban Form I	3	5	125	2.5	2	0	
ENGL 102	Communication & Presentation Skills	3	5	125	4.5	0	0	ENGL 101
Total		**17**	**29**	**725**	**17**	**5.5**	**6**	

ARUD Study Plan (Year 2)

Semester 1

Course Code	Course Title	CH	ECTS	SWL	Lec.	Tut.	Lab.	Prerequisites
ARUD 101	Design Studio I (Residential - Site)	4	7	175	1.5	0	5	ARUD 001, ARUD 011
SSCI 001	Selected Topics in Social Sciences: Research Methods	2	3	75	2	1	0	
ARUD 121	Environment Behaviour Studies	3	5	125	2.5	2	0	HUMA 003
ARUD 132	History of Arch and Urban Form II	3	5	125	2.5	2	0	ARUD 031
ARUD 151	Construction I	3	5	125	1.5	3.5	0	ARUD 001
ARUD 161	Visual I	3	5	125	1	2.5	1	ARUD 001
Total		**18**	**30**	**750**	**11**	**11**	**6**	

Semester 2

ARUD 102	Design Studio II (Public Realm - Street Design)	4	7	175	1.5	0	5	ARUD 101, ARUD 121, ARUD 151, ARUD 161
ARUD 122	Dwelling and Neighbourhood Design	3	5	150	1	3.5	0	ARUD 121, SSCI 001
ARUD 141	Building Physics I	3	5	125	2	2.5	0	MATH 103, PHYS 002
ARUD 152	Structure I	3	5	125	2	2.5	0	ARUD 151
ARUD 162	Visual II	3	5	150	1	2.5	1	ARUD 161
ARUD 171/2/3	Elective (I, II or III)	2	4	100	1	1	1	
Total		**18**	**31**	**825**	**8.5**	**12**	**7**	

ARUD Study Plan (Year 3)

Semester 1

Course Code	Course Title	CH	ECTS	SWL	Lec.	Tut.	Lab.	Prerequisites
ARUD 203	Design Studio III (Dwelling & neighbourhood design)	6	10	250	1.5	0	6.5	ARUD 102, ARUD 122, ARUD 152, ARUD 162
ARUD 223	Building Types: Places for People	3	5	125	2	2.5	0	ARUD 121
ARUD 233	Theory of Architecture & Urban Form I: Modern	3	5	125	2.5	2	0	ARUD 132
ARUD 242	Building Physics II	3	5	125	2	2.5	0	ARUD 141
ARUD 253	Construction II	3	5	125	1	3.5	0	ARUD 152
Total		**18**	**30**	**750**	**9**	**10.5**	**6.5**	

Semester 2

ARUD 204	Design Studio IV Facilities - Public Building - Public Space)	6	10	250	1.5	0	6.5	ARUD 203, ARUD 223, ARUD 253, ARUD 242
ARUD 212	Advanced Design Process	3	5	125	1	2	1.5	ARUD 011
ARUD 224	People-centred Urban Design & Public Space	3	5	150	1	3.5	0	ARUD 122
ARUD 243	Building Systems Integration	3	5	125	2	2.5	0	ARUD 242
ARUD 254	Structure II	3	5	125	1	3.5	0	ARUD 253
Total		**18**	**30**	**800**	**6.5**	**11.5**	**8**	

ARUD Study Plan (Year 4)

Semester 1

Course Code	Course Title	CH	ECTS	SWL	Lec.	Tut.	Lab.	Prerequisites
ARUD 305	Design Studio V (Multi-Function Building Ensemble - City Extension)	6	10	250	1.5	0	6.5	ARUD 204, ARUD 212, ARUD 224, ARUD 243, ARUD 254
ARUD 325	Spatial & Urban Dynamics	3	5	150	1	3.5	0	ARUD 224
ARUD 334	Theory of Arch and Urban Form II: Contemporary	3	5	125	2.5	2	0	ARUD 233
ARUD 355	Construction III	3	6	150	1	2.5	2	ARUD 254
ARUD 374/5	Elective (IV or V)	2	4	100	2	1	0	
Total		**17**	**30**	**750**	**8**	**9**	**8.5**	

Semester 2

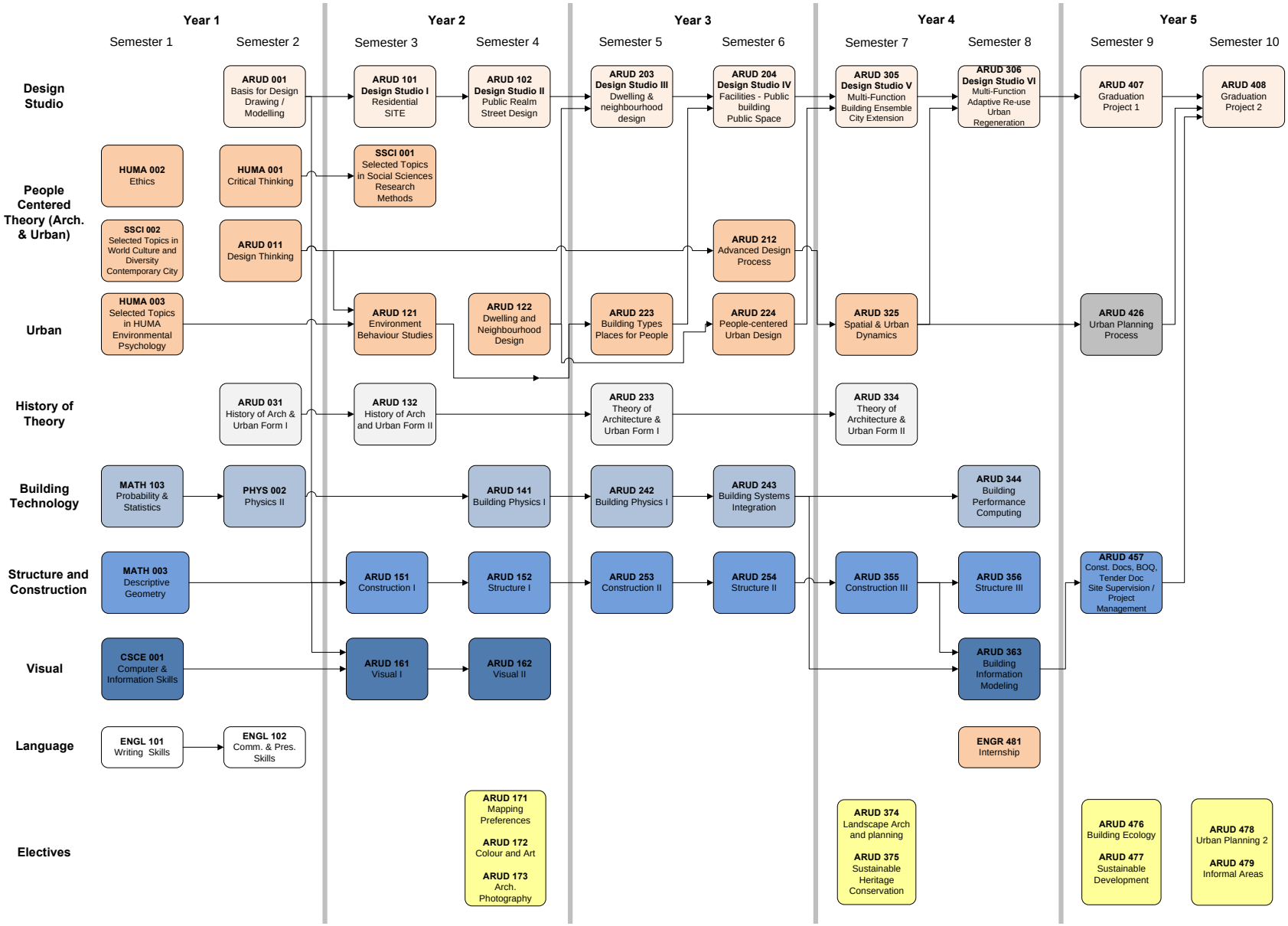
ARUD 306	Design Studio VI (Multi-Function Adaptive Re-use - Urban Regeneration)	6	10	250	1.5	0	6.5	ARUD 305, ARUD 325, ARUD 334, ARUD 355
ARUD 344	Building Performance Computing	3	5	125	2	1.5	1	ARUD 243
ARUD 356	Structure III	3	5	125	1	3.5	0	ARUD 355
ARUD 363	Building Information Modelling (BIM)	3	5	125	1	2.5	1	ARUD 355, ARUD 243
ARUD 481	Internship	3	5	125				
Total		**18**	**30**	**750**	**5.5**	**7.5**	**8.5**	

ARUD Study Plan (Year 5)

Course Code	Course Title	CH	ECTS	SWL	Lec.	Tut.	Lab.	Prerequisites
				Semester 1				
ARUD 407	Graduation Project I	3	6	180	1.5	0	5	ARUD 306, ARUD 356, ARUD 363
ARUD 426	Urban Planning Process	3	6	150	2	3.5	0	ARUD 325
ARUD 457	Const. doc BOQ Tender Doc - Site Supervision /Project Management	3	6	180	1	3.5	1	ARUD 344, ARUD 356, ARUD 363
ARUD 476/7	Elective (VI or VII)	2	4	100	2	1	0	
Total		**11**	**22**	**610**	**6.5**	**8**	**6**	
				Semester 2				
ARUD 408	Graduation Project II	6	16	480	1.5	0	15.5	ARUD 407
ARUD 478/9	Elective (VIII or IX)	2	4	100	2	1	0	
Total		**8**	**20**	**580**	**3.5**	**1**	**15.5**	

ARUD Electives

Course Code	Course Title	CH	ECTS	SWL	Lec.	Tut.	Lab.	Prerequisites
ARUD 171	Elective I: Mapping Preferences	2	4	100	1	1	1	ARUD 111
ARUD 172	Elective II: Colour and Art	2	4	100	1	1	1	ARUD 161
ARUD 173	Elective III: Architecture Photography	2	4	100	1	1	1	
ARUD 374	Elective IV: Landscape Arch and Planning	2	4	100	2	1	0	ARUD 224
ARUD 375	Elective V: Informal Areas	2	4	100	2	1	0	ARUD 122
ARUD 476	Elective VI: Sustainable Development	2	4	100	2	1	0	ARUD 325
ARUD 477	Elective VII: Building Ecology	2	4	100	2	1	0	ARUD 344
ARUD 478	Elective VIII: Urban Planning II	2	4	100	2	1	0	ARUD 426
ARUD 479	Elective IX: Sustainable Heritage Conservation	2	4	100	2	1	0	ARUD 325, ARUD 355


