إعلان بخصوص عقد دورة تدريبية وورشة عمل

NARS 2018 Gap Analysis & Action Plan

كأحد متطلبات التقدم للاعتماد الأكاديمي من الهيئة القومية لضمان جودة التعليم والاعتماد

وذلك يوم الأحد الموافق 2020/02/23
من الساعة 11 ص إلى 02 ظهراً

وذلك في القاعة متعددة الأغراض – المبنى التعليمي

وحدة التطوير المستمر وتوكيد الجودة

أ. د. جمال محمد هاشم

٢٠٢٠/١٢/١٣

على جميع الحضور إحضار الملفات الآتية كنسخة إلكترونية:

1. NARS 2009
2. NARS 2018
3. توصيف البرنامج لائحة 2013/2003
4. توصيف البرنامج لائحة 2018
5. إحضار Laptop

سورة النمل – بسم الله الرحمن الرحيم

وَتَرَى الْجِبَالَ تَحْسَبُهَا جَامِدَةً وَهِيَ تَمُرُّ مَرَّ السَّحَابِ ۚ

صُنْعَ اللَّهِ الَّذِي أَتْقَنَ كُلَّ شَيْءٍ ۚ إِنَّهُ خَبِيرٌ بِمَا تَفْعَلُونَ

(88)

المختصر المفيد في تبني المعايير الاكاديمية

NARS 2018

ودراسة الفجوة مقارنة مع المعايير الاكاديمية

NARS 2009

والخطط التنفيذية لسد الفجوة

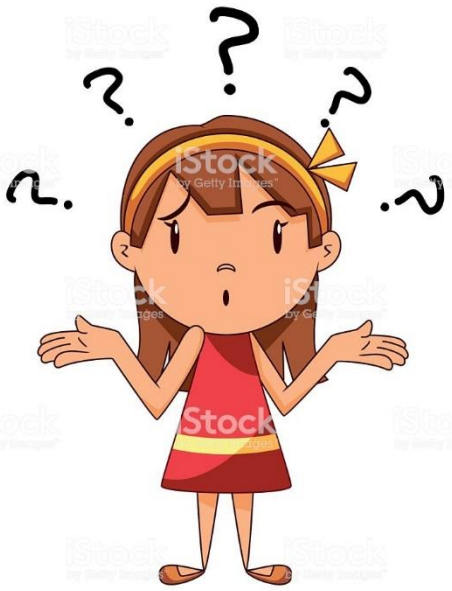
Prof. Dr. Gamal Hashem

Director CIQAU, ASU – FE

Feb. 2020

Why we have to do that

- **According to NAQAAE official letter sent to all engineering institutions, all academic programs to adopt NARS 2018 and to define the gap between NARS 2018 & NARS 2009. Then action plan to consider this gap.**





رئاسة مجلس الوزراء
الهيئة القومية
لضمان جودة التعليم والاعتماد

السيد الأستاذ الدكتور/ رئيس جامعة عين شمس

تحية طيبة وبعد،،،

تتويجاً للجهود الدءوبة التي تبذلها الهيئة القومية لضمان جودة التعليم والاعتماد وكافة مؤسسات التعليم العالي لتحقيق معايير ضمان الجودة والوصول بالعملية التعليمية داخل مؤسسات التعليم العالي للمستوي المنشود، فقد اعتمدت الهيئة المعايير القومية الأكاديمية المرجعية للقطاعات الآتية:

- قطاع الهندسة (NARS: Engineering)
- قطاع الطب (NARS: Medicine)
- قطاع الصيدلة (NARS: Pharmacy)
- قطاع التمريض (NARS: Nursery)

على أن يتم تفعيلها والعمل بها للعام الجامعي ٢٠١٩/٢٠٢٠. وعلي كافة كليات القطاعات المذكورة المتقدمة للاعتماد أن تتبنى تلك المعايير الجديدة وتقوم بتصميم البرامج طبقا لتلك المعايير القائمة علي الكفايات. كما تود الهيئة أن تقوم الكليات بعمل تحليل لبرامجها لإيضاح الفجوة بين المعايير المستخدمة حالياً والجديدة، ووضع الخطط لسد الفجوات بالنسبة للدفعات التي تم تخريجها.

يرجي التكرم من سيادتكم بالإيعاز بما يلزم نحو إطلاع السادة عمداء الكليات والسادة مديري مراكز الجودة بجامعتكم الموقرة على المعايير الجديدة المتاحة على موقع الهيئة www.naqaae.eg والتفضل باتخاذ ما يلزم.

شاكرين لسيادتكم حسن تعاونكم مع الهيئة

رئيس مجلس إدارة الهيئة

أ.د/ يوهانسن عيد

العنوان: ٥ ش الفنان محمود المليجي – امتداد ش رمسيس – الحي السادس – مدينة نصر – القاهرة
التليفون: ٠٢٢٣٨٩٢٠٤٩ – الفاكس: ٠٢٢٣٨٩٢٠٤٨ – ص.ب: ١٣-١١٨٥٢

خطاب من الهيئة القومية بخصوص الكليات التي سوف تتقدم للاعتماد بداية من العام الاكاديمي 2019/2020

على أن يتم تفعيلها والعمل بها للعام الجامعي ٢٠١٩/٢٠٢٠. وعلي كافة كليات القطاعات المذكورة المتقدمة للاعتماد أن تتبنى تلك المعايير الجديدة وتقوم بتصميم البرامج طبقا لتلك المعايير القائمة علي الكفايات. كما تود الهيئة أن تقوم الكليات بعمل تحليل لبرامجها لإيضاح الفجوة بين المعايير المستخدمة حالياً والجديدة، ووضع الخطط لسد الفجوات بالنسبة للدفعات التي تم تخريجها.

