

Program Specifications

“Civil Engineering Program “

“According to NARS 2018”

I. Basic information:

Program name	Civil Engineering
Program type	Single
Study system	Semester System
Bylaw approval	December 2017
Academic standard /approval date	(NARS .2018)/ May 2020
Internal Examiner	
External Examiner	

II. Specialized Information:

1- PROGRAM MISSION

To graduate civil engineers with distinguished competitive level in local, regional and international markets by providing an excellent atmosphere of study represented in high caliber Faculty members and appropriate infrastructure through advanced laboratory equipment and appropriate library facilities. The students thus acquire information and skills concerning latest development in civil engineering applications.

2- PROGRAM VISSION

The mission of the Department of Civil Engineering is to develop highly competent professionals, preparing them for entry-level positions in civil engineering, life-long learning, and societal leadership. The Department is dedicated to provide a dynamic learning environment that emphasizes open-ended design, problem-solving skills, teamwork, communication, and leadership skills.

3- PROGRAM OBJECTIVES

1. Contribute to the preparation of graduates from civil engineers in the field of maintaining good human health with regard to construction, irrigation, infrastructure, environmental conservation and public works.
2. Prepare the graduates to compete with the local and international labor market and meet the requirements of the community to contribute in the design and implementation of construction.
3. Providing students with strong knowledge, and proficient skills in the design, operation, maintenance, and management of different civil engineering projects.
4. Provide the necessary environment for the development of student's sense towards the importance of learning and search for information and develop his/her scientific ability.

5. Apply different software in the analysis and design of different civil engineering projects, and eliminate the gap between academic knowledge and practical experience .
6. Work independently, communicate effectively and experience multidisciplinary projects and multi-cultural environments.
7. Consider the impact of engineering solutions in a global and societal issues and improve the ability to understand other cultures.
8. Engage in lifelong learning and develop the ability to pursue further studies.
9. Use of computers and multimedia in the field of civil engineering.
10. Emphasis on the ethics of the profession and its important role in community development and environmental conservation.

The Attributes of the graduates of the engineering programs should be able to:

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.
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.

4. ACADEMIC STANDARDS

- In the recent past a shift occurred of the Learning Outcomes (LO)-based education to competency-based education (CBE) thus emerged out of a need to focus engineering education on developing learners' competencies and engaging them in real life experiences, and to emphasize learners' abilities and foster the good practices of integrated learning.

- Due to the special engineering education, the NARS will be divided as follows:
 - **Graduate Attributes;** The specific qualities that distinguish the graduate engineer
 - **General (Generic) competencies:** General description of the Graduate
 - ❖ Common Competencies that signify all graduates
 - ❖ All graduates of any engineering faculty should be able to master.
 - ❖ These compromise the basis for the development of the programs.

III- PROGRAM ACADEMIC REFERENCE STANDARDS

- The 2nd edition National Academic Reference Standards (NARS-2018) for engineering has been adapted as a reference for the program as follows:

1-Competencies of Engineering Graduate

The Engineering Graduate must be able to:

- A1. Identify, formulate, and solve complex engineering problems by applying 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.
- A3. 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.
- A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
- A5. Practice research techniques and methods of investigation as an inherent part of learning.
- A6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.
- A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.

A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

A9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.

A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

2-Competencies Of civil Engineering Graduate

In addition to the Competencies for All Engineering Programs the BASIC Civil Engineering graduate and similar programs must be able to:

B1. Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.

B2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.

B3. Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.

B4. Deal with biddings, contracts and financial issues including project insurance and guarantees.

3- Relationship Between Academic Standards and Objectives

Competencies		Program objectives									
		O1	O2	O3	O4	O5	O6	O7	O8	O9	O10
General Engineering Competencies	A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	x		x	x		x				
	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.	x	x			x		x		x	
	A3. 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	x	x	x		x		x	x		x

Competencies	Program objectives									
	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10
development.										
A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	X	X	X		X				X	
A5. Practice research techniques and methods of investigation as an inherent part of learning.	X				X	X		X	X	
A6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	X	X	X				X			
A7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	X		X			X				X
A8. Communicate effectively – graphically, verbally and in writing – with a range of	X					X	X			

Competencies		Program objectives									
		O1	O2	O3	O4	O5	O6	O7	O8	O9	O10
	audiences using contemporary tools.										
	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	X				X	X	X	X		
	A10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	X		X				X	X		X
Civil Engineering Competencies	B1. Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	X	X	X	X			X	X		

Competencies	Program objectives									
	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10
B2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.	X	X			X		X	X	X	
B3. Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.		X	X			X	X			
B4. Deal with biddings, contracts and financial issues including project insurance and guarantees.		X	X							

Relationship Between Academic Standards and Attributes

No.	Attributes	COMPETENCIES OF ENGINEERING										Comp. Civil			
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4
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	X			X					X		X		X	
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;		X					X	X		X		X	X	
3	Behave professionally and adhere to engineering ethics and standards.										X	X			X
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.	X						X			X			X	X
5	Recognize his/her role in promoting the engineering field and contribute to the development of the profession and the community.										X	X	X		
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;	X									X	X			X
7	Use techniques, skills and modern engineering tools necessary					X		X	X				X	X	X

No.	Attributes	COMPETENCIES OF ENGINEERING										Comp. Civil				
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	
	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;							X					X	X		X
9	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;	X	X								X	X	X	X	X	X
10	Demonstrate leadership qualities, business administration and entrepreneurial skills.			X				X		X	X		X			X

4- Relationship Between CBE's And Courses

No.	Course Code	Course	COMPETENCIES OF ENGINEERING										COMP. Civil			
			A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4
Preparatory year - First term																
1	BAS 011	Mathematics 1	*	*									*			
2	BAS 021	Physics 1	*	*									*			
3	BAS 041	Engineering Chemistry	*				*						*			
4	MED 011	Engineering Drawing & Projection	*					*					*			
5	HUM 011	Arabic Language							*	*						
6	HUM 012	English Language 1							*	*						
7	MED 021	History of Engineering & Technology						*		*						
Preparatory year - Second term																
8	BAS 012	Mathematics 2	*	*									*			

No.	Course Code	Course	COMPETENCIES OF ENGINEERING										COMP. Civil				
			A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	
9	BAS 022	Physics 2	*	*									*				
10	BAS 031	Mechanics	*	*			*						*				
11	HUM 052	Human Rights								*	*						
12	MED 022	Principles of Manufacturing Engineering	*		*								*				
13	HUM 013	English Language 2								*	*						
14	ELC 021	Computer Programming	*	*		*							*				
First year - First term																	
15	CIS 111	Institute Elective A (A1)	*		*	*							*				
16	CIS 141	Properties of Materials 1	*	*		*							*	*			
17	CIS 112	Structure Analysis 1	*				*							*			
18	CIS 113	Solid Mechanics	*										*	*			
19	CIS 151	Engineering Geology	*										*	*			
20	CIW 111	Civil Drawing	*						*					*			
21	HUM 182	Analysis & Research Skills	*					*				*					
First year - Second term																	
22	B3	Institute Elective B	*							*			*				
23	BAS 111	Mathematics 3	*					*					*				
24	CIS 142	Properties of Materials 2		*				*					*		*		

No.	Course Code	Course	COMPETENCIES OF ENGINEERING										COMP. Civil				
			A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	
25	CIS 114	Structure Analysis 2	*				*							*			
26	CIW 121	Engineering Surveying	*				*					*	*	*			
27	IEN 131	Monitoring & Quality Control Systems	*			*			*			*					
28	HUM - A2	General Elective A	*								*						
Second year - First term																	
29	BAS 211	Mathematics 4	*				*					*					
30	BAS 212	Statistics & Probability Theory	*				*					*					
31	CIS 221	Design of Concrete Structures 1	*		*	*					*	*	*	*	*		
32	CIS 241	Concrete Technology		*	*	*						*	*			*	
33	CIW 112	Hydraulics	*				*						*				
34	CIW 216	Topographic Surveying	*	*	*						*		*	*			
35	CIS 211	Structural Analysis 3	*				*						*				
Second year - Second term																	
36	291	Field Training 1								*	*				*	*	
37	CIS 231	Design of Steel Structures 1	*		*	*					*	*	*	*	*		

No.	Course Code	Course	COMPETENCIES OF ENGINEERING										COMP. Civil				
			A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	
38	CIS 251	Soil Mechanics	*				*						*				
39	CIS 212	Structure Analysis 4		*									*			*	
40	*	Hydrology	*										*				
41	ARC 131	Building Construction 1					*					*					
42	HUM A4	General Elective B		*				*			*						
Third year - First term																	
43	CIS 321	Design of Concrete Structures 2	*		*	*				*	*	*	*	*			
44	CIS	General Civil Elective A			*	*			*		*		*		*		
45	CIW 211	Irrigation Network Engineering			*			*						*			
46	CIW 231	Environmental Engineering		*					*				*		*		
47	CIW 331	Environmental Impact of Projects		*											*		
48	IEN 351	Engineering Economics	*		*												*
49	CIS 311	Structural Analysis 5		*								*	*				
Third year - Second term																	
50	391	Field Training 2			*						*			*	*		

No.	Course Code	Course	COMPETENCIES OF ENGINEERING										COMP. Civil				
			A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	
51	CIS 331	Design of Steel Structures 2	*		*	*					*	*	*	*	*		
52	CIS 351	Foundation Engineering 1	*			*	*		*			*		*			
53	CIW 311	Design of Irrigation Structures	*				*						*	*			
54	CIW 341	Highway Engineering	*				*						*	*			
55	HUM 181	Communication & Presentation Skills							*	*		*					
56	HUM 351	Professional Ethics							*	*		*					
Fourth year - First term																	
57	CIS 491	Project 1		*			*		*	*			*	*	*	*	*
58	CIS 361	Construction Management				*		*							*	*	*
59	CIW 332	Sanitary Engineering	*										*	*	*	*	
60	CIS 451	Foundation Engineering 2	*			*	*		*			*		*			
61	CIS 421	Design of Concrete Structures 3	*		*	*				*	*	*	*	*			
62	IEN 314	Project Management			*			*	*							*	
63	CIS	General Civil Elective B				*	*		*			*	*		*	*	
Fourth year - Second term					*			*						*			

No.	Course Code	Course	COMPETENCIES OF ENGINEERING										COMP. Civil				
			A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	
62	CIS 492	Project 2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
63	CIS	General Civil Elective C				*										*	
64	CIW	General Civil Elective D			*												*
65	CIS 431	Design of Bridges	*		*	*							*	*			
66	HUM 111	Technical Report Writing	*	*								*					
67	HUM 381	Principles of Negotiation								*	*	*					*

5- Hours distribution according to NARS categorization

No.	Course Code	Course	Subject Category							(lectures+ tutorials/lab.)
			HSS	MBS	BES	AED	CAICT	Proj&prac.	Discre.	
Preparatory year - First term										
1	BAS 011	Mathematics 1	0	4	0	0	0	0	0	4
2	BAS 021	Physics 1	0	5	0	0	0	0	0	5
3	BAS 041	Engineering Chemistry	0	0	5	0	0	0	0	5
4	MED 011	Engineering Drawing & Projection	0	0	7	0	0	0	0	7
5	HUM 011	Arabic Language	2	0	0	0	0	0	0	2
6	HUM 012	English Language 1	3	0	0	0	0	0	0	3
7	MED 021	History of Engineering & Technology	1	0	0	0	0	0	0	1
Preparatory year - Second term			6	9	12	0	0	0	0	27
8	BAS 012	Mathematics 2	0	4	0	0	0	0	0	4

No.	Course Code	Course	Subject Category							(lecture s+ tutorial s/lab.)
			HSS	MBS	BES	AED	CAICT	Proj&p rac.	Discre.	
9	BAS 022	Physics 2	0	5	0	0	0	0	0	5
10	BAS 031	Mechanics	0	0	5	0	0	0	0	5
11	HUM 052	Human Rights	1	0	0	0	0	0	0	1
12	MED 022	Principles of Manufacturing Engineering	0	0	4	0	0	0	0	4
13	HUM 013	English Language 2	3	0	0	0	0	0	0	3
14	ELC 021	Computer Programming	0	0	0	0	4	0	0	4
First year - First term			4	9	9	0	4	0	0	26
15	A1	Institute Elective 1	0	0	3	0	0	0	0	3
16	CIS 141	Properties of Materials 1	0	3	3	0	0	0	0	6
17	CIS 112	Structure Analysis 1	0	3	1	0	0	0	0	4
18	CIS 113	Solid Mechanics	0	2	2	0	0	0	0	4
19	CIS 151	Engineering Geology	0	0	3	0	0	0	0	3
20	CIW 111	Civil Drawing	0	5	0	0	0	0	0	5
21	HUM 182	Analysis & Research Skills	3	0	0	0	0	0	0	3
First year - Second term			3	13	12	0	0	0	0	28
22	B3	Institute Elective B	0	3	0	0	0	0	0	3
23	BAS 111	Mathematics 3	0	4	0	0	0	0	0	4
24	CIS 142	Properties of Materials 2	0	2	2	2	0	0	0	6

No.	Course Code	Course	Subject Category							(lecture s+ tutorial s/lab.)
			HSS	MBS	BES	AED	CAICT	Proj&p rac.	Discre.	
25	CIS 114	Structure Analysis 2	0	3	1	0	0	0	0	4
26	CIW 121	Engineering Surveying	0	2	2	0	1	0	0	5
27	IEN 131	Monitoring & Quality Control Systems	1	0	0	0	0	0	0	1
28	HUM - A2	General Elective A	2	0	0	0	0	0	0	2
Second year - First term			3	14	5	2	1	0	0	25
29	BAS 211	Mathematics 4	0	4	0	0	0	0	0	4
30	BAS 212	Statistics & Probability Theory	0	3	0	0	0	0	0	3
31	CIS 221	Design of Concrete Structures 1	0	1	1	1	0	1	0	4
32	CIS 241	Concrete Technology	0	0	2	1	1	0	0	4
33	CIW 112	Hydraulics	0	2	2	0	0	0	0	4
34	CIW 216	Topographic Surveying	0	0	1	1	1	0	0	3
35	CIS 211	Structural Analysis 3	0	1	2	1	0	0	0	4
Second year - Second term			0	11	8	4	2	1	0	26
36	291	Field Training 1	0	0	0	1	2	2	1	6
37	CIS 231	Design of Steel Structures 1	0	0	1	1	0	1	1	4

No.	Course Code	Course	Subject Category							(lecture s+ tutorial s/lab.)
			HSS	MBS	BES	AED	CAICT	Proj&p rac.	Discre.	
38	CIS 251	Soil Mechanics	0	1	2	1	0	0	0	4
39	CIS 212	Structure Analysis 4	0	1	2	1	0	0	0	4
40	*	Hydrology	0	1	2	0	0	0	0	3
41	ARC 131	Building Construction 1	0	1	2	1	1	0	0	5
42	HUM A4	General Elective B	2	0	0	0	0	0	0	2
Third year - First term			2	4	9	5	3	3	2	28
43	CIS 321	Design of Concrete Structures 2	0	0	1	2	1	1	0	5
44	CIS	General Civil Elective A	0	0	0	4	0	0	0	4
45	CIW 211	Irrigation Network Engineering	0	0	0	3	1	1	0	5
46	CIW 231	Environmental Engineering	0	0	1	2	0	0	0	3
47	CIW 331	Environmental Impact of Projects	0	0	1	2	0	0	0	3
48	IEN 351	Engineering Economics	0	1	0	2	1	0	0	4
49	CIS 311	Structural Analysis 5	0	0	1	2	1	0	0	4
Third year - Second term			0	1	4	17	4	2	0	28
50	391	Field Training 2	0	0	0	0	2	2	2	6

No.	Course Code	Course	Subject Category							(lecture s+ tutorial s/lab.)
			HSS	MBS	BES	AED	CAICT	Proj&p rac.	Discre.	
51	CIS 331	Design of Steel Structures 2	0	0	0	1	1	1	1	4
52	CIS 351	Foundation Engineering 1	0	0	0	2	1	1	0	4
53	CIW 311	Design of Irrigation Structures	0	0	0	2	0	2	0	4
54	CIW 341	Highway Engineering	0	0	0	3	1	0	0	4
55	HUM 181	Communication & Presentation Skills	2	0	0	0	0	0	0	2
56	HUM 351	Professional Ethics	1	0	0	0	0	0	0	1
Fourth year - First term			3	0	0	8	5	6	3	25
57	CIS 491	Project 1	0	0	0	0	1	3	1	5
58	CIS 361	Construction Management	0	0	0	2	0	0	1	3
59	CIW 332	Sanitary Engineering	0	0	0	3	0	0	0	3
60	CIS 451	Foundation Engineering 2	0	0	0	1	1	1	1	4
61	CIS 421	Design of Concrete Structures 3	0	0	0	1	1	1	1	4
62	IEN 314	Project Management	0	0	0	2	1	0	0	3
63	CIS	General Civil Elective B	0	0	0	3	0	0	1	4
Fourth year - Second term			0	0	0	12	4	5	5	26

No.	Course Code	Course	Subject Category							(lecture s+ tutorial s/lab.)
			HSS	MBS	BES	AED	CAICT	Proj&p rac.	Discre.	
62	CIS 492	Project 2	0	0	0	0	3	3	2	8
63	CIS	General Civil Elective C	0	0	0	2	0	0	2	4
64	CIW	General Civil Elective D	0	0	0	2	0	1	1	4
65	CIS 431	Design of Bridges	0	0	0	2	0	1	1	4
66	HUM 111	Technical Report Writing	3	0	0	0	0	0	0	3
67	HUM 381	Principles of Negotiation	2	0	0	0	0	0	0	2
			5	0	0	6	3	5	6	25
Total Hours			26	61	59	54	26	22	16	264

Subject Area	NARS Characterization		No. of contact hours	Program Characterization %
	Tolerance	%		
HSS (Univ. Req.)	9-12.	11	26	9.85
MBS	20-26	21	61	23.11
BES	20-23	21	59	22.35
AED	20-22	21	54	20.45
CAICT	9-12.	10	26	9.85
Projects and Practice	8-10.	9	22	8.33
SUBTOTAL	92-94	93	92-94	93.94
Discretionary Subjects	6-8.	7	16	6.06
Total	100%	100%	264	100%

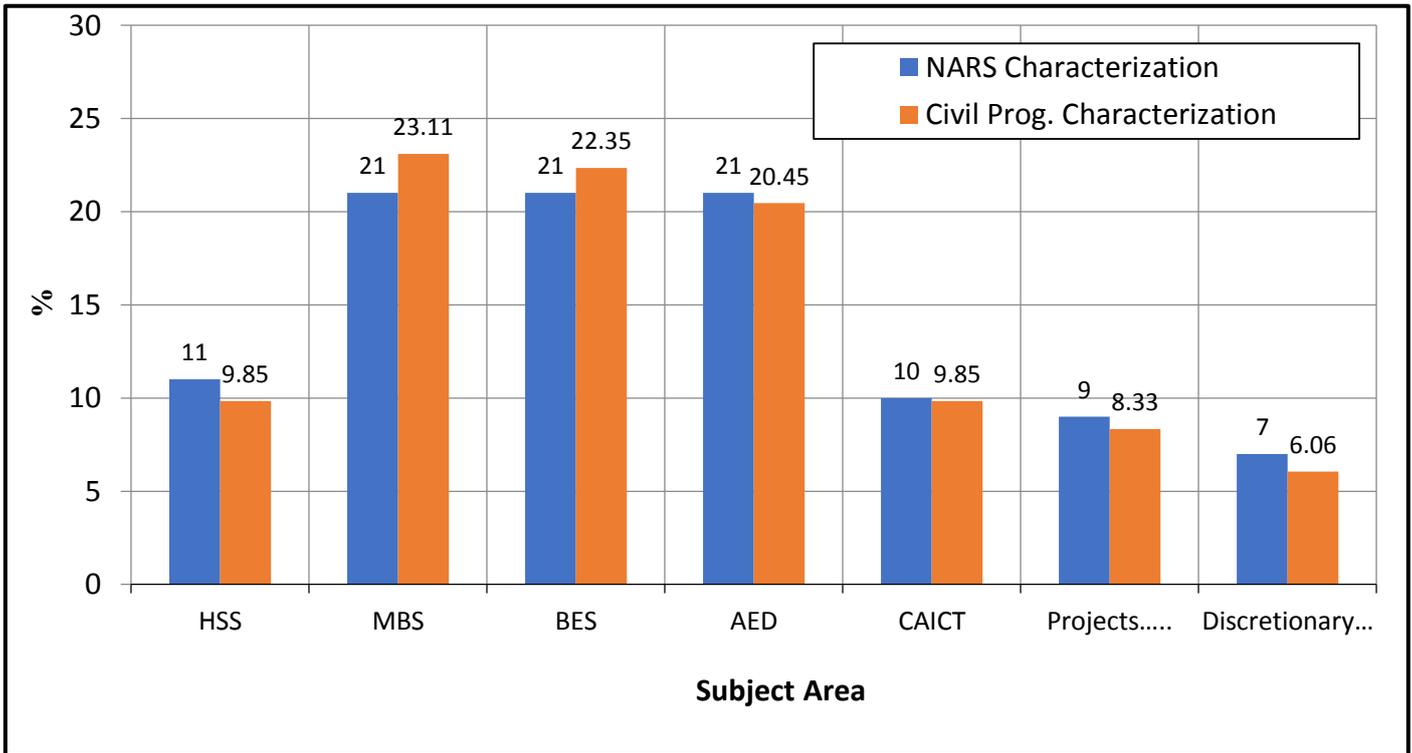


Figure (1): Comparison between subject area of civil Engineering Program and NARS 2018

6-Teaching and Learning Methods

COMPETENCIES BASED EDUCATION (CBEs)		Teaching and Learning Methods																		
		Lectures Presentations and Movies	Discussions	Tutorials	Practical /lab	Problem solving	Brain storming	Report	Site visits	Cooperative	Discovering	Case study								
COMPETENCIES ENGINEERING	By the end of the program, student should be able to:																			
	A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	x	x	x	x		x	x												
	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.		x		x	x						x	x	x						
	A3. 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.	x	x	x	x		x		x											x
	A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	x	x				x	x									x			x
	A5. Practice research techniques and methods of investigation as an inherent part of learning.			x			x		x		x	x	x							
	A6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.				x							x	x	x	x					
	A7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.				x			x				x	x							
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.		x	x				x											x		

COMPETENCIES BASED EDUCATION (CBEs)		Teaching and Learning Methods											
		Lectures	Presentations and Movies	Discussions	Tutorials	Practical /lab	Problem solving	Brain storming	Report	Site visits	Cooperative	Discovering	Case study
CIVIL ENGINEERING	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.		X		X	X			X			X	
	A10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.					X	X		X		X		
	B1. Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	X	X	X	X	X	X						
	B2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.	X	X	X	X	X	X					X	X
	B3. Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.	X		X	X	X	X			X		X	X
	B4. Deal with biddings, contracts and financial issues including project insurance and guarantees.	X		X	X	X	X						

7- Assessment Methods

COMPETENCIES BASED EDUCATION (CBEs)		Assessment Methods									
		Written Exam	Presentation assessment	Oral Exam	Tutorial assessment	Laboratory Test	Report assessment	Quiz assessment	Project assessment	Case study	Model assessment
COMPETENCIES ENGINEERING	A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	x	x	x	x		x	x			
	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.	x	x	x	x	x	x	x	x	x	
	A3. 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.	x	x	x	x		x	x		x	x
	A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	x	x	x	x		x	x	x		x
	A5. Practice research techniques and methods of investigation as an inherent part of learning.					x			x	x	x
	A6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.			x	x					x	x

COMPETENCIES BASED EDUCATION (CBEs)		Assessment Methods									
		Written Exam	Presentation assessment	Oral Exam	Tutorial assessment	Laboratory Test	Report assessment	Quiz assessment	Project assessment	Case study	Model assessment
	A7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.		x				x			x	x
	A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.		x	x					x	x	
	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	x				x			x	x	x
	A10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.			x			x		x		x
CIVIL ENGINEERING	B1. Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	x	x	x	x		x	x			
	B2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.	x	x	x	x		x		x	x	

COMPETENCIES BASED EDUCATION (CBEs)		Assessment Methods									
		Written Exam	Presentation assessment	Oral Exam	Tutorial assessment	Laboratory Test	Report assessment	Quiz assessment	Project assessment	Case study	Model assessment
	B3. Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.	x	x	x	x		x	x	x	x	
	B4. Deal with biddings, contracts and financial issues including project insurance and guarantees.	x	x	x			x	x	x	x	x

Program coordinator	Prof. Dr. /
Head of the Department	Prof. Dr. /
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