



**King Fahd University of Petroleum &
Minerals Dhahran 31261, Saudi Arabia**

Department of Chemistry

Deanship of Academic Development

Self-Assessment REPORT for

**Chemistry
&
Industrial Chemistry**

Undergraduate Programs

May 17, 2003

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Summary

The Planning and Program Development Committee of the Chemistry Department in collaboration with various Departmental Standing Committees, followed the Guidelines from the Deanship of Academic Development (DAD) in preparing this report for self-assessment of Chemistry and Industrial Chemistry undergraduate programs. All faculty members participated in the preparation of this report, directly or indirectly, through various standing committees, department council and, on individual basis providing input on numerous items required in the assessment criteria and standards included in the report.

The Department offers two undergraduate degrees, namely BS in Chemistry and Industrial Chemistry. The items where the two programs differ are identified separately for each program. There are several criteria, which are common to both programs. Such criteria are given for the Department as a whole and not for the individual programs to avoid any duplications.

All matrices, survey forms, analyses of the survey forms, tables and similar documents are included in the main report. The list of library holdings, descriptions of courses and faculty resume are given under Appendices. Each appendix is referred at the proper place in the main report and the actual appendix is placed at the end of the report.

The program self-assessment checklist is included in the beginning of the report. The overall layout and the task assignments including the procedure adopted in writing the report is given in the table entitled 'Task Assignment' attached at the end of the report.

The final report was made available to all committee members at all stages of its preparation and all inputs were incorporated in the report. The data in the report were obtained through the appropriate departmental committees or chemistry department secretariat. Data from outside the department was secured through the Self-Assessment Center of the Deanship of Academic Development.

The Planning and Program Development Committee is thankful to all faculty members who provided pieces of information included in this report. It is our sincere hope that this report on program self-assessment will be used to identify the strengths and weaknesses in our programs, which after all, is the main objective of this exercise. We further hope that all points of strengths would be further enhanced and remedial measures will be taken to improve the weaknesses.

***Chemistry Department Planning
and Program Development Committee***

**Deanship of Academic Development
Program Assessment Center**
Program Self-Assessment Checklist

The following is a summary checklist of the main criteria and the associated standards that need to be **addressed** in the program self-assessment report:

Department: Chemistry
Programs: Chemistry and Industrial Chemistry Programs

Criteria and the Associated Standards		Addressed	Not Addressed
C1. Program Mission, Objectives and Outcomes		<input type="checkbox"/>	
S1.1	Program measurable objectives	<input type="checkbox"/>	
			<input type="checkbox"/>
	Program outcomes		<input type="checkbox"/>
			<input type="checkbox"/>
		<input type="checkbox"/>	
			<input type="checkbox"/>
S1.3	Assessment results and improvement plans		
S1.4	Overall performance using quantifiable measures		
C2. Curriculum Design and Organization			
	Courses detailed outline as in item E criterion 2	<input type="checkbox"/>	
S2.1	Courses vs. objectives		
		<input type="checkbox"/>	
		<input type="checkbox"/>	
S2.2	Theory, problem analysis/solution and design in program		
		<input type="checkbox"/>	
S2.3	Mathematics and basic sciences requirements	<input type="checkbox"/>	
S2.4	Major requirements as specified by accreditation body	<input type="checkbox"/>	
S2.5	Humanities, social sciences, arts, ethical, professional and other requirements.	<input type="checkbox"/>	
S2.6	Information technology content integration throughout the program	<input type="checkbox"/>	
S2.7	Communication skills (oral and written)	<input type="checkbox"/>	
C3. Laboratories and Computing Facilities			
S3.1	Lab manuals/documentation/instructions	<input type="checkbox"/>	
S3.2	Adequate support personnel for labs	<input type="checkbox"/>	
S3.3	Adequate computing infrastructure and facilities	<input type="checkbox"/>	
C4. Student Professional Support and Advising			
S4.1	Sufficient frequency of course offering	<input type="checkbox"/>	

S4.2	Effective faculty/student interaction	<input type="checkbox"/>	
S4.3	Professional advising and counseling	<input type="checkbox"/>	
C5. Process Control			
S5.1	Admission process	<input type="checkbox"/>	
S5.2	Registration and student monitoring process	<input type="checkbox"/>	
S5.3	Faculty recruitment and retention process.	<input type="checkbox"/>	
S5.4	Effective teaching and learning processes.	<input type="checkbox"/>	
S5.5	Program requirements completion process.	<input type="checkbox"/>	
C6. Faculty			
S6.1	Program faculty qualifications and number	<input type="checkbox"/>	
		<input type="checkbox"/>	
B.			
S6.2	Current faculty, scholarly activities and development	<input type="checkbox"/>	
S6.3	Faculty motivation and job satisfaction		<input type="checkbox"/>
		<input type="checkbox"/>	

C7. Instructional Facilities			
S7.1	New trends in learning (e.g. e-learning)	<input type="checkbox"/>	
S7.2	Library collections and staff	<input type="checkbox"/>	
S7.3	Class-rooms and offices adequacy	<input type="checkbox"/>	
C8. Instructional Support			
S8.1	Support and financial resources	<input type="checkbox"/>	
S8.2	Number and quality of GSs, RAs & Ph.D. students	<input type="checkbox"/>	
S8.3	Financial support for library, labs and computing facilities	<input type="checkbox"/>	

Department Program Team Coordinator: --- Prof. M. Sakhawat Hussain

Date: May 17, 2003

Criterion # 1

Chemistry and Industrial Chemistry

Programs Missions, Objectives and Outcomes

Criterion 1: Program Mission, Objectives and Outcomes
(Approved by the Chemistry Department Council)

The Programs in Chemistry and Industrial Chemistry are guided by the mission of the KFUPM College of Sciences, and by the statements-of-purpose, or Program Objectives, as developed and periodically reviewed by its constituencies - a group that includes Chemistry faculty, Chemistry students, Alumni of the Department, and Industrial Practitioners.

Standard 1-1:

(a) OBJECTIVES of Chemistry Program

The objective statements given below are not necessarily in their order of priority.

The objectives of the Chemistry Program:

- (a) To provide high quality academic support in Chemistry and Related Applied Areas to all Colleges in the University, (Support to other Colleges)
- (b) To provide a broad, innovative, and quality education in all areas of Chemistry (Quality Education)
- (c) To ensure that our graduates are well-rounded, competitive, (Competitive Education)
- (d) To make students prepared for either advanced studies in chemistry or other related graduate programs, or careers in industry, (Advanced studies)
- (e) To initiate interdisciplinary undergraduate and diploma programs related to chemistry, (Interdisciplinary Programs), and
- (f) To serve the community through extension services. (Extension Services)

Table 4.1: Chemistry Program objectives Assessment

Objective	How measured	When measured	Improvement identified	Improvement made
(a)	Since this is first time the self-assessment is carried out by the department, the Program objectives assessment will be carried out during the next semester .			
(b)				
(c)				
(d)				
(e)				
(f)				

(b) **OBJECTIVES** of Industrial Chemistry Program

The objective statements given below are not necessarily in their order of priority.

- (a) To maintain high Quality instructions in Industrial Chemistry at the undergraduate level.
- (b) To provide industrial experience for graduates through on-the-job industrial summer training program.
- (c) To prepare graduates for advanced study in chemistry or other related areas.
- (d) To provide research experience by undertaking chemistry and industrial chemistry projects.

Table 4.1: Industrial Chemistry Program objectives Assessment

Objective	How measured	When measured	Improvement identified	Improvement made
(a)	Since this is first time the self-assessment is carried out by the department, the Program objectives assessment will be carried out during the next semester .			
(b)				
(c)				
(d)				

Standard 1- 2:

(a) **OUTCOMES** of Chemistry Program

To meet the Chemistry Program Objectives, the Department of Chemistry will graduate professional, competent chemists who are able to demonstrate the following measurable outcomes:

- # 1 a proficiency in chemistry and basic sciences including mathematics, physics, and computer skills. (Proficiency in Basic Sciences)
- # 2 a proficiently in chemical science concepts covering all areas of basic chemical concepts. (Proficiency in Chemistry)
- # 3 a knowledge of the structure of chemical materials on scales ranging from the electronic and atomic levels to macroscopic levels.(Knowledge)
- # 4 the ability to analyze existing and new chemical compounds, improve traditional compounds, and produce useful compounds reliably and economically through a variety of synthesis and processing techniques; (Analysis)
- # 5 the ability to characterize compound properties of all kinds using modern measurement techniques; (Characterization Techniques)
- # 6 the ability to select, specify, and design chemical substances that are appropriate for applications in various useful environments; (ability to design)
- # 7 the ability to express thoughts and ideas through oral, written, and computer communications; (ability to express)

- # 8 an appreciation for the humanities and the responsible role of technology in society, including a sensitivity to the environment and the responsible use of natural resources; (role of technology in society)
- # 9 an appreciation for other cultures and for international events; (other culture)
- # 10 the ability to work effectively on interdisciplinary teams and demonstrate problem solving, leadership, and organizational skills.(interdisciplinary areas)
- #11 The ability of technical report writing and oral communication skills; team building skills and knowledge of societal and environmental issues in relation to technology. (report writing ability)

Table 4.2(A): Matrix Relating Chemistry Program Outcomes to Chemistry Program Objectives

Program outcomes	Program objectives					
	(a) Support to other Colleges	(b) Quality Education	(c) Competitive Education	(d) Advanced studies	(e) Interdisciplinary Programs	(f) Extension Services
# 1: Proficiency in basic Sciences	x		X		x	
# 2: Proficiency in Chemistry	x			X		
# 3: Knowledge		X	x			x
# 4: Analysis					X	
# 5: Characterization Techniques	x		x			
# 6: ability to design					x	x
# 7: ability to express	x			x	x	
# 8: role of technology in society	x			x		
# 9: other culture		X				
# 10: interdisciplinary areas					X	
# 11: report writing ability				X		

**Table 4.2(B) Matrix Relating Courses in Chemistry Program to
Chemistry Program Outcomes**

Program Courses	Program Outcomes										
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11
Anal. Chem.(8)	X			X	X						X
Gen. Chem (8)	X	X	X								
Inorg. Chem (7)	X		X	X	X						
Org. Chem. (11)	X			X	X	X					
P. Chem.(11)	X		X		X		X				X
Prof. Skills (5)					X	X		X		X	
ENGL (6)							X				X
MATH (14)	X										
PHYS (8)	X										
IAS (2) courses									X		

(b) OUTCOMES of Industrial Chemistry Program.