Year 1
Year 2
Year 3
Year 4
Year 5
Semester 1
Semester 2
Semester 3
Semester 4
Semester 5
Semester 6
Semester 7
Semester 8
Semester 9
Semester 10
Design Studio
ARUD 001 Basis for Design Drawing / Modelling
ARUD 101 Design Studio I Residential SITE
ARUD 102 Design Studio II Public Realm Street Design
ARUD 203 Design Studio III Dwelling & neighbourhood design
ARUD 204 Design Studio IV Facilities - Public building Public Space
ARUD 305 Design Studio V Multi-Function Building Ensemble City Extension
ARUD 306 Design Studio VI Multi-Function Adaptive Re-use Urban Regeneration
ARUD 407 Graduation Project 1
ARUD 408 Graduation Project 2
People Centered Theory (Arch. & Urban)
HUMA 002 Ethics
HUMA 001 Critical Thinking
SSCI 001 Selected Topics in Social Sciences Research Methods
SSCI 002 Selected Topics in World Culture and Diversity Contemporary City
ARUD 011 Design Thinking
ARUD 212 Advanced Design Process
Urban
HUMA 003 Selected Topics in HUMA Environmental Psychology
ARUD 121 Environment Behaviour Studies
ARUD 122 Dwelling and Neighbourhood Design
ARUD 223 Building Types Places for People
ARUD 224 People-centered Urban Design
ARUD 325 Spatial & Urban Dynamics
ARUD 426 Urban Planning Process
History of Theory
ARUD 031 History of Arch & Urban Form I
ARUD 132 History of Arch and Urban Form II
ARUD 233 Theory of Architecture & Urban Form I
ARUD 334 Theory of Architecture & Urban Form II
Building Technology
MATH 103 Probability & Statistics
PHYS 002 Physics II
ARUD 141 Building Physics I
ARUD 242 Building Physics I
ARUD 243 Building Systems Integration
ARUD 344 Building Performance Computing
Structure and Construction
MATH 003 Descriptive Geometry
ARUD 151 Construction I
ARUD 152 Structure I
ARUD 253 Construction II
ARUD 254 Structure II
ARUD 355 Construction III
ARUD 356 Structure III
ARUD 457 Const. Docs, BOQ, Tender Doc Site Supervision / Project Management
Visual
CSCE 001 Computer & Information Skills
ARUD 161 Visual I
ARUD 162 Visual II
ARUD 363 Building Information Modeling
Language
ENGL 101 Writing Skills
ENGL 102 Comm. & Pres. Skills
ENGR 481 Internship
Electives
ARUD 171 Mapping Preferences
ARUD 172 Colour and Art
ARUD 173 Arch. Photography
ARUD 374 Landscape Arch and planning
ARUD 375 Sustainable Heritage Conservation
ARUD 476 Building Ecology
ARUD 477 Sustainable Development
ARUD 478 Urban Planning 2
ARUD 479 Informal Areas

توصيف المقررات

متطلبات الجامعة

Course Title	**Intensive English**	
Course Code	**ENGL 001**	
Prerequisites	A minimum score of 400 on TOEFL ITP, 4.5 on IELTS, 32 on TOEFL IBT or B1 on APTIS. Students sometimes will also be required to pass a written NU writing exam.	
Classification within the curriculum	Depends on Admission Level in English	
Course Position in Study Plan	Fall/Spring	
Contact Hours	Lectures	
	Tutorials	
	Labs	
	TOTAL	0
EG Credit Hours		
ECTS		
Student Workload (SWL) / semester		
Topic Category	NONE	
Topic Level	University Requirement	

Description
This is a preparatory foundation course designed to build students' proficiency in the reading, listening and writing skills. This course will cover the mechanics of writing with special emphasis on grammar, sentence structure and paragraph organization. It also focuses on the reading skills of skimming, scanning, reading for gist, predicting and reaching conclusions, as well as summarizing and note-taking. Students are also required to write three to five paragraph academic essays.

Lab and Tutorials
NONE

Literature
Course Textbook:
1. Reading & Study skills:
- Cox, K & Hill, D (2011). EAP NOW!. English for Academic purposes, 2nd edition. Australia: Pearson.
- Rogers, L. (2011). Reading Skills. England: Delta Publishing.
- Baker, L. et al (2007). Interactions 2: Integrated Skills Edition. New York: McGraw-Hill/Contemporary.
Vocabulary: (Supplementary material)
- Schmitt, D., Schmitt, N. & Mann,D (2011). Focus on Vocabulary1 Bridging Vocabulary. Pearson Education, NY
2. Writing & Grammar:
- Oshima, A. & Hogne, A. (2007). Introduction to Academic Writing, 3rd ed. NY: Addison Wesley Longman.
- Azar, B. Hagen, A. (2009) Understanding and Using English Grammar, Fourth edition, Pearson Education ESL
3. Supplementary material
- Prepared by the teacher as required.

Course Title	**English I**	
Course Code	**ENGL 002**	
Prerequisites	A minimum score of 500 on the TOEFL. Students will also be required to pass a written NU test (essay).	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall/ Spring	
Contact Hours	Lectures	
	Tutorials	
	Labs	
	TOTAL	0
EG Credit Hours		
ECTS		
Student Workload (SWL) / semester	50	
Topic Category	Humanities and Social Sciences	
Topic Level	University Requirement	

Description
This course introduces students to the process of writing through reading. It uses an integrated approach to teaching the skills of thinking, reading and writing that first-year students need in order to succeed in their academic work. Students are challenged to be independent thinkers by showing them how to organize information, interpret different perspectives, solve challenging problems, analyze complex issues and communicate their ideas clearly by drawing heavily on exciting topics to stimulate their interests and guide them into thinking and writing critically.

Lab and Tutorials
NONE

Literature
Course Textbook:
1. Reading:
   - Lockwood, R.B & Sippell, K. (2012). Four point Reading and Writing Intro: English for Academic purposes. U.S.A.
   - Flemming, L. (2009). Reading for Thinking, Sixth Edition, U.S.A: Heinle, Cengage Learning.
   - Flemming, L. (2011). Reading for Results, Eleventh Edition, Canada: Wadsworth, Cengage Learning.
2. Writing:
   - Oshima, A. & Hogue, A. (2006). Writing Academic English, Fourth Edition, New York: Addison Wesley, Longman.
   - Davis, J. & Liss, R. (2006). Effective Academic Writing 3, New York: OUP. (Recommended for supplementary material).
3. Supplementary Material

Course Title	**English II**	
Course Code	**ENGL 103**	
Prerequisites	ENGL 002 - English I	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall/ Spring	
Contact Hours	Lectures	
	Tutorials	
	Labs	
	TOTAL	0
EG Credit Hours		
ECTS		
Student Workload (SWL) / semester	50	
Topic Category	Humanities and Social Sciences	
Topic Level	University Requirement	

Description
This course builds on the skills introduced in English 101. It is developed to help students as they move to more formal, academic discourse, focusing on writing meaningful essays and developing their skills, through observation, analysis, critical reading and thinking. Emphasis is placed on the arts of style, organization and thoughtful content as well as sharpening the skills of logical reasoning and problem analysis through the development of reading comprehension strategies for informative and expository texts with focus on summarizing, analyzing and synthesizing textual material. Students will examine selected readings and stylistic strategies as a means of developing effective argument-based writing.

Lab and Tutorials
NONE

Literature
Course Textbook:

- Vandermey, R., Meyer, V., Van Rys, J., & Sabranek, P. (2012). *The College Writer: A guide to Thinking, Writing, and Researching. International Edition, 4th Edition*. U.S.A: Wadsworth, Cengage Learning.
- Smalley, R.L. Ruetten, M.K. & kozyrev, J.R. (2012). *Refining Composition Skills, Sixth Edition*. U.S.A: Heinle, Cengage Learning.
- *Supplementary material*

Course Title	**Writing Skills**	
Course Code	**ENGL 101**	
Prerequisites	ENGL 103 - English II - or IELTS 6.5 or equivalent	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall/ Spring	
Contact Hours (weekly)	Lectures	4.5
	Tutorials	0
	Labs	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL) / semester	125	
Topic Category	Humanities and Social Sciences	
Topic Level	University Requirement	

Description
This course focuses on the development and use of research, critical analysis, organization and revision within the writing process. Students are given instructions in library and online research and methods of documentation, using quotations and source citations for professional papers using inductive and deductive reasoning, developing the skills of scientific argumentation, persuasion, evaluation and criticism needed for a research paper. Most of the course work focuses on students' work. Each student completes one minor and one major project during the term as well as a series of short response essays.

Lab and Tutorials
NONE

Literature
Course Textbook:

- Vandermey, R., Meyer, V., Van Rys, J., & Sabranek, P. (2012). *The College Writer: A guide to Thinking, Writing, and Researching. International Edition, 4th Edition*. U.S.A: Wadsworth, Cengage Learning.
- Dollahite, N.E, & Haun, J. (2012). *Source Work, Second Edition*. U.S.A: Heinle, Cengage Learning.
- Supplementary material

Course Title	**Communication and Presentation Skills**	
Course Code	**ENGL 102**	
Prerequisites	ENGL 101 - Writing Skills	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall/ Spring	
Contact Hours (weekly)	Lectures	4.5
	Tutorials	0
	Labs	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL) / semester	125	
Topic Category	Humanities and Social Sciences	
Topic Level	University Requirement	

Description
The ability to communicate effectively through the use of the written and spoken word is a requirement in today's increasingly complex world. This course helps students learn and practice the skills of interpersonal and professional communication, improving on their skills in oratory and public presentations by introducing them to writing professional documents, including technical/ scientific reports, business letters, faxes, resumes, etc. It also helps them understand the report writing process by practicing techniques of writing a well-structured report as well as delivering a well-structured presentation in a formal setting. It focuses on inter-personal and professional communication with special consideration given to the cultural and linguistic aspects. Attention is also given to human perceptions, interpersonal dynamics, the art of listening and convincing as well as the value of verbal and visual symbols.

Lab and Tutorials
NONE

Literature
Course Textbook:

- Vandermey, R., Meyer, V., Van Rys, J., & Sabranek, P. (2012). *The College Writer: A Guide to Thinking, Writing, and Researching. International Edition, 4th Edition*. U.S.A: Wadsworth, Cengage Learning.
- Supplementary Material

Course Title	**Introduction to Scientific & Critical Thinking**	
Course Code	**HUMA 001**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall/ Spring	
Contact Hours (weekly)	Lectures	3
	Tutorials	0
	Labs	0
	TOTAL	3
EG Credit Hours	2	
ECTS	3	
Student Workload (SWL) / semester	75	
Topic Category	Humanities and Social Sciences	
Topic Level	University Requirement	

Description
The course aims to develop a broad understanding of logical and critical thinking method; it also works between science and society in our daily lives, such as studying the characteristics of the method of scientific inquiry and to give an overview of the role of scientific communities. It can be regarded as an applicable method for helping students to develop a reliable persuasive method.

Lab and Tutorials None

Literature
Course Textbook:
Kirby, G. (2004). Thinking, New Jersey: Prentice Hall Ruggiero
Carey, S., (1997). A Beginner's guide to scientific method, Belmont , Calif.: Wadsworth Publishing Company
Selected articles from different social-science journals.

Course Title	**Introduction to Ethics**	
Course Code	**HUMA 002**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall/ Spring	
Contact Hours (weekly)	Lectures	3
	Tutorials	0
	Labs	0
	TOTAL	3
EG Credit Hours	2	
ECTS	3	
Student Workload (SWL) / semester	75	
Topic Category	Humanities and Social Sciences	
Topic Level	University Requirement	

Description
The emphasis of the course is on ethical issues and problems that arise in professional and business environments, such as integrity, civic responsibility, ethical conduct and misconduct, employee and corporate rights and responsibilities, and on issues concerning social and economic justice in a global economy.

