

T-103  
2022

## Program Specification

Program Name:	<b>Master of Science in Chemistry</b>	
Program Code (as per Saudi university ranking):	053101	
Qualification Level:	7	
Department:	<b>Chemistry</b>	
College:	<b>Science</b>	
Institution:	<b>King Khalid University</b>	
Program Specification:	New <input type="checkbox"/>	updated* <input checked="" type="checkbox"/>
Last Review Date:	<b>17/10/1444H</b>	

\*Attach the previous version of the Program Specification.

## Content:

Content	Page
A. Program Identification and General Information	3
B. Mission, Objectives, and Program Learning Outcomes	4
C. Curriculum	5
D. Student Admission and Support:	7
E. Faculty and Administrative Staff:	8
F. Learning Resources, Facilities, and Equipment:	9
G. Program Quality Assurance:	10
H. Specification Approval Data:	11



## A. Program Identification and General Information

### 1. Program's Main Location:

- College of Science, Main Campus, Alfaraa, Abha, Saudi Arabia

### 2. Branches Offering the Program (if any):

- None

### 3. Partnerships with other parties (if any) and the nature of each:

- None

### 4. Professions/jobs for which students are qualified

- Researchers (research centers in public and private sectors, industry, etc.)
- Academic staff at higher education institutions
- Consultants at public and private sectors (industry, experience houses, etc.)

### 5. Relevant occupational/ Professional sectors:

Higher education  
Research and development  
Industry

### 6. Major Tracks/Pathways (if any):

Major track/pathway	Credit hours (For each track)	Professions/jobs (For each track)
1. None		
2.		
3.		
4.		

### 7. Exit Points/Awarded Degree (if any):

Exit points/awarded degree	Credit hours
1. None	

### 8. Total credit hours: 64 Hours

## B. Mission, Objectives, and Program Learning Outcomes

### 1. Program Mission:

To prepare distinguished graduates in scientific research and able to compete in the labor market and graduate studies, and active in community development.

### 2. Program Objectives:

- To prepare distinguished graduates in scientific research and innovation.

2. To qualify graduates able to compete in the labor market and graduate studies.

3. To encourage scientific research that contributes to community development.

### 3. Program Learning Outcomes\*

#### Knowledge and understanding

K1	To demonstrate a deep understanding of the fundamental theories and concepts in chemistry.
K2	To reproduce advanced and applied experiments in chemistry.
K3	To demonstrate a deep and specialized knowledge in research area.
K4	To list the basic methods needed to carry out scientific research.

#### Skills

S1	To develop specialized skills in application of fundamental theories and concepts in chemistry for solving problem.
S2	To interpret scientific data with critical thinking on recent topics in chemistry
S3	To master recent experimental techniques and their applications in a selected research area.
S4	To interpret present and defend data and research findings in chemistry.
S5	To prepare research proposals and write scientific publications.

#### Values, Autonomy, and Responsibility

V1	To demonstrate a high level of commitment with scientific ethics.
V2	To show professional oral and written communications in the scientific community.
V3	To show respect to the diversity and inclusion in work environment.
V4	To show transmittance in exchanging relevant information using professional databases.

\* Add a table for each track or exit Point (if any)

## C. Curriculum

### 1. Curriculum Structure

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Courses	Required	13	39	87%
	Elective	0	0	0%
Graduation project (if any)				-
Thesis (if any)	Required	1	9	13%
			-	-
Field Experience(if any)	-	-	-	
Others	-	-	-	
Total		14	48	100%

\* Add a separated table for each track (if any).

### 2. Program Courses



Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	6100CHEM	Heterocyclic Chemistry	Required	-	3	Program
	6200CHEM	Chemical Applications of Group Theory	Required	-	3	Program
	6300CHEM	Advanced Physical Chemistry	Required	-	3	Program
Level 2	6400CHEM	Advanced Analytical Chemistry	Required	-	3	Program
	6101CHEM	Spectroscopy of Organic Chemistry	Required	-	3	Program
	6201CHEM	Physical Methods in Inorganic Chemistry	Required	-	3	Program
Level 3	6301CHEM	Quantum Chemistry and Its Applications	Required	-	3	Program
	6401CHEM	Methods for Spectroscopic and Electrochemical analysis	Required	-	3	Program
	6000CHEM	Guidance for Chemical Scientific Research	Required	-	3	Program
Level 4	6102CHEM	Selected topics in Organic Chemistry	Required	-	3	Program
	6202CHEM	Selected topics in Inorganic Chemistry	Required	-	3	Program
	6302CHEM	Selected topics in Physical Chemistry	Required	-	3	Program
Level 5	6402CHEM	Techniques in Separation Chemistry	Required	-	3	Program
	6001CHEM	Master dissertation	Required	-	9	Program
Level 6	6001CHEM	Master dissertation	Required	-		Program

\* Include additional levels (for three semesters option or if needed).

\*\* Add a table for the courses of each track (if any)

### 3. Course Specifications:



Insert hyperlink for all course specifications using NCAA template (T-104)

#### 4. Program learning Outcomes Mapping Matrix:

Align the program learning outcomes with program courses, according to the following desired levels of performance (*I = Introduced*      *P = Practiced*      *M = Mastered*).

Course code & No.	Program Learning Outcomes												
	Knowledge and understanding				Skills					Values, Autonomy, and Responsibility			
	K1	K2	K3	K3	S1	S2	S3	S4	S5	V1	V2	V3	V4
6100CHEM	I		I		I	I	I			I		I	
6200CHEM	I		I		I	I		I		I	I	I	I
6300CHEM	I		1		I		I	I		I	I	I	I
6400CHEM	I	I	I		I		I	I		I	I	I	I
6101CHEM	P	P	P		P	P	P			P	P	P	
6201CHEM				P				P		P	P	P	P
6301CHEM				P				P			P	P	
6401CHEM	P	P	P		P	P	P			P	P	P	P
6000CHEM				P		P		P	P	P	P	P	P
6102CHEM	M	M	M					M		M	M	M	M
6202CHEM	M		M			M	M			M	M	M	M
6302CHEM	M	M	M		M	M				M	M	M	M
6402CHEM	M	M	M		M	M				M	M	M	M
6001CHEM	M	M	M		M	M	M	M	M	M	M	M	M

\* Add a separated table for each track (if any).

#### 5. Teaching and learning strategies applied to achieve program learning outcomes.

Describe teaching and learning strategies, including curricular and extra-curricular activities, to achieve the program learning outcomes in all areas.

A wide range of teaching strategies, such as, Lectures, seminars, classroom discussion, case study, interactive teaching sessions, tutorials, problems solving sessions would be followed throughout the learning process

The extra-curricular activities are achieved under the supervision of the Student Club and the supervisor of the student activities. The extra-curricular activities include learning and

culture, art and handicrafts, science competitions, public and recreational activities, voluntary work, community service as well as sport.

## 6. Assessment Methods for program learning outcomes.

Describe assessment methods (Direct and Indirect) that can be used to measure the achievement of program learning outcomes in all areas.

The program should devise a plan for assessing Program Learning Outcomes (all learning outcomes should be assessed at least twice in the bachelor program's cycle and once in other degrees).

- Written and oral exams
- Assignments, reports, presentations, research.
- Case study
- Open book exam
- Take away exam

## D. Student Admission and Support:

### 1. Student Admission Requirements

The applicant must be a Saudi or has a grant for postgraduate studies if he is not Saudi. The applicant obtained a college degree from a Saudi University or another attested University. Submission of two Recommendation letters. The consent of the employer if an employee. Get an estimate of "good high: 3.5 /5" and very good in the specialty subjects.

Departmental requirements

To pass the department's acceptance test by at least 50%.

Pass one of the English language test according to the following Table

TOFEL – IBT	STEP	IELTS
45	67	4.5

The first week in the semester is devoted to guide and orient the new students by The Guidance and Counseling Unit. All relevant rules and regulations are explained to the new students during this week.

In addition, the study plan and the significant regulations are available in the department and university website

### 2. Guidance and Orientation Programs for New Students

(Include only the exceptional needs offered to the students of the program that differ from those provided at the institutional level).

- An orientation week is usually organized at the beginning of each academic year.
- A scientific advisor should be appointed (for each student) within a month of entering the program.

### 3. Student Counseling Services

(Academic, professional, psychological and social)

(Include only the exceptional needs offered to the students of the program that differ from those provided at the institutional level).



- Appointing a scientific advisor for each student within a month of entering the program
- Familiarizing students with the rules and regulations that govern the program
- Announce 5 office hours for each faculty member to be part of academic supervision and scientific assistance.
- Faculty member help and support students solving problems
- Faculty member advice students planning their career,
- The availability of full information about department and its members and their contact information
- The availability of full information about study plan and courses taught.

#### 4. Special Support

(Low achievers, disabled, gifted, and talented students).

- Low achiever students  
Direct communication between the instructor and students in order to identify the problems experienced by students.
- Disabled students  
The public facilities at the university are compatible with people with disabilities  
The Special Needs Unit in the university communicates continuously with the disabled students and provides the required support
- Gifted and talented  
Honoring talented students in every semester  
Involvement of the talented student in the research projects

### E. Faculty and Administrative Staff:

#### 1. Needed Teaching and Administrative Staff

Academic Rank	Specialty		Special Requirements / Skills (if any)	Required Numbers		
	General	Specific		M	F	T
Professor	Chemistry	1 Organic	-	2	2	4
		1 Inorganic				
		1 Analytical				
		1 Physical				
Associate Professor	Chemistry	2 Organic	-	4	4	8
		2 Inorganic				
		2 Analytical				







		2	Physical				
Assistant Professor	Chemistry	3	Organic	-	6	6	12
		3	Inorganic				
		3	Analytical				
		3	Physical				
Lecturer	0	-	-	-	0	0	0
Teaching Assistant	0		-	-	0	0	0
Technicians and Laboratory Assistant	Chemistry	2	Organic	As the requirements and skills of KKU of the technicians	4	4	8
		2	Inorganic				
		2	Analytical				
		2	Physical				
Administrative and Supportive Staff	Administrative	2	Program coordinator and Deputy coordinator	-	6	4	10
		8	MSc program officers				
Others (specify)	-		-	-	-	-	-



## F. Learning Resources, Facilities, and Equipment:

### 1. Learning Resources

Learning resources required by the Program (textbooks, references, and e-learning resources and web-based resources, etc.)

Adopting relevant textbook recommended by King Khalid University, Academic department & the Curriculum Committee.

b. Curriculum committee will review the appropriateness of the required and recommended textbooks by KCU IE department

c. Concerned departments and faculty are consulted for this matter then approval is sought from the departmental board, curriculum committee and College Board.

d. Writing laboratory manuals and some other textbooks by faculty and reviewing them with independent advice before approval and continually updating them every 2 to 3 years.

e. Posting courses on the web Blackboard.

1b. What processes are followed by faculty and teaching staff for planning and acquisition resources

for library, laboratories, and classrooms.

a. Faculty member decide textbooks that used in his courses, and make a list and submit to curriculum committee.