"لنجاح تطوير التعليم لابد أن

يتزامن مع تطوير القائمين

على تنفيذه"

Content

1. **NARS 2009 Overview**
2. **NARS 2018 Overview**
3. **Gap Analysis Between NARS 2009 & NARS 2018**
4. **Example:**
   - **Electrical Power Engineering Program EPM**
   - **Architecture Engineering Program ARC**
   - **Building Engineering Program BLDG**
5. **Proposed Action Plan**
6. **References**
7. **Instructor Contact Info**

Overview – National Academic Reference Standard NARS 2009

- **The National Academic Reference Standards (NARS) statements:**
- **Provide measures for the academic community to *describe the nature and characteristics* of academic programs in certain fields of specialty.**
- **They also represent general expectations about the *qualifications, the attributes and capabilities* that the graduates of those programs should be able to demonstrate.**

Section 1: NARS 2009 for Engineering



- **The attributes of the engineer (A to K) - 11**
- **Intended Learning Outcomes (ILOs)**
  - **Knowledge and Understanding (A to L) -12**
  - **Intellectual Skills (A to L) - 12**
  - **Practical and Professional Skills (A to L) - 12**
  - **General and Transferable Skills (A to I) – 9**

Total Engineering ILO = 45

The Attributes of the Engineer (A to K)

a. **Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems.**

b. **Design a system; component and process to meet the required needs within realistic constraints.**

c. **Design and conduct experiments as well as analyze and interpret data.**

d. **Identify, formulate and solve fundamental engineering problems.**

e. **Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.**

f. **Work effectively within multi-disciplinary teams.**

g. **Communicate effectively.**

h. **Consider the impacts of engineering solutions on society & environment.**

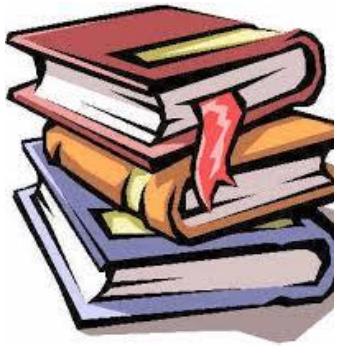
i. **Demonstrate knowledge of contemporary engineering issues.**

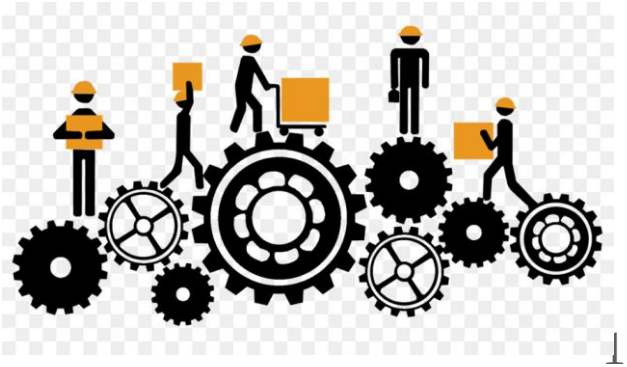
j. **Display professional and ethical responsibilities; and contextual understanding**

k. **Engage in self- and life- long learning.**

Indicative Curricula Content by Subject Area

	Subject Area	%	Tolerance
A	Humanities and Social Sciences (Univ. Req.)	11	9-12 %
B	Mathematics and Basic Sciences	21	20-26 %
C	Basic Engineering Sciences (Faculty/Spec. Req.)	21	20-23 %
D	Applied Engineering and Design	21	20-22 %
E	Computer Applications and ICT*	10	9-11 %
F	Projects* and Practice	9	8-10 %
	Subtotal	93	92-94 %
G	Discretionary (Institution character-identifying) subjects	7	6-8 %
	Total	100	100%



NARS 2009

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Arab Republic of Egypt
National Authority for Quality
Assurance and Accreditation of Education



NATIONAL ACADEMIC REFERENCE STANDARDS

ENGINEERING

2nd Edition
August 2009

المجلس الأعلى للجامعات
وزارة التعليم العالي

لجنة قطاع الدراسات
الهندسية والتكنولوجية والصناعية

الإطار المرجعي لإعداد البرامج الدراسية لمرحلة

البكالوريوس بكليات الهندسة (2016)

MASH

5. محددات الإطار المرجعى للوائح الدراسة بمرحلة البكالوريوس

- نسب واضحة للموضوعات التي يحتوي عليها البرنامج الدراسي، تتناسب ومهارات ومعارف الخريج المطلوبة، على النحو التالي:

لجنة قطاع الدراسات الهندسية والتكنولوجية والصناعية

م	التخصص	الحد الأدنى %	الحد الأقصى %
1	العلوم الاجتماعية والانسانية	8	12
2	ادارة الاعمال	2	4
3	الرياضيات والعلوم الأساسية	18	22
4	الثقافة الهندسية	4	6
5	العلوم الهندسية الأساسية	25	30
6	التطبيقات الهندسية والتصميم	25	30
7	المشروع والتدريب الميداني	4	6

MASH

Example – NARS Characterization for Electrical Power Engineering

- **The attributes of electrical engineer (A to H) - 8**
- **Intended Learning Outcomes (ILOs)**
  - **Knowledge and Understanding (A to K) -11**
  - **Intellectual Skills (A to D) - 4**
  - **Practical and Professional Skills (A to E) - 5**

Electrical Power Engineer = 65 ILOs

Process to Design Program Courses

NARS 2009

↓

Bylaw 2003

Main Stream *(Adapted to NARS 2009)*

↓

EPM Program Specification

A = 23, B = 16, C = 17, D = 9

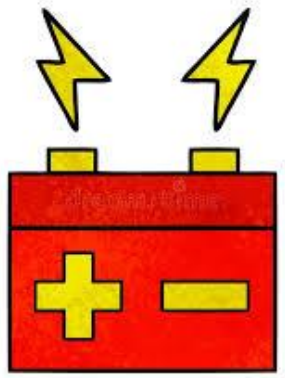
Total 65 ILOs

↓

EPM

Courses = 55





Sample: EPM courses / NARS 2009 ILOs

Table [6] relationship matrix of "Program's ILOs Vs Program's Courses".

Course Code		Course Title	A- Knowledge and understanding ILO's (1/2)																					
			NARS for Engineering												NARS for Electrical Power Engineering									
			A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23
PHM	011	Mathematics (1)	x																					
PHM	021	Physics (1)	x									x												
PHM	031	Mechanics (1)	x		x																			
PHM	041	Chemistry	x																					
PHM	112	Mathematics (2)	x																					
PHM	121	Physics (2)	x									x												
PHM	131	Mechanics (2)	x		x																			
PHM	211	Mathematics (3)	x																					
MDP	021	Engineering Drawing&	x				x																	
MDP	022	Production Technology&				x		x		x	x		x	x										
CSE	011	Computer Technology		x						x				x										
CSE	121	Computers Programming		x																				
CSE	211	Computer Organization (1)		x		x																		
CSE	241	Logic Circuits		x		x																x		
CSE	271	Systems Dynamics &	x			x	x																	
HUM	x11	Technical English Language										x												
HUM	x12	Technical Report Writing										x												
HUM	x21	Management & Marketing							x		x							x						
HUM	x31	Engineering Economy									x													
HUM	x32	Project Management									x							x						
HUM	x41	Legislation & Contracts									x													
HUM	x42	Environmental Impact of									x													
CES	114	Civil Engineering	x		x																			
MEP	211	Mechanical Engineering			x		x																	
ECE	131	Electronic Engineering	x		x		x																	
ECE	241	Electronic Circuits (1)	x			x	x																	
ECE	251	Signal Processing	x				x																	
EPM	113	Electrical Circuits	x				x								x								x	
EPM	171	Electrical Measurements&					x			x				x										
EPM	211	Electromagnetic Fields	x		x		x	x							x									

NARS 2018

- In the recent past a shift occurred to the ***Learning Outcomes (LO)-based education***, where intended learning outcomes were articulated in the form of ***Knowledge, Skills and Attitudes*** that a student ***must achieve***. Despite its being a relatively successful student centered and outcome-oriented model for education; the LO based education model worked with a critical assumption that achieving separate learning outcomes (that were often subject-specific) will enable the engineering graduate to reach an appropriate level of competence to practice with ***some degree of autonomy***. It was also based on the assumption that all learners would achieve the outcomes within the same time-based model.