Lab and Tutorials
None

Literature
Course Textbook:
Hartman L.P., DesJardins J. (2008), *Business Ethics: Decision Making for Personal Integrity & Social Responsibility,* McGraw Hill Higher Education Division (ISBN: 9780071264600)
DesJardins J. (2011), *An introduction to Business Ethics,* McGraw Hill Higher Education Division (ISBN: 139780073535814)
Weiss J.W. (2009), Business Ethics: A Stakeholder & Issues Management Approach, 5th Edition, South-Western Cengage Learning (ISBN: 978-0-324-59704-2)
Martin, M.W., and Schinzinger, R. (2005), *Ethics in Engineering, 4th edition, McGraw-Hill* (ISBN: 0-07-283115-4)

Additional References
Additional teaching materials (PPT presentations, references …) can be downloaded from the course *Moodle* site accessible via the following URL: www.courses.nileu.edu.eg. The enrolment key to access the site will be provided by the NU IT or registrar Department prior to the first class.

Course Title	**Selected Topics in Humanities: Environmental Psychology**	
Course Code	**HUMA 003**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	1
	Labs / Studios	0
	TOTAL	3
EG Credit Hours	2	
ECTS	3	
Student Workload (SWL)	75	
Topic Category	Humanities and Social Science	
Topic Level	University Requirement	

Description

In different disciplines, students will be dealing with people; providing a service or designing for them. This course aims to raise awareness about human nature; the universalities and the variations across age, gender and other variables that affect people's needs, expectations and preferences. The course covers the major theoretical concepts that explain the psychological processes in the human mind such as perception, cognition, stress and affective response. It discusses stressors and ways to mitigate them such as restorative environments, increased user control and the price of adaptation. It illustrates the significance of the subjective assessment of people to issues, places and innovative solutions, and how these subjective views actually shape people's decision-making, emotions and actions. This course enables students to be more attentive to their clients and co-workers, increasing effectiveness and efficiency of their work.

Lab and Tutorials

Practicum

Literature

Bell, P., Greene, T., Fisher, J. & Baum, A. (2001). Environmental Psychology. 4th Edition. Harcourt College Publishers.

Steg, L., van den Berg, A.E., & de Groot, J.I.M. (Eds.) (2013). Environmental Psychology: An introduction. Wiley-Blackwell.

Course Title	**Selected Topics in Social Sciences: Research methods**	
Course Code	**SSCI 001**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	1
	Labs / Studios	0
	TOTAL	3
EG Credit Hours	2	
ECTS	3	
Student Workload (SWL)	75	
Topic Category	Mathematics and Basic Sciences	
Topic Level	University Requirement	

Description

The aim of this course is to give the basic knowledge and competences on how to conduct research in various scientific fields. In particular, both qualitative and quantitative data collection and data analysis methods will be addressed, in order to provide an array of scientific underpinnings for the preparation of proper research designs. Measurements as well as self-reports from questionnaires and interviews will be covered. Observational methods such as behavior mapping will also be addressed. Experimental and quasi-experimental methods will be addressed as well as case study methods to suit the different disciplines. Issues of validity and reliability, credibility and trustworthiness will also be explained as well as the different sampling techniques that suit different research aims. The skills to be developed include a proper scientific and technical vocabulary, critical reflection and evaluation of data analysis and interpretation of research results, understanding of methodological aspects, understanding and reporting of scientific papers.

Lab and Tutorials

Practicum

Literature

Breakwell, G.M, Smith, J.A., & Wright, D.B. (2012). Research Methods in Psychology. SAGE.
Zeisel, John. (2006). Inquiry by Design. Norton.
Lincoln, Y. and Guba, E. (1985). Naturalistic Inquiry. Sage.
Margolis, E. & Pauwels, L. (Eds.) (2011). The SAGE Handbook of Visual Research Methods. SAGE

Course Title	**Selected Topics in World Culture and Diversity: Contemporary City**	
Course Code	**SSCI 002**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	1
	Labs / Studios	0
	TOTAL	3
EG Credit Hours	2	
ECTS	3	
Student Workload (SWL)	75	
Topic Category	Humanities and Social Science	
Topic Level	University Requirement	

Description

This course aims to introduce first year's students to the context of cities and urbanization – in Egypt and globally. It introduces students to the possibilities that engineering, planning, design and other professions have to shape the processes within them. The main objectives are to sensitise the students on the most significant "frontiers", the roles and interventions needed to face the challenges and opportunities of our cities. It familiarises the students with main concepts, terms and definitions to better comprehend the various processes and the actors that shape human environments and cities. Issues include: urban issues, trends problems and opportunities, urban debates types of cities and categories of urban fabrics, planning and design approaches, methods and strategies in the 21 Century.

Lab and Tutorials

Parallel exercise elaborating a case study in groups parallel to the lecture

Practicum

Urban Transect, Urban Expedition/Safari, Guided Inner City Tour

Literature

متطلبات الكلية

Course Title	**Computer & Information Skills**	
Course Code	**CSCE 001**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall/ Spring	
Contact Hours (weekly)	Lectures	1.5
	Tutorials	0
	Labs	4.5
	TOTAL	6
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL) / semester	125	
Topic Category	Mathematics and Basic Sciences	
Topic Level	Engineering Requirements	

Description
This course serves as an introduction to computers and information skills to enable efficient use of computers and to prepare student for lifelong learning in information technology.
The course focuses on basic understanding of operating-systems, hardware, networks, software applications, as well as a basic understanding of system development, and social implications of information technology. The course also introduces students to standard office software applications for information formatting and web-page design, and database management. Through a series of assignments and projects.

Course Title	**Math I: Probability & Statistics**	
Course Code	**MATH 103**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall (Third Semester)	
Contact Hours (weekly)	Lectures	3
	Tutorials	1.5
	Labs	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL) / semester	125	
Topic Category	Mathematics and Basic Sciences	
Topic Level	Engineering Requirements	

Description
This course is an introduction and overview of probability and statistics where the students will discuss organization and presentation of statistical data– Measures of central tendency– Measures of dispersion– Definition of the probability- Conditional probability - Independence of events and Bayes theorem - Definition of the random variable- discrete and continuous distribution – some special probability distributions (Binomial distribution, Poisson distribution, Geometric distribution, Hypergeometric distribution, Uniform distribution, Normal distribution and Exponential distribution).

Lab and Tutorials
Examples are discussed in detail during the tutorial as well as only one week for Matlab software

Literature
Course Textbook:- Ronald E Walpole and et al. “Probability and Statistics for Engineers and Scientists” Boston : Prentice Hall 9th edition.

Course Title	**Descriptive Geometry**	
Course Code	**MATH 003**	
Prerequisites		
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall/ Spring	
Contact Hours (weekly)	Lectures	1.5
	Tutorials	1.5
	Labs	0
	TOTAL	3
EG Credit Hours	2	
ECTS	4	
Student Workload (SWL) / semester	100	
Topic Category	Mathematics and Basic Sciences	
Topic Level	Engineering Requirements	

Description
Descriptive Geometry is the branch of geometry concerned with the two-dimensional representation of three-dimensional objects. In other words, it is the graphical solution to three-dimensional spatial problems. Modern mechanical drawing and architectural drawing are based on the principles of Descriptive Geometry. This course is an examination of methods to develop graphical solutions to problems involving points, lines, and planes in space.

Lab and Tutorials This is a theoretical course that includes tutorials for discussion and lab applications on the topic.

Literature

Course Title	**Physics II**	
Course Code	**PHYS 002**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall/ Spring	
Contact Hours (weekly)	Lectures	3
	Tutorials	1.5
	Labs	1
	TOTAL	5.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL) / semester	125	
Topic Category	Mathematics and Basic Sciences	
Topic Level	Engineering Requirements	

Description
Optics: Interference, Diffraction, Polarization, electric and magnetic properties of light. Thermodynamics: The nature of heat, the laws of thermodynamics, temperature, thermal expansion, absorption of heat by solids and liquids, heat transfer mechanisms, kinetic theory of gases, ideal gases, distribution of molecular speed, molar specific heat, degrees of freedom, entropy, reversible and irreversible processes. Solid state physics: conductors, insulators and semiconductors. Statics. Relevant lab experiments will be conducted.

Lab and Tutorials This is a theoretical course that includes tutorials for discussion and lab applications on the topic.

Literature

Course Title	**Building Physics I** – The thermal environment	
Course Code	**ARUD 141**	
Prerequisites	MATH 103, PHYS 002	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	2
	Tutorials	2.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Mathematics and Basic Sciences	
Topic level	Engineering Requirement	

Description
This course introduces the fundamentals of thermal aspects of building performance.
Topics include: Introduction to the fundamental of building physics, heat and mass transfer in buildings, thermal comfort, energy performance of buildings, determination of heating and cooling loads of buildings, solar controls and shadings, thermal optimization of buildings, energy-efficient and sustainable building design, human ecology, climate, moisture control in buildings, thermal properties of building materials and components.

Lab and Tutorials
Tutorials: Independent study

Practicum

Literature
1. Stein, Benjamin; Reynolds, John S., 2014. Mechanical and electrical equipment for buildings
2. Szokolay, Stephen V., 2014. Introduction to architectural science: the basis of sustainable design
3. Hagentoft, Carl-Eric, 2001. Introduction to building physics
4. Hens, Hugo, 2017. Building Physics – Heat, Air and Moisture: Fundamentals and Engineering Methods with Examples and Exercises
5. Clarke, J. A., 2011. Energy simulation in building design
6. Lechner, Norbert, 2015. Heating, cooling, lighting: design methods for architects

Course Title	**Building Physics II** – The visual and acoustical environments	
Course Code	**ARUD 242**	
Prerequisites	ARUD 141 (Building Physics I)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	2
	Tutorials	2.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Mathematics and Basic Sciences	
Topic Level	Engineering Requirement	

Description
This course introduces the scientific foundations of building acoustics, room acoustics, daylighting and illuminating engineering.
Topics in visual aspects include: introduction to visual perception, physics of light, daylighting, electrical lighting fundamentals, lighting design.
Topics in acoustical aspects include: introduction to acoustical perception, physics of acoustics, building acoustics, room acoustics.

Lab and Tutorials
Tutorials: Independent study

Practicum

Literature
1. Stein, Benjamin; Reynolds, John S., 2014. Mechanical and electrical equipment for buildings
2. Szokolay, Stephen V., 2014. Introduction to architectural science: the basis of sustainable design
3. Tregenza, Peter; Loe, David, 2014. The design of lighting
4. Long, Marshall, 2014. Architectural acoustics
5. Mehta, Madan; Johnson, James; Rocafort, Jorge, 1999. Architectural Acoustics: principles and design
6. Lechner, Norbert, 2015. Heating, cooling, lighting: design methods for architects

Course Title	**Building Systems Integration**	
Course Code	**ARUD 243**	
Prerequisites	ARUD 242 (Building Physics II)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	2.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Basic Engineering Sciences	
Topic Level	Engineering Requirement	

Description
This course introduces the fundamentals of buildings´ technical systems including HVAC systems, electrical systems, water and sewage systems, as well as fire safety.
Topics include: Fundamental overview on HVAC systems (heating, ventilation, air-conditioning), water and wastewater infrastructure, electric installations, basics of fire safety (fire alarm systems, sprinkler systems, fire smoke exhaust), introduction to building controls and automation.

