

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

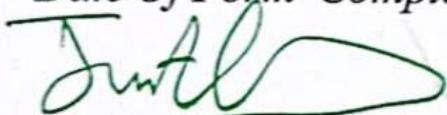
Academic Program Specification Form For The Academic Year 2022-2023

University: Technology

College : Department of Chemical Engineering / Chemical Processing
Engineering

Number Of Departments In The College : 3

Date Of Form Completion : update 2022



Prof. Dr. Jamal M. Al-Rubaee



Prof. Dr. Asawer A. Alwasiti



Dr. Feras K. Al-Zuhairi

Dean's Name

Date : 12 / 1 / 2023

Signature

Head of Department

Date : 2 / 1 / 2023

Signature

The College Quality
Assurance And University
Performance Manager

Date : 2 / 1 / 2023

Signature

Quality Assurance And University Performance Manager

Date : / / 2023

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 Processing 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 2022
9. Aims of the Programme	
1-	Able to engage engineering theories with chemical engineering practice to design and analyse process problems taking into account environmental impacts and safety.
2-	Effective communication team work and Successful leadership in chemical engineers related careers (industries, water treatment, catalytic reactor).
3-	Maintain a lifelong interest in learning for personal and professional developments.

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, transport processes, separation processes, mechanical 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 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. 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 Processing Engineering

No.	<i>First Semester</i>					
	Code Course	Subject	L	P	T	Credits
1	CES.P.111	Technical English I	2	0	0	2
2	CES.P.121	Mathematics I	2	0	1	2
3	CES.P.123	Chemistry I	2	2	0	3
4	CES.P.125	Physics	2	0	1	2
5	CES.P.126	Engineering Drawing	1	2	0	2
6	CES.P.113	Computer Science	1	2	0	2
7	CES.P.114	Workshop I	0	6	0	-
		Total	10	12	2	13
		Hours/week	24			

No.	<i>Second Semester</i>					
	Code Course	Subject	L	P	T	Credits
1	CES.P.112	Technical EnglishII	2	0	0	2
2	CES.P.122	Mathematics II	2	0	1	2
3	CES.P.131	Chemical Engineering Principles I	3	0	1	3
4	CES.P.124	Chemistry II	2	2	0	3
5	CES.P.127	AutoCAD	1	2	0	2
6	CES.P.128	Engineering Mechanics & Strength of Materials	2	0	1	2
7	CES.P.115	Workshop II	0	6	0	-
8	CES.P.116	Human Rights & Democracy	2	0	0	2
		Total	14	10	3	16
		Hours/week	27			

Second Year Chemical Processing Engineering

No.	<i>First Semester</i>					
	Code Course	Subject	L	P	T	Credits
1	CES.P.221	Mathematics III	2	0	1	2
2	CES.P.231	Chemical Eng. Principles II	2	0	1	2
3	CES.P.233	Fluid Flow I	2	2	1	3
4	CES.P.235	Physical Chemistry I	2	2	0	3
5	CES.P.223	Computer Programming I	1	2	1	2
6	CES.P.225	Materials Eng. I	2	0	1	2
7	CES.P.237	Fuel's & Energy Eng.	2	2	0	3
		Total	13	8	5	17
		Hours/week	26			

<i>Second Semester</i>						
No.	Code Course	Subject	L	P	T	Credits
1	CES.P.222	Mathematics IV	2	0	1	2
2	CES.P.232	Chemical Eng. Principles III	2	0	1	2
3	CES.P.234	Fluid Flow II	2	2	1	3
4	CES.P.236	Physical Chemistry II	2	0	0	2
5	CES.P.224	Computer Programming II	1	2	1	2
6	CES.P.226	Materials Eng. II	2	2	1	3
7	CES.P.227	Statistics	2	0	1	2
		Total	13	6	6	16
		Hours/week	25			

Third Year Chemical Processing Engineering

No.	<i>First Semester</i>						No.	<i>Second Semester</i>					
	Code Course	Subject	L	P	T	Credits		Code Course	Subject	L	P	T	Credits
1	CES.P.331	Thermodynamics I	2	2	1	3	1	CES.P.332	Thermodynamics II	2	0	1	2
2	CES.P.321	Numerical Analysis	2	2	1	3	2	CES.P.322	Applied Mathematics in chemical Engineering	2	0	1	2
3	CES.P.333	Mass Transfer	2	2	1	3	3	CES.P.334	Unit Operation I	2	0	1	2
4	CES.P.335	Chemical Reaction Kinetics	2	0	0	2	4	CES.P.336	Reactor Design	2	0	1	2
5	CES.P.337	Heat Transfer I	2	0	1	2	5	CES.P.338	Heat Transfer II	2	2	1	3
6	CES.P.339	Chemical Process Industries I	2	0	0	2	6	CES.P.3310	Chemical Process Industries II	2	3	0	3
7	CES.P.3311	Bio Chemical Engineering	2	0	0	2	7	CES.P.3312	Particles & Nanotechnology	2	0	0	2
8	CES.P.3313	Equipment Design	2	0	1	2	8	CES.P.3314	Equipment Design Using CAD	2	2	1	3
		Total	16	6	5	19			Total	16	7	6	19
		Hours/week	27						Hours/week	29			