NARS 2018



Robert W. White
(psychologist)
1959

Shift from ILOs to Competency-based engineering education

- **According to IEEE Reusable Competency Definition (RCD),**

a Competency is defined as any form of:

Knowledge, Skill, Attitude, ability or educational objective that can be described in a context of learning, education or training.

Competence:

The student should be able to use the mass and energy balances for a given food process

Objectives:

- Understand scope of mass balances in food processing systems.
- Understand appropriate use of mole fractions and mass fractions in mass balances

Learning outcomes:

- Describe the general principles of mass balances in steady state systems.
- Draw and use process flow diagrams with labels on flow streams for mass balance problems.
- Solve mass balance problems associated with food processing operations.
- Design and solve mass balances for complex process flow systems, including batch mixing problems, multiple stage flow problems, problems with multiple inflows and outflows, recycle streams and multiple components, and processes where chemical reactions take place.

What is educational attitude

- **Attitude is a learned behavior and, as such, is highly susceptible to change.**
- **Krathwohl's Taxonomy theory states that a learning attitude is developed over time, and that past learning experiences affect future learning experiences**

الدهانات











التوصيلات الكهربية





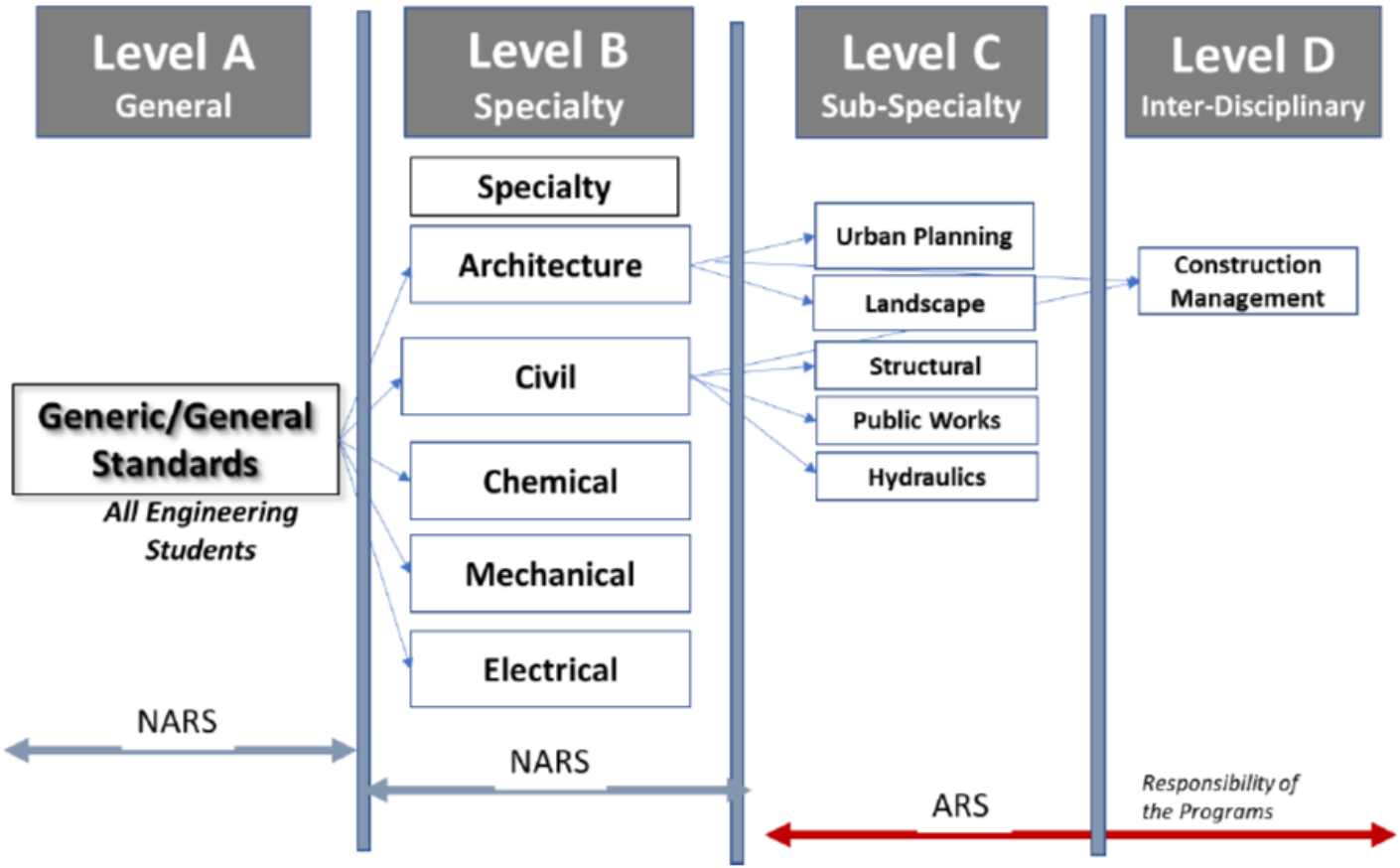


Competency in Arabic

- **الكفايات** هي قدرات مكتسبة تسمح بالسلوك والعمل في سياق معين ويتكون محتواها من معارف ومهارات وقدرات و اتجاهات مندمجة بشكل مركب كما يقوم الفرد الذي أكتسبها باثارتها وتجنيدها وتوظيفها بقصد مواجهة مشكلة ما وحلها.

- **الجدارات** هي مجموعة من السلوكيات المعروفة في تشكل دليل مرتب لتمكين التعرف، التقييم والتطوير لسلوكيات الفرد **الموظف**.

