

الجمهورية الجزائرية الديمقراطية الشعبية
People's Democratic Republic of Algeria
وزارة التعليم العالي والبحث العلمي
Ministry of Higher Education and Scientific Research

University of Khemis Miliana
Faculty of Science and Technology
Department of Process Engineering



جامعة خميس مليانة
كلية العلوم والتكنولوجيا
قسم: هندسة الطرائق

Academic Bachelor's Degree Training Program in Process Engineering

Faculty: Science and Technology

Field: Science and Technology

Sector: Process Engineering

Specialization: Process Engineering

Type of Training: Bachelor's Degree

1- Program Overview

Process Engineering is a key discipline within the field of Science and Technology (ST). Initially developed around Fundamental Chemical Engineering, this field now encompasses a wide range of specializations, including Chemical Engineering, Environmental Engineering, Materials Engineering, Pharmaceutical Engineering, Electrochemical Engineering, Cryogenics, Energy Engineering, and Agro-Food Engineering, among others.

Process Engineering plays a crucial role in industrial processes involving the transformation of matter and energy. Therefore, it is essential to train professionals capable of mastering industrial-scale transformation processes.

This Bachelor's program provides a solid foundation in the core subjects of the discipline, including physical chemistry, unit operations, transport phenomena, and reactors. It serves as a fundamental training for all specializations within Process Engineering.

By the end of this multidisciplinary training, graduates will have acquired fundamental knowledge not only in basic sciences (Mathematics, Physics, Chemistry) but also in technology and industrial processes (Reactors, Process Engineering, Transport Phenomena, Instrumentation, Industrial Installations, etc.), which are essential for understanding process engineering and its various applications.

This program enables graduates not only to continue their studies and pursue specialized master's degrees but also to quickly integrate into the socio-economic sector.

With the curriculum offered in this Bachelor's program, graduates are equipped to enter various socio-economic fields, including:

- Technical teaching in secondary education;
- Research laboratories;
- Public organizations;
- Consulting firms;
- The industrial sector.

2- Key Curriculum Highlights

Every training program must meet the quality standards of today and the future. To ensure the effectiveness of this Bachelor's program, and by leveraging the flexibility of the LMD system, several mechanisms are proposed to assess and monitor the teaching process, curriculum, student-teacher and student-administration relationships, as well as the career paths of graduates. Additionally, feedback from university partners regarding the quality of recruited graduates and the education provided will be considered.

The training team is encouraged to expand this list with additional evaluation criteria based on their resources and objectives.

The evaluation methods may include surveys, on-site monitoring of students in training, and feedback from both employed graduates and their employers. A comprehensive report should be prepared, archived, and widely distributed to ensure transparency and continuous improvement.

3- Core Training Modules (fundamental courses included in the program):

Semester 1

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 1.1 Credits : 18 Coefficients : 9	Mathematics 1	6	3
	Physics 1	6	3
	Structure of matter	6	3

Semester 2

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 1.2 Credits : 18 Coefficients : 9	Mathematics 2	6	3
	Physics 2	6	3
	Thermodynamics	6	3

Semester 3

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 2.1.1 Credits : 10 Coefficients : 5	Mathematics 3	6	3
	Waves and vibrations	4	2
UE Fundamental Code : UEF 2.1.2 Credits : 8 Coefficients : 4	Fluid Mechanics	4	2
	Mineral chemistry	4	2

Semester 4

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 2.2.1 Credits : 8 Coefficients : 4	Solutions chemistry	4	2
	Organic chemistry	4	2
UE Fundamental Code : UEF 2.2.2 Credits : 8 Coefficients : 4	Chemical Thermodynamics	4	2
	Numerical Methods	4	2

Semester 5

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 3.1.1 Credits : 10 Coefficients : 5	Heat Transfer	4	2
	Mass Transfer	4	2
	Momentum Transfer	2	1
UE Fundamental Code : UEF 3.1.2 Credits : 8 Coefficients : 4	Electrochemistry	4	2
	Instrumentation & Sensors	2	1
	Kinetics and Homogeneous Catalysis	2	1