Fourth Year Chemical Processing Engineering

No.	<i>First Semester</i>						No.	<i>Second Semester</i>					
	Code Course	Subject	L	P	T	Credits		Code Course	Subject	L	P	T	Credits
1	CES.P.421	Project I	1	2	0	2	1	CES.P.422	Project II	1	2	0	2
2	CES.P.431	Unit Operations II	2	2	1	3	2	CES.P.432	Unit Operations III	2	0	1	2
3	CES.P.433	Process Dynamics	2	0	1	2	3	CES.P.434	Process Control and Instruments	2	2	1	3
4	CES.P.435	Petroleum Refinery Processing	2	0	1	2	4	CES.P.436	Petrochemical Industries	2	0	1	2
5	CES.P.437	Heterogeneous Reactor & Catalyst	2	0	1	2	5	CES.P.424	Optimization	2	0	1	2
6	CES.P.423	Industrial Management & Ethics	2	0	0	2	6	CES.P.439	Corrosion Eng.	2	0	0	2
7	CES.P.438	Environment Eng. & Industrial Safety	2	0	1	2							
		Total	13	4	5	15			Total	11	4	4	13
		Hours/week	22						Hours/week	19			

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

Programme Learning Outcomes

Year / Level	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	
First Year/ 1st semester	CES.P.111	Technical English I	C	√					√		√			√		√		√			
	CES.P.121	Mathematics I			√				√												
	CES.P.123	Chemistry I		√		√	√				√		√		√						
	CES.P.125	Physics I		√			√								√						
	CES.P.126	Engineering Drawing I		√			√		√	√	√	√		√	√				√		
	CES.P.113	Computer Science I		√	√		√	√	√	√	√			√	√	√	√				√
	CES.P.114	Workshop I					√		√		√	√						√	√		

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Programme Learning Outcomes

Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	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
				Second Year/ 1 st semest er	CES.P.2	Mathematics	(O)		√				√	√						√
CES.P.2	Chemical Eng.	√	√		√			√	√	√	√	√		√						
CES.P.2	Fluid Flow I 33	√	√		√			√	√	√		√		√						
CES.P.2	Physical 25	√			√				√			√		√		√				
CES.P.2	Computer 23 Programming I	√	√					√	√	√	√			√	√	√	√			√
CES.P.2	Materials Eng. I 25	√			√	√						√				√				
CES.P.2	Fuel's & Energy 37 Eng.	√			√			√								√				

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Programme Learning Outcomes

Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	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
				Second Year/ 2 nd semest er	CES.P.2	Mathematics	C		√				√	√						√
CES.P.2 32	Chemical Eng. Principles III	√	√		√			√	√	√	√	√			√					
CES.P.2 34	Fluid Flow II	√	√		√			√	√	√		√		√		√				
CES.P.2 36	Physical Chemistry II	√			√				√			√		√		√				
CES.P.2 24	Computer Programming II	√	√					√	√	√	√			√	√	√	√			√
CES.P.2 26	Materials Eng. II	√			√	√						√				√				
CES.P.2 27	Statistics	√	√						√	√	√	√		√	√	√				√

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Programme Learning Outcomes

Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	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		
Third Year 1 st semester	CE.331	Thermodynamics I	C	√		√	√	√	√	√		√	√	√		√						
	CE.321	Numerical Analysis			√				√	√	√	√	√			√	√			√	√	
	CE.333	Mass Transfer		√	√	√		√	√	√		√	√	√		√						
	CE.335	Chemical Reaction Kinetics		√	√	√		√	√	√		√	√	√	√	√						
	CE.337	Heat Transfer I		√	√	√		√	√	√		√	√	√		√						
	CE.3313	Equipment Design		√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	CE.3311	Bio Chemical Eng.		√		√	√					√	√				√					
	CE.339	Chemical Process Industries I		√		√	√					√		√	√		√					

Curriculum Skills Map

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Programme Learning Outcomes

Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	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		
Third Year 2 nd semester	CE.332	Thermodynamics II	C	√		√	√	√	√	√		√	√	√		√						
	CE.322	Applied Mathematics			√				√	√	√	√	√	√	√	√						
	CE.334	Unit Operation I		√	√	√		√	√	√		√	√	√		√						
	CE.336	Reactor Design		√	√	√		√	√	√		√	√	√	√	√						
	CE.338	Heat Transfer II		√	√	√		√	√	√		√	√	√		√						
	CE.3314	Equipment Design using Computer		√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	CE.3312	Particles & Nanotechnology		√		√	√				√			√				√				
	CE.3310	Chemical Process Industries		√		√	√			√					√	√		√				

Curriculum Skills Map

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Programme Learning Outcomes

Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	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	
Fourth Year/ 1 st semester	CE.421	Project I	C	√		√	√	√	√	√	√	√	√	√	√		√	√	√	√	
	CE.431	Unit Operations II		√	√	√		√	√	√		√	√	√		√					
	CE.433	Process Dynamics		√	√	√	√	√	√	√		√		√	√	√					
	CE.435	Petroleum Refinery Processing		√		√	√	√	√	√		√	√			√					
	CE.437	Hetrogeneous Reactor & Catalyst		√		√			√	√		√	√			√					
	CE.423	Industrial Management		√	√		√		√		√	√		√	√	√	√	√	√	√	√
	CE.438	Environment Eng. & Industrial Safety		√	√	√	√	√	√	√			√	√		√					

