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: Department of Chemical Engineering / Chemical and Petroleum

Refinery Engineering

Number Of Departments In The College: 3

Date Of Form Completion: update 2019

Assistant Prof. Dr. Khlide Ajm

Prof. Dr. Talib Mohammed

Dr. May Ali Muslim Al-Safar

Dean's Name

Date: 4 / // / 2019

Dean's Assistant For

Scientific Affairs

Signature

Date: 5 / 11 / 2019

Assurance And University Performance Manager

The College Quality

Signature Way

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 Petroleum Refinery Engineering
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	1 October 2019
9. Aims of the Programme	
Able to engage engineering theories with taking into account environmental impact	n chemical engineering practice to design and analyse process problems is and safety.
<ul> <li>Effective communication team work and refinery, Gas technology, Catalysis in refineries).</li> </ul>	Successful leadership in chemical engineers related careers (Petroleum petroleum refineries, Environment pollution & safety in petroleum
	g for personal and professional developments.
	thinking skills, solving open ended problems and to work in teams.

# 10. Learning Outcomes, Teaching, Learning and Assessment Methods

### A. Knowledge and Understanding

- A1. Develop the ability to use chemical engineering principles to solve problems of practical importance to society.
- A2. Able to formulate, analyze, and solve practical chemical engineering problems.
- A3. Identify the principles of chemical engineering, including chemical reaction equilibrium and thermodynamics, mass and energy balance, petroleum refinery, gas technology, unit operations and process control.
- A4. Able to design a chemical system, process, or component with consideration of realistic constraints including practical, economic, environmental, safety, ethical, social, and political implications.

#### B. Subject-specific skills

- B1. Integrate processing steps into a sequence and apply analysis technique such as energy and mass balance.
- B2. Chemical engineering graduates will possess self-learning skills to ensure life-long learning.
- B3. Chemical engineering graduates will have selected technical elective courses, concentrations, projects, and minors that satisfy their professional interest or career goals.
- B4. Able to function and work effectively alone and in a team environment, including multidisciplinary teams.

### 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.

#### 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

## 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. Collaborate effectively within multidisciplinary team.
- D2. Work in stressful environment and within constraints.
- D3. Communicate effectively.
- D4. Search for information and engage life-long self-learning discipline.
- D5. Acquire entrepreneurial skills.

### 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 petroleum Engineering

Vo.		First Seme	ster	77			No.		Second Seme	ster	li .		
-	Code Course	Subject	L	p	Т	Credits		Code Course	Subject	L	P	Т	Credits
1	ENGL102	English Language I	2	0	0	2	1	ENGL106	English Language II	2	0	0	2
2	MATHIII	Mathematics I	2	0	1	3	2	MATH115	Mathematics II	2	0	1	3
3	HRDE103	Human Rights & Democracy	2	0	0	2	3	CHPR121	Chemical Engineering Principles I	2	0	1	3
4	CHEM113	Chemistry I	2	2	0	3	4	CHEM122	Chemistry II	2	2	0	3
5	PHYS112	Physics	2	0	1	3	5	PHYS116	Engineering Mechanics	2	0	0	2
6	ENDRI14	Engineering Drawing	1	3	0	2	6	COPR118	Computer Programing	1	2	0	2
7	COMP104	Computer Science	1	2	0	2	7	ENDR117	Engineering Drawing	1	3	0	2
8	WRKS101	Workshop I	0	6	0	1	8	WRKS105	Workshop II	0	6	0	1
							9		Elective	1	0	0	2
		Total	12	13	2	18			Total	13	13	2	20
		Hours/week		27					Hours/week		28	-	20

# Second Year Chemical and petroleum Engineering

No.		First Seme	ste	r			No.		Second Ser	nest	er		
	Code Course	Subject	L	P	T	Credits		Code Course	Subject	L	P	Т	Cred
1	CES.R.221	Engineering Mathematics I	2	0	1	2	1	CES R 222	Engineering Mathematics II	2	0	1	2
2	CES.R.231	Energy Balance	2	0	E.	2	2	CES.R.232	Material & Energy Balance	2	0	1	2
3	CES.R.233	Fluid Flow I	2	2	1	3	3	CES.R.234	Fluid Flow II	2	2	1	3
4	CES.R.235	Physical Chemistry I	2	2	0	3	4	CES.R.236	Physical Chemistry II	2	0	0	2
5	CES.R.211	Computer Programming II	1	2	1	2	5	CES.R.212	Computer Programming III	1	2	1	2
6	CES.R.223	Materials Eng. I	2	0	1	2	6	CES.R.224	Materials Eng.	2	2	1	3
7	CES.R.237	Properties of petroleum fuels	2	2	0	3	7	CES.R.238	Properties of petroleum Products	2	0	0	2
8	CES.R.213	Democracy	1	0	0	1	8	CES.R.225	Eng. Statistics	2	2	1	3
		Total	14	8	5	18			Total	15	8	6	19
		Hours/week		27					Hours/week		29		. 13

