Republic of Yemen
Ministry of Higher Education and Scientific Research
Sana'a University
Faculty of Pharmacy
Quality Assurance Unit

الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
جامعة - صنعاء
كلية الصيدلة
وحدة ضمان الجودة

Course Specification of Sterile Preparations

I. Course Identification and General Information:							
1	Course Title:	Sterile Preparations					
2	Course Number & Code:	Ph2713					
3	Credit hours:	C.H				Total	
		Theoretical	Practical	Training	Seminar		
		1				1	
4	Study level / semester at which course is offered:	Level: - Fourth years/ First Semester					
5	Pre –requisite (if any):	Pharmaceutics I,II,III and IV					
6	Co –requisite (if any):	-					
7	Programs in which course is offered:	Bachelor of pharmacy					
8	Language of teaching the course:	English					
9	Department in which course is offered:	Pharmaceutics and Industrial Pharmacy					
10	Location of teaching the course:	Faculty of Pharmacy- Sana`a university					
11	Prepared by:	Prof. Dr. Maged Alwan					
12	Date of approval:						

II. Course description:

The current course is intended to provide students with information related to liquid dosage forms, sterile products, specification of radiopharmaceutical products, design and additives maintaining the stability, bioavailability of drug and quality attributes of the selected products.

III. Intended Learning Outcomes (ILOs) of the Course:

At the end of this course, the students will be able to:

1. Recognize sterile products such injectable and ocular preparations according the cGMP regulation
2. Explain knowledge of radiopharmaceutical formulations
3. Recognize the role of formulation design and additives in maintaining the stability of the dosage forms and the bioavailability of drug.
4. Discuss the quality attributes of the selected products.
5. Select the best liquid forms, additives and packaging to enhance the stability of pharmaceutical solutions, suspensions and other disperse systems
6. Predict instability problems in selected products and suggest solutions for these problems.
7. Adjust the quality attributes of sterile pharmaceuticals.
8. Analyze stable effective liquid dosage form.
9. Examine the best method for sterilization of different pharmaceutical products.
10. Assess the quality attributes of liquid dosage forms and packaging.
11. Examine the necessary quality control tests of parenteral and other sterile products according to the cGMP regulation.
12. Work independently and in groups
13. Retrieve and evaluate information from different sources.

IV. Intended learning outcomes (ILOs) of the course:

(A) Knowledge and Recognizeing:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Knowledge and Recognizeing.

Program Intended Learning Outcomes (Sub- PILOs) in: Knowledge and Recognizeing	Course Intended Learning Outcomes (CILOs) in: Knowledge and Recognizeing
After completing this program, students will be able to:	After completing this course, students will be able to:

A4-	Recognize the pharmaceutical dosage form design and the quality control of pharmaceutical formulations according to GMP and pharmacopeial requirements to support the pharmaceutical industries.	**a1-**	Recognize sterile products such injectable and ocular preparations according the cGMP regulation.
		a2-	Explain knowledge of radiopharmaceutical formulations
		a3	Recognize the role of formulation design and additives in maintaining the stability of the dosage forms and the bioavailability of drug.
		a4	Discuss the quality attributes of the selected products

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Knowledge and Recognizeing to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Knowledge and Recognizeing		Teaching strategies/methods to be used	Methods of assessment
completing this course, students will be able to:		▪ Lectures brainstorming and discussion	▪ Attendance ▪ Written and oral exams ▪ Quiz and Small Projects
a1-	Recognize sterile products such injectable and ocular preparations according the cGMP regulation.		
a2-	Explain knowledge of radiopharmaceutical formulations		
a3	Recognize the role of formulation design and additives in maintaining the stability of the dosage forms and the bioavailability of drug.		
a4	Discuss the quality attributes of the selected products		

(B) Intellectual Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Intellectual skills

Program Intended Learning Outcomes (Sub-PILOs) in Intellectual skills	Course Intended Learning Outcomes (CILOs) of Intellectual Skills
After completing this program, students will be able to:	**After completing this course, students will be able to:**