NARS 2018 Characteristics



NARS 2018 Structure

- **The Engineering Graduate MUST: 1 to 10**
- **Level A (General) - Competences of Engineering Graduate: 1 to 10**
- **Level B (Specialty) – Example: Competences of Electrical Engineer 1 to 5**

- **Level C (Sub-specialty) – to be defined by each institute ARS**
- **Level D (Inter-disciplinary) – to be defined by each institute ARS**

The Attributes of the Engineer (1 to 10)

1. **Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;**

2. **Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;**

3. **Behave professionally and adhere to engineering ethics and standards;**

4. **Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;**

5. **Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;**

The Attributes of the Engineer (1 to 10)

6. **Value the importance of the environment, both physical and natural, and work to promote sustainability principles;**

7. **Use techniques, skills and modern engineering tools necessary for engineering practice;**

8. **Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;**

9. **Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;**

10. **Demonstrate leadership qualities, business administration and entrepreneurial skills.**



Example: Comparison

NARS 2009 Versus NARS 2018

Attributes of the Engineer

a. **Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems. NARS 2009**

1. **Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations. NARS 2018**

Edit by

Dr. Tamer

Samir

NARS 2018 Versus NARS 2009

	NARS 2018		NARS 2009
1.	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;		A. Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems. B. Design a system; component and process to meet the required needs within realistic constraints.
2.	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;		C. Design and conduct experiments as well as analyze and interpret data. D. Identify, formulate and solve fundamental engineering problems.
3.	Behave professionally and adhere to engineering ethics and standards;		J. Display professional and ethical responsibilities; and contextual understanding
4.	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;		F. Work effectively within multi-disciplinary teams.
5.	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;		J. Display professional and ethical responsibilities; and contextual understanding
6.	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;		H. Consider the impacts of engineering solutions on society & environment.
7.	Use techniques, skills and modern engineering tools necessary for engineering practice;		E. Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.
8.	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;		K. Engage in self- and life- long learning.
9.	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;		G. Communicate effectively .
10.	Demonstrate leadership qualities, business administration and entrepreneurial skills.		
			I. Demonstrate knowledge of contemporary engineering issues.

Reddish statements refer to missing competences in NARS 2009, or a higher standard than what was in NAES 2009

NARS 2018 – Specialized Programs

1. Civil Engineering
2. Mechanical Engineering
3. Architectural Engineering
4. Chemical Engineering
5. Electrical Engineering
6. Textile Engineering
7. Petroleum, Mining & Metallurgy Engineering



- شعبة الهندسة المدنية
- شعبة الهندسة المعمارية
- شعبة الهندسة الميكانيكية
- شعبة الهندسة الكهربائية
- الهندسة الكيميائية والنووية
- هندسة البترول والتعدين والفلزات
- شعبة هندسة الغزل والـنسيج

Each Program Task

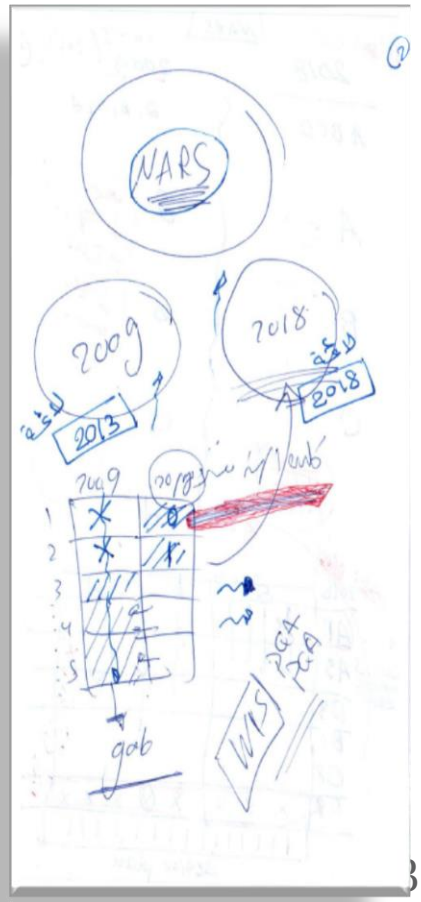




ASU – FE Current Situation 2019/2020

NARS 2009 Bylaw 2003 / 2013 – ILOs Based	NARS 2018 Bylaw 2018 – Competences Based
Level 0 & 1 ========	Level 0 & 1 2019/2020
Level 2, 3 & 4 2019/2020	Level 0, 1 & 2 2020/2021
Level 3 & 4 2020/2021	Level 0, 1, 2 & 3 2021/2022
Level 4 2021/2022	All levels will be running forward ISA
==========	

Bylaw 2020



If applied for accreditation 2020 – competences based (NARS 2018) There will be graduates based NARS 2009