Lab and Tutorials
Tutorials: Independent study

Practicum

Literature
1. Stein, Benjamin; Reynolds, John S., 2014. Mechanical and electrical equipment for buildings
2. Warburton, Peter; Butcher, K. J, 2009. Building control systems
3. Angel, W. Larsen, 2012. HVAC Design Sourcebook
4. Zito, Phil, 2016. Building Automation Systems A To Z: How To Survive In A World Full Of Bas
5. Buchanan, Andrew H.; Kwabena Abu, Anthony, 2017. Structural Design for Fire Safety

Course Title	**Building Performance Computing**	
Course Code	**ARUD 344**	
Prerequisites	ARUD 243 (Building Systems Integraion)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	2
	Tutorials	1.5
	Labs / Studios	1
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Basic Engineering Sciences	
Topic Level	Engineering Requirement	

Description

Building Performance Computing provides an introduction to computational methods and applications for building performance assessment. This course introduces thermal and visual modelling fundamentals of building performance simulation.

Topics include: modeling and design, overview of thermal and visual simulation methods, introduction to the application of computational building simulation tools for thermal and visual performance assessment, case studies and assignments on the application of simulation in building design and operation.

Specifically, an appropriate 3D modelling environment along with its visual scripting plugin are used as a basis for development of energy and daylighting models. To this end, the course deploys plugins toward climate analysis and generation of models for detailed building performance simulation exercises.

Lab and Tutorials

Labs/ Tutorials: Parametric modelling, climate and site analysis, parametric energy simulation, parametric daylighting simulation

Practicum

Literature

1. Hensen, Jan L. M.; Lamberts, Roberto, 2011. Building Performance Simulation for Design and Operation

2. Konis, Kyle; Selkowitz, Stephen, 2017. Effective Daylighting with High-Performance Facades

Course Title	**Structure I**	
Course Code	**ARUD 152**	
Prerequisites	ARUD 151 (Construction I)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	2
	Tutorials	2.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Mathematics and Basic Sciences, Basic Engineering Science	
Topic Level	Engineering Requirement	

Description
The aim of this course is to approach the basic structural types along history analyzing the relation between its mechanical behavior and the space generation.
The course also covers basic structural concepts as: resistance, deformation, stress-strain curve, stress types. The student will get to know which the forces acting over the building-loads and tributary areas- and how its transmission through the structure to the ground is produced. Structural types: isostatic and hyper static and its understanding using diagrams.

Lab and Tutorials
Exercise 1- Heritage buildings visits and its structure analysis (in groups).
Exercise 2- Short calculation exercises and its relation with real situations (in groups).

Practicum
Reflected in DESIGN STUDIO: Working with simple structures and being aware of the space they generate and their mechanical behavior.

Literature

Course Title	**Structure I**I – Wet construction: structural systems and pre-dimensioning (mainly rigid knots)	
Course Code	**ARUD 254**	
Prerequisites	ARUD 253 (Construction II)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1
	Tutorials	3.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Basic Engineering Science	
Topic Level	Engineering Requirement	

Description
The aim of this course is to explore the design, mechanical behavior and calculation (pre dimensioning) of the structural systems based on adding (masonry) or casting (reinforced concrete) mainly rigid knots. The student will deal with: wall structures -brick and block-; frame structures -cast in place concrete-; confined masonry; different slab types; foundations and retaining walls. Introduction to soil mechanics. The course includes: interventions over existing structural systems. Consolidation, refurbishment and retrofitting.

Lab and Tutorials
Exercise 1- Field visits description and analysis (in groups).
Exercise 2- Short calculation exercises and its relation with real situations (in groups).

Practicum
Reflected in DESIGN STUDIO: No specific concern.

Literature

Course Title	**Structure III** – Dry construction: structural systems and pre-dimensioning (mainly articulated knots)	
Course Code	**ARUD 356**	
Prerequisites	ARUD 355 (Construction III)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1
	Tutorials	3.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Basic Engineering Science	
Topic Level	Engineering Requirement	

Description

The aim of this course is to explore the design, mechanical behavior and calculation (pre dimensioning) of the structural systems based on assembling either steel or wood. Mainly articulated knots. The student will deal with: steel frame structures; steel decks and steel spatial structures. Students will get to know the different connection mechanisms: bolted and welded.
The course is focalized in steel and so this material will have a deep approach; nevertheless wood structures -platform frame and CLT- are also covered.
The course analyses the different ferrous alloys and their life-cycle assessment.
The student will deal with parametric design/pre-dimensioning using BIM.

Lab and Tutorials

Exercise 1- Field visits description and analysis (in groups).
Exercise 2- Short calculation exercises and its relation with real situations (in groups).
Exercise 3- Steel structure design and pre-dimensioning using parametric software.

Practicum

Reflected in DESIGN STUDIO: No specific concern.

Literature

Course Title	**Const. doc BOQ Tender Doc. Site Supervision /Project Management**	
Course Code	**ARUD 457**	
Prerequisites	ARUD 344, ARUD 356, ARUD 363	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	1
	Tutorials	3.5
	Labs / Studios	1
	TOTAL	5.5
EG Credit Hours	3	
ECTS	6	
Student Workload (SWL)	180	
Topic Category	Business administration	
Topic Level	Program Requirement	

Description:
The course is subdivided into two categories; **Const. doc BOQ Tender Doc.** specifically concerned with producing the project unpriced Bill of Quantity for the Architecture and ID works only in all project phases (schematic through tender submission). Perform a Cost Estimate Process for the works of Electrical (Power, Conveying, and Communication & Security System), HVAC, Mechanical, Architectural, Structural, Landscape and Infrastructure. Perform a final review of the BOQs and Cost Estimate Lists before submission. Provide guidelines for the proper Bid Evaluation of projects. Contractor pre-qualification that is a process by which a bidder on a construction project is evaluated in order to determine whether the bidder has the skill, judgment, integrity, sufficient financial resources and the ability required to complete the required performance of a contract relating to construction work. **Site Supervision / Project Management** targets creating a consistent management style among all types of projects. Familiarization with project management professional (PMP) state-of-the-art. Understanding different responsibilities, roles & functions within a project.

Lab and Tutorials
Students will expose to and practice the techniques & process of developing Tender documents & BOQ's.
Students will practice a project's cost estimation process and techniques.
Students will visit construction sites to learn & gain the necessary skills in project management cycle and process and expose to different roles & functions within a project.
Students will reflect upon these visits and present a seminar on what have been learnt & demonstrate the link between theory & real practice.

Practicum
Const. Doc/BOQ –Tender Doc course includes Procurement Strategies, Tender Action Process, Responding to Tenderers Queries and Conditions, Contractors Prequalification and registration on Technical Database, Cost Estimate & BOQ.
Site Supervision & Project Management course includes Time & Scope Management, Cost & Procurement Management, Quality Management, HR & Communication Management, Safety & Risk Management.

Literature
ECG training Material

Course Title	**Building Information Modeling**	
Course Code	**ARUD 363**	
Prerequisites	ARUD 355 (Construction III), ARUD 243 (Building Systems)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1
	Tutorials	2.5
	Labs / Studios	1
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Basic Engineering Sciences	
Topic Level	Program Requirement	

Description

The course is concerned specifically with the utilization of Building Information Modelling (BIM) technology. The aim of the course is to give students a practical, hands-on introduction to BIM and related computer-based techniques for the documentation and modelling of designed structures. The course will be focusing on the processes involved in developing a full 3D design object model, not for the purpose of visualization alone, but more importantly as a tool for understanding and documenting how a proposed building design fits together and how it will perform during use. We will be exploring the principles of component modelling, and the process of assembling those components to produce a design model from which traditional documentation (such as plans, elevations and sections) can be derived. From there, we will explore technologies that allow a BIM model to be exported and subsequently imported in to a range of design analysis packages. Several lectures will be delivered by guests from industry, affording an opportunity to understand the technology from that perspective.

Lab and Tutorials

During the lab Sessions student will work on BIM Software As Revit platform then will present their project through Tutorials.

Practicum

- Projects: 3-5 in-term projects provide a task-oriented opportunity for students to practice their skills. These projects are either individual or small group projects and they comprise a wide range of topics covered in this course.
- Assignments: 3-4 smaller assignments allow for practice of more defined skills
- Term Project: A term project requires students to work on one BIM topic in a self-guided manner. This project should center on the student's interests and may require self-study of material.

Literature

1. Course Textbook: Reference #1.
2. Additional Resources: BIM Handbook, Autodesk Revit handout, Bently handout, AIA and UK Codes for BIM.

متطلبات البرنامج

Course Title	**Basis for Design**	
Course Code	**ARUD 001**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1.5
	Tutorials	0
	Labs / Studios	5
	TOTAL	6.5
EG Credit Hours	3	
ECTS	6	
Student Workload (SWL)	150	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
The aim of this course is to approach to the basis needed for design, as the sense of proportion and relations, measuring, technical drawing and modelling and, at the same time, to awake a certain awareness, comprehension and sensibility of the surrounding built reality.
The final aim is to promote and develop the capacity for critical observation and analysis, the capacity for synthesis and spatial understanding.
Design of basic spatial structures – market stalls – shelters.

Lab and Tutorials
Combine short practices (around 3) with a main project of synthesis

Practicum
Field visits

Literature
Von Meiss, P. (2013). Elements of Architecture: From form to place + tectonics (2nd ed.) EPFL Press.

Course Title	**Design Studio I**	
Course Code	**ARUD 101**	
Prerequisites	ARUD 001 - Basis for Design, ARUD 011 – Design Thinking	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	1.5
	Tutorials	0
	Labs / Studios	5
	TOTAL	6.5
EG Credit Hours	4	
ECTS	7	
Student Workload (SWL)	175	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
Main topic: Site and Basic Program
Arch - Following the design thinking process from inquiry to formulating a basic architecture program for a building or structure design, this studio aims at exploring the synergy of form and function, the integration of diverse structural and construction systems to be implemented in specific sites, the understanding of the logic of topography, geometry, and enclosure, and the consideration of the surrounding context including the ambient, natural, built and social environment.

UD – Complementary fitting of the architectural discourse in the framework of urban patterns and tissues as a combination of the processes of urbanization, raising student awareness of different plot subdivisions, densities and building typologies (for example in downtown areas, gated communities, informal settlements, etc.) to build an urban vocabulary and enable them to distinguish and understand the differences in the experiential qualities of urban space. Urban analysis that takes advantage of Cairo as the main focus of exploration.

Lab and Tutorials
2/3 projects per semester

Practicum
Field visits

Literature
Von Meiss, P. (2013). Elements of Architecture: From form to place + tectonics (2nd ed.) EPFL Press.
Pont, M. & Haupt, P. (2010). Spacematrix: Space, Density and Urban Form. NAI

Course Title	**Design Studio II**	
Course Code	**ARUD 102**	
Prerequisites	ARUD 101, ARUD 121, ARUD 151, ARUD 161	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1.5
	Tutorials	0
	Labs / Studios	5
	TOTAL	6.5
EG Credit Hours	4	
ECTS	7	
Student Workload (SWL)	175	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
Main topic: Public Realm Settings and Street Design
Arch - Within the urban framework, the space for an open collective program (markets, meeting points, transportation nodes…) is designed through the definition of a coherent technical and structural logic that translates systems of activity settings into integrated functional opportunities applying rules of geometry and proportion, structural and constructive systems, materials and light.