B3-	Design different types of safe and effective pharmaceutical dosage forms and develop novel methods of analysis for pharmaceutical and biopharmaceutical products that support pharmaceutical research.	**b1-**	Select the best liquid forms, additives and packaging to enhance the stability of pharmaceutical solutions, suspensions and other disperse systems.
B5-	Interpret the prescriptions, patient and clinical data, Analysis all the encountered pharmaceutical problems and plan the strategies for their solution, to develop the health care. .	**b2-**	Predict instability problems in selected products and suggest solutions for these problems.
		b3-	Adjust the quality attributes of sterile pharmaceuticals.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Intellectual Skills.		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		Lectures, discussion and brain storming	Written , report and oral exams
b1-	Select the best liquid forms, additives and packaging to enhance the stability of pharmaceutical solutions, suspensions and other disperse systems.		
b2-	Predict instability problems in selected products and suggest solutions for these problems.		
b3-	Adjust the quality attributes of sterile pharmaceuticals.		

(C) Professional and Practical Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Professional and Practical Skills

Program Intended Learning Outcomes (Sub-PILOs) in Professional and Practical Skills	Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills
After completing this program, students will be able to:	**After completing this course, students will be able to:**

C1-	Operate different pharmaceutical equipments and instruments and use emerging technologies in pre-formulation, formulation, packaging, storage and analysis of pharmaceutical products according to GLP, GSP and cGMP guidelines.	c1-	Analyze stable effective liquid dosage form..
		c2-	Examine the best method for sterilization of different pharmaceutical products.
		c3-	Assess the quality attributes of liquid dosage forms and packaging.
		c4-	Examine the necessary quality control tests of parenteral and other sterile products according to the cGMP regulation.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		Lectures, Problem solving sessions, tutorials, discussion and brain storming	Written and oral exams
c1-	Analyze stable effective liquid dosage form..		
c2-	Examine the best method for sterilization of different pharmaceutical products.		
c3-	Assess the quality attributes of liquid dosage forms and packaging.		
c4-	Examine the necessary quality control tests of parenteral and other sterile products according to the cGMP regulation.		

(D) General / Transferable Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: General and Transferable skills

Program Intended Learning Outcomes (PILOs) in General / Transferable skills		Course Intended Learning Outcomes (CILOs) in General / Transferable skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
D1-	Practice independent learning needed for continuous professional Development	d1-	Work independently and in groups
D5-	Apply information and communication technology and working effectively in a team	d2	Retrieve and evaluate information from different sources

Teaching And Assessment Methods For Achieving Learning Outcomes:			
Alignment of Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods:			
Course Intended Learning Outcomes (CILOs) in General and Transferable Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		Lectures and discussion	Reports, project, Written and oral exams
d1-	Work independently and in groups		
d2	Retrieve and evaluate information from different sources		

V. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	Introduction to Sterile Preparations	a1, b1,c1,d1-2	Introduction, Objective, Definitions, Sources of Product Contamination, Aseptic Technique	1	1
2	Parenterals.…	a1, c1, c2,d1-2	Advantages, disadvantages, necessities, Routes of Parenteral Administration in general.	1	1
3	Parenterals -(IM)….	a2, b2, c2,d1-2	Intramuscular (IM), Factors influencing absorption: In general, Factors influencing absorption from IM route.	1	1
4	Parenterals-(IV)	a1, a3, b1, c3,d1-2	II- Intravenous (IV), infusion of large volume fluid, Examples of LVP solutions, Common examples.	1	1

5	Parenterals- Admixture	b1, c3, c4,d1-2	IV admixture, IV Admixture Labels Intra-arterial (IA), Intra-thecal, Intra-articular, Intra-pleural,	**1**	**1**
6	Parenterals- other sterile preparation	a1, b3, c2, c1,d1-2	Intra-cardial, Intradermal, Sub-cutanous routes, Other sterile preparations, Total Parenteral Nutrition, Cardiologic solutions, Peritoneal dialysis solution, Peritoneal dialysis solutions,	**1**	**1**
7	**Mid-term exam**	a1-3,b1-3,c1-4		**1**	**1**
8	Parenterals-formulation	a1-4,b1-3,c1-4,d1-2	Types of Parenteral Preparation, Solution, Factors should be consider in Formulation of parenterals, Injections, Infusion Fluids, Sterile solids, Parenteral Suspensions, Parenteral Emulsion, Official Types of Injections, Physiological Norms (pH, Tonicity, Pyrogenicity, Sources of pyrogens in sterile preparations, distilled water, injections requiring water free from carbon dioxide, Water-miscible vehicles, Water Immiscible Vehicls,	**1**	**1**
9	Parenterals- additive	a1-4,b1-3,c1-2,d1-2	Additive: To maintain solubility, Stability,	**1**	**1**