Gap Analysis

NARS 2009

- **ILOs for Engineering**

  a, b, c & d

- **ILOs for Program**

  A, B & C



NARS 2018

- **Competences for Engineering –**

  level A

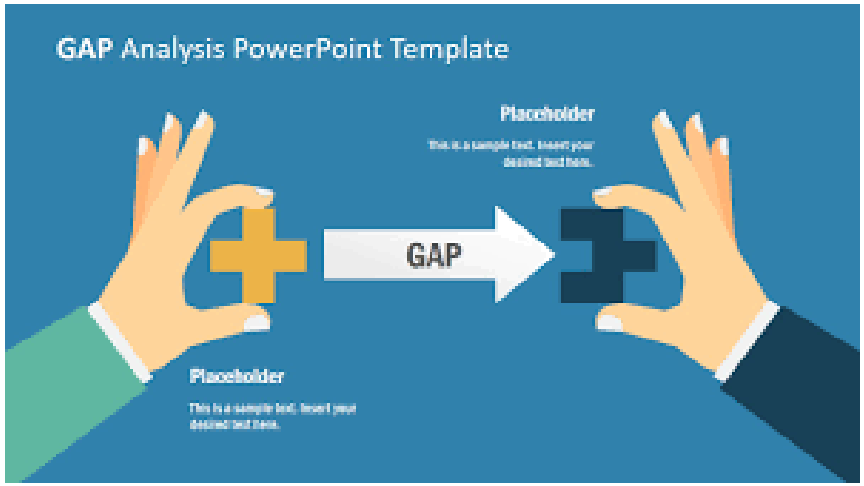
- **Competences for Program**

  Level B & C / D

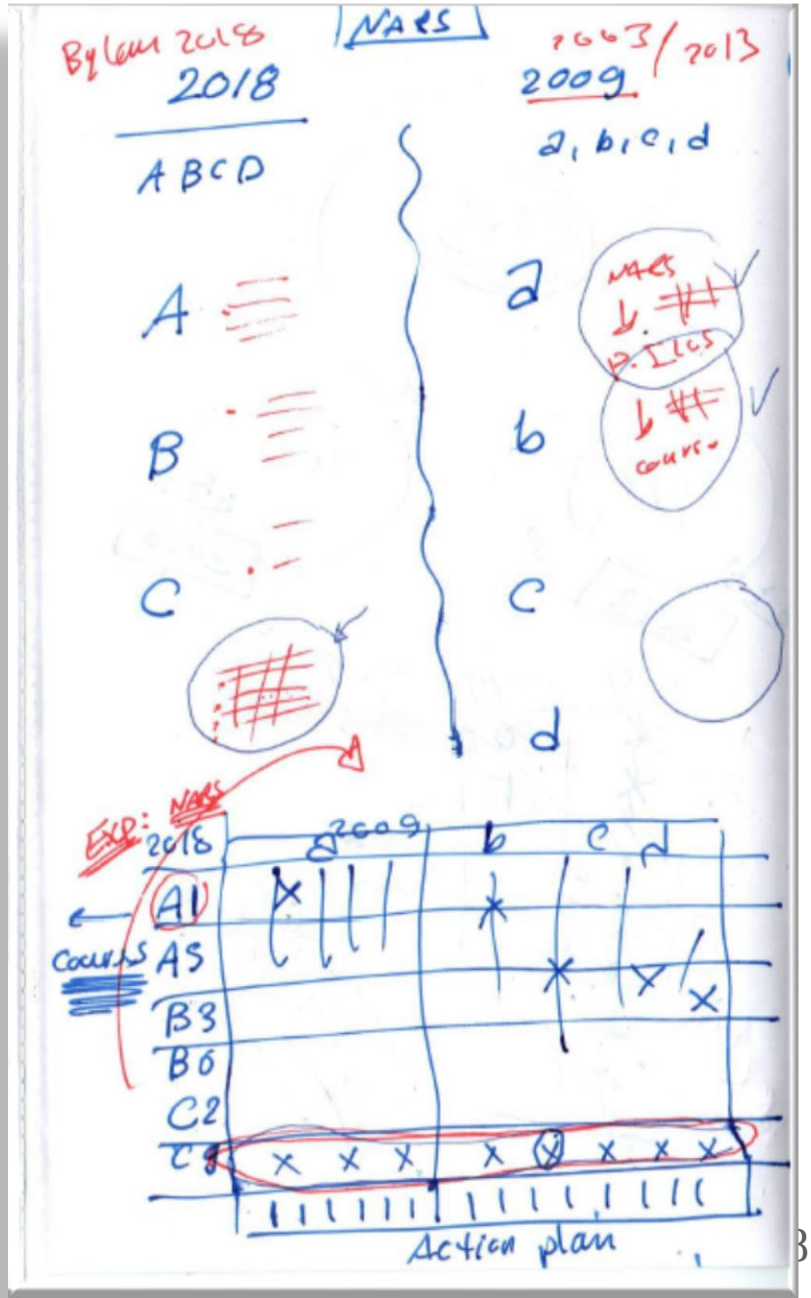
Action Plan

Gap Analysis

1. Gap analysis for EPM program based NARS 2009 & NARS 2018, is performed based in the gained experience as a member in EPM department offering EPM program. This is in addition to the long experience in the Quality of education.



2. Other situation, a brain storm to be conducted to define the exact Gap Analysis among selected members of the program. Mapping matrix to be generated to show the exact relation between individual ILOs and Competences.



Example 01: EPM Program Gap Analysis

Engineering Competences: Level A (NARS 2018)

- **- (3) Cost effective, sustainable design**
- **- (4) Risk management**
- **- (5) Capacity to engage in postgraduate and research studies**
- **- (9) Leader-ship & entrepreneurial skills**

Electrical Engineering: Level B (NARS 2018)

- **- (2) Optimize design**
- **- (5) Adopt Standards & Codes**

Electrical Power & Machine: Level C (ARS)

- **All are the same**

Sample: EPM courses / NARS 2018 Competences

	CODE	COURSE	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Freshman Level	PHM012	Mathematics (1)	X	X								
	PHM013	Mathematics (2)	X	X								
	PHM021	Vibrations and Waves	X	X								
	PHM022	Electricity and Magnetism	X	X			X			X		X
	PHM031	Statics	X	X			X			X		
	PHM032	Dynamics	X	X						X		
	PHM041	Engineering Chemistry	X	X			X		X			
	CSE031	Introduction to Computer Engineering		X	X		X			X		
	ENG011	Fundamentals of Engineering			X					X	X	
	MDP081	Production Engineering			X	X				X		
	MDP011	Engineering Drawing (1)	X	X			X		X			
	CEP011	Projection and Engineeing Graphics								X	X	

A6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;