UD - The street as a first level of urbanity and the essential scene in the public realm. Analysis of activity settings as the unit of place and basic urban interventions as supportive environment for user interaction. Variables, elements and the sequence of relations that configure streetscapes and their experience.

Lab and Tutorials
1 or 2 projects per semester

Practicum
Field visits

Literature
Hertzberger, H. (2005). Lessons for Students in Architecture.
Bentley, I., Alcock, A., Murrain, P., McGlynn, S. & Smith, G. (1985). Responsive Environments. Architectural Press.
Southworth, M. & Ben-Joseph, E. (2003). Streets and the shaping of Towns and Cities. Island Press.
Vernez Moudon, A. (1991). Public Streets for Public Use. Columbia University Press.
Habraken, J., Mignucci, A. & Teicher, J. (2014). Conversations with Form. Routledge.

Course Title	**Design Studio III**	
Course Code	**ARUD 203**	
Prerequisites	ARUD 102, ARUD 122, ARUD 152, ARUD 162	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	1.5
	Tutorials	0
	Labs / Studios	6.5
	TOTAL	8
EG Credit Hours	6	
ECTS	10	
Student Workload (SWL)	250	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
Main topic: Home and Neighbourhood Design
Arch - Drawing upon people-centred courses on dwelling and the meaning of home - considering social, psychological and cultural aspects in design and variation in user needs by age, sex and ability. This studio focuses on housing typologies, aggregation mechanisms and models of clustering. It explores layout guidelines: combinations, measurements, depths, distances, etc. that affords the appropriate, adaptable, affordable home and residential environment for diverse household structure and lifestyles

UD - Residential project as a synthesis of inter-scale relationships between neighbourhood, block and dwelling. Street typology, open spaces and character in residential districts with integrated mixed-use services and leisure. It addresses designing in-between and near-home spaces, achieving different degrees of publicness (semi-private, collective, public) to satisfy community needs and territorial claims.

Lab and Tutorials
1 or 2 projects per semester

Practicum
Field visits

Literature
Correa, C. (2000). Housing and Urbanisation. Thames & Hudson
Vernez Moudon, A. (1989). Built for Change. MIT Press.
Colquhon, I. (2008). RIBA Book of British Housing (2nd ed.). Architectural Press.
Tipple, G. (2000). Extending themselves: User initiated transformations.

Course Title	**Design Studio IV**	
Course Code	**ARUD 204**	
Prerequisites	ARUD 203, ARUD 223, ARUD 253, ARUD 242	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1.5
	Tutorials	0
	Labs / Studios	6.5
	TOTAL	8
EG Credit Hours	6	
ECTS	10	
Student Workload (SWL)	250	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description

Main topic: Medium Size Public Facilities and Collective Space

Arch - Drawing from people-centred courses on special building types and considering social, psychological and cultural user-need variables of different user groups to design medium sized facilities such as schools, health centres and libraries are designed enhancing relation between function in its broadened definition, gradients of privacy and transition spaces for the collective, material, technique, structural skeleton and skin as a regulator of indoor-outdoor continuity and transition.

UD - Fostering interaction between facilities and collective public spaces as a constitutive system of the public realm. The studio covers the scope of the collective space, its typologies, sizes and boundaries: from large urban parks or waterfronts to small plazas, midans and courtyards. Public space design of fixed and semi-fixed feature elements and their composition with an awareness of the experiential implications of the design (cognitive and behavioural) and change over time (adaptability and flexibility, management and upkeep).

Lab and Tutorials

1 or 2 projects per semester

Practicum

Field visits

Literature

Moughtin, C. (2003). Street and Square. Architectural Press.
Glaser, M. et. al. (2012). The City at Eye Level. Eburon.
De Chiara, J. & Crosbie, M. (2001) Time-saver Standards for Building Types.
HBRC (2003). The Egyptian Accessibility Code for Buildings and Open Spaces.

Course Title	**Design Studio V**	
Course Code	**ARUD 305**	
Prerequisites	ARUD 204, ARUD 212, ARUD 224, ARUD 243, ARUD 254	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	1.5
	Tutorials	0
	Labs / Studios	6.5
	TOTAL	8
EG Credit Hours	6	
ECTS	10	
Student Workload (SWL)	250	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
Main topic: City Extension and Mix-use Programs
Arch - Design a multifunctional fragment that combines housing, hotels, tertiary, facilities, leisure and public space. Design new buildings that integrate complex structural and enclosure building solutions, considering materials, performance of the building, etc.. showing awareness of building systems and consideration to diverse user groups moving and using the spaces for different purposes.

UD - Designing new city extensions integrating environmental values (geography, relief, water, vegetation, etc.) with socio-economic values of mobility and accessibility in efficient ex-novo mixed-use layouts. New projects will consider connections to the existing urban fabric and the interdependence between land uses in both showing an awareness to the social and economic implications on land value, street occupancy, safety, variables of density and traffic intensity, ecological connectivity and energy efficiency.

Lab and Tutorials
1 project per semester

Practicum
Field visits

Literature

Course Title	**Design Studio VI**	
Course Code	**ARUD 306**	
Prerequisites	ARUD 305, ARUD 325, ARUD 334, ARUD 355	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1.5
	Tutorials	0
	Labs / Studios	6.5
	TOTAL	8
EG Credit Hours	6	
ECTS	10	
Student Workload (SWL)	250	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
Main topic: Urban Regeneration and Adaptive Building Re-use
UD - Urban Regeneration of mid-scale sites, through selective urban renewal and infill interventions mixed with upgrading and rehabilitation in central or peripheral areas (downtown, waterfront, etc) defying the typical “clean slate” approach. Urban proposals that balance contemporary needs and future aspirations for social, cultural and economic evolution on the one hand with heritage conservation of architectonic, cultural lifestyles, historic and social values on the other.

Arch - Project of building adaptive re-use through new programs that retrofit their spatial, functional and material configuration; incorporating existing valuable elements into a hybrid project that introduces, revives and conserves living heritage with future needs and wants. The studio will guide in implementation of rehabilitation techniques and efficient retrofitting of structural and construction systems, natural and artificial performance of buildings (thermal, acoustic and lighting), use of traditional and modern materials.

Lab and Tutorials
1 project per semester

Practicum
Case study analysis and participation in workshops co-organized with Real Estate development agencies specialized in regeneration of heritage buildings and areas. Field visits.

Literature

Course Title	**Graduation Project I**	
Course Code	**ARUD 407**	
Prerequisites	ARUD 306, ARUD 356, ARUD 363	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	1.5
	Tutorials	0
	Labs / Studios	5
	TOTAL	6.5
EG Credit Hours	3	
ECTS	6	
Student Workload (SWL)	180	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description

Graduation Project I and II constitute a 2-term studio that synthesize knowledge of the Architecture and Urban Design Program through a multidisciplinary, integrative and professional approach. The course aims to develop the students' personal skills to enable them to provide critical responses and demonstrate independence and ability to tackle a wide range of architectural and urban design standard regular projects.

Working in continuity with Graduation Project II, the main goal of this course is to embark upon the development of a complex project, dealing with inter-scale design challenges integrating urban, social, psychological, cultural, technological, ecological, creative and economic input.

In the first term, each student will define the scope and rationale, the program and the specific site within a broad area and will follow general guidelines to formulate the design objectives. At the level of a preliminary design, fundamentals of the project will be set (scales from 1/10.000 to 1/100): place, brief, strategies and concept and general solution guidelines, all of which will take into consideration the cognitive and behavioural implications of the design in addition to environmental, economic and social sustainability.

Lab and Tutorials

1 project per semester

Literature

Course Title	**Graduation Project II**	
Course Code	**ARUD 408**	
Prerequisites	ARUD 407	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1.5
	Tutorials	0
	Labs / Studios	15.5
	TOTAL	17
EG Credit Hours	6	
ECTS	16	
Student Workload (SWL)	480	
Topic Category	Project and Practice	
Topic Level	Program Requirement	

Description

Graduation Project I and II constitute a 2-term studio that synthesize knowledge of the Architecture and Urban Design Program through a multidisciplinary, integrative and professional approach. The course aims to develop the students' personal skills to enable them to provide critical responses and demonstrate independence and ability to tackle a wide range of architectural and urban design standard regular projects.

Working in continuity with Graduation Project I, the main goal of this course is to expand upon the development of a complex project, dealing with inter-scale design challenges integrating urban, social, psychological, cultural, technological, ecological, creative and economic input.

In the second term, the project elaborated in Graduation Project I is developed in detail moving from the preliminary design ideas to the outline project first, and afterwards to the technical project, which will comply with established technical requirements (scales from 1/500 to 1/10).

Students will: define the relationship between the main concept of the project and its embodiment in physical environment; demonstrate their capacity to deliberately create space and form at different scales; clearly demonstrate an understanding of the building process showing coherence between general ideas and detail (integrate technological solutions - constructional, structural and energy - and materials); demonstrate an awareness of the performance and meaning of the resulting built environment with regard to how people will interact with it (perceive it, use it, maintain it).

Synthetic results from the Graduation Project I and II will be presented to a jury made up of professors and external experts that will certify the achievement of the competences which will enable the initiation of a career in Architecture and Urban Design.

Lab and Tutorials

1 project per semester

Literature

Egyptian Building Codes

Course Title	**Design Thinking**	
Course Code	**ARUD 011**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	2.5
	Tutorials	2
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description

The aim of this course is to improve the students' capabilities in organizing and performing the design process to suit the nature of each design problem as well as attain student-generated formulation of design objectives and program. It would train the students in analytical tools and systematic design thinking and methods. The course covers different models of the design process as well as design methods, tools, and techniques, such as problem-solving techniques, operational definition of objectives, architectural programming, design performance criteria. It aims to assist students externalize the design thinking process, sharpening their awareness as they think in iterative cycles between intuitive creative thinking and systematic rational thinking. The course empowers the students with analytical and representation skills to better proceed from research and knowledge acquisition to design through the explicit mapping of the problem and requirements coupled by the deliberate formulation of design objectives. Through practical implementation, students learn to develop design criteria that serve to guide their design thinking as well evaluate their design product.

Lab and Tutorials

Practicum

Literature

Hershberger, R. (1999). Architectural Programming and Predesign Manager. New York: McGraw-Hill.
Sanoff, H. (2016). Integrating Programming, Evaluation and Participation in Design: A theory Z approach. Routledge Revivals.
Rowe, P. (1987). Design Thinking. Cambridge, Massachusetts: MIT Press.