			sterility, isotonicity,7 to facilitate administration. General Procedure for Preparation of parenteral, Packaging component for parenteral Preparation, glass container, Plastic, Rubber,		
10	Parenterals-equipment	c4,d1-2	Physical Norms of the parenteral solution, Sterile Preparation Facilities and Equipment, Laminar Flow Hoods, Syringes, Types, Needles, Ampoules, IV bags.	**1**	**1**
11	Parenterals- sterilization	a4,b3,c3,c4,d1-2	Definition Terms Related to Sterilization, Methods of Sterilization, Aseptic Technique, Equipment and Environment, Hand Washing, Clean Room,	**1**	**1**
12	Parenterals-requirements	a1, b3, c4,d1-2	Compounding of Solutions, Labeling, Storage conditions, Industrial Parenteral production, Specific requirements, plant layout planning,	**1**	**1**
13	Ophthalmic Preparations, ocuserts and Contact lenses.	b1, c3,d1-2	Introduction, types, preparation.	**1**	**1**
14	Radio-pharmacy	a2, c2,d1-2	Preparation, compounding, dispensing, packaging.	**1**	**1**
15	Quality Control, of sterile preparations	a4,b3,c3,c4,d1-2	Preparation, compounding, packaging.	**1**	**1**
16	**Final Exam**	a1-4,b1-3,c1-4		**1**	**1**

Number of Weeks /and Units Per Semester	16	16

VI. a- Teaching strategies of the course:

Lecture method, Group Discussion, Problem solving sessions, tutorials and brainstorming.

b-Assessment Methods:

Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, project, and Written exam

VII. Assignments:

No.	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Homework Assignments	**a1-4, b1-3,d1-2**	Sporadic through the semester	**10**
2	Reports	**c1-4,d1-2**		

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	**Participation,** Attendance, report, project **and quizzes**	**All weeks**	**5**	10%	a1-4,b1-3,c1-4,**d1-2**
2	**Assignments and** Oral Exam,	4-12	**5**	10%	a1-4,b1-3,c1-4,**d1-2**
3	**Mid-semester exam**	**5**	**10**	20%	a1-3,b1-3,c1-4
5	**Final Exam**	**16**	**30**	70%	a1-4,b1-3,c1-4
	Total		**50**	**100%**	

IX. Students' Support:

Office Hours/week	Other Procedures (if any)
Two contact hours per week	None

X. Learning Resource (MLA style or APA style)s:

1- Required Textbook(s) (maximum two)

1. Notes on Sterile preparations prepared by the department staff.
2. Ansel; H.C., (2011) Pharmaceutical Dosage Forms and drug Delivery Systems'. 9th ,Lea & Febiger; Philadelphia; London.
3. Aulton, M.E. (ed). (2013) Pharmaceutics, the design and manufacture of medicines. edition, Churchill Livingstone, Edinburgh.

2- Recommended Readings and Reference Materials

1. Loyd, V Allen J.,2013, Remington: The Science and Practice of Pharmacy 22nd edi Pharmaceutical Press, London.
2. Florence, A.T. and Attwood, D., 2006, "Physicochemical Principles of Pharmacy", 4 edition, Pharmaceutical Press, London.

3- Electronic Materials and Web Sites *etc.*

http://www.pharmaceutical technology.com
http://www.sciencedirect.com
http://www.pubmed.com
http://www.google.com

4- Other Learning Material:

J. Pharm. Sci
Published articles related to the discussed topics

XI. Facilities Required:

1 - Accommodation:	- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc. - Well-equipped laboratories with all required equipment and reagents.
2 - Computing resources:	- Computer laboratory with internet facilities.