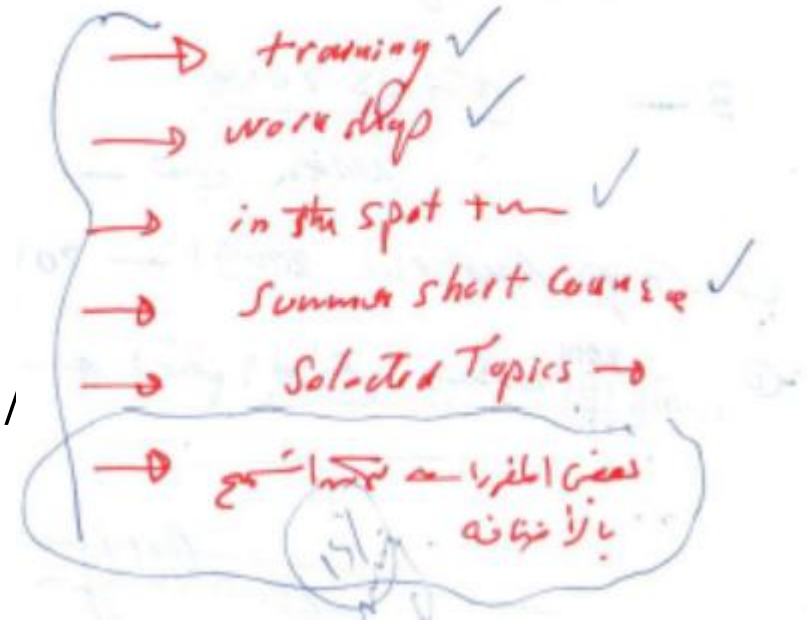
Edit by Dr Haytham Zohny

Sample: EPM courses / NARS 2018 Competences

Code	Course Name	0	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1e	B2e	B3e	B4e	B5e	C1	C2	C3	C4	C5	C6
	SEMESTER 1																						
EPM214	Electrical Systems Simulation												X	X	X			X		X	X		
ECE252	Fundamentals of Communication systems													X	X	X	X						
CSE353	Industrial Networks													X	X	X	X						
CSE211	Introduction to Embedded Systems													X	X	X	X						
ASU111	Human Rights	X																					
	SEMESTER 7																						
EPM321	Transformers and DC Machines																	X	X	X	X		
EPM331	Electrical Transmission Systems																	X	X		X		
EPM341	High Voltage Engineering																	X		X	X		
EPM351	Power Electronics (1)																	X		X	X		X
EPM312	Design of Control Systems												X	X	X	X	X						
ASU114	Selected Topics in Contemporary issues	X																					
	SEMESTER 8																						
EPM322	Alternating Current Machines																	X	X	X	X		
EPM332	Power System Analysis																	X	X	X	X	X	X
EPM333	Electrical Distribution Systems																	X	X		X	X	X

Action Plan - Proposed

To cover the competences not included in NARS 2009 (Bylaw 2003 / 2013)



1. **Short training course (during semester / Summer)**
2. **In the spot training (during Lecture / tutorial / Lab,…)**
3. **Work-shop (during semester / Summer)**
4. **Selected topics courses (if any)**
5. **Some related courses to be adapted.**
6. **Graduation Projects (34 Weeks)**



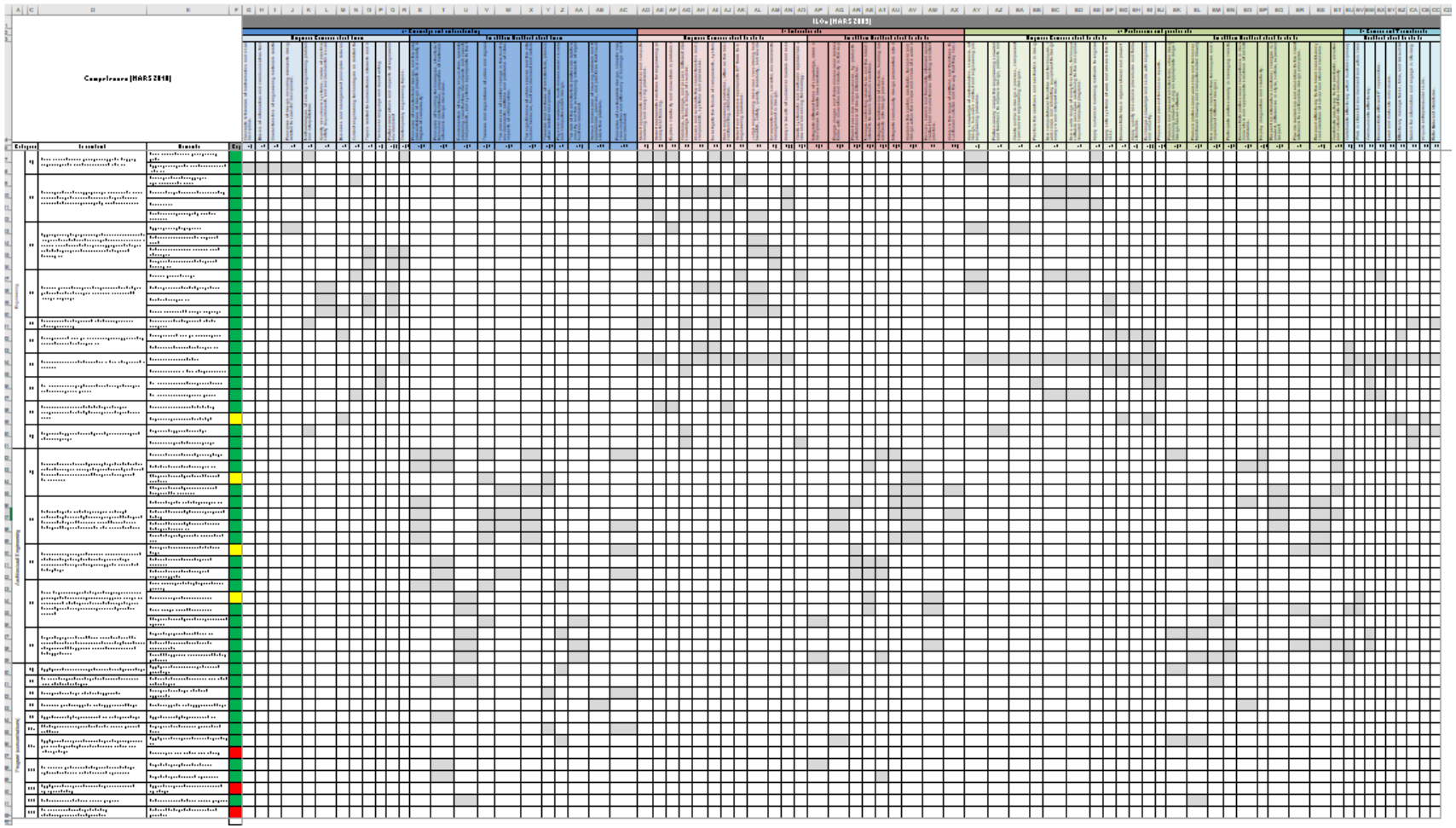
Example 02: ARC

Program Gap Analysis

- **The idea is to breakdown each competency, to sub competences.**
- **Then compare each sub competency with related ILOs (NARS 2009)**
- **Then extract the gap between them.**

Courtesy ARC Quality Team

ARC – Gap Analysis



ARC – Gap Analysis

Category	Full content	Elements
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	Identify, formulate, and solve complex engineering problems
		Apply engineering fundamentals, basic science and mathematics
A2	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.	Develop and conduct appropriate experimentation and/or simulation
		Analyze and interpret data, assess and evaluate findings
		Use statistical analyses
		Use objective engineering judgment to draw conclusions

ARC Action Plan

Action Plan for The Gap Analysis

Program of Architecture Engineering (2003 Bylaw)