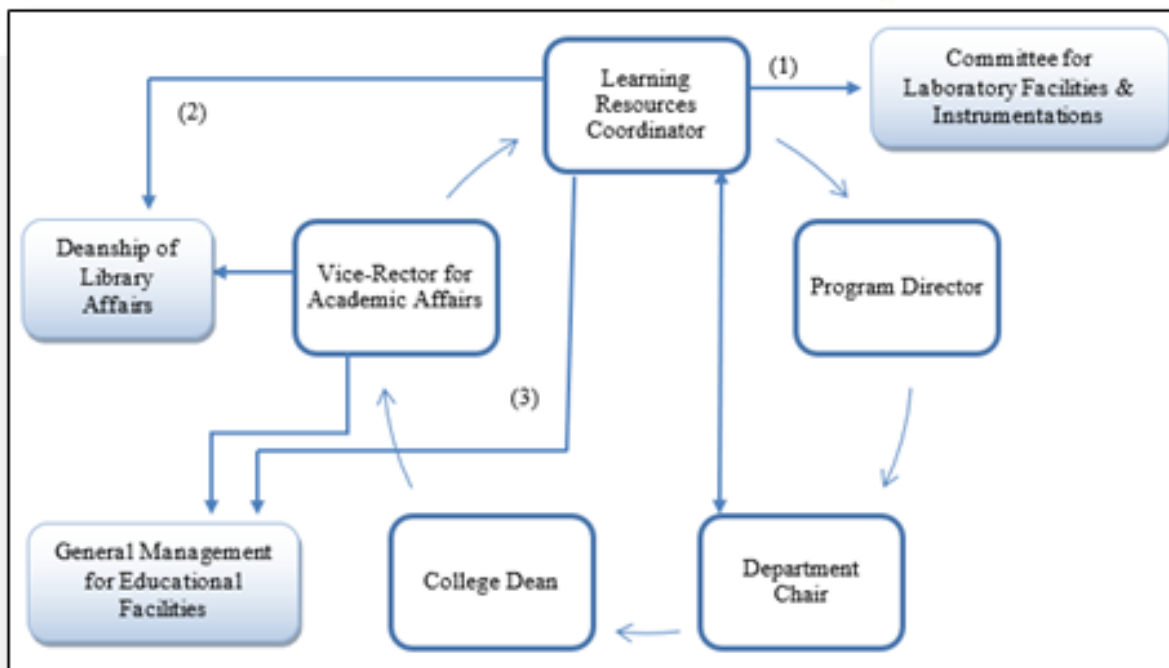
b. The curriculum committee is responsible to evaluate the adequacy of resources for library, laboratories, and classrooms textbooks, and reference materials for each course and units. The postgraduate committee ensures that the resources are suitable for teaching & learning.

c. Required resources by different disciplines are to be discussed in the departmental board meetings and to be sent to the dean or responsible vice deans.

d. Requests for resource improvement are regularly included in the annual course reports. Committees are formed to inspect the current textbook and compare it to the most recent textbooks in the field. The departmental board and curriculum committee and higher academic councils in the university will approve the new book selected.

Survey Evaluation faculty member for learning resources.

College board approves the required textbook upon the recommendations of the Curriculum committee based on the recommendations coming from departmental board meetings, course coordinators, and unit coordinators



## 2. Facilities and Equipment

(Library, laboratories, classrooms, etc.)

Central library, classroom with access to internet, data show, smart board

Four research laboratories equipped with both basic and modern instruments.

## 3. Procedures to ensure a healthy and safe learning environment

(According to the nature of the program)

To maintain a healthy and safe environment during the master's program in chemistry, students should be introduced to the safety management system at the Chemistry department. A keynote lecture regarding health and safety are provided as welcoming the new students. A safety manual should be provided to each student, besides a course should be delivered as a core course and at the beginning of the master's study. Awareness of the students about safety and health must be increased. The risk assessment must be performed before doing any experiment and/or research project. Safety circle should be followed in this aspect, which means you should PLAN, DO, CHECK, and ACT. By identifying the hazard, the control measures should be in place, test the effectiveness of the measures, and redo whatever process fails to control the hazard. Personal protective equipment (PPE) is compulsory in the laboratory. Dealing with chemical students should always read the Material Safety Data Sheet (MSDS) of the chemicals to be used in the laboratory. The health and safety policy in the chemistry department should clearly outline the responsibilities and the role of students, staff members, and personnel.