Third Year
Chemical and petroleum Engineering

No.		First Semes	ster				No.		Second Seme	ster			
	Code Course	Subject	L	P	Т	Credits		Code Course	Subject	L	Р	т	Credits
1	CES.R.331	Thermodynamics I	2	2	1	3	1	CES.R.332	Thermodynamics II	2	0	1	2
2	CES.R321	Numerical Analysis	2	2	1	3	2	CES.R.322	Applied Mathematics in chemical Engineering	2	0	1	2
3	CES.R.333	Mass Transfer	2	2	1	3	3	CES.R.334	Unit Operation I	2	0	1	2
4	CES.R.335	Chemical Reaction Kinetics	2	0	0	2	4	CES. R.336	Reactor Design	2	0	1	2
5	CES.R.337	Heat Transfer 1	2	0	1	2	5	CES. R .338	Heat Transfer II	2	2	1	3
6	CES.R.339	Combustion	2	0	0	2	6	CES.R.3310	Petroleum and Gas Field Processing	2	0	0	2
7	CES.R.331	Chemicals from Petroleum	2	0	1	2	7	CES.R.3312	Petroleum Refinery Eng, I	2	2	1	3
8	CES.R .3313	Equipment Design	2	0	1	2	8	CES.R.3314	Equipment Design Using Computer	2	2	1	3
		Total	16	6	6	19			Total	16	6	7	19
		Hours/week		28					Hours/week		29	110-	

# Fourth Year

Chemical and petroleum Engineering

No.		First Seme	ster				No.		Second Sen	nesi	ter		
	Code Course	Subject	L	Р	Т	Credits		Code Course	Subject	L.	P	Т	Credits
1	CES.R.421	Project I	1	2	0	2	1	CES.R.422	Project II	1	2	0	2
2	CES.R.431	Unit Operations II	2	2	1	3	2	CES.R.432	Unit Operations I I I	2	0	1	2
3	CES.R.433	Process Dynamics	2	0	1	2	3	CES.R.434	Process Control & Instruments for Petroleum Refinery	2	2	1	3
4	CES.R.435	Petroleum Refinery Eng. II	2	0	1	2	4	CES.R.436	Petroleum Refinery Economics	2	0	0	2
5	CES.R.437	Heterogeneous Reactor &Catalyst	2	0	1	2	5	CES.R.424	Optimization	2	0	1	2
6	CES.R.423	Refinery Management &Ethics	2	0	I	2	6	CES.R.439	Corrosion Eng. In Petroleum Refinery	2	0	0	2
7	CES.R.438	Environment Pollution & Safety	2	0	1	2							
		Total	13	4	6	15			Total	11	4	3	13
		Hours/week		22	1				Hours/week		18		

## 13. Personal Development Planning

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

#### 14. Admission criteria.

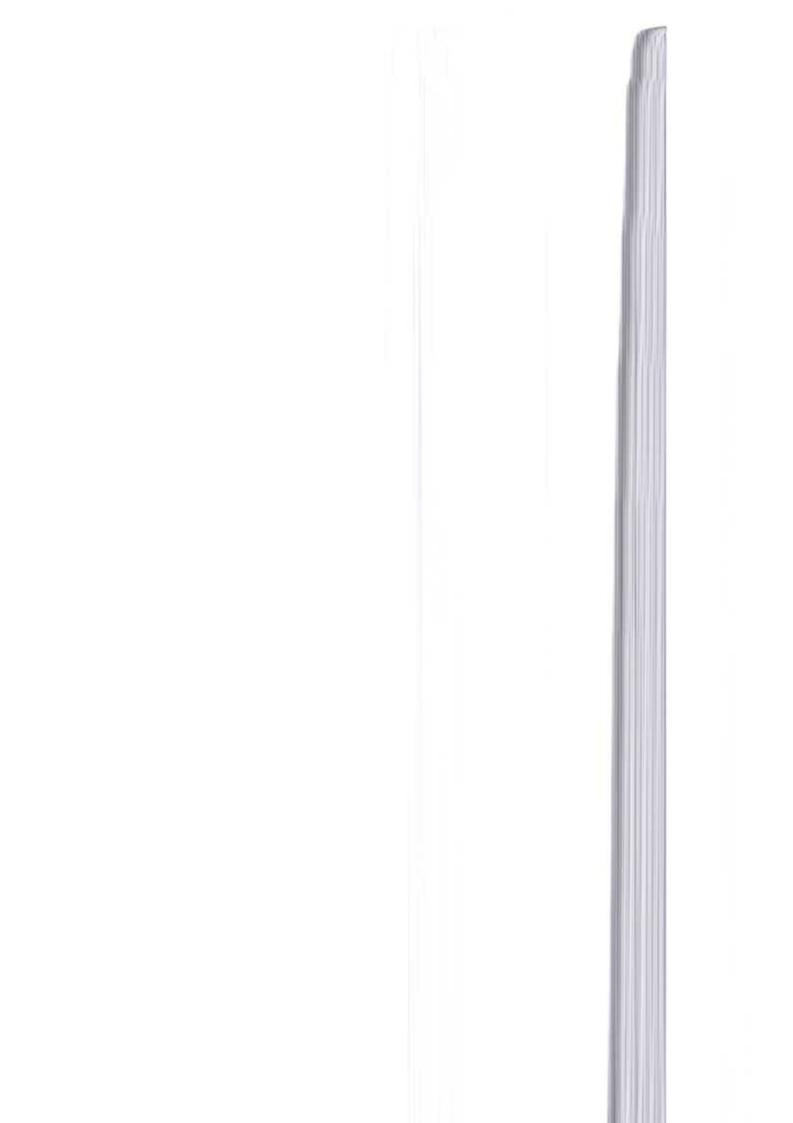
- 1- The applicant must have completed a minimum of 12 years of education in school and passed all the subjects in the Higher Secondary examination.
- 2- All applicants must complete 17 years of age on or before the 31st of December in the year of admission.
- 3- Admission to higher education in Iraq 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