Semester 6

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 3.2.1 Credits : 10 Coefficients : 5	Unit Operations	6	3
	Equilibrium Thermodynamics	4	2
UE Fundamental Code : UEF 3.2.2 Credits : 8 Coefficients : 4	Homogeneous Reactors	4	2
	Surface Phenomena and Heterogeneous Catalysis	4	2

4- Advanced Training Modules

Semester1

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 1.1 Credits : 18 Coefficients : 9	Structure of Matter	6	3

Semester 2

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 1.2 Credits : 18 Coefficients : 9	Thermodynamics	6	3

Semester 3

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 2.1.2 Credits : 8 Coefficients : 4	Mineral Chemistry	4	2

Semester 4

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 2.2.1 Credits : 8 Coefficients : 4	Solutions chemistry	4	2
	Organic chemistry	4	2
UE Fundamental Code : UEF 2.2.2 Credits : 8 Coefficients : 4	Chemical thermodynamics	4	2

Semester 5

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 3.1.1 Credits : 10 Coefficients : 5	Heat transfer	4	2
	Mass transfer	4	2
UE Fundamental	Electrochemistry	4	2

Code : UEF 3.1.2 Credits : 8 Coefficients : 4	Kinetics and Homogeneous Catalysis	2	1
---	---------------------------------------	---	---

Semester 6

Unit	Module	Credit	Coefficient
UE Fundamental Code : UEF 3.2.1 Credits : 10 Coefficients : 5	Unit Operations	6	3
	Equilibrium Thermodynamics	4	2
UE Fundamental Code : UEF 3.2.2 Credits : 8 Coefficients : 4	Homogeneous Reactors	4	2

5- Training Structure (program plan or visual structure):

Attached are the detailed programs for the 6 semesters.

Duration: 6 semesters (3 years) – **Total:** 180 credits

Semester 1

Unit	Module	Credits	Coefficient	Weekly Hourly Volume			Semester Hourly Volume (15 weeks)	Additional Work In Consultation (15 weeks)	Assessment Method	
	Title			Course	DW	LAB			Continuous Assessment	Exam
UE Fundamental Code : UEF 1.1 Credits : 18 Coefficients : 9	Mathematics 1	6	3	3h00	1h30		67h30	82h30	40%	60%
	Physics 1	6	3	3h00	1h30		67h30	82h30	40%	60%
	Structure of matter	6	3	3h00	1h30		67h30	82h30	40%	60%
UE Methodological Code : UEM 1.1 Credits : 9 Coefficients : 5	Lab Physics 1	2	1			1h30	22h30	27h30	100%	
	Lab Chimistry 1	2	1			1h30	22h30	27h30	100%	
	Informatics 1	4	2	1h30		1h30	45h00	55h00	40%	60%
	Writing Methodology	1	1	1h00			15h00	10h00		100%
UE Discovery Code : UED 1.1 Credits : 1 Coefficients : 1	Careers in Science and Technologies 1	1	1	1h30			22h30	02h30		100%
E Transversal Code : UET 1.1 Credits : 2 Coefficients : 2	Ethical and deontological dimension (the foundations)	1	1	1h30			22h30	02h30		100%
	Foreign Language 1 (French or English)	1	1	1h30			22h30	02h30		100 %
Total semester 1		30	17	16h00	4h30	4h30	375h00	375h00		

Semester 2

Unit	Matter	Credits	Coefficient	Weekly Hourly Volume			Semester Hourly Volume (15 weeks)	Additional Work In Consultation (15 weeks)	Assessment Method	
	Title			Cours e	DW	LAB			Continuous assessment	Exam
UE Fundamental Code : UEF 1.2 Credits : 18 Coefficients : 9	Mathematics 2	6	3	3h00	1h30		67h30	82h30	40%	60%
	Physique 2	6	3	3h00	1h30		67h30	82h30	40%	60%
	Thermodynamics	6	3	3h00	1h30		67h30	82h30	40%	60%
UE Methodological Code : UEM 1.2 Credits : 9 Coefficients : 5	TP Physique 2	2	1			1h30	22h30	27h30	100%	
	TP Chimie 2	2	1			1h30	22h30	27h30	100%	
	Informatique 2	4	2	1h30		1h30	45h00	55h00	40%	60%
	Presentation Methodology	1	1	1h00			15h00	10h00		100%
UE Discovery Code : UED 1.2 Credits : 1 Coefficients : 1	Careers in science and technologies 2	1	1	1h30			22h30	02h30		100%
UE Transversal Code : UET 1.2 Credits : 2 Coefficients: 2	Foreign Language 2 (French and/or English)	2	2	3h00			45h00	05h00		100 %
Total semester 2		30	17	16h00	4h30	4h30	375h00	375h00		

Semester 3

Unit	Title	Credits	Coefficient	Weekly Hourly Volume			Semester Hourly Volume (15 weeks)	Additional Work In Consultation (15 weeks)	Assessment Method	
				Course	DW	LAB			Continuous assessment	Exam
UE Fundamental Code : UEF 2.1.1 Credits : 10 Coefficients : 5	Mathematics 3	6	3	3h00	1h30		67h30	82h30	40%	60%
	Waves and vibrations	4	2	1h30	1h30		45h00	55h00	40%	60%
UE Fundamental Code : UEF 2.1.2 Credits : 8 Coefficients: 4	Fluid Mechanics	4	2	1h30	1h30		45h00	55h00	40%	60%
	Inorganic chemistry	4	2	1h30	1h30		45h00	55h00	40%	60%
UE Methodological Code : UEM 2.1 Credits : 9 Coefficients : 5	Probability and statistics	4	2	1h30	1h30		45h00	55h00	40%	60%
	Informatics 3	2	1			1h30	22h30	27h30	100%	
	Technical drawing	2	1			1h30	22h30	27h30	100%	
	Lab Waves and Vibrations	1	1			1h00	15h00	10h00	100%	
UE Discovery Code : UED 2.1 Credits : 2 Coefficients : 2	HSE Industrial Facilities	1	1	1h30			22h30	02h30		100%
	Regulations and standards	1	1	1h30			22h30	02h30		100%
UE Transversal Code : UET 2.1 Credits : 1 Coefficients : 1	Technical English	1	1	1h30			22h30	02h30		100%
Total semester 3		30	17	13h30	7h30	4h00	375h00	375h00		

Semester 4

Unit	Matter	Credits	Coefficient	Weekly Hourly Volume			Semester Hourly Volume (15 weeks)	Additional Work In Consultation (15 weeks)	Assessment Method	
	Title			Course	DW	LAB			Continuous assessment	Exam
UE Fundamental Code : UEF 2.2.1 Credits : 8 Coefficients : 4	Solution chemistry	4	2	1h30	1h30		45h00	55h00	40%	60%
	Organic chemistry	4	2	1h30	1h30		45h00	55h00	40%	60%
UE Fundamental Code : UEF 2.2.2 Credits : 8 Coefficients : 4	Chemical thermodynamics	4	2	1h30	1h30		45h00	55h00	40%	60%
	Numerical methods	4	2	1h30	1h30		45h00	55h00	40%	60%
UE Fundamental Code : UEF 2.2.3 Credits : 2 Coefficients : 1	Chemical kinetics	2	1	1h30			22h30	27h30		100%
UE Methodological Code : UEM 2.2 Credits : 9 Coefficients : 5	Lab Solution chemistry	2	1			1h30	22h30	27h30	100%	
	Lab Organic chemistry	1	1			1h00	15h00	10h00	100%	
	Lab Fluid Mechanics	2	1			1h30	22h30	27h30	100%	
	Lab Numerical methods	2	1			1h30	22h30	27h30	100%	
	Lab Chemical kinetics	2	1			1h30	22h30	27h30	100%	
UE Discovery Code : UED 2.2 Credits : 2 Coefficients : 2	Introduction to Refining and Petrochemicals	1	1	1h30			22h30	02h30		100%
	Notions of transfer phenomena	1	1	1h30			22h30	02h30		100%
UE Transversal Code : UET 2.2 Credits : 1 Coefficients : 1	Expression, information and communication techniques	1	1	1h30			22h30	02h30		100%

Total semester 4		30	17	12h00	6h00	7h00	375h00	375h00		
------------------	--	-----------	-----------	--------------	-------------	-------------	---------------	---------------	--	--

Semester 5

Unit	Matter	Credits	Coefficient	Weekly Hourly Volume			Semester Hourly Volume (15 weeks)	Additional Work In Consultation (15 weeks)	Assessment Method	
	Title			Cours e	DW	LAB			Continuous assessment	Exam
UE Fundamental Code : UEF 3.1.1 Credits : 10 Coefficients : 5	Heat Transfer	4	2	1h30	1h30		45h00	55h00	40%	60%
	Mass Transfer	4	2	1h30	1h30		45h00	55h00	40%	60%
	Momentum Transfer	2	1	1h30			22h30	27h30		100%
UE Fundamental Code : UEF 3.1.2 Credits : 8 Coefficients : 4	Electrochemistry	4	2	1h30	1h30		45h00	55h00	40%	60%
	Instrumentation - sensors	2	1	1h30			22h30	27h30		100%
	Kinetics and homogeneous catalysis	2	1	1h30			22h30	27h30		100%
UE Methodological Code : UEM 3.1 Credits : 9 Coefficients : 5	Analysis techniques	4	2	1h30		1h30	45h00	55h00	40%	60%
	Lab Physical Chemistry 1 and Chemical Engineering 1	2	1			1h30	22h30	27h30	100%	
	Macroscopic balance	3	2	1h30	1h00		37h30	37h30	40%	60%
UE Discovery Code : UED 3.1 Credits : 2 Coefficients : 2	Pharmaceutical Processes	1	1	1h30			22h30	02h30		100%
	Food processing	1	1	1h30			22h30	02h30		100%
UE Transversal Code : UET 3.1 Credits : 1 Coefficients : 1	Pollution: Air, water, soil	1	1	1h30			22h30	02h30		100%
Total semester 5		30	17	16h30	5h30	3h00	375h00	375h00		

Semester 6

Unit	Module	Credits	Coefficient	Weekly Hourly Volume			Semester Hourly Volume (15 weeks)	Additional Work In Consultation (15 weeks)	Assessment Method	
	Title			Course	DW	LAB			Continuous assessment	Exam
UE Fundamental Code : UEF 3.2.1 Credits : 10 Coefficients : 5	Unit Operations	6	3	3h00	1h30		67h30	82h30	40%	60%
	Thermodynamics of equilibria	4	2	1h30	1h30		45h00	55h00	40%	60%
UE Fundamental Code : UEF 3.2.2 Credits : 8 Coefficients : 4	Homogeneous reactors	4	2	1h30	1h30		45h00	55h00	40%	60%
	Surface phenomena and heterogeneous catalysis	4	2	1h30	1h30		45h00	55h00	40%	60%
UE Methodological Code : UEM 3.2 Credits : 9 Coefficients : 5	End of Cycle Project	4	2			3h00	45h00	55h00	100%	
	Process Simulators	3	2	1h30		1h00	37h30	37h30	40%	60%
	Lab Physical Chemistry 2 and Chemical Engineering 2	2	1			1h30	22h30	27h30	100%	
UE Discovery Code : UED 3.2 Credits : 2 Coefficients : 2	Cryogenic Processes	1	1	1h30			22h30	02h30		100%
	Corrosion	1	1	1h30			22h30	02h30		100%
UE Transversal Code : UET 3.2 Credits : 1 Coefficients : 1	Entrepreneurship and business management	1	1	1h30			22h30	02h30		100%
Total semester 6		30	17	13h30	6h00	5h30	375h00	375h00		