XII. Course Improvement Processes:

1- Strategies for obtaining student feedback on effectiveness of teaching	
	▪ Student-based assessment of the effectiveness of teaching using a questionnaire designed by the Quality Assurance Unit at the end of the semester. ▪ Meeting with students and faculty (once per semester).
2- Other strategies for evaluation of teaching by the instructor or by the department.	
	▪ Assessment of the course syllabus and contents by the teachers using a questionnaire designed by the Quality Assurance Unit of the university at the end of the semester. ▪ Regular meeting and discussion of the course content between the Head of Department and the teaching staff of the course (for theory and practice).
3- Processes for improvement of teaching.	
	▪ Revision of the course specification and its teaching strategies every three academic years after consideration of all issues raised by the teachers and/or students during regular meetings and discussions. ▪ Exploring any possible defects in the course that might encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.
4- Processes for verifying standards of students' achievement	
	▪ Checking of a sample of students' work by an independent faculty member. ▪ Periodic exchange and check marking of a sample of students' assignments with a faculty member from another institution. ▪ Adoption of scoring rubrics to assess the students' achievement (both for ongoing or summative assessments). ▪ Regular follow-up of laboratory logbooks to assess the practical achievement of students.
5- Procedures for periodically reviewing of course effectiveness and planning for improvement	
	▪ Student rating and feedback ▪ Peer rating and feedback ▪ Regular meeting of the Curriculum Committee of the faculty.
6- Course development plans	
	▪ Conducting regular workshops for the staff for improving their course specification skills. ▪ Regular revision of course specification and syllabus items.

XIII. Course Policies: (including plagiarism, academic honesty, attendance etc)	
The University Regulations on academic misconduct will be strictly enforced. Please refer to ----------	
1	**Class Attendance:** ▪ Attendance of all lectures and practical sessions is required. Unexcused absence exceeding 25% of the lectures or practical sessions will disqualify the student from entering the final exam.

2	**Tardy:** - Roll will be called in the very beginning of each lecture and practical class. Retardation for more than three weeks without a reasonable excursion, the student involved shall not be allowed to attend the class any longer and consequently shall be considered to be absent.
3	**Exam Attendance/Punctuality:** ▪ Exam attendance is obligatory unless being excused by the department and faculty. ▪ Absence from assignments or exams will dealt with according to the general policy of the university.
4	**Assignments & Projects:** ▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable.
5	**Cheating:** ▪ Punishment of cheating will be according to the general policy of the university in this respect.
6	**Plagiarism:** ▪ Plagiarism in written essays, reports, etc. is not accepted, and students who plagiarize the works of others will be punished according to the general policy of the university.
7	**Other policies:** ▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit.

Course Plan of Sterile Preparations

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Prof. Dr. Maged Alwan	Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1-	**Course Title:**	Sterile Preparations				
2-	**Course Number & Code:**	Ph2713				
3-	**Credit hours: 1hrs**	**C.H**				**Total**
		Th.	**Seminar**	**Pr.**	**F. Tr.**	
		1	-	-		1
4-	**Study level/year at which this course is offered:**	4th Level /1st Semester				
5-	**Pre –requisite (if any):**	Pharmaceutics I,II,III and IV				
6-	**Co –requisite (if any):**					
7-	**Program (s) in which the course is offered**	Bachelor of Pharmacy				
8-	**Language of teaching the course:**	English				
9-	**System of Study:**	Semesters				
10-	**Mode of delivery:**	Regular				
11-	**Location of teaching the course:**	Faculty of Pharmacy-Sana'a University				

III. Course description:

The current course is intended to provide students with information related to liquid dosage forms, sterile products, specification of radiopharmaceutical products, design and additives maintaining the stability, bioavailability of drug and quality attributes of the selected products.

IV. Intended learning outcomes (ILOs) of the course:

At the end of this course, the students will be able to:

1. Recognize sterile products such injectable and ocular preparations according the cGMP regulation
2. Explain knowledge of radiopharmaceutical formulations
3. Recognize the role of formulation design and additives in maintaining the stability of the dosage forms and the bioavailability of drug.
4. Discuss the quality attributes of the selected products.

5. Select the best liquid forms, additives and packaging to enhance the stability of pharmaceutical solutions, suspensions and other disperse systems
6. Predict instability problems in selected products and suggest solutions for these problems.
7. Adjust the quality attributes of sterile pharmaceuticals.
8. Analyze stable effective liquid dosage form.
9. Examine the best method for sterilization of different pharmaceutical products.
10. Assess the quality attributes of liquid dosage forms and packaging.
11. Examine the necessary quality control tests of parenteral and other sterile products according to the cGMP regulation.
12. Work independently and in groups
13. Retrieve and evaluate information from different sources.

V. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	Introduction to sterile preparations	a1, b1,c1,d1-2	Introduction, Objective, Definitions, Sources of Product Contamination, Aseptic Technique	1	1
2	Parenterals.…	a1, c1, c2,d1-2	Advantages, disadvantages, necessities, Routes of Parenteral Administration in general.	1	1
3	Parenterals -(IM)….	a2, b2, c2,d1-2	Intramuscular (IM), Factors influencing absorption: In general, Factors influencing absorption from IM route.	1	1
4	Parenterals-(IV)	a1, a3, b1, c3,d1-2	II- Intravenous (IV), infusion of large volume fluid, Examples of LVP	1	1

			solutions, Common examples.		
5	Parenterals- Admixture	b1, c3, c4,d1-2	IV admixture, IV Admixture Labels Intra-arterial (IA), Intra-thecal, Intra-articular, Intra-pleural,	**1**	**1**
6	Parenterals- other sterile preparation	a1, b3, c2, c1,d1-2	Intra-cardial, Intradermal, Sub-cutanous routes, Other sterile preparations, Total Parenteral Nutrition, Cardiologic solutions, Peritoneal dialysis solution, Peritoneal dialysis solutions,	**1**	**1**
7	**Mid-term exam**	a1-3,b1-3,c1-4		**1**	**1**
8	Parenterals-formulation	a1-4,b1-3,c1-4,d1-2	Types of Parenteral Preparation, Solution, Factors should be consider in Formulation of parenterals, Injections, Infusion Fluids, Sterile solids, Parenteral Suspensions, Parenteral Emulsion, Official Types of Injections, Physiological Norms (pH, Tonicity, Pyrogenicity, Sources of pyrogens in sterile preparations, distilled water, injections requiring water free from carbon dioxide, Water-miscible vehicles, Water Immiscible Vehicls,	**1**	**1**

9	Parenterals- additive	a1-4,b1-3,c1-2,d1-2	Additive: To maintain solubility, Stability, sterility, isotonicity,7 to facilitate administration. General Procedure for Preparation of parenteral, Packaging component for parenteral Preparation, glass container, Plastic, Rubber,	1	1
10	Parenterals-equipment	c4,d1-2	Physical Norms of the parenteral solution, Sterile Preparation Facilities and Equipment, Laminar Flow Hoods, Syringes, Types, Needles, Ampoules, IV bags.	1	1
11	Parenterals- sterilization	a4,b3,c3,c4,d1-2	Definition Terms Related to Sterilization, Methods of Sterilization, Aseptic Technique, Equipment and Environment, Hand Washing, Clean Room,	1	1
12	Parenterals-requirements	a1, b3, c4,d1-2	Compounding of Solutions, Labeling, Storage conditions, Industrial Parenteral production, Specific requirements, plant layout planning,	1	1
13	Ophthalmic Preparations, ocuserts and Contact lenses.	b1, c3,d1-2	Introduction, types, preparation.	1	1
14	Radio-pharmacy	a2, c2,d1-2	Preparation, compounding, dispensing, packaging.	1	1
15	Quality Control, of sterile preparations	a4,b3,c3,c4,d1-2	Preparation, compounding, packaging.	1	1

16	**Final Exam**	a1-4,b1-3,c1-4		**1**	**1**
Number of Weeks /and Units Per Semester				**16**	**16**

VI. a- Teaching strategies of the course:

Lecture method, Group Discussion, Problem solving sessions, tutorials and brainstorming.

b-Assessment Methods:

Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, project, and Written exam

VII. Assignments:

No.	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Homework Assignments	**a1-4, b1-3,d1-2**	Sporadic through the semester	**10**
2	Reports	**c1-4,d1-2**		

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	**Participation,** Attendance, report, project **and quizzes**	**All weeks**	**5**	10%	a1-4,b1-3,c1-4,**d1-2**
2	**Assignments and** Oral Exam,	4-12	**5**	10%	a1-4,b1-3,c1-4,**d1-2**
3	**Mid-semester exam**	**5**	**10**	20%	a1-3,b1-3,c1-4
5	**Final Exam**	**16**	**30**	70%	a1-4,b1-3,c1-4
	Total		**50**	**100%**	