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	ENGL102 English Language	English Language I		7					77		7			7		7		>		7
	MATH111	MATH111 Mathematics (I)			7				7											
1	HRDE103 Human Rights	Human Rights					7		7		7	7						1	7	
Year/	CHEM11	CHEM11 Chemistry I	O	7		7	7					7	VIII	7		7				
1st semester	ENDR114	ENDR114 Engineering Drawing I	1343	7			7		>	>	7	>			7	>			7	
	PHYS112 Physics	Physics .		7	HV.		7									7				
	COMP10	COMP10 Computer 4 Science		7	7		7	7	7	7	7			7	7	7	>			>
	WRKS10	WRKS10 Workshop1					7		7		7	7						7	7	



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

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	Course		English Language II	MATH111 Mathematic s (II)	Basic Principles of Chem. Eng. 1 (I)	CHEM122 Chemistry II	Engineering Mechanics	COPR118 Programing	Elective	WRKS105 Workshop II	
	Course		ENGL106 English Languag	MATH111	CHPR121	CHEM122	PHYS116	COPR118		WRKS105	
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please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed Curriculum Skills Map

Programme Lea	Course Course (C) Title Option Option	(0) AI A2 A3 A4 BI	CE.221 Engineering Vi Mathmatics I	CE 231 Energy Balance N N N	CE 233 Fluid Flow I V V V V	CE.235 Physical C V V Chemistry (I)	CE 211 Computer V V V Programming (III)	CE.223 Material Eng. (I) V V	CE.237 Proprties of V V V Potroleum Fuels	
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	CE.232	CE.232 Material & Energy Balance		7		>	7					>				7				
Second	CE.234	CE.234 Fluid Flow II		7	7	7		7	7	7		7		7		7		1		
Year	CE.236	CE.236 Physical Chemistry II	U	7		7			7			7		7		7				
2 <sup>nd</sup> Semester		CE.212 Computer Programming (III)		7	7			7	>	7	7	>		7	7	>	7			7
	CE.224	CE.224 Materials Eng.		>		7	7			THE REAL PROPERTY.		7				7				
	CE.238	CE.238 Proprties of Petroleum Products		7		7		7								7				
	CE.22	CE.225 Eng. Statistics		7	7				~	7	7	7		7	7	7				7

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

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	Course		CE.331 Thermodynamics	Numerical Analysis	CE.333 Mass Transfer	Chemical Reaction Kinetics	CE,337 Heat Transfer I	Combustion	CE.3311 Chemicals from Petroleum	CE.3313 Equipment Design
	Course		CE.331	CE.321	CE.333	CE.335 Chemical Reaction	CE.337	CE.339	CE.3311	CE.3313
	Year /				Third	Year	121	semester CE.339 Combustion		

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

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		A1	7		7	7	7	>	7	7
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	Course		CE.332 Thermodynamics	Applied Mathematics in chemical Engineering	Unit Operation I	Reactor Design	Heat Transfer II	CE.3310 Petroleum and Gas Field Processing	CE,3312 Petroleum Refinery Eng. I	CE.3314 Equipment, Storge Design Using Computer
	Course		CE.332	CE.322	CE.334	CE.336	CE.338	CE.3310	CE.3312	CE.3314
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please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed Curriculum Skills Map

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21 P	CE.421 Project I		7		7	7	7	7	7	7	7	7	7	7		-	-	
31 =	CE.431 Unit Operations		>	7	7		7	7	7		7	7	7		7			
33 P	CE,433 Process Dynamics	O	7	7	7	7	7	7	7		7		7	7	7			
35 P	CE.435 Petroleum Refinery Eng. II		7		7	7	7	7	7		7	7			7			
37 R	CE.437 Hetrogeneous Reactor & Catalyst		7		7			7	>		7	7			7		7	1 1 2 1
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	CE.422	CE.422 Project II	100	7		7	7	7	7	7	7	7	>	7	7		7	7	>	
	CE.432	CE.432 Unit Operations		7	7	7		7	7	7		7	>	7		7				
Harring		CE.434 Process Control		7	7	7	7	7	7	7		7		7	7	7				
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