To meet the Industrial Chemistry Program Objectives, the Department of Chemistry will graduate professional, competent Industrial Chemists who are able to demonstrate the following measurable outcomes:

- # 1 a proficiency in chemistry and basic sciences including mathematics, physics, and computer skills.
- # 2 a proficiency in chemical and industrial chemistry concepts covering all areas of basic chemical concepts and their industrial applications (industrial chemistry program)
- # 3 the ability to predict and evaluate the performance of chemical substances as functional elements of industrial systems;
- # 4 the ability to express thoughts and ideas through oral, written, and computer communications;
- # 5 an appreciation for the humanities and the responsible role of technology in society, including a sensitivity to the environment and the responsible use of natural resources;
- # 6 an appreciation for other cultures and for international events;
- # 7 the ability to work effectively on interdisciplinary teams and demonstrate problem solving, leadership, and organizational skills;
- # 8 The ability of technical report writing and oral communication skills; team building skills and knowledge of societal and environmental issues in relation to technology.

Table 4.2(A) : Matrix Relating Industrial Chemistry Program Outcomes to Industrial Chemistry Program Objectives

Program outcomes	Program objectives					
	(a) Support to other Colleges	(b) Quality Education	(c) Competitive Education	(d) Advanced studies	(e) Interdisciplinary Programs	(f) Extension Services
# 1	x				x	x
# 2	x					x
# 3			x			x
# 4						
# 5	x		x			
# 6					x	x
# 7	x			x	x	
# 8	x			x		

Table 4.2(B): Matrix Relating Courses in Industrial Chemistry Program to Industrial Program Outcomes

Program Courses	Program Outcomes							
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8
Anal. Chem.(6)	X	X		X				X
Gen. Chem (8)	X	X		X				
Inorg. Chem (4)	X	X		X				
Org. Chem. (11)	X	X		X				
P. Chem. (8)	X	X		X				X
CHE 201 (3)			X	X				X
Industrial Chem. (19)			X		X			
MGT 301							X	X
Prof. Skills (3)				X			X	X
ENGL (6)				X				X
MATH (14)	X							
PHYS (8)	X							
IAS (2) courses						X		

Surveys

Assessment of Programs Outcome/Objectives

The assessment of programs objectives and outcome was accomplished by conducting the following three surveys:

1. Survey of graduating seniors.
2. Survey of Employers.
3. Survey of Alumni.

The questionnaires for the first two surveys were made available online on the DAD Home Page. Alumni Committee of the Chemistry Department carried out the Alumni Survey. The target audience of each survey was informed repeatedly through e-mails, general notices and through students and faculty in the department and departmental council meetings. The survey forms from the DAD Web Page are reproduced on pages 11, 15 & 18, respectively.

The results for each survey are summarized at the end of each survey. The first two surveys need to be repeated preferably during the next semester or any subsequent semester and conclusions drawn should be implemented at that time.

The summaries of each survey and their analyses are given at the end of each survey. The response to the first two surveys was very poor and the results were not statistically valid. The Alumni survey was to some extent reasonable and some useful trends were observed and are identified in this report.

The questionnaires for surveys for the co-op and senior project presentations are not yet available and need to be construction. This survey should be made available online on the Home Page of the Chemistry Department and all students returning from their co-op assignments must be required to respond to this survey. Outcome examinations are not conducted so far, but it should be carried out in near future.

Since it is the first time that the present self-assessment is carried out, it is recommended that all of the above surveys should be repeated during the next academic year and the results be summarized and added to a revised self- assessment report. The Department should carefully utilize the results of the surveys and all conclusions be implemented in order to improve the programs as soon as possible.

Chemistry Department

Graduating Students Survey

The survey seeks graduating students' input on the quality of education they received in their program and the level of preparation they had at King Fahd University of Petroleum and Minerals. The purpose of this survey is to assess the quality of the academic programs. We seek your help in completing this survey.

1. The work in the program is too heavy and induces a lot of pressure.
 Strongly agree Agree Neutral Disagree Strongly disagree
1. The program is effective in enhancing team- working abilities.
 Strongly agree Agree Neutral Disagree Strongly disagree
2. The program administration is effective in supporting learning.
 Strongly agree Agree Neutral Disagree Strongly disagree
3. The program is effective in developing analytic and problem solving skills.
 Strongly agree Agree Neutral Disagree Strongly disagree
4. The program is effective in developing independent thinking.
 Strongly agree Agree Neutral Disagree Strongly disagree
5. The program is effective in developing written communication skills.
 Strongly agree Agree Neutral Disagree Strongly disagree
6. The program is effective in developing planning abilities.
 Strongly agree Agree Neutral Disagree Strongly disagree
7. The mathematical content of the program is adequate for pursuing the advanced courses in the program.
 Strongly agree Agree Neutral Disagree Strongly disagree
8. The chemistry contents of the program is balanced in basic areas of chemistry for pursuing advanced studies in chemistry.
 Strongly agree Agree Neutral Disagree Strongly disagree
9. The program is balanced in chemistry and enabled me to work in an academic And/or industrial environment.
 Strongly agree Agree Neutral Disagree Strongly disagree

Answer question 11 if applicable

11. The co-op training experience is effective in enhancing:

- a. Ability to work in teams

Strongly agree Agree Neutral Disagree Strongly disagree

- b. Independent thinking

Strongly agree Agree Neutral Disagree Strongly disagree

- c. Appreciation of ethical values

Strongly agree Agree Neutral Disagree Strongly disagree

d. **Professional Development**

Strongly agree Agree Neutral Disagree Strongly disagree

e. **Time management skills**

Strongly agree Agree Neutral Disagree Strongly disagree

f. **Judgment**

Strongly agree Agree Neutral Disagree Strongly disagree

g. **Discipline**

Strongly agree Agree Neutral Disagree Strongly disagree

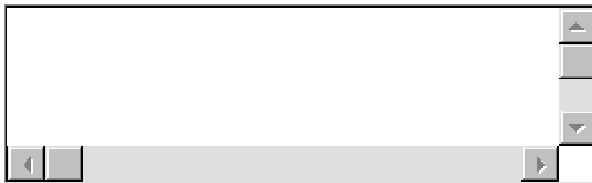
h. **The link between theory and practice**

Strongly agree Agree Neutral Disagree Strongly disagree

i. **On-the job training to work effectively**

Strongly agree Agree Neutral Disagree Strongly disagree

12. What are the best aspects of your program?



13. What aspects of your program could be improved?



14. Specify the chemistry program you were (are) in

- Applied Chemical Engineering (ACHE)
- Chemical Engineering (CHE)

- Chemistry (CHEM)
- Industrial Chemistry (ICHM)

Submit Form

Reset Form

Developed by: Computer Application Development (CAD), Information Technology Center (ITC),
KFUPM.

For: Academic Development Center (ADC), KFUPM.

Results of Survey of Graduating Students

The Department Chairman, through general notifications, announcements in the department and in the department council meetings, repeated e-mails and general announcements, informed all graduating students and their advisors requesting them to participate in the surveys by filling the online survey forms. However, the response was not very encouraging. Though the number of students in chemistry service courses is quite high, the total number of chemistry or Industrial Chemistry majors at any given point in time has never been very high. Only TWO students responded by filling the online survey forms on the DAD Home page. Being inconclusive, the analysis of this survey was not attempted during the current self-assessment cycle. Another effort to conduct this survey will be made again during the next academic year, and the analysis will be presented in a future self-assessment report.

Chemistry Department Employer Survey

This survey is with regard to KFUPM graduates employed in your organization. The purpose of this survey is to obtain input from employers regarding the quality of education provided by King Fahd University of Petroleum and Minerals. This survey is required for the Self-Assessment of our Academic Programs. Thus, we invite you to complete this survey in order to receive your valuable feedback. Please choose the most appropriate response for each of the following questions:

I Knowledge

1. **Math, Science and Industrial Skills**
 Excellent Very Good Good Fair Poor
2. **Problem solving skills**
 Excellent Very Good Good Fair Poor
3. **Collecting and analyzing appropriate data**
 Excellent Very Good Good Fair Poor
4. **Ability to relate theory to Practice**
 Excellent Very Good Good Fair Poor
5. **Ability to set up, perform and report experiments**
 Excellent Very Good Good Fair Poor
6. **Computer knowledge utilization of IT skills**
 Excellent Very Good Good Fair Poor
7. **Skill to use Internet recourses**
 Excellent Very Good Good Fair Poor
8. **Knowledge and practice of Lab Safety**
 Excellent Very Good Good Fair Poor
9. **Relating chemical knowledge to General life situations**
 Excellent Very Good Good Fair Poor

II. Communicational Skills

1. **Oral communication**
 Excellent Very Good Good Fair Poor
2. **Report writing**
 Excellent Very Good Good Fair Poor
3. **Presentation skills**
 Excellent Very Good Good Fair Poor
4. **Competence in Chemistry**
 Excellent Very Good Good Fair Poor

III. Interpersonal Skills

1. **Ability to work in teams**
 Excellent Very Good Good Fair Poor
2. **Leadership**
 Excellent Very Good Good Fair Poor

3. **Ability to think independently**
 Excellent Very Good Good Fair Poor
4. **Ability to design new experiments**
 Excellent Very Good Good Fair Poor
5. **Motivation**
 Excellent Very Good Good Fair Poor
6. **Reliability**
 Excellent Very Good Good Fair Poor
7. **Appreciation of ethical values**
 Excellent Very Good Good Fair Poor

IV. Work Skills

1. **Time management skills**
 Excellent Very Good Good Fair Poor
2. **Judgment**
 Excellent Very Good Good Fair Poor
3. **Discipline**
 Excellent Very Good Good Fair Poor
4. **Adherence to Lab safety**
 Excellent Very Good Good Fair Poor

V. General Comments

Please make any additional comments or suggestions, which you think would help strengthen our programs for the preparation of graduates who will enter your field.

VI. Information About Organization

Organization Name

Type of Business

Number of Graduates (in each Chemistry program) in your Organization:

Applied Chemical Engineering (ACHE)

Chemical Engineering (CHE)

Chemistry (CHEM)

Industrial Chemistry (ICHM)

Results of Employer Survey

The Department Chairman contacted all employers on the chemistry department mailing list, at least three times by e-mails. The survey sought very useful information from the point of view of the employers of chemistry and industrial chemistry graduates. The number of employers generally constituted individuals in Chemical and related industries. The response to this survey was also very poor. Only two employers responded . It is recommended that another attempt be made during the next academic year to contact these employers. The results from this survey should be of great significance since responses should provide useful information about the success of our two programs. The conclusions should only be drawn after a statistically valid survey has been carried out. These results should be used to make any necessary adjustments in our programs.

Chemistry Department

Alumni Survey

The purpose of this survey is to obtain alumni input on the quality of education they received and the level of preparation they had at King Fahd University of Petroleum and Minerals. The purpose of this survey is to assess the quality of the academic program. We seek your help in completing this survey.

A : Excellent B: Very good C: Good D: Fair E: Poor

I Knowledge

1. Math, Science and Engineering skills (A) (B) (C) (D) (E)
2. Problem formulation and solving skills (A) (B) (C) (D) (E)
3. Collecting and analyzing appropriate data (A) (B) (C) (D) (E)
4. Ability to link theory to practice (A) (B) (C) (D) (E)
5. Ability to design a system component
or process (A) (B) (C) (D) (E)
6. Computer knowledge (A) (B) (C) (D) (E)

II. Communication Skills

1. Oral communication (A) (B) (C) (D) (E)
2. Report writing (A) (B) (C) (D) (E)
3. Presentation skills (A) (B) (C) (D) (E)

III Interpersonal Skills

1. Ability to work in teams (A) (B) (C) (D) (E)
2. Independent thinker (A) (B) (C) (D) (E)
3. Appreciation of ethical
Values (A) (B) (C) (D) (E)
4. Professional development (A) (B) (C) (D) (E)

IV Work Skills

1. Time management skills (A) (B) (C) (D) (E)
2. Judgment (A) (B) (C) (D) (E)
3. Discipline (A) (B) (C) (D) (E)

V General comments

Please make any additional comments or suggestions, which you think would help strengthen our programs.

VI Alumni Information

1. Name (Optional) -----
2. Name of organization-----
3. Position in organization: -----
4. Year of graduation:-----

Results of Alumni Survey

The input from **25** Alumni was received for this Survey and the results are summarized below:

#	<i>Skill Assessed</i>	<i>Average Ratings</i>
1	Knowledge	Fair to Good
2	Communication skills	Very good
3	Interpersonal skills	Good
4	Work skills	Very good

Conclusions:

Our Alumni rated the skills they acquired from either of our undergraduate programs, between fair and very good. This survey should be repeated during the next academic year with a larger sample participating in the survey.

Standard 1- 3:

Assessment results and improvement plans

the program will only be documented after all statistically valid surveys are completed and analyzed. The following points need to be considered.

- ◆ This is the first assessment carried out by the department. The results are not conclusive at the present stage because of very poor response to the surveys.
- ◆ Future program improvements plans based on the assessments are not yet available.
- ◆ Strengths and weaknesses of the program are summarized below:
 - Strengths: Quite comprehensive programs, Reasonably balanced course offerings, Strong faculty, Excellent facilities,
 - Weaknesses: Very Low enrollment in majors, Less credit hours for research training, Ratings for skills acquired are only between fair and very good.
- ◆ Future development plans for the two chemistry programs need to be drawn and implemented.

Standard 1-4:

Overall performance using quantifiable measures

The department must assess its overall performance periodically starting with the next academic year using quantifiable measures.

- ◆ Present undergraduate students enrolment in majors during the last several years has been very low. Average graduating grade point average per semester is around 2.0.
- ◆ Employers inputs from survey are inconclusive.
- ◆ The median/average student evaluation for all courses is around 3.0 and about 10 % of faculty awarded excellence in teaching award.
- ◆ Present performance measures for research activities. The journal publications, funded projects, conference publications per faculty per year are quite high and highest in the College of Sciences. About 10 % of faculty awarded excellence in research award.
- ◆ Present performance measures for community services. The total number of short courses, workshops and seminars organized are between 10-12 last year.
- ◆ Indications from faculty and students satisfaction regarding the administrative services offered by the department. The students surveys are inconclusive whereas conclusions from faculty servay given in criterion 6, are mixed. .

Biology Courses

The objective of Biology courses offered in the Chemistry Department is to:

Provide support for all courses related to biological sciences required in newly initiated or forthcoming interdisciplinary programs.

Note

Biology Courses are given separately in the outlines for courses descriptions, only for the sake of completeness. None of these courses are required in any of the undergraduate programs offered by the Chemistry Department.

Criterion # 2

Curriculum design and Organization

The curricula for Chemistry as well as Industrial Chemistry programs have been designed and organized to achieve the objectives and outcomes specified in Criterion # 1 for the two programs. All course outcomes are outgrowth of the program objectives. The breakdowns of the two curricula satisfy the standards specified in this section. Curriculum standards are specified in terms of credit hours of study.

The information about the curricula of the two programs are given below:

- A. Title of degree programs.** (1) BS in Chemistry
 (2) BS in Industrial Chemistry
- B. Definition of credit hour.** A semester credit hour equals one class hour or four laboratory hours per week. The semester is approximately fifteen weeks.
- C. Degree plan:** The degree plans for Chemistry and Industrial Chemistry programs are given on pages 23 & 26, respectively.
- D. Curriculum vs. Requirements** Table 4.3 showing curriculum breakdown in terms of mathematics and basic sciences, major requirements, social sciences and other requirements are given on pages 24 & 27.
- E. Course Descriptions:** Course Descriptions for each course in the program that can be counted for credit specifying the following, are given in the Appendices at the end of the report:
- Course title
 - Course objectives and outcomes
 - Catalog description
 - Text book(s) and references
 - Syllabus breakdown in lectures
 - Computer usage
 - Laboratory
 - Content breakdown in credit hours (if applicable) as basic science, math, engineering science, engineering design for engineering discipline, general education requirements, business requirements and major requirements for the College of Sciences at the KFUPM..

Degree Plan:

BS in Chemistry

General Requirements (52 credits)

Communication Skills	ENGL 214, IAS 101, 201, 301	9
Computer Programming	ICS 101	3
English	ENGL 101, 102	6
Islamic and Arabic Studies	IAS 111, 211, 311	6
Mathematics	Math 101, 102, 201, 202	14
Physical Education	PE 101, 102	2
Physics	PHYS 101, 102, 201	12

Core Requirement (50 credits)

Analytical Chemistry	CHEM 223, 323, 324	8
General Chemistry	CHEM 101, 102	8
Inorganic Chemistry	CHEM 331, 332	7
Organic Chemistry	CHEM 201, 202, 303	11
Physical Chemistry	CHEM 212, 311, 312	11
Professional Skills	CHEM 471, 472, 479	5

Electives (20 credits)

Chemistry Elective	Two CHEM XXX courses	6
Islamic and Arabic Studies	IAS 4xx	2
Free Electives	Four courses	12

Summer Training (CHEM 399, 2 credits)

Total: 124 semester credit hours

Table 4.3:**Semester wise Course Descriptions for
Chemistry Program****as given in Appendix E of DAD Guidelines**

Semester	Course Number	Category (Credit Hours)				
		Math and Basic Science		Major requirements	Humanities and Social Sciences	Others (Arts)
		Math	Basic Science			
First	CHEM 101		4	4		
First	IAS 111				2	
First	ENGL 101				3	
First	MATH 101	4				
First	PE 101					1
First	PHYS 101		4			
Second	CHEM 102		4	4		
Second	ENGL 102				3	
Second	ICS 101					3
Second	MATH 102	4				
Second	PHYS 102		4			
Third	CHEM 201			4		
Third	ENGL 214				3	
Third	IAS 211				2	
Third	MATH 201	3				
Third	CHEM 223			2		
Third	PE 102					1
Fourth	CHEM 202			4		
Fourth	CHEM 212			4		
Fourth	CHEM 323			3		
Fourth	IAS 101				2	
Fourth	MATH 202	3				
Fifth	CHEM 331			4		
Fifth	CHEM 311			4		
Fifth	IAS 311				2	
Fifth	PHYS 201		4			
Sixth	CHEM 303			3		
Sixth	CHEM 332			3		
Sixth	CHEM 324			3		
Sixth	CHEM 312			3		
Sixth	IAS 201				2	
Seventh	CHEM 471			2		
Seventh	CHEM 479			1		
Seventh	CHEM xxx			3		

Seventh	CHEM xxx			3		
Seventh	IAS 301				2	
Seventh	XXX xxx					3
Summer	CHEM 399			2		
Eighth	CHEM 472			2		
Eighth	XXX xxx					3
Eighth	XXX xxx					3
Eighth	IAS 4xx				2	
Eighth	XXX xxx					3
Total		14	20	58	23	17
Minimum Requirements		14	20	58	23	17

Degree Plan: BS in Industrial Chemistry

General Requirements (55 credits)

Communication Skills	ENGL 214, IAS 101, 201, 301	9
Computer Programming	ICS 101	3
English	ENGL 101, 102	6
Islamic and Arabic Studies	IAS 111, 211, 311	6
Management	MGT 301	3
Mathematics	Math 101, 102, 201, 202	14
Physical Education	PE 101, 102	2
Physics	PHYS 101, 102, 201	12

Core Requirement (59 credits)

Industrial Chemistry (19 credits)

Introduction to Chemical Engineering	CHE 201	3
Industrial Catalysis	CHEM 352	3
Polymer Chemistry	CHEM 450	
Petroleum Chemistry	CHEM 453	3
Industrial Inorganic Chem.	CHEM 455	3
Industrial Organic Chem.	CHEM 456	3

Pure Chemistry (40 credits)

Analytical Chemistry	CHEM 323, 324	6
General Chemistry	CHEM 101, 102	8
Inorganic Chemistry	CHEM 331	4
Organic Chemistry	CHEM 201, 202, 203	11
Physical Chemistry	CHEM 212, 311	8
Professional Skills	CHEM 471, 473	3

Electives (8 credits)

Islamic and Arabic Studies	IAS 4xx	2
Free Elective	One Course	3
Engineering Elective	One course	3

Summer Training (CHEM 399, 2 credits)

Total: 124 semester credit hours

Table 4.3:
Semester wise Course Descriptions for
Industrial Chemistry Program
as given in Appendix E of DAD Guidelines

Semester	Course Number	Category (Credit Hours)				
		Math and Basic Science		Major requirements	Humanities and Social Sciences	Others (Arts)
		Math	Basic Science			
First	CHEM 101		4	4		
First	IAS 111				2	
First	ENGL 101				3	
First	MATH 101	4				
First	PE 101					1
First	PHYS 101		4			
Second	CHEM 102		4	4		
Second	ENGL 102				3	
Second	MATH 102	4				
Second	ICS 101					3
Second	PHYS 102		4			
Third	CHEM 201			4		
Third	ENGL 214				3	
Third	IAS 211				2	
Third	MATH 201	3				
Third	PE 102					1
Fourth	CHEM 202			4		
Fourth	CHEM 212			4		
Fourth	IAS 101				2	
Fourth	MATH 202	3				
Fourth	CHEM 323			3		
Fifth	PHYS 201		4			
Fifth	CHEM 331			4		
Fifth	CHEM 311			4		
Fifth	CHE 201			3		
Fifth	IAS 311				2	
Sixth	CHEM 303			3		
Sixth	CHEM 355			3		
Sixth	IAS 201				2	
Sixth	CHEM 324			3		
Sixth	CHEM 456			3		

Summer	CHEM 399			2		
Seventh	CHEM 453			3		
Seventh	CHEM 455			3		
Seventh	IAS 301				2	
Seventh	MGT 301			3		
Seventh	XXX xxx					3
Eighth	CHEM 479			1		
Eighth	CHEM 450			4		
Eighth	CHEM 471			2		
Eighth	IAS 4xx				2	
Eighth	XXX xxx					3
Total		14	20	64	23	11
Minimum Requirements		14	20	64	23	11

Standard 2-1:

- ◆ The program content (courses) meets the program objectives
- ◆ The matrix shown below linking courses to program outcomes. List the courses and tick against relevant outcomes.

Table 4.4: Matrix Relating BS Chemistry Courses verses Chemistry Program Outcomes

Program Courses	Program Outcomes										
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11
Anal. Chem.(8)	X			X	X						X
Gen. Chem (8)	X	X	X								
Inorg. Chem (7)	X		X	X	X						
Org. Chem. (11)	X			X	X	X					
P. Chem.(11)	X		X		X		X				X
Prof. Skills (5)					X	X		X		X	
ENGL (6)							X				X
MATH (14)	X										
PHYS (8)	X										
IAS (2) courses									X		

Table 4.4: Matrix Relating BS Industrial Chemistry Courses to Industrial Chemistry Program Outcomes

Program Courses	Program Outcomes							
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8
Anal. Chem.(6)	X	X		X				X
Gen. Chem (8)	X	X		X				
Inorg. Chem (4)	X	X		X				
Org. Chem. (11)	X	X		X				
P. Chem. (8)	X	X		X				X
CHE 201 (3)			X	X				X
Industrial Chem. (19)			X		X			
MGT 301							X	X
Prof. Skills (3)				X			X	X
ENGL (6)				X				X
MATH (14)	X							
PHYS (8)	X							
IAS (2) courses						X		

Standard 2-2:

Theoretical background, problems analysis, solution design and experimental

- ◆ Indicate which courses contain a significant portion (more than 30%) of the elements in standard 2-2. There are several courses which have more than one element associated to a course.

Table 4.5: Standard 2-2 Requirements for BS Chemistry Courses

Program Courses	Theoretical background	Problem analysis	Solution design	Experimental Skills	Humanities
Anal. Chem.(8)				x	
Gen. Chem (8)				x	
Inorg. Chem (7)				x	
Org. Chem. (11)				x	
P. Chem.(11)	x			x	
Prof. Skills (5)		x	x		
ENGL (6)					x
MATH (14)	x				
PHYS (8)	x	x			
IAS (2) courses					x

Table 4.5: Standard 2-2 Requirements for BS Industrial Chemistry Courses

Program Courses	Theoretical background	Problem analysis	Solution design	Experimental Skills	Humanities
Anal. Chem.(6)				X	
Gen. Chem (8)				X	
Inorg. Chem (4)				X	
Org. Chem. (11)				X	
P. Chem. (8)	X			X	
CHE 201 (3)			X	X	
Industrial Chem. (19)			X		
MGT 301		X			
Prof. Skills (3)			X		
ENGL (6)					X
MATH (14)	X				
PHYS (8)	X				
IAS (2) courses					X

Standard 2-3:

The curriculum satisfy the mathematics and basic sciences requirements for the program, as specified by the respective accreditation body.

The mathematics and basic science requirements for all courses for the two programs are shown on pages 24 and 27 for the Chemistry and Industrial Chemistry programs, respectively. These requirements are in general satisfy the requirements specified by the accreditation bodies such as the American Chemical Society or the Royal Chemical Society.

Standard 2-4:

The curriculum for the two programs satisfy the major requirements for the program as specified by the respective accreditation body. (Tables on pages 24 & 27).

Standard 2-5:

The curriculum satisfy humanities, social sciences, ethical, professional and other discipline requirements for the program, as specified by the respective accreditation body and shown on Pages 24 and 27.

Standard 2-6 :

Information technology component of the curriculum is integrated throughout the two programs, as much as possible.

Standard 2-7:

Oral and written communication skills of the student are developed and applied in the program, through courses exclusively devoted to Research Projects, Seminars and co-op assignments and their reports presentations.

Criterion # 3: Laboratories and Computing Facilities

The chemistry Department offers BS degrees in Chemistry and Industrial Chemistry. The designed curriculum for Chemistry program provides a fundamental knowledge in the major areas of Chemistry recommended by international chemical organizations.

The core requirements cover the basic fields of chemistry containing many Lab activities. The Lab/computer facilities for each field are described below:

1. General Chemistry: (CHEM 101 & CHEM 102)

Two general chemistry courses are given for both programs: CHEM 101 and CHEM 102. The credit system for any one of them is 3-4-4, i.e., three credits for lecture and four hours (one credit) for laboratory work. *The required standards to meet this criterion for CHEM 101 and CHEM 102 labs are discussed below:*

Standard 1.1: Lab manuals/documentation/instruction:

Lab title and Location: General Chemistry I and II, Bld # 4-202, 204, 206, 208.

Objective: To introduce qualitative/quantitative aspects to freshman students.

Adequacy for Instruction:

of charge and faculty instruction manuals are also provided on the first day to all the enrolled students and instructors, respectively.

Standard 1.2: Support personnel for instruction and maintenance:

Students per Lab: The maximum number of student is 20 students per lab section.

Personnel per Lab: An instructor and a technician are available during the lab time to help students in understanding the experimental concepts.

Maintenance: Glass blowers and an electronic engineer maintain the supporting instruments in the labs and fix all the minor malfunctioning.

Standard 1.3: University facilities and safety regulations:

Lab Equipment: The university provide chemicals, glassware, chemical analysis equipment including: pH-meters, in all the labs and free of any charge.

Safety regulations: Safety rules and regulations are explained on experiment # 01 with respect to the following: Personal safety, equipment safety, handling chemicals, waste disposal guidelines. Safety agreement is signed and dated by each student and handed back to his lab instructor on the first day of the lab.

Benchmarks:

Some of the international institutions have lab manuals for general chemistry that contains many well-designed experiments related to industry and commonly used materials. The department will try to include some of these experiments in a revised lab syllabus.

2. Analytical Chemistry: (CHEM 223, CHEM 323 & CHEM 324)

Three analytical chemistry courses namely, CHEM 223, CHEM 323, and CHEM 324 are given at KFUPM. The credit system of CHEM 223 is 1-4-2 and of CHEM 323 or CHEM 324 is 2-4-3. *The required standards to meet this criterion for analytical labs are given below:*

Standard 2.1: Lab manuals/documentation/instruction:

Lab title and Location: Analytical Chemistry, Bld # 4-234, 236.

Objective: Training the students to develop skills in wet chemistry using basic analytical techniques such as: Gravimetric, titrimetric, electrometric and photometric methods.

Adequacy for Instruction:

manuals are provided on very first day to all the enrolled students and instructors, respectively.

Standard 2.2: Support personnel for instruction and maintenance:

Students per Lab: The maximum number of student is 12 students per lab section.

Personnel per Lab: An instructor and a chemist are available during lab period to help students in understanding the experimental concepts and data analysis.

Maintenance: Glass blowers and an electronic engineer maintain and fix the entire minor problems and/or faults.

Standard 2.3: University facilities and safety regulations:

Lab Equipment: The university provide chemicals, glassware, chemical and free of charge.

Safety regulations: The first part of experiment # 01 is about the safety rules and the students are informed about these rules at the beginning of the lab and when it is necessary.

Benchmarks:

Analytical labs are equipped and run with facilities as well as instruction guides that are very similar to many international institutions.

3. Inorganic Chemistry: (CHEM 331 & CHEM 332)

Two inorganic chemistry courses are given at KFUPM namely; CHEM 331 and CHEM 332. Only CHEM 331 has lab as a part of the course with its credit system being 3-4-4, i.e., four hours (one credit) for laboratory work.

The Chem 331 lab course is being developed as a hybrid online course which will be a combination of virtual, virtual/conventional, and conventional experiments. The lab material will be available and delivered online with effect from the first semester of the academic year 2003-2004 (Term 031). The lab is designed on the standards used in most American and British Universities. The required standards to meet this criterion for CHEM 331 lab is discussed below:

Standard 3.1: Lab manuals/documentation/instruction:

Lab title and Location: CHEM 331-Lab:Modern Inorganic Chemistry I, Bld # 4-244.

Objective: To instruct students in modern topics in Inorganic Chemistry, synthesis/identifying coordination, organometallic compound and molecular graphics.

Adequacy for Instruction:

day to all the enrolled students and instructors.

Standard 3.2: Support personnel for instruction and maintenance:

Students per Lab: The maximum number of student is 12 students per lab section. They perform experiments in rotation and work in pair and given lecture as they carry out experiments.

Personnel per Lab: An instructor and a technician are available during lab period to help students in understanding the experimental concepts and data analysis. Upon the compilation of the synthetic part an instrumental technician helps the students run UV, IR, NMR etc.

Maintenance: Glass blowers fix glass equipment required in the lab.

Standard 3.3: University facilities and safety regulations:

Lab Equipment: The university provide chemicals, glassware, chemical analysis equipment including: Chromatography column, Models, UV, IR, NMR, Gouy Balance,

Safety regulations: All safety regulations are applied as in every other teaching laboratories including: Personal safety, equipment safety, handling chemicals, waste disposal guidelines.

Computational facilities:

by using computer using general software such as Excel, ChemDraw etc..

Benchmarks:

The inorganic lab runs similar facilities as for many international institutions.

4. Organic Chemistry: (CHEM 201, CHEM 202 & CHEM 303)

Three organic courses are given at KFUPM: CHEM 201, CHEM 202 and CHEM 303. The credit system of CHEM 201 and CHEM 202 courses are 3-4-4 for each and CHEM 303 course is 2-4-3. *The required standards to meet this criterion for the labs of these courses are discussed below:*

Standard 4.1: Lab manuals/documentation/instruction:

Lab title and Location: Organic Chemistry I and II (CHEM 201 and CHEM 202) and Spectroscopic and Qualitative Organic Chemistry (CHEM 303) , Bld # 6-234, 236.

Objective: To instruct students in organic chemistry and synthesis/identifying various organic compounds and basic spectroscopic techniques.

Adequacy for Instruction:

manuals are provided in very first day to all the enrolled students and instructors.

Standard 4.2: Support personnel for instruction and maintenance:

Students per Lab: The maximum number of student is 20 students per lab section.

Personnel per Lab: An instructor and a chemist or technician are available during lab time to help students in understanding the experimental concepts. Upon the compilation of the synthetic part instrumental technician help the students run UV, IR, NMR etc. for identification.

Maintenance: Glass blowers and an electronic engineer maintain and fix all the minor problems and/or faults.

Standard 4.3: University facilities and safety regulations:

Lab Equipment: The university provide chemicals, glassware, chemical analysis equipment including: Models, UV, IR, NMR spectrometers, physical

Safety regulations: The first part of experiment # 01 is about the safety rules and the students are informed about these rules at the beginning of the lab and when it is necessary.

Benchmarks:

Organic labs are equipped and run with facilities as well as instruction guides that are very similar to many international institutions.