Covering the gaps in NARS 2018

Competences fully/partially uncovered		Uncovered or weak parts	Current availability (Courses partially covering the part)	Further Actions	Responsibilities
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	Acquire entrepreneurial and leadership skills.	This part is covered by only general skills (d) as ILOs in the following courses: • ARC471: Feasibility Studies & Project Management • Some Design Studios (teamwork) • ARC499: Graduation Project	Therefore, more professional entrepreneurial and leadership skills should be either: • Given in summer workshops, • Embedded in design studios, or • Embedded in practical training.	
B1	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.	Adequate knowledge of related fine arts.	The following courses cover the relation between architecture and some related fine arts: • ARC111: Visual Design and design Fundamentals • ARC313: Spatial Compositions & Aesthetics in architecture	This part is not clearly covered in ILOs. More related fine arts should be either: • Embedded in courses of design fundamentals, compositions and theories, • Given in extracurricular activities, or • Given in summer workshops.	
B3	Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology and engineering problems associated with building designs.	Eco-responsible, conservation and rehabilitation designs.	Eco-responsibility and conservation only focus on Energy aspects in the following courses: • ARC361: Environmental Design & Energy Conservation • Some Design Studios (design themes) • ARC499: Graduation Project	Aspects for site and resources as well as rehabilitation in design should be either: • Given in summer workshops, or • Embedded in design studios and graduation project.	
B4	Transform design concepts into buildings and	Project financing and cost	Cost control constraints are covered in the	Project financing should be either:	

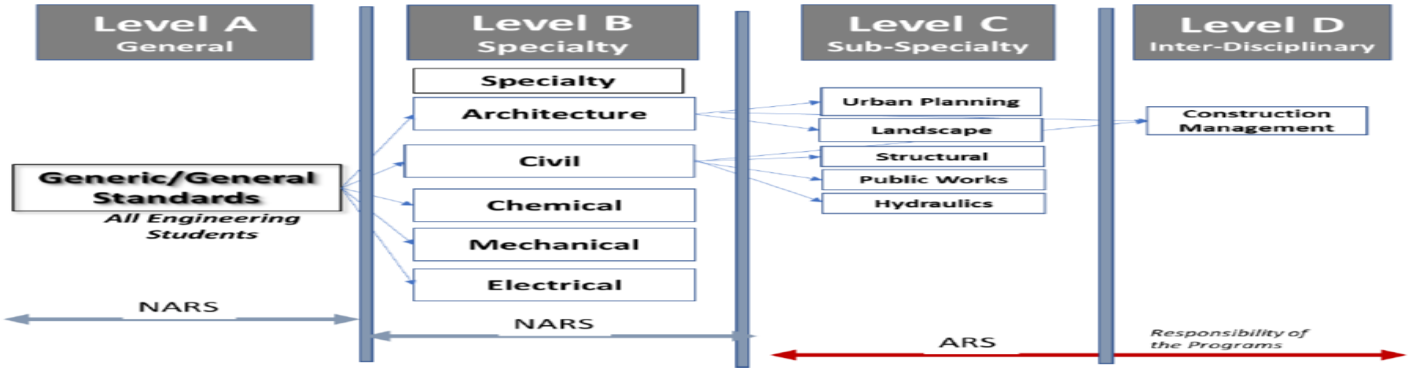
For Programs Adopting ARS

All Interdisciplinary Programs

BLDB – COMM – MATL
MANF – ERGY – MCTA
CESS - LAAR – ENVR

For Programs Adopting ARS

- **The process will be repeated based on the Academic Reference Standard ARS (2013 – 2018)**
- **Comparing program ILOs with Competences A & B & D**



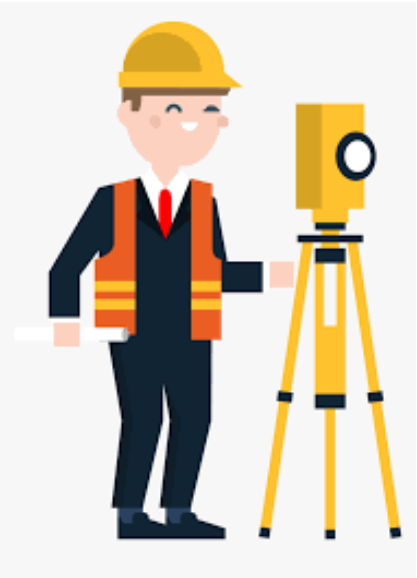
What is the difference between disciplinary and interdisciplinary

- **Cross disciplinary**: viewing one discipline from the perspective of another.
- **Multidisciplinary**: studies degree program allows students to custom design a plan of course work from three disciplines rather than the two disciplines reflected by the traditional major/minor format.
- **Interdisciplinary**: studies involves the combining of two or more academic disciplines into one activity.

Gap Analysis For Interdisciplinary Programs

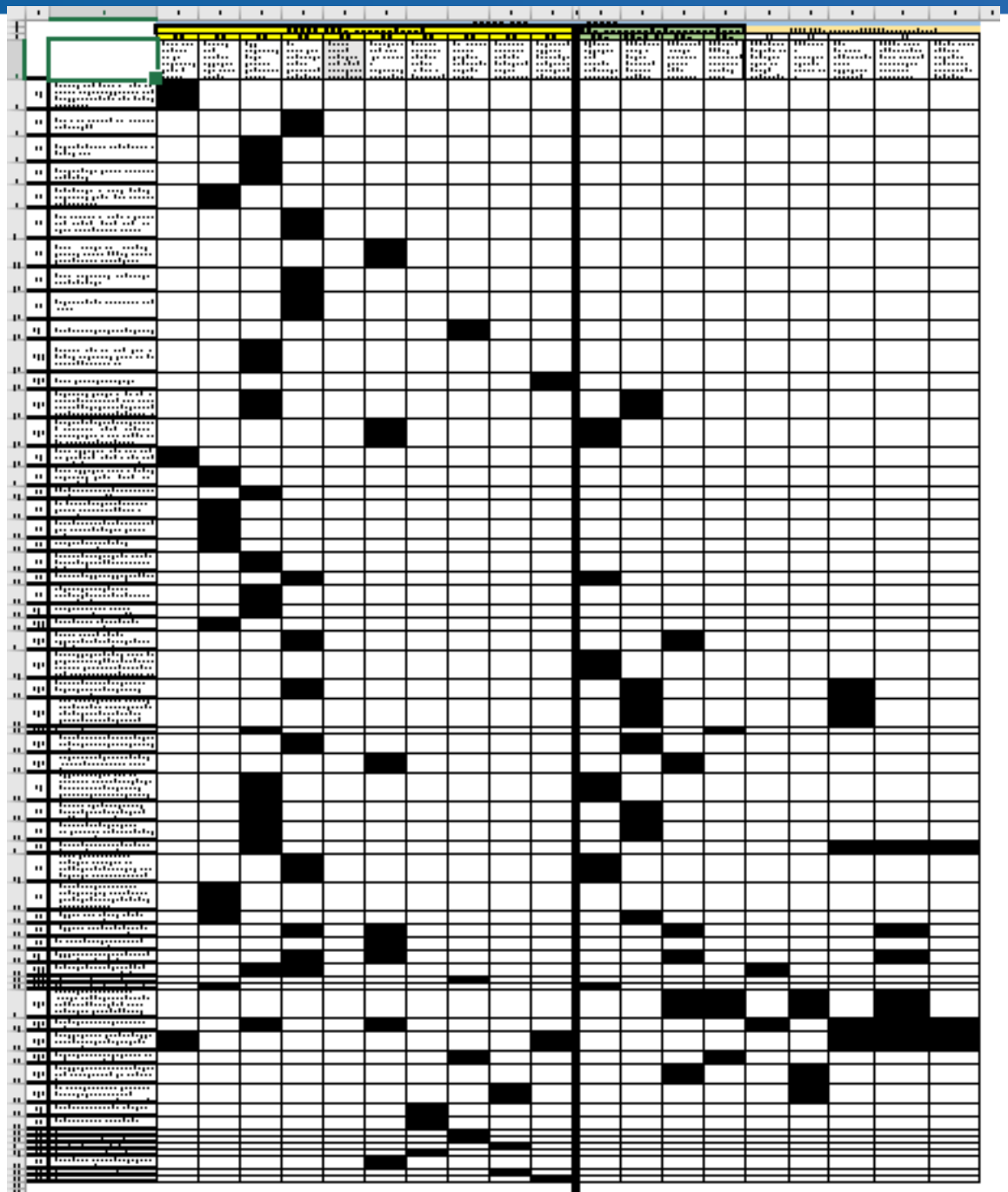
Example 03 – Building Engineering Program BLDG

