

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

*Dr. Khalid A. Sukkar*

Dean's Assistant For  
Scientific Affairs

*May*  
The College Quality Assurance  
and University Performance  
Manager

Date: 4 / 11 / 2019

Date: 5 / 11 / 2019

Date: 5 / 11 / 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.

1. Teaching Institution	University of Technology
2. University Department/Centre	Chemical Engineering Department/
3. Programme Title	Chemical and Environmental Pollution Engineering Branch
4. Title of Final Award	B.Sc. in chemical engineering
5. Modes of Attendance offered	4 years full time
6. Accreditation	None
7. Other external influences	
8. Date of production/revision of this specification	October 2019
9. Aims of the Programme	††
*Produce graduate Chemical Engineers satisfying the academic requirements at Chem. Eng. level for Corporate Membership of the Institution of Environmental Chemical Engineers.	
*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

C1. 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
ENDR117	ENDR114	2	3	1	Eng. Drawing II
COPR118	COMP104	2	2	1	Computer Programing I
CHEM122	CHEM113	3	2	2	Chemistry II
		38	26	30	Total

## Second Year

### Chemical and Environmental Engineering Branch

No.	First Semester					
	Code Course	Subject	L	P	T	Credits
1	CES.E.221	Engineering Mathematics I	2	0	1	2
2	CES.E.231	Energy Balance	2	0	1	2
3	CES.E.233	Fluid Flow I	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	0	1
		Total	14	8	6	18
		Hours/week	28			

No.	Second Semester					
	Code Course	Subject	L	P	T	Credits
1	CES.E.222	Engineering Mathematics II	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.II	2	2	1	3
7	CES.E.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	30			

### 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











### Curriculum Skills Map

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

Year / Lev	Course Code	Course Title	Core (C) Title or Option (O)	Programme Learning Outcomes																
				Knowledge and Understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4	D5
	CES.E.421	Project I		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	CES.E.431	Unit Operations II		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fourth Year 1st semester	CES.E.433	Process Dynamics	C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	CES.E.435	Water and Wastewater Treatment		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	CES.E.423	Industrial & Petroleum		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	CES.E.437	Catalysis and Catalytic Eng.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	CES.E.438	Environmental Engineering Management and Ethics		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>