5. Physical Chemistry: (CHEM 212, CHEM 311 & CHEM 312)

Three physical courses are given at KFUPM: CHEM 212, CHEM 311 and CHEM 312. The credit system of CHEM 212 and CHEM 311 courses are 3-4-4 for both of them. *The required standards to meet this criterion for CHEM 212, CHEM 311 labs are discussed below:*

Standard 5.1: Lab manuals/documentation/instruction:

Lab title and Location: Physical Chemistry I and II, Bld # 4-248, 250.

Objective: To skill the students on physical measurements, error analysis, calorimeter, electro-chemistry, chemical kinetics, and surface chemistry.

Adequacy for Instruction:

instruction manuals are provided in very first day to all the enrolled students and instructors. They are also provided schedule which experiment they will be carrying out.

Standard 5.2: Support personnel for instruction and maintenance:

Students per Lab: The maximum number of student is 12 students per lab section.

Personnel per Lab: An instructor and a chemist or technician are available during lab time to help students in understanding the experimental concepts.

Maintenance: Glass blowers and an electronic engineer maintain and fix the entire minor problems and/or faults.

Standard 5.3: University facilities and safety regulations:

Lab Equipment: The university provide chemicals, glassware, physical properties equipment including: Spectrometers, calorimeters, conductance cells, polarimeters,

Safety regulations: The first part of experiment # 01 is about the safety rules and the students are informed about these rules at the beginning of the lab and when it is necessary.

Computational facilities:

by using computer as spreadsheet (e.g., Excel MS software).

Benchmarks:

Organic labs are equipped and run with facilities as well as instruction guides that are very similar to many international institutions.

6. Industrial Chemistry (CHEM 450, CHEM 453, CHEM 455 & CHEM 456)

Four industrial chemistry courses are given at KFUPM namely; CHEM 450, CHEM 453, CHEM 455, and CHEM 456. CHEM 450 and CHEM 453, have Lab parts where their credit systems are 3-4-4 and 2-4-3 respectively. The required standards to meet these criteria for the labs of these courses are discussed below.

Standard 6.1 Lab manuals/documentation/instruction:

Lab title and location: Polymer Chemistry (CHEMM 450), Chemistry of Petroleum Processes (CHEM 453), Bldg # 4-254, 214.

Objective: To instruct students in polymer synthesis, polymer properties and characterization, petroleum process chemistry catalytic reactions, preparation and characterization of catalysts, and hydrocarbon analysis.

Adequacy for Instructions

Lab manuals along with the schedules are provided in very first day to all enrolled students and instructors.

Standard 6.2 Support personnel for instruction and maintenance:

Students per Lab: The maximum number of student is 12 students per lab section. They perform experiments in rotation and work in pair and given lecture as they carry out experiments.

Personnel per Lab: An instructor and a technician are available during lab time to help students in understanding the experimental concepts and data analysis. Upon the completion of the synthetic part the technician helps the students with reaction and analysis.

Maintenance: Glass blowers and an electronic engineer maintain and fix the entire minor problems and/or faults.

Standard 6.3: University facilities and safety regulations:

Lab Equipment: The University provides chemicals, glassware, reactors, distillation set ups, chemical analysis equipment including: Chromatography (GC, HPLC), UV, IR, NMR, VPO and others.

Safety regulations: all safety regulations are applied as in every other teaching laboratories including: Personal safety, equipment safety, handling chemicals, waste disposal guidelines.

Computational facilities:

By using computer but no specific software is required.

Benchmarks: Industrial Lab are equipped and run with facilities as well as instruction guides that are equivalent to many international institutions.

Criterion # 4

Standard 4-1:

Courses are offered with sufficient frequency and number for students to complete their respective programs in a timely manner.

- ◆ The required courses are offered based on the needs of the students. There are courses that are offered every semester like : Chem 101, Chem 102, Chem 111. There are courses which are offered in the first semester and others offered in the second semester or in summer. Each division decides the courses to be offered every semester based on the needs of the students.
- ◆ Elective courses are offered based on the needs of the students. These students together with their advisors decide which elective is required and the concerned division is informed prior the early registration period in order to include that course in the list of courses to be offered during the coming semester..
- ◆ Required courses outside the department are offered according to the plan of the program. Certain courses are offered every semester like Math 101, Math 102, Phys 101 and phys 102. Other required courses are offered based on the pre-registration period and the number of students who made an early registration for the required courses.

Standard 4-2:

Courses in the major are structured to ensure effective interaction between students, faculty and teaching assistants.

- ◆ One instructor offers all of the chemistry courses. Each instructor adopts his way to interact with his students either in the class or during the office hours.

Standard 4-3 :

Guidance on how to complete the program are available to all students and access to qualified advising is available to make sound course decisions and career choices.

- ◆ Students are informed about the program requirements from the degree plan prepared for every student, from the advisor as well as from the undergraduate bulletin which contains all the information about the program. The student can also visit the website of the university which provides the required information.

- ◆ Every Student in chemistry department is assigned to a qualified advisor. The student can consult with his advisor any time during the office hours of the advisor.
- ◆ Professional counseling is usually made with the assigned advisor. The student can also consult with the chairman of the department or with the office of the registrar.
- ◆ Every semester the department arranges for scientific trips to industrial sights where the students can interact with the people in the industry. In addition the students can interact within the college club.

Criterion # 5: **Process Control**

Standard 5-1:

The process of admission to the Chemistry Department, for the Chemistry and the Industrial Chemistry option, is the same as for admission to the University. An applicant must satisfy the following conditions. (Article 3 of KFUPM Regulations)

Article Three

An applicant for admission to the university must satisfy the following conditions.

- a. He should have the secondary school certificate, or its equivalent from inside or outside the Kingdom of Saudi Arabia.
- b. He should have obtained the secondary school certificate in a period of less than 5 years prior to the date of application. However, the University Council may waive this condition if the applicant has a satisfactory explanation.
- c. He must have a record of good conduct.
- d. He must successfully pass any examination or personal interviews as determined by the University Council.
- e. He must be physically fit and healthy.
- f. He must obtain the approval of his employer, if he is an employee of any government or private agency.
- g. He must satisfy any other conditions the University Council may deem necessary at the time of application.

Implementation Rules of Article Three

Applicants having Saudi secondary school certificates must have majored in the natural, or technological sciences. If the applicant earned his secondary school certificate from outside the Kingdom, equivalent requirements apply.

- o Policy regarding program/credit transfer.

The college council shall review the courses taken by the student outside the University based on the recommendations of the departments which offer equivalent courses. The courses evaluated as equivalent will be transferred to

cumulative GPA.

Implementation Rules of Article Forty Three

In order to get transfer of credit for any course taken outside the University, the student should:

1. have obtained grade of C or high in the course;
 2. have taken the course at a recognized college or university;
 3. have taken a course equivalent in all respects to one of the courses which are included in the KFUPM degree requirements.
 4. The grade earned by the student in the course is not included in the
- The admission criteria at the University are based on the rules issued under the Higher Education Council, Ministry of Higher Education. KFUPM University Council reviews these rules periodically.

Standard 5-2

REGISTRATION PROCEDURES

Pre-registration

At approximately the middle of the first (fall) semester, preregistration is held in each academic department for the courses to be taken by students during the second (spring) semester; and in the middle of the second semester of each year, students preregister for both the coming summer session and the first semester of the following academic year.

Pre-registration is required of all enrolled students who intend to continue their studies at the University during the following terms. Students preregistered for a particular semester are also required to register formally on the scheduled registration day for that semester. A student is only allowed to change his preregistration with the approval of his academic advisor.

Formal Registration

Formal registration is held at the beginning of each semester or summer session as indicated in the academic calendar. Each student must personally register himself. Registration by proxy or mail is not permitted.

Late Registration

Students, who have not completed the formal registration process on the fixed date, may register late during the period specified in the academic calendar.

MONITORING OF ACADEMIC STATUS

appear on the transcript that shows his achievements throughout his undergraduate academic status may be one of the following.

Good Standing

This status is assigned to all students at the beginning of their course of study. Students are expected to maintain this standing till their graduation. This involves a

Academic Warning

A student will be given this status after the final grade have been processed at the end of each regular semester if:

- a. his cumulative GPA is less than 2.00 but more than 1.00 out of 4.00;
- b. his semester GPA is less than 2.00 out of 4.00.

Academic Probation

A student is given this status after the final grades have been processed at the end of a regular semester, if his cumulative GPA is less than 1.00 out of 4.00.

- The process of registration and monitoring are evaluated every four years and the results are used to improve the process.

Standard 5-3

FACULTY RECRUITEMENT

The Faculty Affairs Department makes all arrangements pertinent to faculty recruitment, including functions such as: announcements for open positions in local

applications to the concerned departments; arranging interviews; processing employment offers; answering inquiries raised by the candidates on various personal and professional issues prior to their joining.

The Industrial Chemistry Division, Department of Chemistry evaluates all applications through a Faculty Application Evaluation Committee, comprising of selected faculty members from the department.

FACULTY PERFORMANCE EVALUATIONS

Faculty Performance Evaluations are annually reviewed by the Faculty Affairs Committee, which is one of the standing committees of the University, comprising all academic deans and selected faculty members from each College, chaired by the Dean of Faculty & Personnel Affairs. The annual faculty evaluation is a continuous process throughout their services in the University. The Committee deliberations are submitted to His Excellency the Rector of the University for approval. Thereafter, the Chairman of the Faculty Affairs Committee writes to the faculty members about their

- (1) Teaching
- (2) Research
- (3) Community service

Standard 5-4

COURSE MANAGEMENT

Faculty are fully responsible for the administration of all course work which includes preparation of lecture notes, distribution of notes and other reading materials, preparation of homework or other assignments for the students and their grading, conduct of examinations and grading of examinations and forwarding the final grades to the office of the Deanship of Admissions & Registration.

The instructor of a course shall adopt, if available, a detailed syllabus of a course developed and approved by the department. In the event of a first-time offering of a course, the instructor shall develop the course outline on the basis of the approved course description and seek its approval prior to the offering of the course.

The University maintains a policy on course files, according to which an instructor is required to prepare a course file with necessary documentation and submit it to the department on completion of the course. The course file should contain materials in

assigned class work, homework, and assignments and through scheduled examinations. A letter grade, based on the aggregate numerical score, is given to students following the grade distribution policy of the University.

Standard 5-5

FOLLOW UP PROCEDURE

The University assigns an academic advisor to each student to assist him in matters relating to his academic progress such as:

- a.*
- b.* interpreting and understanding the academic regulations;
- c.* informing the student of the sequence of required and elective courses in his degree program and suggesting electives;
- d.*
- e.* assisting in preregistration and other registration activities;
- f.* assisting in course substitution, if necessary.

The academic advisor is a faculty member in the Chemistry Department.

Criterion # 6: Faculty

All faculty members, except only two, in the chemistry department have Ph.D degrees from well reputed universities in North America, Europe, and the KFUM. All faculty members are quite current and active in their discipline and have the necessary technical depth and breadth to support the two undergraduate programs as well as Graduate Programs. There are enough faculty members to provide continuity and stability, to cover the curriculum adequately and effectively, and to allow for scholarly activities. A list of faculty members with their terminal degree, rank, main area of specialization and their e-mail contacts is given below.

List of faculty Members with their Fields of Specialization				
Name		Rank	Area	E-mail
<u>ABULKIBASH, A.</u>	PhD	PROFESSOR	Analytical	<u>abdallam@kfupm.edu.sa</u>
<u>ALI, M. F.</u>	PhD	PROFESSOR	Industrial	<u>mfali@kfupm.edu.sa</u>
<u>ALI, S. A.</u>	PhD	PROFESSOR	Organic	<u>shaikh@kfupm.edu.sa</u>
<u>AL-ARFAJ, A. R.</u>	PhD	PROFESSOR	Inorganic	<u>aarfaj@kfupm.edu.sa</u>
<u>AL-MUALLEM, H.</u>	PhD	ASST. PROF.	Organic	<u>hmuallem@kfupm.edu.sa</u>
<u>AL-THUKAIR, A. A.</u>	PhD	ASST. PROF.	Enviromental Ecology	<u>thukair@kfupm.edu.sa</u>
<u>BADAWI, H. M.</u>	PhD	PROFESSOR	Physical	<u>hbadawi@kfupm.edu.sa</u>
<u>BARRI, S.</u>	PhD	ASSOC. PROF.	Industrial	<u>sabarri@kfupm.edu.sa</u>
<u>EL- ALI, BASSAM</u>	PhD	ASSOC. PROF.	Industrial	<u>belali@kfupm.edu.sa</u>
<u>EL-FAER, M. Z.</u>	PhD	PROFESSOR	Inorganic	<u>mzelfaer@kfupm.edu.sa</u>
<u>EL-RAYYES, A.</u>	PhD	RES. ASSOC.	Physical	<u>elrayyes@kfupm.edu.sa</u>
<u>FETTOUHI, M. B.</u>	PhD	ASST. PROF.	Inorganic	<u>fettouhi@kfupm.edu.sa</u>
<u>FORNER, W.</u>	PhD	ASSOC.PROF	Physical	<u>forner@kfupm.edu.sa</u>
<u>FORRISTAL, I.</u>	PhD	ASST. PROF.	Organic	<u>ianf@kfupm.edu.sa</u>
<u>HAMDAN, A.</u>	PhD	ASST. PROF.	Organic	<u>ajhamdan@kfupm.edu.sa</u>
<u>HUSSAIN, M. S.</u>	PhD	PROFESSOR	Inorganic	<u>sakhawat@kfupm.edu.sa</u>

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Standard 6-1

There are enough full time faculty who are committed to the program to provide adequate coverage of the program areas/courses, continuity and stability. The interests and qualifications of faculty members are sufficient to teach all courses, plan, modify and update courses and curricula. All faculty members have a level of competence obtained through graduate work in their discipline. All faculty members (except two) hold a Ph.D. in their discipline.

- ◆ A table indicating program areas and number of faculty in each area is given below.

- ◆ The resume of all faculty member, prepared in a format given in Appendix B are included in the Appendices.
- ◆ Information recorded in Table 4.6 and faculty members resumes are sufficient to validate standard 6-1.

Program areas	Courses in the area	Average number of sections per year	Number of faculty members in each area	Number of faculty with Ph.D
General Chemistry	4	9	All Faculty	All Faculty
Inorganic Chemistry	2	4	3	All
Analytical Chemistry	3	3	3	All
Physical Chemistry	4	4	4	All
Organic Chemistry	4	4	4	All
Industrial Chemistry	4	4	4	All
Interdisciplinary Areas	4	2	3	All
Environmental Chemistry	2	2	3	All

Standard 6-2:

All faculty members are quite current in their discipline and sufficient time is provided for their scholarly activities and professional development. Also, effective programs for faculty development are in place through the Deanship of Academic Development.

- ◆ The research publications, participation in short courses, development of online courses, updating of course materials etc are used as some of the criteria for faculty to be deemed current in the discipline. Based on these criteria and considered as current in their subject area..
- ◆ For ensuring that full time faculty members have sufficient time for scholarly and professional development, the department uses teaching load as one of the criteria. The teaching load is within the limits for the College of Sciences and the faculty members can devote time to research and other scholarly activities.
- ◆ Several faculty members participate in development programs at the departmental and university level. These programs include participation in local and international meetings, course development programs such as WebCT, participation in seminars and workshops.
- ◆ This is the first program involving self-assessment faculty programs and no conclusions drawn from these evaluations are available.

◆ **Standard 6-3:**

Faculty motivation and job satisfaction were monitored through Faculty Survey carried out by filling online forms submitted directly to the Deanship of Academic Development.

- ◆ To the best our knowledge no programs and processes are in place for faculty motivation.
- ◆ Faculty input using faculty survey (Appendix C) on programs for faculty motivation and job satisfaction are summarized under faculty surveys.
- ◆ Indicate how effective are these programs.

Chemistry Department Faculty Survey

The purpose of this survey is to assess faculty members, satisfaction level and the effectiveness of programs in place to help them progress and excel in their profession. We seek your help in completing this survey and the information provided will be kept in confidence. **Indicate how satisfied are you with each of the following aspects of your situation at your department?**

1. **Your mix of research, teaching and community service.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

2. **The intellectual stimulation of your work.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

3. **Type of teaching/research you currently do.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

4. **Your interaction with students.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

5. **Cooperation you receive from colleagues.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

6. **The mentoring available to you.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

7. **Administrative support from the department.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

8. **Providing clarity about the faculty promotion process.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

9. **Your prospects for advancement and progress through ranks.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

10. **Salary and compensation package.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

11. **Job security and stability at the department.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

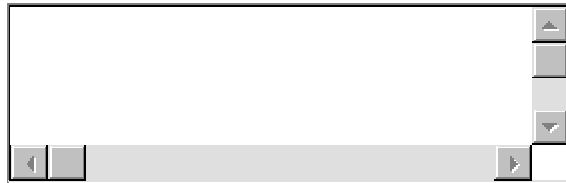
12. **Amount of time you have for yourself and family.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

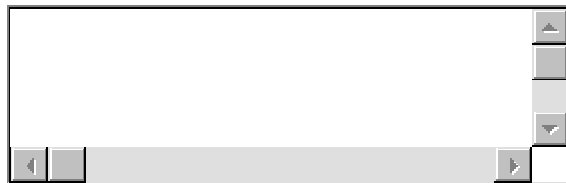
13. **The over all climate at the department.**

Very Satisfied Satisfied Neutral Dissatisfied Very Dissatisfied

14. **What are the best programs/factors currently available in your department that enhance your motivation and job satisfaction?**



15. **What aspects of your program could be improved?**



Information about faculty member.

1. **Academic rank:**

- Professor
 Associate Prof.
 Assistant Prof.
 Instructor
 Lecturer

2. **Years of service:**

- 1-5
 6-10
 11-15
 16-20
 >20

Submit Form	Reset Form
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Results of Faculty Survey

The Department Chairman through general notifications, announcements in the department and in the department council meetings, and repeated e-mails, requested all faculty members to participate in the faculty survey by filling the online forms. However, the results were not as encouraging as one would expect. Only 17 faculty members (about 50 % of the total faculty) participated in the survey. Therefore, this survey needs to be repeated in the beginning of the next academic year. Although quite inconclusive, some trends were obvious and are summarized below. Another effort to repeat this survey during the next academic year will be highly useful for valid conclusions.

Question Nos.	Majority Observations
Question Nos 1-9	Majority of participants was satisfied. Only minor number was on the extreme ends.
Question No. 10 (Salary and compensations)	Only one participant was satisfied, four were neutral and 12 were dissatisfied or very dissatisfied.
Question 11 (Job security and stability)	Six were satisfied whereas seven were not satisfied about the job security and stability.
Question 12 (time for family)	Six faculty members were satisfied, and 11 were either neutral or dissatisfied.
Question 13 (Overall climate)	Eight faculty members were satisfied with the overall climate in the department, four were neutral and five were dissatisfied or very dissatisfied.

Conclusions: Though some trends are obvious from this survey, the data can not be considered conclusive due to the small sample (only 50 % of the faculty) participating in the survey. It was not clear as to why the remaining 50% chose not to participate in the survey in spite of the fact that the department chairman made his best efforts in passing out the information to all faculty members in the department. Nevertheless, it will be desirable that this survey is repeated within a short time period in future.

MAJOR RESEARCH AREAS IN THE DEPARTMENT

Though research activity is a strong reflection of graduate program, it also contributes towards the strength of undergraduate programs. The department actively pursue several research areas which are summarized below.

ANALYTICAL CHEMISTRY

Electrochemical Methods of Analysis; Spectrochemical Methods of Analyses, Chemometric and the latest developments in Flow Injection Techniques.

CATALYSIS

Homogeneous and Heterogeneous Catalysis using Transition Metal Complexes, Free radical Polymerization using Catalytic chain transfer agents , and Electrocatalysis,

ENVIRONMENTAL CHEMISTRY

Marine Pollution.

INDUSTRIAL CHEMISTRY

Petroleum Chemistry and Refining Research
Materials (Waste plastic, waste oils) recycling.

INORGANIC & ORGANOMETALLIC CHEMISTRY

Structural and Spectroscopic Studies of Model Compounds for Anti-Arthritic Gold Drugs, Molecular conducting and magnetic materials, and Chemical Crystallography.

ORGANIC CHEMISTRY

Synthesis, Mechanisms and Natural Products, Corrosion Inhibitors, Synthetic Organic Chemistry of Heterocyclic Quinones, and Oils and Fats.

PHYSICAL CHEMISTRY

Electrochemical Methods for the study of corrosion and chemically modified electrodes Electrocatalysis, Solution thermodynamics and phase diagrams from solute-liquid crystal solvent interactions, Laser Spectroscopy and Photophysics and Photochemistry of Biologically important compounds, ESR and NMR Spectroscopy, and Molecular Dynamics in the liquid State.

THEORETICAL CHEMISTRY

Normal coordinate analyses, vibrational assignments and barrier to internal rotation studies, Identification and characterization of charge carriers in polymers, Dynamic studies of nonlinear excitations, and Design of new theoretical methods for the calculation of correlation effects in polymeric systems.

POLYMERS

Water Soluble Polymers
Free Radical Polymerization with Chain Transfer Catalytic Agents,
Pulsed Laser Polymerization and
Controlled molecular weight polymerization.

Criterion # 7: Institutional Facilities

Standard 7-1 :

The KFUPM have the infrastructure to support new trends in learning. All lecture rooms, labs and class-rooms provide support for e-learning and some faculty members have recently started using these facilities.

The infrastructure and facilities that support new trends in learning, and their adequacy are given below.

- ◆ Every faculty members in the Chemistry Department is provided with a computer, some are IBM Pentium 4 Computer and 17-inch 85 kHz Flat Screen Color Monitor and others are Dell Pentium 3 Computer and Color Monitor. The computers are connected via an optical cable to a high speed server. Faculty members can browse the web and access the library via the Internet. The facilities are adequate.
- ◆ While at home faculty members who have their own modem to check emails and browse the web.
- ◆ KFUPM Web page has Quick Links to the Library, WebCT and Blackboard. DAD arranges seminars on tools such as WebCT and Blackboard. DAD also conducts workshops on WebCT that typically runs for two weeks with sessions on two alternate days of each week. Faculty can join either the SM sessions or UT sessions.
- ◆ The University has a few Smart Classroom in Bldg. 24. The Digital Class Rooms in Bldg. 24, 104, 106, 112, 114, 125, 135, 141, 146, 165, 178, 137, 156, 158, 180 have network connected computers. These computers are provided for use by faculty to conduct lectures.
- ◆ The University has a General Purpose PC Lab in Bldg. 4. It is located in Bldg. 4, Rooms 104-2, 104-3, and 104-4. It has 20 IBM Pentium IV workstations, a server, three printers (1 HP and 2 Epson dot matrix). Undergraduate students mainly use these computers.
- ◆ The Chemistry Department has a PC Lab located in Bldg 4 Room 261D. It has 9 workstations, a server, and two printers (1 HP laser printer and 2 Epson Dot Matrix printers). Graduate students and staffs mainly use these computers. In addition, there are PC sets available in many of the teaching laboratories.
- ◆ The Main auditorium in Bldg. 4 (Room 4-125) has network cable for computers. At present the auditorium (4-125) does not have any infrastructure to support e-learning.

Standard 7-2 :

The library possesses an up-to-date technical collection relevant to the two chemistry programs and is adequately staffed with professional personnel. The Library holdings important for Chemistry programs, are given in Appendix C in the tables for Appendices.

1. collection are summarized below.

The total collection /holdings as of September 2000 is 911,288.

Resources - Collection / Holdings	
As of September 2000	
Monographs (Books)	294,471
Periodicals (Bound Volumes)	65,453
Full-text Journal Titles	825
Microfilms	37,522
Microfiche	486,923
Films	2,367
Other Media	23,713
Current Periodicals on Subscription	1,084
Serial Title on Standing Order	241
Total Collection	911,288

The library has 61 subscriptions (or 100 including the supplements) of chemistry journals listed in **Appendix A** and 79 electronic chemistry journals online listed in **Appendix B**.

a midsize state college in the US.

2. Assess the support rendered by the library.

The library services available are as follows:

KFUPM Library Services
1. Cataloging Services
2. Collection Development Services
3. Collection Use Services
4. Reference and Information Services

SERVICES AND RESOURCES DIRECTORY
<i>PLATEAU LEVEL</i>
COLLECTION USE SERVICES
Circulation
Current periodicals
Islamic and Middle East collection (BP, DS - DT, PJ - PK)

Newspapers and magazines
New arrivals
Photocopy service
Reserve books
REFERENCE AND INFORMATION SERVICES
Arabic reference collection
CD-ROM Lab.
Computer catalog terminals
Interlibrary loans
Microform reader/printers
Online searching
Reference and information
Reference collection
Special collection
<i>SECOND FLOOR</i>
Administration
Collection Development
Dean's Office
Cataloging Operations/Library Systems Office
<i>THIRD FLOOR</i>
Books and periodicals (A - PZ, except BP, DS -DT, PJ - PK)
Computer catalog terminal & Printer
Conference rooms
Microform collection
Microform reader/printers
Prayer area
<i>FOURTH FLOOR</i>
Computer catalog terminal
<i>BASEMENT</i>
Audio-visual materials
Auditorium
Transparencies

The Reference and Information Services provide help to faculty members and students on on-line searching. The library allows each faculty member to take out a total of 15 books. Students are allowed a total of 10 books. Faculty members are allowed to check out 3 journals at a time for photocopying. The Library has reduced the photocopying charges to SR 10/card and the charge of copying is SR 0.10/page.

Standard 7-3 :

Classrooms are adequately equipped and offices are adequate to enable faculty to carry out their responsibilities. The adequacy of the classrooms, and of faculty offices is given below.

Classrooms

- ◆ The main auditorium in Bldg 4 (Room 4-125) has network cable for computer to access the Internet. However, at present the auditorium (4-125) does not have the infrastructure to support e-learning. The auditorium is equipped with an overhead projector. The overhead projector is maintained by the Audio Visual Department.
- ◆ Most classrooms in Bldg. 4 do have network cables for computer to access the Internet. There is infrastructure in the small classrooms to support e-learning. Each of the classrooms in Bldg. 4 is equipped with an overhead projector. The overhead projectors are maintained by the Audio Visual Department.

Faculty Offices

- ◆ Faculty offices are equipped with a minimum of 1 table, several chairs, and filing cabinets for books.
- ◆ Every faculty members in the Chemistry Department is provided with a computer. Some faculty members have IBM Pentium 4 Computer and 17-inch 85 kHz Flat Screen Color Monitor and others are Dell Pentium 3 Computer and Color Monitor. The computers are connected via an optical cable to a high speed server.

Criterion # 8: Institutional Support & Resources

Standard 8-1:

The Chemistry Department provides sufficient support and financial resources to retain some high quality faculty and provide the means for them to maintain competence as teachers and research scholars. In recent years the department has been hiring fresh KFUPM graduates as post-doctoral and at Assistant Professor levels.

A. Research support:

The Chemistry Department supports research with the following major and minor Research Facilities. Some of these facilities are out-dated and need to be replaced, whereas some of these equipment are underused when compared with similar equipment in established universities.

(I) Major Research Equipment / Facilities			
Name of The Major Research Facility	Location	Year of Initiation	Faculty In-charge (if any)
1. Bruker Single Crystal X-Ray Diffractometer	4-157	2002	Fettouhi, M. B.
2. Jeol LA-500 NMR Mass Spectrometer	4-153	1998	Perzanowski, H.
3. Bruker AC-80 NMR Spectrometer	4-147-7	1994	Perzanowski, H.
4. Bruker 200D-SRC EPR Spectrometer	4-155	1983	Morsy, M.A.
5. Varian E-109 EPR Spectrometer	4-155	1982	Hwang, J.
6. Perkin-Elmer Inductively Coupled Plasma Spectrophotometer	4-240	1994	Abulkibash, A.
7. Siemens D-5005 X-Ray Diffractometer	4-224	1998	Barri, S. A. I.
8. Perkin-Elmer 16F PC FTIR-Infrared Spectrophotometer	4-147-1	1991	Perzanowski, H.
9. EG&G 273A Electrochemical Analytical system	4-246-1	1995	Khaled, M.
10. EG&G 246A Electrochemichal Analytical system	4-239	1992	Jaber, A. M.
Elemental Analyzer	4-239	1995	Abulkibash, A.
12. Atomic Absorption Spectrometer	4-239	1991	Abulkibash, A.
13. Varian T-60 NMR Spectrometer	4-153	1975	Perzanowski, H.
14. Perkin-Elmer Lambda 5 UV/VIS Spectrophotometers	4-153	1986	Perzanowski, H.

15. Waters HPLC	1-111	1984	Jaber, A. M.
16. Buchi-670 DCC EXCHANGER			
17. CAD-4 X-Ray Diffractometer	4-154	1974	Hussain, M. S.
18. Perkin-Elmer Optical Rotation Polarimeter	4-153	1986	Pernanowski, H.
(II) Minor Research Equipment / Facilities			
Conventional and Capillary GAS Chromatographs	Location Room No.	Year of Initiation	
1. Perkin-Elmer Autosystem Gas Chromatograph (TCD and FID)	4-246	1992	
2. Shimadzu GC-8A Gas Chromatograph (FID)	26-302	1990	
3. Varian Vista 6000 Gas Chromatograph	4-253	1984	
4. Shimadzu GC-9A Gas Chromatograph (TCD)	4-210	1983	
5. Hewlett-Packard 5790A Gas Chromatograph (TCD)	4-235	1983	
6. Hewlett-Packard 5790A Gas Chromatograph (TCD)	4-210	1983	
7. Hewlett-Packard 5880A Gas Chromatograph (FID and TCD)	26-207	1980	

B. Financial Resources

Faculty members can submit research proposals for externally funded research projects. Beside other sources, the research funding is available through KACST, SABIC and University funded research Grants. The chemistry department has been successful in securing external funding for research in the department. The following is a list of externally funded research projects in the past 5 years.

Externally (SABIC, KACST etc.) Funded Research Projects in Past Five Years				
Names of P.I./ and Co-PI		Title of the Project	Source and amount	
			Agency	SR
<i>I</i>	Shaikh Asrof Ali	<i>Low molecular weight polyquarternary ammonium and trivalent amine as potential corrosion inhibitors</i>	SABIC	85,000

2	Uwe K.A. Klein Than Htun	<i>A new approach to examine the stability of plastics produced by SABIC using laser-induced fluorescence decays</i>	SABIC	100,000
3	M. S. Hussain	<i>Polymerization reaction using metal-chelates as catalytic chain transfer agents</i>	SABIC	67,000
4	Salah M. Sultan Abdalla M.Abulkibash	<i>FIA extraction spectrophotometric method for Mercury(II) based on thiacrown ether and bromocresol green</i>	SABIC	75,000
5	M.B. Fettouhi B. El Ali	<i>Synthesis and characterization of new important magnetic metal coordinated polypyrrols.</i>	SABIC	37,000
6	Shaikh Asrof Ali M. T. Saeed	<i>Synthesis of isoxazolidine and their applications in corrosion inhibitors</i>	SABIC	38,000
7	M. S. Hussain	<i>Free-radical polymerization with metal-chelates as chain transfer catalysis</i>	SABIC	33,000
8	Uwe K.A. Klein, S. A. I. Barri, E. Khawaja, F. F. Al-Adel, S. M. A. Durrani	<i>Formulation of zeolitic membrane by pulsed laser deposition</i>	LRS /SABIC	150,000
9	M. Z. El-Faer B. El Ali	<i>The sources of pollution with toxic heavy elements of the Saudi territorial waters of the Arabian Gulf</i>	KACST	
10	S. A. Ali	<i>Influence of polymer structure on recovery and selectivity of proteins in two-phase aqueous systems</i>	KACST	
11	M. F. Ali M. N. Siddiqui	<i>Chemical composition and performance related properties of polymer modified asphalts</i>	KACST	90,000
12	M. F. Ali M. N. Siddiqui	<i>Waste plastics-recovery and depolymerization with petroleum residue</i>	KACST	562,600
13	A. R. Al-Arfaj S. A. I. Barri	<i>Synthesis and commercial applications of mesophorus metallosilicates</i>	KACST	1,909,750
14	Assad Al-Thukair Khattab Al-Hinai Ibrahim Arif	<i>Two years monitoring program of algalmites located in the Red Sea</i>	KACST	639,480
15	M. Fettouhi B. El Ali	<i>Synthesis and characterization of new magnetic metallopolypyrrols</i>	SABIC	37,000