Course Title	**Advanced Design Process**	
Course Code	**ARUD 212**	
Prerequisites	ARUD 011 (Design Thinking)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1
	Tutorials	2
	Labs / Studios	1.5
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Business administration	
Topic Level	Program Requirement	

Description

The aim of this course is to improve the students' capabilities in innovative design thinking and methods integrating the diverse theoretical basis as well as building bridges with future users of places. The course aims to develop the students' analytical and synthesising skills improving their ability to process knowledge, explore concept formulation and the quest for organising principles. It trains students in different innovative design processes such as parametric design and participatory design. It enables students to explore the possibilities of utlising ICT in inquiry, analysis and design thinking, exposing them to the latest practices such as Play the city, Smart cities, and case studies from around the world of designing with people.

Lab and Tutorials

Practicum

Literature

Sanoff, H. (1990). Participatory Design: Theory and Techniques. H. Sanoff

Sanoff, H. (2016). Integrating Programming, Evaluation and Participation in Design: A theory Z approach. Routledge Revivals.

Schuler, D. & Namioka, A. (Ed.) (1993). Participatory Design: Principles and practice. Lawrence Erlbaum Associates.

Tan, E. (2017). Play the City. Jap Sam Books.

Shehayeb, D. et al. Maximizing Use Value Guide: Manual 1

Thomas, D. (2016). Place Making: An urban design methodology. Routledge

Course Title	**Environment Behaviour Studies**	
Course Code	**ARUD 121**	
Prerequisites	HUMA 003	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2.5
	Tutorials	2
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Humanities and Social Science	
Topic Level	Program Requirement	

Description

Designing for people is based upon an understanding of the relationship between a person and his, or her, environment; the ambient, the built, the natural and the social environment that surrounds a person. The aim of this course is to introduce to the students the nature of this interaction, the theories that explain it, and its relevance to the design of the built environment, with application in architectural and urban design. The course draws upon social psychology, anthropology and environmental psychology to provide students with the major theoretical concepts and models that mediate the relationship between a person and the physical environment that surrounds him or her. The course introduces innovative concepts to describe the built environment such as Activity Settings and Potential Functional Opportunities. It sets the framework for students to conceptualize the built form in all design studios; it is the lens through which the student will see the relation between designed space and what it may become as a 'place' when it is used. Students would apply these theories later in other courses to a variety of functional settings at architectural and urban scales.

Lab and Tutorials

Practicum

Literature

Bell, P., Greene, T., Fisher, J. & Baum, A. (2001). Environmental Psychology. 4th Edition. Harcourt College Publishers.
Rapoport, A. (1991). The Meaning of the Built Environment.
Lynch, K. (1961). Image of the City. The MIT Press.

Course Title	**Dwelling and Neighbourhood Design**	
Course Code	**ARUD 122**	
Prerequisites	ARUD 121, SSCI 001	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1
	Tutorials	3.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	150	
Topic Category	Basic Engineering Sciences	
Topic Level	Program Requirement	

Description
The aim of this course is to enable students to design residential environments that are supportive to people's lifestyles, fulfilling to their social and psychological needs in addition to the main function of shelter from the ambient environment. The people-centred approach to dwelling design is based on the explanatory theory of the meaning of 'home.' It sensitizes students to the concept of home as regulator of social interaction and communicator of social status and identity. Students understand how dwelling can be understood as system of activity settings with boundaries outside the private domain in shared spaces, accommodating daily activities, trips to work, opportunities for education and leisure. The course covers neighbourhood design and planning with its spatial layout, land use and connectivity, enabling students to understand and design the balance between several dichotomies such as sense of community and social mix; between economic prosperity and community privacy, between appropriation of collective space, safety, sense of belonging and accessibility, inclusiveness and equity. It explores the revival of home-based work, different contemporary lifestyles, patterns of living heritage and varying households. The course compliments the view of housing as a product, with that of housing as a process, the tenets of 'adequate housing' and the special considerations for different user groups; women, children, elderly…etc..

Lab and Tutorials
Group exercises include analysis of case studies from different countries, reflective seminar classes, Practice design thinking on improving the dwelling experience for different household structures, user lifestyles, and types of neighbourhoods. Student work presentations.

Practicum
Field visits, conducting empirical research, participating in workshops

Literature
Turner, J. (1976). Housing by People. Marion Boyars
Rapoport, A. (1969). House, Form and Culture. Prentice Hall
Cooper Marcus, C. & Sarkissian, W. (1988). Housing as if People Mattered. University of California Press.
Shehayeb, D., Turgut, H. & Kellet, P. (2006). Appropriate Home. HBRC.
Gehl, J. (2011). Life between Buildings: Using public space. Island Press.

Course Title	**Building Types: Places for People**	
Course Code	**ARUD 223**	
Prerequisites	ARUD 121	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	2.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Basic Engineering Sciences	
Topic Level	Program Requirement	

Description
The aim of this course is to enable students to design buildings and spaces with special functions such as hotels, hospitals, schools, factories and to learn about the special considerations and design criteria and principles that apply to these special facilities. The course builds upon the students' knowledge and awareness of special user groups such as children, the handicap and the elderly. It also draws upon their previous knowledge and fundamentals of environmental psychology and people-environment relations. This theory course supplements what students would search and find by themselves about design standards and building codes for specialized facilities. They enrich the students' knowledge base with innovative concepts for restorative, de-stressing, well-being promoting designs and future places.

Lab and Tutorials

Practicum
Field visits, conducting empirical research

Literature
Fleury-Bahi, G., Pol, E. & Navarro, O. (2017). Environmental Psychology and Quality of Life. Spinger International Publishing.
Bell, P., Greene, T., Fisher, J. & Baum, A. (2001). Environmental Psychology. 4th Edition. Harcourt College Publishers.

Course Title	**People-centred Urban Design and Public Space**	
Course Code	**ARUD 224**	
Prerequisites	**ARUD 122**	
Classification within the curriculum	**Compulsory**	
Course Position in Study Plan	**Spring**	
Contact Hours	Lectures	1
	Tutorials	3.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	150	
Topic Category	Basic Engineering Sciences	
Topic Level	Program Requirement	

Description
The aim of this course is to enable students to design public spaces based on an understanding of how people perceive, understand and utilize urban space, that would in turn lead to future places that are supportive to what people want to do, minimizing the chance of misuse or neglect of these spaces. The course covers the seminal normative theories of urban design and illustrates to the students the relation between those theories, their limitations and how they relate to other courses such history of urban form, neighbourhood design and the basic theories of environment-behaviour studies. The course conveys to the students the importance of public space and the multiple functions it plays in people's lives; how its is at once a place for movement, for leisure, a workplace and a place to learn and grow. It equips students to address public space and be able to address its multiple economic, social and political dimensions; having the knowledge and synthesizing skills to plan and design the most integral and central urban element as defined by the latest global manifestos. Through field visits and literature review, the students will be trained on physical survey, behavioral observation, reading maps, photographic documentation, conducting interviews, documentation and analysis of collected data as well as participatory design and presentation to stakeholders.

Lab and Tutorials

Practicum
Field visits, conducting empirical research

Literature
Whyte, W. (1980). The Social Life of Small Urban Spaces.
Cullen, G. (1961). Townscape.
Broadbent, G. (1990). Emerging Concepts in Urban Space Design.
Jacobs, J. (1961). The Death and Life of Great American Cities. Random House.
Trancik, R. (1986). Finding Lost Space. Van Nostrand Reinhold.

Course Title	**Spatial and Urban Dynamics**	
Course Code	**ARUD 325**	
Prerequisites	ARUD 224	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	1
	Tutorials	3.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	150	
Topic Category	Business administration	
Topic Level	Program Requirement	

Description

This course aims at providing the students with a comprehensive understanding of urban environments´ spatial and physical dynamics. It includes two foci. One focuses on transformation and change over time in the existing urban fabric, its use, and its meaning to different users. It provides the students with the different theoretical basis that explain those spatial dynamics such as theories of building adaptability, of production and reproduction of public space, rules of appropriation, stakeholder analysis, and systems of activity settings that work together across the conventional domains of intervention and management of the built environment. This enhances the capacity of students to better predict people's behaviour and use of spaces, patterns of mobility and propensity to participate in the upkeep and maintenance of the public realm. This enables the student to design more appropriate, adaptable environments with higher use value to diverse users, where communities can partner the public sector and reduce the burden on the government and where the built form can stand the challenge of time and transform to changing needs. The other introduces the fundamentals of urban physics that addresses ambient environmental issues related to urban-level performance of the built form as well as the interrelations among various urban systems including the urban microclimate, energy infrastructure and mobility systems. Both foci integrate in their impact on the design and regeneration of parts of cities including infrastructure, mobility, detailed land use, building morphology, and public space. Applications would include adaptive re-use and conservation of heritage building ensembles, revitalisation of heritage urban patterns such street markets, hammams, or artisan districts, as well as the urban regeneration of informal areas, historic cores, downtown areas, waterfronts…etc..

Lab and Tutorials

Exercises include group work on case studies, interacting with visiting practitioners working in local communities.

Practicum

Field visits to upgrading and regeneration projects
Visits to experts in adaptive re-use and urban regeneration
Participating in workshops within real on-going projects.

Literature

Lawrence, R. Turget, H. & Kellet, P. (2012). Requalifying the Built Environment: Challenges and Responses. Hogrefe.
Punter, J. & Carmona, M. (2007). The design Dimension of Planning. Routledge, Spon Press.
UNESCO (2011-2014). Urban Regeneration of Historic Cairo Project documents.
Gartland, L. (2008). Heat Islands: understanding and mitigating heat in urban areas
Erell. Evyatar, Pearlmutter, David, Williamson, Terry, (2011). Urban microclimate: designing the spaces between buildings.

Course Title	**Urban Planning Process**	
Course Code	**ARUD 426**	
Prerequisites	ARUD 325	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	3.5
	Labs / Studios	0
	TOTAL	5.5
EG Credit Hours	3	
ECTS	6	
Student Workload (SWL)	150	
Topic Category	Basic Engineering Sciences	
Topic Level	Program Requirement	

Description

Is the city a form, or a process, or both? Are architects and urban designers responsible for the form and urban planners for the process part? How can these two, together with other parties cooperate to promote sustainable urban development and to resolve conflicting interests? Which skills, instruments and tools are needed?

The aim of this course is to familiarize participants with the dimension of the urban planning process so that architects and urban designers understand their role and responsibilities in relation to other stakeholders. Based on a reflection of the legacy of architectural and planning professions and their paradigms the course will explore the potentials of architects and urban designers as part of a new urban planning approach that is integrated, inclusive and participatory and that follows principles such as compactness, social inclusion, integration and connected cities and neighbourhoods that are resilient to climate change. The class builds on the knowledge established in the introductory contemporary cities course (SSCI 101). It integrates research and practice and will explore lessons from relevant case studies from Egypt and beyond. Selected issues comprise: economic development, infrastructure and services, housing, environment, food security, historic preservation, regional development.

Lab and Tutorials

Roles games. Case study based learning from successful and failed projects. Individually and in groups.

Practicum

Several visits to case study projects including engagement with local stakeholders

Course Title	**History I** – History of Architecture and Urban Form I	
Course Code	**ARUD 031**	
Prerequisites	None	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	2.5
	Tutorials	2
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Engineering Culture	
Topic Level	Program Requirement	

Description

The aim of this course is to have students understand architectural terminology, themes and building types used in world architecture up until the 17th Century and acquire knowledge of significant structures and buildings in their historical, regional and cultural contexts in this period. Through history it explores the definitions of architecture and style as well as the relation between the built environment and the socio-cultural dimensions that shaped it through a chronological overview of the different eras in history. The study begins with the first traces of prehistoric buildings and settlements in the Ancient World and the engineering and science of the monuments of the Ancient Egyptian Civilization. It provides a survey of the Classical Civilizations focusing on the theories of aesthetics and order in architecture, art and the political dimension behind the shaping of cities in the Greek and Roman periods.

Lab and Tutorials

Practicum

Conduct individual research on a selected aspect of architecture history.
Field visits to some selected Egyptian sites (Saqqarah, Coptic Cairo…) and use of VR libraries as much as possible to visit remote sites.

Literature

Conway, H. & Roenisch, R. (1994). Understanding Architecture. Psychology Press.
Kostof, S. (1993). The City Shaped. Thames and Hudson.
Behrens-Abouseif, D. (1992). Islamic Architecture in Cairo. E.J. Brill

Course Title	**History II** – History of Architecture and Urban Form II	
Course Code	**ARUD 132**	
Prerequisites	ARUD 031 (History of Arch and Urban Form I)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2.5
	Tutorials	2
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Engineering Culture	
Topic Level	Program Requirement	

Description
The course covers a synopsis of architecture, art and city design in the Early Christian (including Coptic Cairo), and Byzantine. It will also cover the Medieval Romanesque and Gothic eras exploring the different meanings and aims of architecture. This course introduces students extensively to the history of Islamic Architecture and the formation of Islamic cities. Students begin by examining the formation, development, transfers, parallels and differences between European and Islamic architecture that are revealed in building traditions, materials, spatial layouts and related to lifestyle. They are simultaneously introduced to the ideologies, cultural, climatic and technological influences that shaped these cities, including the functional aspects reflected in the various religious, civic and residential buildings of the period and the manipulation of mass, light and acoustics from the inside-out to achieve the desired functions. This course finally covers the Renaissance, Baroque and Rococo eras in Europe. It also covers the developments of the nineteenth century and the transferal of influences that characterized it stopping at the beginnings of the industrial revolution with its innovations in materials (iron and glass) tracing its connections through eclecticism and classical revival.

Lab and Tutorials

Practicum
Field visits to some selected Egyptian sites.

Literature
Lesnikowski, W. (1982). Rationalism and Romanticism in Architecture. McGraw Hill.
Lozano, E. (1990). Community Design and the Culture of Cities. Cambridge University Press.
Abu Lughod, J. (1971). Cairo the City Victorious: 1001 Years.

Course Title	**Theory I** –Theory of Architecture and Urban Form I: Modernism	
Course Code	**ARUD 233**	
Prerequisites	ARUD 132 (History of Arch and Urban Form II)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2.5
	Tutorials	2
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Engineering Culture	
Topic Level	Program Requirement	

Description

The aim of this course is to understand the reflections of the 20th C. social, economic and political movements within the scope of modern Architecture. It aims also to explore the developments that followed the 19th C. and industrial revolution into the 20th C. theories of Modern Architecture and its rising to set global trends in the design or buildings and cities. The course provides a detailed insight into the classification of different architectural movements and their pioneers, as well as the essential characteristics of “Modernism” and its different phases. A detailed introduction to the history of modern architecture from its intellectual and artistic origins in the nineteenth century the course proceeds to cover the emergence of technological, theoretical and aesthetic principles of modern design beginning with the socio-cultural impact of industrialization through innovations in materials (iron and glass) and new functions. Based on an understanding of the seminal views that shaped the Modernist era, those world trends were subjected to regional interpretations including the Egyptian experience led by national pioneer architects.

Lab and Tutorials

analyzing International and national examples.

Practicum

Field visits to some selected Egyptian sites.

Literature

Frampton, K. (2007). Modern Architecture: A critical history. Thames ad Hudson.
Frampton, K. (2015). A Genealogy of Modern Architecture. Lars Muller.
Ashour, S. (2018).

Course Title	**Theory II** –Theory of Architecture and Urban Form II: Contemporary	
Course Code	**ARUD 334**	
Prerequisites	ARUD 233 (Theory of Arch. & Urban Form I)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2.5
	Tutorials	2
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Basic Engineering Sciences	
Topic Level	Program Requirement	

Description

This course provides an overview of the principal theories that have informed, animated, or destabilized recent architectural discourse (Regionalism and space spacifity, Tectonic expression, Environmentalism ethics and biomimicry, etc), focusing on key figures, movements, and texts from the late 1960s to the present. Recent technical approaches useful for contemporary architecture. Exploring the space as the extension of the human body; the sequence of space views experienced by people not the one from a high angle view. ICT contribution; video games which is specialized at the spatial storytelling, by collecting the scene played by people, and extend the human body. Students should be able to critically assess the ways which architectural movements achieve architectonic form; understand socio-cultural and technological factors undermining the emergence of various architectural discourses of contemporary architecture.

Lab and Tutorials

Practicum

Literature

Spencer, D. (2017). The Architecture of Neoliberalism. Bloomsbury.
Elsheshtawy, Y. (2008). The Evolving Arab City. Routledge.

Course Title	**Construction I**	
Course Code	**ARUD 151**	
Prerequisites	ARUD 001	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	1
	Tutorials	3.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Basic Engineering Science	
Topic Level	Program Requirement	

Description

The aim of this course is to explore the basic requirements that arise from the function of providing shelter (comfort); and those that arise from combining diverse elements and/or materials in a single system. The student will get to know the different strategies to satisfy those requirements: from the conceptual principle to the constructive solution.

Course content covers: vocabulary; building elements; comfort requirements; constructive requirements; construction techniques and materials. The student makes a first approach to the importance of construction in formalizing architecture studying wall-bearing heritage construction methods along local history.

Lab and Tutorials

Exercise 1- Case of study: an example of architecture familiar to the student –house, school …: describe it from both material and sensorial aspects. Name the elements that form it and analyze its function. Assess how the building (o a part of it) responds to the most basic functional and comfort needs.
Objective: obtaining vocabulary, knowing the elements and understanding their function.
Exercise 2- Short exercises dealing with movements. Analyzing real situations of coercive and permissive union mechanisms (in groups).
Objective: Allowing the student to discern between coercive and permissive solutions.

Practicum

Reflected in DESIGN STUDIO: Approaching the exercise in the design studio clearly understanding the importance of deeply knowing the site: its climate, topography, natural resources,… This information gives clues for design: the user and the context.

Literature

Course Title	**Construction II** – Building the structure: materials and techniques	
Course Code	**ARUD 253**	
Prerequisites	ARUD 152 (Structure I)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	1
	Tutorials	3.5
	Labs / Studios	0
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Mathematics and Basic Sciences, Basic Engineering Science	
Topic Level	Program Requirement	

Description

The aim of this course is to explore the basic construction techniques for erecting structures and the related materials to each technique. The techniques are: masonry, rammed, casting, assembling. The related material: ceramics -brick–, earth, concrete, and wood (including their life-cycle assessment). This approach to the techniques and materials studied through its application to basic structures will permit the student getting to know the constructive bases for erecting: wall structures, pillars, beams and slabs.

In this course the student will also explore the ground and how the building is accommodated over it: Types, technical design and construction process of foundations and retaining walls (including drainage and water tightness).

Lab and Tutorials

Exercise 1- Field visits (building on process): identifying different materials according to their form - amorphous, small elements, semi-finished products and components- and describe the related construction techniques (in groups).

Exercise 2- Working with models, analyze the structural types behavior (in groups).

Practicum

Reflected in DESIGN STUDIO: the skeleton as the building shape definition. Loads being bear and stability as design clues. The material used implies a technique, both (material and technique) bring the structure model to reality.

Literature

Course Title	**Construction III** – Closing the building – facades and roofs – and arranging the public space	
Course Code	**ARUD 355**	
Prerequisites	ARUD 254 (Structure II)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	1
	Tutorials	2.5
	Labs / Studios	2
	TOTAL	5.5
EG Credit Hours	3	
ECTS	6	
Student Workload (SWL)	150	
Topic Category	Mathematics and Basic Sciences, Basic Engineering Science	
Topic Level	Program Requirement	

Description

The aim of this course is addressing the constructions systems for closing the building: non-load bearing facades and roofs. Contemporary techniques and related materials. Facades; conventional, ETICS, claddings, rain screen, panel, curtain wall, openings and their filters. Roofs; flat roofs- watertight membranes, pitched roofs-tiles, low slope roofs- metal sheets. For all of them (facades and roofs) it will be done a system description, and deeply studied its behavior according to the climate conditions, architectonic possibilities and constructive requirements.

This course also covers construction systems for arranging the public space.

The course analyses the following materials: watertight membranes, thermal insulation materials, non-ferrous metals, glass, stones, cladding boards (including their life-cycle assessment).

Lab and Tutorials

Exercise 1- Development of the technical details (working drawings) of a student's previous Design Studio exercise. That exercise should have addressed a rehabilitation or intervention in an existing building so as to cover many different constructive situations (Retrofitting of heritage and industrial buildings).

Practicum

Reflected in DESIGN STUDIO: Focusing on the enclosure design and its energetic efficiency, and on the construction of the public space.

Literature: Books

- The architectural detail. Edward Ford
- An Engineer Imagines. Peter Rice Ed.llipsis London Pr Ltd ISBN-10: 1899858113
- Building: 3,000 Years of Design, Engineering and Construction. Bill Addis Ed. Phaidon
- Façade construction manual (Detail) Herzog Krippner Lang;Ed. Birkhäuser ISBN 3764371099
- Roof construction manual (Detail) Ed. Birkhäuser Architecture ISBN-10: 3764369868
- Dry Construction (Detail) Ed. Birkhäuser ISBN 9783764388089
- Interiors Construction Manual (Detail) G.Hausladen, K.Tichelmann; ISBN-10: 3034602847

Journals

- Detail ; Tectónica; TC cuadernos; Arquitectura Viva ; AV Monografias

Web:- http://facad3s.net http://filt3rs.net

Course Title	**Visual I**	
Course Code	**ARUD 161**	
Prerequisites	ARUD 001 (Basis for Design)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	1
	Tutorials	2.5
	Labs / Studios	1
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	125	
Topic Category	Basic Engineering Science	
Topic Level	Program Requirement	

Description

The aim of this course is to explore an introduction to architectural representation, Orthographic projections, descriptive geometry, contours, paraline drawings, shade and shadows and model making are presented and applied, where some practical constructions just to get a sense of what one can accomplish using different untraditional tools by studying different details of orthographic projections and culminating in some useful applications such as casting 3d isometrics, shades and shadows and the intersection of surfaces, and the development of surfaces. The course is concerned with the graphical solution to three dimensional spatial problems and an examination of methods to develop graphical solutions to problems involving points, lines, and planes in space in addition to its perception discussing concepts such as (enclosure, complexity, uniformity, etc.) depending on VR lab and tools. Different concepts, methods, and issues of Design as a vehicle of visual organization, structure, thought, and expression. The broad scope of the subject is explored through lectures, discussions, critiques, and the process of making images, and objects. Students are introduced to the dynamics of composition, form and content, color systems and theory, aesthetic issues, visual analysis, perception, spatial structure and the value of visual awareness and creativity in an increasingly image-oriented culture. The course also seeks to provide some experience with a variety of media, develop skills in observation and technique, and encourage personal involvement in resolving a visual problem or expressing an idea. Exercises focus on specific concepts, preparation and planning, and creative visual thinking.

Lab and Tutorials

Practicum

Literature

Course Title	**Visual II**	
Course Code	**ARUD 162**	
Prerequisites	ARUD 161 (Visual I)	
Classification within the curriculum	Compulsory	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1
	Tutorials	2.5
	Labs / Studios	1
	TOTAL	4.5
EG Credit Hours	3	
ECTS	5	
Student Workload (SWL)	150	
Topic Category	Basic Engineering Science	
Topic Level	Program Requirement	

Description

The aim of this course is to explore drawing as a tool of communication through exercises that explore observation and perception, form and proportion, representation, analysis and diagramming using a variety of materials and Media. An introduction to both drawings techniques of technical drawings whether manual or digital. On one hand the freehand drawing technique focusing on the delineation of interior and exterior spaces, starting with drawing from observation to speculative drawings, including the study of light conditions. It provides the student with the knowledge, skills and aptitude required to use a range of fundamental architectural sketching and drawing skills based on observation of the physical world, in particular the built world. On the other hand, the digital graphic communication tools and techniques in architecture. Where students learn to use digital representation tools. They acquire representation techniques of space and form in 2D and 3D using digital modeling, visual analysis, different simulations. The course covers complex intersection of volumes. In parallel, students continue their exploration of freehand representation of form, space, urban scenery and landscape in order to maintain the shift between both worlds the manual and digital of design thinking and representation.

Lab and Tutorials

Practicum

Literature

Course Title	**Mapping Preferences**	
Course Code	**ARUD 171**	
Prerequisites	ARUD 111	
Classification within the curriculum	Elective	
Course Position in Study Plan	Spring	
Contact Hours	Lectures + seminars	1
	Tutorials	1
	Labs / Studios	1
	TOTAL	3
EG Credit Hours	2	
ECTS	4	
Student Workload (SWL)	100	
Topic Category	Mathematics and Basic Sciences	
Topic Level	Program Requirement	

Description
The aim of this course is to present specific methods and techniques, developed in social sciences (particularly environmental psychology), for mapping lay people preferences. In particular, the focus will be put on the coding, decoding, analysis and interpretation of “subjective” data, to be compared to “objective” data concerning the same environmental feature (e.g., urban greens, residential choice,…). The course will build upon what ICT offers in the field of mapping, exploring what is termed ‘soft’ GIS.

Lab and Tutorials

Practicum

Literature
To be decided.

3. Additional Resources:
   - Reference #2.
   - Reference #3.

Course Title	**Colour and Art**	
Course Code	**ARUD 172**	
Prerequisites	ARUD 161	
Classification within the curriculum	Elective	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1
	Tutorials	1
	Labs / Studios	1
	TOTAL	3
EG Credit Hours	2	
ECTS	4	
Student Workload (SWL)	100	
Topic Category	Mathematics and Basic Sciences	
Topic Level	Program Requirement	

Description
This course aims to allow students to put theory into practice and develop their artistic competency and enhance their expression capabilities. It conveys to students the fundamental principles of artistic expression including graphic design which covers image making, typography, composition, working with color and shape as well as apply practical visual solutions for self-promotion, resumes, logo design, and Web design. Students will practice perspective, and learn how to draw illusions, utilize value and imply texture, understand color schemes and the color wheel. This art basics course will allow students to develop techniques through a variety of mediums including ink, colour pencil, pastels and paint and enhance their skills to create art for visual communication applications. At the end of this course students will have learned how to explore and investigate visual representation through a range of image-making techniques; practice basic principles of working with shape, color and pattern; and understand and have applied the principles of composition and visual contrast.

Lab and Tutorials
Combine short practices (around 3) with a main project of synthesis

Practicum
Field visits

Literature

Course Title	**Architecture Photography**	
Course Code	**ARUD 173**	
Prerequisites	None	
Classification within the curriculum	Elective	
Course Position in Study Plan	Spring	
Contact Hours	Lectures	1
	Tutorials	1
	Labs / Studios	1
	TOTAL	3
EG Credit Hours	2	
ECTS	4	
Student Workload (SWL)	100	
Topic Category	Mathematics and Basic Sciences	
Topic Level	Program Requirement	

Description
This course will address the basic technical knowledge, and guidelines for composition and visual expression. Students should learn to see light and how it alters the visual impact of architectural forms, enabling them to utilize light and composition focusing on perception and how it affects choosing angles and taking photos in order to produce expressive images of not only architecture interior and exterior but the urban environment like streets and people.

Lab and Tutorials

Practicum
field-trips to practice photography on both historical and modern architectural projects.

Literature

Course Title	**Landscape Architecture & Planning**	
Course Code	**ARUD 374**	
Prerequisites	ARUD 224	
Classification within the curriculum	Elective	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	1
	Labs / Studios	0
	TOTAL	3
EG Credit Hours	2	
ECTS	4	
Student Workload (SWL)	100	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
The course aims at introducing the discipline of Landscape Design and Planning as well as to its potentials, instruments and its role among various other urban disciplines. Core issues include water landscapes, intertwined urban and regional relations, place and identity, integration, and environmental preservation. It aims that students understand cities and their large-scale processes of production and consumption that are claiming more and more space, to understand the new reality that is emerging on the ground and how can the environmental qualities and the identity of places be preserved. The course covers the roles, capacities and main instruments of landscape architecture and design, also referred to as Landscape Urbanism, that is becoming more important in the contemporary situation of an all-encompassing valorization of space though urbanization. This course tackles the spaces of nature, green and the environment as core entities of urban development, instead of mere “left over” spaces. It also comprises the appreciation of various new forms of urban fabrics, at various scales such as new intertwined systems of housing, infrastructure, “logistics”, water, greens, and different natural landscapes. The course also informs students in the localization and adaptation of global systems and solutions to local contexts under consideration of local identities.

Lab and Tutorials
Studying case studies of local urban landscapes from the lens of natural landscapes and natural elements (water, green, desert…).

Practicum
Field trips. Urban transects.

Course Title	**Informal Areas**	
Course Code	**ARUD 375**	
Prerequisites	ARUD 122	
Classification within the curriculum	Elective	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	1
	Labs / Studios	0
	TOTAL	3
EG Credit Hours	2	
ECTS	4	
Student Workload (SWL)	100	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
The aim of this course is to equip the students with skills and information to be able to address the root of informality and its effects based on a rights-based and social justice strategy responding to the problems of informality. It focuses on understanding the Local Community practices and how to identify the positive and negative aspects, defining the role of the different stakeholders (Local Government, NGOs, CBOs,…) and discussing the potential to partner and regulate the Local Community practices and achieve a maximizing use value when upgrading informal areas. Finally, it touches on some policies relates to informal areas and the possibility to have a future role in decreasing the formation of new informal areas.

Lab and Tutorials

Practicum

Literature

Course Title	**Sustainable Development**	
Course Code	**ARUD 476**	
Prerequisites	ARUD 325	
Classification within the curriculum	Elective	
Course Position in Study Plan	Fall	
Contact Hours	Lectures + seminars	2
	Tutorials	1
	Labs / Studios	0
	TOTAL	3
EG Credit Hours	2	
ECTS	4	
Student Workload (SWL)	100	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
The aim of this course is to transfer knowledge and skills about how to promote sustainable attitudes and behaviours for facing threats such as climate change and environmental risks, loss of heritage and historic areas, spread of informality. Socio-psychological models and constructs explaining environment-related behaviours will be addressed, with a specific focus on natural and urban environments. A further issue will concern the effectiveness of communication campaigns for triggering sustainable behaviour at the community level.

Lab and Tutorials

Practicum

Literature
Steg, L., van den Berg, A.E., & de Groot, J.I.M. (Eds.) (2013), Environmental Psychology: An introduction. Oxford (UK): Wiley-Blackwell.

Course Title	**Building Ecology**	
Course Code	**ARUD 477**	
Prerequisites	ARUD 344 (Building Performance Computing)	
Classification within the curriculum	Elective	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	1
	Labs / Studios	0
	TOTAL	3
EG Credit Hours	2	
ECTS	4	
Student Workload (SWL)	100	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
This course introduces methods for the description and evaluation of ecological performance of building elements, components, systems and structures. Specifically, the application of LCA (Life-Cycle Assessment) and EIA (Environmental Impact Analysis) techniques in the building domain for analysis of the environmental footprint of buildings and the sustainability implications of design and construction decisions are introduced.

Lab and Tutorials
Tutorials: Independent study

Practicum
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Literature
1. ISO 21930: 2017 07 01; Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
2. Hauschild, Michael; Wenzel, Henrik; Alting, Leo, 2001. Environmental Assessment of Products: 1. Methodology, tools and case studies in product development
3. Hauschild, Michael; Wenzel, Henrik; Alting, Leo, 1998. Environmental Assessment of Products: 2. Scientific background
4. Berge, Bjørn, 2009. The ecology of building materials
5. Kibert, Charles J., 2002. Construction ecology: Nature as the basis for green buildings

Course Title	**Urban Planning II**	
Course Code	**ARUD 478**	
Prerequisites	ARUD 426	
Classification within the curriculum	Elective	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	1
	Labs / Studios	0
	TOTAL	3
EG Credit Hours	2	
ECTS	4	
Student Workload (SWL)	100	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
The course Urban Planning II is an extension of the mandatory course Urban Planning (ARUD 526). The aim of this elective course is to deepen selected aspects, such as legal, economic, spatial dimensions and practices and introduces the students to innovative practices in urban planning such as Transport Oriented Planning, Land Value Capture, Innovative practices of slum upgrading, New forms of management and operation, monitoring and evaluation practices etc.

Lab and Tutorials
Among others: Deep case studies. Evaluation exercise.

Practicum

Literature

Course Title	**Sustainable Heritage Conservation**	
Course Code	**ARUD 479**	
Prerequisites	ARUD 325, ARUD 355	
Classification within the curriculum	Elective	
Course Position in Study Plan	Fall	
Contact Hours	Lectures	2
	Tutorials	1
	Labs / Studios	0
	TOTAL	3
EG Credit Hours	2	
ECTS	4	
Student Workload (SWL)	100	
Topic Category	Engineering Applications and Design	
Topic Level	Program Requirement	

Description
The aim of this course is to provide the students with a comprehensive understanding of different patterns of living heritage in order to be able to achieve a sustainable heritage conservation. It addresses the potentials and issues related to the historic areas such as the urban fabric, building morphology, land value, land distribution, system of activity settings, as well as the heritage lifestyle patterns, territorial domains, claims of public space, and the sustainability of commercial and productive heritage activities. It also emphasizes the importance of historic areas as an asset focusing on the value of this living heritage and the importance of redirecting the different perceptions towards these areas, discussing the transformations happening in the historic areas and the different ways to mitigate the negative aspects in order to save them from losing the heritage but rather turning them into potentials for economic development and social sustainability.

Lab and Tutorials

Practicum

Literature