By Dr Haytham Zohny



Building Engineering Program is interdisciplinary program between Civil & Architecture Engineering





	ILOs	NARS 2018 -Competencies for BLDG Progrm										NARS 2018 -Competencies for Civil Engineering L			
		NARS 2018 -Competencies Level A													
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1c	B2c-80%	B3c	
		Identify, formulate, and solve complex engineering problems by applying	Develop and conduct appropriate experimentation and/or simulation,	Apply engineering design processes to produce cost-effective	Utilize contemporary technologies, codes of practice and standards, quality	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects, taking into	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural	Communicate effectively – graphically, verbally and in writing – with a range of	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership	Acquire and apply new knowledge; and practice self, lifelong and other learning	D1.Select appropriate and sustainable technologies for construction of buildings,	D2.Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and	D3.Plan and manage construction processes; address construction	D4.D biddi contr finan inclu insur
A1	Concepts and theories of mathematics, sciences, engineering projection and	■													
A2	Basics of information and communication technology (ICT)				■										
A3	Properties, behaviour and fabrication of building materials			■											
A4	Principles of design specific to construction and building.			■											
A5	Methodologies of solving building engineering problems, data collection and		■												
A6	Quality assurance systems, codes of practice and standards, health and safety				■										
A7	Projects management, including planning, finance						■								

BLDG – Action Plan

After comparing the program Graduate Attributes in bylaw 2013 (based on NARS 2009) vs NARS 2018 Graduate Attributes (See Appendix 1), we can conclude the following:

Some attributes' weights are relatively low covered in the program bylaw 2013 courses). The suggested action is to try to insert topics or segments in some program courses to increase the weights of these attributes. A list of these attributes is:

> 6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles;
>
> 8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;
>
> 10. Demonstrate leadership qualities, business administration and entrepreneurial skills.

After comparing the program ILOs in bylaw 2013 (based on NARS 2009) vs program competences (based on NARS 2018). (See Appendix 2), we can conclude the following:

All competences are covered by the offered courses except one:

> A5. Practice research techniques and methods of investigation as an inherent part of learning.

To overcome the Gap in attributes and competences a change in Learning and assessment methods in some courses will be adopted

Course	Modification
CES419: Senior Seminar	Each group of students should submit research paper that will be reviewed by a panel of expert professors
CES498: Graduation project (2)	Each project will be showed on a panel in graduation fair and every student discuss his project with the visitors

Important Notice

- **All academic programs to adopt NARS 2018.**
- **Submission to include all previous explained documents.**
- **All action plan future activities to be documented, as they will be documents to be submitted for accreditations.**

Action Plan

Implementation

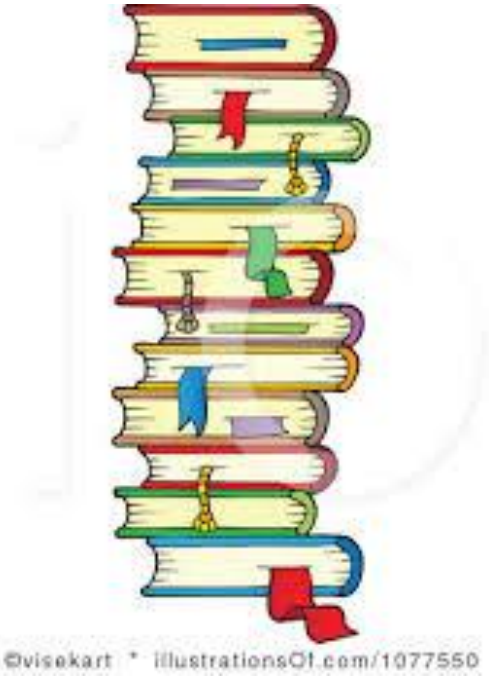
Documentation



1. **Program detail**
2. **Define action plan item (from the list of program action plan)**
3. **Detail of corresponding topic to covered**
4. **Methodology of implementation (short training course, lecture, site visit,……)**
5. **Detail of activities performed**
6. **Supporting documents (attachments , such as class list, supported materials, students feedback, students activities, photos documentations,……..**

References

1. NARS 2009, issued by NAQAAE
2. NARS 2018, issued by NAQAAE
3. Bylaw 2003, ASU FE
4. Bylaw 2013, ASU FE
5. Bylaw 2018, ASU FE
6. CIQAU – ASU FE Documents



المستندات المطلوب تقديمها من كل برنامج

1. خطاب يفيد تبني المعايير الاكاديمية القياسية القومية NARS 2018 مع تحديد موافقة مجلس القسم بتاريخ 00/02/2020
2. مصفوفة مقارنة NARS 2009 – NARS 2018
3. قائمة الفجوة التي تم تحديدها
4. خطة سد الفجوة
5. مرفقات (قائمة مقررات البرنامج لائحة 2003 – 2013 – 2018)

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وحدة التطوير المستمر وتوكيد الجودة

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Thanks