## G. Program Quality Assurance:

### 1. Program Quality Assurance System

Provide a link to quality assurance manual.

The program has a quality assurance manual.

Please insert the link here

### 2. Procedures to Monitor Quality of Courses Taught by other Departments

None

### 3. Procedures Used to Ensure the Consistency between Main Campus and Branches (including male and female sections).

None

### 4. Assessment Plan for Program Learning Outcomes (PLOs),

Survey for employers about PLOs know the quality of graduates

Survey form the last year students about PLOs to know the quality of educations

Survey form the alumni about PLOs to know the quality of educations

Survey form faculty members about PLOs to know the quality of graduates

## 5. Program Evaluation Matrix

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Effectiveness of teaching and assessment	Student, per Review, Program leaders	Program evaluation, Student-Faculty meeting	end of academic year
Extent of achievement of course/program learning outcomes	Program Leaders, Faculty, quality and development unit	Preparation of program Report -Peer consultation on teaching -Department Council discussions - Self-study report	At end of each study term
Quality of learning Resources	Student, Faculty, internal and external auditors.	Program evaluation Self-study report	At end of each study term At writing of self-study report



Evaluation Areas/Aspects (e.g., leadership, effectiveness of teaching & assessment, learning resources, services, partnerships, etc.)

Evaluation Sources (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others.)

Evaluation Methods (e.g., Surveys, interviews, visits, etc.)

Evaluation Time (e.g., beginning of semesters, end of the academic year, etc.)

## 6. Program KPIs\*

The period to achieve the target (\_\_\_\_) year(s).

KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
KPI-MC-1	Percentage of achieved indicators of the program operational plan objectives	90%	Direct measurement	End of the year
KPI-MC-2	Students' Evaluation of quality of learning experience in the program	4.8/5	Questionnaire	End of the year
KPI-MC-3	Students' evaluation of the quality of the courses	4.5/5	Questionnaire	End of the year
KPI-MC-4	Students' evaluation of the quality of scientific supervision	5/5	Questionnaire	End of the year
KPI-MC-5	Average time for students' graduation (Year)	3.5	From the cohort analysis	End of the year
KPI-MC-6	Rate of students dropping out of the program	0	Statistical data	End of the year
KPI-MC-7	Graduates' employability	80%	Statistical data	End of the year
KPI-MC-8	Employers' evaluation of the program graduates' competency	4.5/5	Questionnaire	End of the year



KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
KPI-MC-9	Students' satisfaction with the provided services	4.1/5	Questionnaire	End of the year
KPI-MC-10	Ratio of students to faculty members	1:1	Statistical data	End of the year
KPI-MC-11	Percentage of faculty members' distribution based on academic ranking	40:30:30*	Statistical data	End of the year
KPI-MC-12	Proportion of faculty members leaving the program	0	Statistical data	End of the year
KPI-MC-13	Satisfaction of beneficiaries with learning resources	4.5/5	Questionnaire	End of the year
KPI-MC-14	Satisfaction of beneficiaries with research facilities and equipment	4.0/5	Questionnaire	End of the year
KPI-MC-15	Percentage of publications of faculty members	100%	Statistical data	End of the year
KPI-MC-16	Rate of published research per faculty member	22 publications	Statistical data	End of the year
KPI-MC-17	Citations rate in refereed journals per faculty member	200	Statistical data	End of the year
KPI-MC-18	Percentage of students' publication	70%:10%**	Statistical data	End of the year
KPI-MC-19	Number of patents, innovative products, and awards of excellence	1:1**	Statistical data	End of the year

\*including KPIs required by NCAAA

\* Percentage of Professor: Percentage of Associate Professor: Percentage of Assistant Professor



\*\* Publications: Conferences

\*\*\* Number of patents and innovative products: Number of national and international excellence awards

## H. Specification Approval Data:

COUNCIL / COMMITTEE	Plan and curriculum committee Academic Development and Quality committee Department Council
REFERENCE NO.	21\1444
DATE	26-10-1444