IX. Students' Support:

Office Hours/week	Other Procedures (if any)

Two contact hours per week	None

X. Learning Resource (MLA style or APA style)s:

5- Required Textbook(s) (maximum two)

4. Notes on Sterile preparations prepared by the department staff.
5. Ansel; H.C., (2011) Pharmaceutical Dosage Forms and drug Delivery Systems'. 9th ,Lea & Febiger; Philadelphia; London.
6. Aulton, M.E. (ed). (2013) Pharmaceutics, the design and manufacture of medicines. edition, Churchill Livingstone, Edinburgh.

6- Recommended Readings and Reference Materials

3. Loyd, V Allen J.,2013, Remington: The Science and Practice of Pharmacy 22nd edi Pharmaceutical Press, London.
4. Florence, A.T. and Attwood, D., 2006, "Physicochemical principles of pharmacy", 4 edition, Pharmaceutical Press, London.

7- Electronic Materials and Web Sites *etc*.

http://www.pharmaceutical technology.com
http://www.sciencedirect.com
http://www.pubmed.com
http://www.google.com

8- Other Learning Material:

J. Pharm. Sci
Published articles related to the discussed topics

XI. Facilities Required:

1 - Accommodation:	- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc. - Well-equipped laboratories with all required equipment and reagents.
3 - Computing resources:	- Computer laboratory with internet facilities.

XII. Course Improvement Processes:	
6- Strategies for obtaining student feedback on effectiveness of teaching	
	▪ Student-based assessment of the effectiveness of teaching using a questionnaire designed by the Quality Assurance Unit at the end of the semester. ▪ Meeting with students and faculty (once per semester).
7- Other strategies for evaluation of teaching by the instructor or by the department.	
	▪ Assessment of the course syllabus and contents by the teachers using a questionnaire designed by the Quality Assurance Unit of the university at the end of the semester. ▪ Regular meeting and discussion of the course content between the Head of Department and the teaching staff of the course (for theory and practice).
8- Processes for improvement of teaching.	
	▪ Revision of the course specification and its teaching strategies every three academic years after consideration of all issues raised by the teachers and/or students during regular meetings and discussions. ▪ Exploring any possible defects in the course that might encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.
9- Processes for verifying standards of students' achievement	
	▪ Checking of a sample of students' work by an independent faculty member. ▪ Periodic exchange and check marking of a sample of students' assignments with a faculty member from another institution. ▪ Adoption of scoring rubrics to assess the students' achievement (both for ongoing or summative assessments). ▪ Regular follow-up of laboratory logbooks to assess the practical achievement of students.
10- Procedures for Periodically Reviewing Of Course Effectiveness and Planning for Improvement	
	▪ Student rating and feedback ▪ Peer rating and feedback ▪ Regular meeting of the Curriculum Committee of the faculty.
6- Course Development Plans	
	▪ Conducting regular workshops for the staff for improving their course specification skills.

	▪ Regular revision of course specification and syllabus items.

XIII. Course Policies: (including plagiarism, academic honesty, attendance etc)	
The University Regulations on academic misconduct will be strictly enforced. Please refer to ----------	
1	**Class Attendance:** ▪ Attendance of all lectures and practical sessions is required. Unexcused absence exceeding 25% of the lectures or practical sessions will disqualify the student from entering the final exam.
2	**Tardy:** - Roll will be called in the very beginning of each lecture and practical class. Retardation for more than three weeks without a reasonable excursion, the student involved shall not be allowed to attend the class any longer and consequently shall be considered to be absent.
3	**Exam Attendance/Punctuality:** ▪ Exam attendance is obligatory unless being excused by the department and faculty. ▪ Absence from assignments or exams will dealt with according to the general policy of the university.
4	**Assignments & Projects:** ▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable.
5	**Cheating:** ▪ Punishment of cheating will be according to the general policy of the university in this respect.
6	**Plagiarism:** ▪ Plagiarism in written essays, reports, etc. is not accepted, and students who plagiarize the works of others will be punished according to the general policy of the university.
7	**Other policies:** ▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit.