Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation
International Accreditation Dept.

Academic Program Specification Form For The Academic Year 2019-2020

University: Technology

College: Chemical Engineering Department / Chemical and

Environmental Pollution Engineering Branch
Number of Departments in the College: 3
Date Of Form Completion: update 2019

Assistant Prof. Dr. Khalid A. Sukkar Assistant Prof. Dr. Zainab Y. Shnain Dr. May Ali Muslim

Dean's Name JA. Sukka

Dean's Assistant For Scientific Affairs The College Quality Assurance and University Performance Manager

Date: 4 / // / 2019

Date: 5 / 1 / 2019

Date: 5 / U / 2019

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Quality Assurance and University Performance Manager

Date: /

/ 2019

Signature

TEMPLATE FOR PROGRAMME SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the programme.

University of Technology
Chemical Engineering Department/
Chemical and Environmental Pollution Engineering Branch
B.Sc. in chemical engineering
4 years full time
None
October 2019
II .

^{*}Develop students' intellectual and reasoning powers, their ability to perceive the broader perspective, and their problem-solving skills through the integration of a broad range of subject material

^{*}Produce graduates capable of contributing to the profession of Environmental chemical engineering in the

^{*}Teach students to communicate clearly, to argue rationally and to draw conclusions based on a rigorous, analytical and critical approach to data and systems.

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

- A1: Mathematics, science and engineering underlying the practice of chemical engineering.
- A2: The interactions involved in chemical engineering systems and analytical and computational tools to deal with these.
- A3: The scope of chemical engineering from the molecular to the large scale.
- A4: The economic, management and statutory requirements involved in the practice of chemical engineering.

B. Subject-specific skills

- B. Subject-specific skills
- B1: Use mathematics, science and engineering to support theoretical and practical analysis of process operations.
- B2: Employ concepts from the applied and engineering sciences creatively to design industrial processes and equipment.
- B3: Show awareness of the significance of scale-up techniques in design work.

Teaching and Learning Methods

Lectures, Tutorials, Example Classes, Practical Applications, reports, Weekly homework problems.

Assessment methods

Most of the curriculum supports B1: classroom time includes tutorial sessions, where students attempt problems. In private study, students develop skills by writing laboratory reports, and tackling problems set by the tutor or in past examinations. B2 and B3 are of increasing importance as students' progress from level 1 up to 3.

C. Thinking Skills

- Perform complete mass and energy balances for chemical engineering plants.
- C2. Apply the principles of chemical equilibrium and process thermodynamics to systems with chemical reactions.
- C3. Chemical engineering graduates will be able to write coherent, concise, and accurate technical reports.
- C4. Chemical engineering graduates will be able to use computers effectively for solving chemical engineering problems.

Teaching and Learning Methods

Written method implies the following forms of activity: copying, taking notes, composing theses, writing essays, etc.

Laboratory method implies the following forms of activity: conducting experiments, showing video materials, etc.

Practical methods unite all the teaching forms that stimulate developing practical skills in students. Explanatory method is based on discussing a given issue.

Designing and presenting a project.

Discussion/debates. This is the most widely spread method of interactive teaching.

Case study – the teacher discusses concrete cases together with the students and they study the issue thoroughly.

Assessment methods

partial test (Oral questions :- multiple choice ,alternative response), Open questions that have a definite answer , or do not have a definite answer , Quizzes, homework problems , Mid. term exams , Final exam.

D. General and Transferable Skills (other skills relevant to employability and personal development)

- D1: Manipulate, sort and present data in forms useful for understanding. Select, interpret and validate data, identifying possible errors and inconsistencies
- D2: Communicate clearly the findings of experiments, projects and other assignments using written reports, oral and visual presentations.
- D3: Work effectively in a team, recognizing the roles played by different team members.

Teaching and Learning Methods

Lectures, Tutorials, Example Classes, Practical Applications, reports, Weekly homework problems.

Assessment Methods

partial test (Oral questions :- multiple choice ,alternative response), Open questions that have a definite answer , or do not have a definite answer , Quizzes, homework problems , Mid. term exams , Final exam.

First Year
Chemical and Environmental Engineering Branch

Symbol	Prerequisite	Credits	No. of Practical Hours	No. of Theoretical Hours	Subject
WRKS101	None	1	6	0	Workshops I
ENGL102	None	2	0	2	English Language I
HRDE103	None	2	0	2	Human Rights & Democracy
COMP104	None	2	2	1	Computer Science
WRKS105	WRKS101	1	6	0	Workshops II
ENGL106	ENGL102	2	0	2	English Language II
	None	2	0	2	Elective
MATH111	None	3	0	3	Mathematics I
PHYS112	None	3	0	3	Physics
CHEM113	None	3	2	2	Chemistry I
ENDR114	None	2	3	1	Eng. Drawing I
MATH115	MATH111	3	0	3	Mathematics II
MECH116	PHYS112	2	0	2	Mechanics
ENDRI17	ENDR114	2	3	1	Eng. Drawing II
COPR118	COMP104	2	2	1	Computer Programing I
CHEM122	CHEM113	3	2	2	Chemistry H
		38	26	30	Total

Second Year

Chemical and Environmental Engineering Branch

No.		First Semester	+			
	Code Course	Subject	L	P	T	Credits
1	CES.F.221	Engineering Mathematics I	2	0	1	2
2	CES.F.,231	Energy Balance	2	0	1	2
3	CES.E.233	Fluid Flow 1	2	2	1	3
4	CES.E.235	Physical Chemistry and colloid science	2	2	1	3
5	CES.E.211	Computer Programming II	1	2	1	2
6	CES.E.223	Materials Eng. I	2	0	1	2
.7	CES.E.237	Fuel's Technology	2	2	0	3
8	CES.E.213	Democracy	- 1	0	()	1
		Total	14	- 8	Ď	18
		Hours/week		.28		

No.		Second Semest	er			
	Code Course	Subject	L	P	1	Credits
1	CES.E.222	Engineering Mathematics	2	0	1	2
2	CES.E.232	Material &Energy Balance	2	0	1	2
3	CES.E.234	Fluid Flow II	2	2	-1	3
4	CES.E.236	Physical Chemistry	2	0	1	2
5	CES.E.212	Computer Programming III	1	2	1	2
6	CES.E.224	Materials Eng.H	2	2	- 1	3
7	CES.F.238	Fundamentals of Environmental Engineering	2	0	0	2
8	CES.E.225	Eng. Statistics	2	2	1	3
		Total	15	8	7	19
		Hours/week		3.0		

13. Personal Development Planning

- Formative assessments
- · Independent research projects
- · Group projects
- · Assessed seminar presentations
- · Reflective commentaries / logs
- · Portfolio-based assessment

14. Admission criteria.

- 1- The applicant must have completed a minimum of 12 years of education in school and passed all the subjects in the Higher Secondary examination.
- 2- All applicants must complete 17 years of age on or before the 31st of December in the year of admission.
- 3- Admission to higher education in Iraq is granted to students with a Secondary School Certificate. No entrance examination is required for admission to higher education, yet admission to engineering does require high scores in the Secondary School Certificate examination, these scores are determined annually by the Ministry of Higher Education and Scientific Research.

15. Key sources of information about the programme

please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed Curriculum Skills Map

	Year /			First	Year						
	Course Code										
	Course		Workshops I	English Language I	Human Rights & Democracy	Computer Science	Mathematics I	Physics	Chemistry I I	Eng. Drawing	
Core	Option Title				0						
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rogra		A4	<					<	<	<	
mme	Sul	B 1	<		2						
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)utcon	III	B4	2	4	<			<			
nes		CI						<	<		
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	General and Transferable Skills (or) Other skills relevant to employability and personal development	D3		2							
2	ble Skill employs	D4			~						
	s (or) bility	D5	200		4						

please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

Programme Learning Outcomes

					Year	First			Year / Level	
				NAME OF THE PARTY					Course Code	
Chemistry II	Computer Programing I	Eng. Drawing II	Mechanics	Mathematics II	English Language	Workshops II	Elective		Course Title	
					6			(0)	obio obio	Core
	1	<	<		~	<	~	A1	- X	
				<				A2	Knowledge and understanding	
								A3	ge and anding	
		~	<					A4	2015000	
								BI	Subje	
			<	<	<	<		B2	Subject-specific skills	
			<					ВЗ	ific ski	
			<		<	<		В4	5	
			<				<	C1		
								22	Think	
					٨	V		C	Thinking Skills	
			<			<		C4		
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						~		D2	General and Transferable Skills (or) Other skills relevant to employability and personal development	
936					~			D3	ransfera levant to evelopm	
								D4	ble Skil employ ent	
						Marine.		D5	ls (or) ability	

	Year	l evel	- Control		Second	Year	1st semest er				
	Course			CES.E.221	CES.E.231	CES.E.233	CES.E.235 Physical Chemist colloid s	CES.E.211	CES.E.223	CES.E.237	CES.E.213
please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed Programme Learning Outcomes	Course Title			Engineering Mathematics I	Energy Balance	Fluid Flow I	Physical Chemistry and colloid science	Computer Programming II	CES.E.223 Materials Eng. I	Fuel's Technology	CES.E.213 Democracy
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at boxe	Knowk		A2	~	1	1		2			
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where individual Programme Lea Programme Learning Outcomes			Λ4						2		
viduai ne Lea	Subj		B1		2	1		~		~	
Progr	Subject-specific skills		B2	~	2	1	4	~			2
Outco	ific skil		B3		2	1		2		18	
mes	5		B4		~	10		4			
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	General and Transferable Skills (or) Other skills relevant to employability and personal development		3 D4								1
	ills (or) yability		4 D5					2		102.5	

please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

			er	St	Year	Second		Level	Year	
CES.E.225	CES,E.238	CES.E.224	CES.E.212 Computer Programm	CES.E.236 Physical Chemist	CES.E.234	CES.E.232 Material &Energy	CES.E.222		Course Code	
CES.E.225 Eng. Statistics	CES.E.238 Fundamentals of Environmental Engineering	CES.E.224 Materials Eng.	Computer Programming	Physical Chemistry	Year CES.E.234 Fluid Flow II	Material &Energy	Engineering Mathematics II		Course Tide	
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please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed Core Knowledge and **Programme Learning Outcomes** Curriculum Skills Map General and Transferable Skills (or)

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Course		CES.E.421 Project I	CES.E.431 Unit	CES.E.433 Process Dynamic	CES.E.435	CES.E.423	CES.E.437	CES.E.438
Course Title		Project I	Unit Operations II	Process Dynamics	CES.E.435 Water and Wastewater Treatment	CES.E.423 Industrial & Petroleum	CES.E.437 Catalysis and Catalytic Eng.	Environmental Engineering Management and Ethics
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Year	CES.E.436	Water and Wastewater	C	~	2	~	2	2	2	2			-			2				
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	CES.E.439	Corrosion		4					~			4	~			4				
	CES.E.422	Project II		~	2		2				4	2		4	Z.	2	2	~	4	2

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please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

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CES.E.3313	CES.E.3311	CES.E.339	CES.E.337	semes- CES.E.335	CES.E.333	CES.E.321	CES.E.331		Course Code	
CES.E.3313 Equipment Design	Industrial Safety	Air Pollution Control	Heat Transfer I	Chemical Reaction Kinetics	Mass Transfer	Numerical Analysis	Thermodynamics I		Course Title	
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please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

Programme Learning Outcomes

General and Transferable Skills (or)

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Year Third Year Year Z nd Semes	Course Code CES.E.332 CES.E.322	Course Title Title Thermodynamics II Applied Mathematics in Environmental Engineering Unit Operation I Biochemical	ଜୁଣ କ ଅଧିକ ଓ	2 2 2		Knowledge and understanding A2 A3 V		4 2	Subj	ect-spe		A A BB IC,	Subject-specific skills B1 B2 B3 B4 V V V V V V V		2 2 2 Ω 2 2 2 Ω	2 2 2 Ω 2 2 2 Ω	2 2 1 Th	2 2 2 Ω 2 2 2 Ω	## C1 C2 C3 C4	B4 CI C2 C3 C4 V V V V V V V	## C1 C2 C3 C4	Thinking Skills Other skills released to the
CES.E.332 Thermodynamics II CES.E.322 Applied Mathematics in Environmental Find Engineering CES.E.334 Unit Operation I Find CES.E.336 Biochemical Reaction Eng.	Thermodyna Applied Mathematics Environment Engineering Unit Operation Biochemical Reaction Eng	on l al mics !		22 2	22 2	22 2			22 22	22 22	~ ~ ~ ~ ~		2	22 22	2 2 2 2							
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CES.E.331 Solid Waste O Treatment	Solid Waste Treatment		_	2	2	2			~	2	2			2	2	2	2	1	~ ~			
CES.E.331 Environmental 2 Instrumentation and Analysis	Environmental Instrumentation and Analysis	THE RESERVE AND ADDRESS OF THE PERSON NAMED IN		2	1		2		~	2	2	THE REAL PROPERTY.		2	ح	2	2	2	2	2 2	2 2	
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