16	A.M. Jaber S. A. Ali	<i>Carrier-mediated separation studies of phenol from aqueous streams by supported liquid membranes containing functionalized polyorganosiloxanes as integrated solvents/carrier system</i>	SABIC	73,000
17	M. F. Ali M. N. Siddiqui	<i>Structural studies on residual fuel oil asphaltenes by catalyzed oxidation</i>	SABIC	56,200
18	M.I.M. Wazeer Shaik Asrof Ali	<i>Design and syntheses of new polyampholytes for their potential use in protein purification in new aqueous two phase polymer system</i>	SABIC	63,500
19	A. Al-Arfaj M.A. Gondal Zahin H. Yamani M.A. Ali M.A. Dastageer	<i>Methane cracking for production of higher hydrocarbons and hydrogen using selective laser excitation process</i>	SABIC	75,000
20	Sami A.I. Barri A. A. Al-Arfaj Z. S. Seddigi A. Uwais	<i>Dihydrochlorodimerization (DHCD)</i>	SABIC/ RI	1,180,000
21	Jimmy S. Hwang Ghassan A. Oweimreen	<i>The effect of lanthanide ions on the ordering in phospholipid bilayers</i>	SABIC	75,000
22	M. Al-Malack N. Abuzaid A. Bukhari A. Al-Thukair	<i>Characterization, Utilization and Disposal of Municipal Sludge</i>	KACST	489,400
23	Bassam El Ali M. Fettouhi M. Z. El-Faer A. R. Al-Arfaj	<i>Hydroformylation and acetalization reactions using the catalytic conversion of alkenes into aldehydes and acetals.</i>	KACST	940,000
24	E. Z. Hamad B. Abu-Sharkh Shaikh Asrof Ali	<i>Influence of polymer structure on recovery and selectivity of proteins in two-phase aqueous systems</i>	KACST	279,000
25	Salah M. Sultan	<i>Chemiluminescence Assay of Some Phenothiazines Utilizing Sequential Injection Analysis Technique</i>	SABIC	75,000

The University has funded the following research projects in the past five years:

Research funded by the University Research Committee and the department in the Past Five Years		
<i>Name(s) of PI</i>	<i>Agency</i>	<i>Title of Proposal</i>
1. A. A. Isab A. A. Al-Arfaj	KFUPM	<i>¹³C, ¹⁵N and ³¹P NMR studies of the interaction of cyanide ion with gold(I) complexes</i>
2. H. Badawi W. Forner	KFUPM	<i>Conformational behavior, vibrational assignments and barrier to internal rotation in some halo aldehydes and alcohols, based on an initio and normal mode calculations</i>
3. B. Abu-Sharkh E. Hamad H. M. Badawi K. Furati	KFUPM	<i>Glass transition temperatures of strongly interacting polymers from molecular dynamics simulation.</i>
4. B. M. El Ali M. B. Fettouhi	KFUPM	<i>Palladium-heteropolyacids catalyzed asymmetric hydrocarboxylation and styrene derivatives, catalytic synthesis of Iburprofen and Naproxen.</i>
5. W. Forner	KFUPM	<i>Nonlinear charge carrier in polyparaphenylene</i>
6. A. A. Isab A. R. Al-Arfaj H. Perzanowski	KFUPM	<i>¹H, ¹³C, ¹⁵N, ⁷⁷Se and ¹⁰⁹Ag NMR Studies of M(I)-Imidazoline-2-Thiodine and Imidazoline-2-Selenone Complexes (where M = Ag⁺ and Au⁺)</i>
7. M. Farhat Ali Bassam El-Ali	KFUPM	<i>Handbook of Industrial Chemistry: Organic Chemicals (Bookwriting Project)</i>
8. Salah M. Sultan	KFUPM	<i>General Chemistry (Bookwriting Project)</i>

Conference Attendance and Participation in Meetings:

The faculty members can apply for conference attendance once a year based on a paper presentation at a conference or a published paper in an internationally reputable journal. They can also attend a regional conference once a year. Faculty members can also apply for Release Time for one semesters and a summer after 5 years of continuous service at the University. Based on the Research Facilities available in the Department, the Funded Research Projects, the support and financial resources appear to be very good.

C. Teaching support:

Teaching Laboratories

The department operates a large number of Laboratories devoted to teaching and research. Many of these laboratories are used for regular chemistry courses and senior projects carried out by students. The laboratories listed below are classified according to the various functions in the department:

General Purpose Facilities

Oil Testing Center (OTC). The OTC is equipped with major instruments such as: High performance liquid chromatograph, an Atomic absorption spectrophotometer, a Mass spectrometer and others, in addition to instruments needed for standard test required for crude oil and petroleum products.

General Instrumentation Laboratory.

The General Instrumentation Laboratory contains instruments for students to be used for regular courses and senior projects as well as research. This facility needs to be upgraded and handled with trained personnel.

Describe the level of adequacy of secretarial support, technical staff and office equipment.

D. Secretarial support:

The level of secretarial support for faculty is inadequate. There are at present only 3 department secretaries. Most of the secretarial work in university, college, and departmental committees is done by the faculty members themselves, in their offices. This amounts to consuming a good percentage of work of faculty members, in mere secretarial work. This is quite contrary to the general practice in reputed universities where the faculty members are involved in more intellectual pursuits rather than undertaking secretariat assignments.

The University has an Exam Reproduction Center located in Bldg. 21, 8th floor. However this involves several trips from Bldg. 4 to Bldg 21 and vice versa. The usual procedure is for the faculty member to type his original exam paper and take it to the Exam Reproduction Center for reproduction. This is time-consuming. Also the facility in the ITC for generating and grading multiple choice exams for General Chemistry courses (CHEM 101 and 102) is sadly out of date. This practice should have been abandoned long time ago. The faculty members now usually do the exam reproduction and evaluation on desktop without using mainframe facilities.

E. Technical staff:

The technical staff for teaching laboratories appears to be adequate, and for research it is certainly inadequate. This is because there is not a single technician that is

dedicated to any major instrumentation / facility in the department. The Department has an Electronic Workshop and a Glass Blowing Workshop. Electronic engineer is available to take care of troubleshooting, repairing, and maintenance of minor departmental electronic equipment. An experienced glass blower is available with the required equipment and materials to carry out all kinds of glassblowing operations.

F. Office equipment:

The department has only one photocopying machine for faculty use and another one which is located in the secretariat office. One of the photocopying machines is very old and the other one is OK but insufficient to handle the workload in the department.

Standard 8-2:

The number of high quality graduate students, research assistants and Ph.D. students is low as compared to the faculty in the department. The number of graduate students, research assistants and Ph.D. students for the last three years are tabulated below.

Acad.Years	# of Grad. Students	# of Res. Assistants	# of Ph.D. Students
2002-2003	14	5	4
2001-2002	10	2	7
2000-2001	8	3	5

The faculty : graduate student ratio for the last three years is below.

Acad.Years	# of Faculty	# of Grad. Students	Faculty : Grad. Student Ratio
2002-2003	36	20	1.800
2001-2002	34	19	1.789
2000-2001	34	16	2.125

The Faculty:Graduate Student Ratio appeared on the high side. The ideal ratios should be 0.5 as opposed to ≈

Standard 8-3:

Financial resources appears to be adequately provided to acquire Library holdings, laboratories and computing facilities.

The committee does not have complete information on the resources available for library, laboratories, and computing facilities. The information listed in the table below is furnished by the Chairman of the Chemistry Department.

	(Riyals)
Financial Resources available for library	10,000
Financial Resources available for laboratories	3,000,000
Financial Resources available for computing facilities	40,000

Deanship of Academic Development

Self - Assessment

Task Assignments for Planning Committee

Planning Committee Member	Assigned Tasks	Relevant Departmental Committee for information the task
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Report Preparation

Dr. Hussain	<ul style="list-style-type: none"> ◆ Consolidation of the complete report ◆ Surveys through DAD ◆ Circulation of report draft among committee members 	
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Criteria and Standards

Dr. Hussain	<ul style="list-style-type: none"> ◆ Criterion # 1: Program Missions, Objectives and Outcomes 	<ul style="list-style-type: none"> ◆ Department Council
Dr. Klein	<ul style="list-style-type: none"> ◆ Criterion # 2 : Curriculum design and Organization ◆ Appendix A and D 	<ul style="list-style-type: none"> ◆ Curriculum committee ◆ Faculty members ◆ Supervisory Committee
Dr. Morsey	<ul style="list-style-type: none"> ◆ Criterion # 3: Laboratories and Computing Facilities 	<ul style="list-style-type: none"> ◆ Lab development Committee
Dr. Abulkibash	<ul style="list-style-type: none"> ◆ Criterion # 4: Student support and guidance ◆ Matrix relating Programs Outcomes to Program objectives 	<ul style="list-style-type: none"> ◆ Graduate Advising Committee ◆ Supervisory Committee
Dr. M. F. Ali	<ul style="list-style-type: none"> ◆ Criterion # 5: Process control. 	<ul style="list-style-type: none"> ◆ Supervisory committee
Dr. Hussain	<ul style="list-style-type: none"> ◆ Criterion # 6: Faculty Data 	<ul style="list-style-type: none"> ◆ Each faculty member
Dr. Hwang	<ul style="list-style-type: none"> ◆ Criterion # 7: Institutional Facilities 	<ul style="list-style-type: none"> ◆ Department Chairman ◆ Faculty members
Dr. Hwang	<ul style="list-style-type: none"> ◆ Criterion # 8: Institutional support ◆ Matrix relating Courses to Program outcomes 	<ul style="list-style-type: none"> ◆ KFUPM Library

Surveys and Their Analyses

Dr. Hussain	<ul style="list-style-type: none"> ◆ Survey of Graduating students ◆ Employer survey ◆ Alumni Survey ◆ Faculty Survey 	<ul style="list-style-type: none"> ◆ Online surveys
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Appendices

Dr. Hussain	<ul style="list-style-type: none"> ◆ Appendix A Faculty Resume 	
Dr. Hwang	<ul style="list-style-type: none"> ◆ Appendix B Library holding 	
Dr. Hussain	<ul style="list-style-type: none"> ◆ Appendix C Course Descriptions 	

Chemistry Department
Planning and Program Development Committee

Deanship of Academic Development
Self - Assessment

Professor A. Abulkibash	Member
Professor U. Klein	Member
Professor M. Farhat Ali	Member
Professor J. Hwang	Member
Dr. M. A. Morsy	Member
Professor M. Sakhawat Hussain	Chairman
