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

Academic Program Specification Form for The Academic

University: Alnahrain university
College: collage of pharmacy
Number Of Departments In The College: Date of Form Completion:

Dean 's Name
Date : / /

Signature

Dean 's Assistant For Scientific Affairs

Date : / /
Signature

The College Quality Assurance And University Performance Manager
Date : 20/ 7 / 2023
Signatur

Quality Assurance And University Performance Manager Date : / /
Signature

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION/ pharmaceutics course plan

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of Pharmacy
2. University Department/Centre	Al-Nahrain University
3. Course title/code	**Pharmaceutics department**
4. Modes of Attendance offered	Theory-laboratory/ attendance
5. Semester/Year	1st semester/ 1st year To 2nd semester/ 5th year
6. Number of hours tuition (total)	35 hr/ weak
7. Date of production/revision of this specification	12/7/2023
8. Aims of the Course:	
1/ **First stage educated Pharmacy Practice and Pharmaceutical calculation that involved the basics of pharmacy Practice and its history, in addition to teaching methods of measuring weights and volumes**	
2/ **Second stage educated Physical Pharmacy I,II that involved the physical, mathematical and chemical basis of all physical and chemical phenomena of substances in their solid, liquid and gaseous states**	
3/ **Third stage educated Pharmaceutical Technology I,II that involved all the basics of drug compositions such as powders ,liquid ,tablets, ointments ... etc., methods of preparation, stability and packaging**	
4/ **Fourth stage ,first semester educated Biopharmaceutics that involved the ways of absorbing drugs of all kinds and dosages, in addition to mechanism of their absorption, diffusion,**	

metabolism and excretion inside and outside the body. Thereafter in the second semester educated Industrial Pharmacy I that involved the special means of pharmaceutical industry such as mixing, coating and packaging

5/ **Fifth stage, first semester educated Industrial pharmacy II that involved the basics for manufacturing drug of various doses. Thereafter in the second semester educated Dosage Form Design that involved pattern of drug dosages with various forms and ways of delivering them inside the body. Additionally, educated Pharmaceutical Biotechnology that concern with the pharmaceutical doses of hormones and proteins, methods of sterilization, and preservation**

9· Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Cognitive goals .

A1. Identify the types and forms of medicines.

A2. Methods for preparing the active substances in the form of full drug doses

A3. Studying the stability of doses prepared in various forms.

A4. Studying the pharmacological effect, its effectiveness, and its mechanism of action inside the body.

B. The skills goals special to the course.

B1. Acquisition of skill in installation and preparation methods

B 2. Acquiring the skill of knowing how to maintain stability for as long as possible

B 3. Acquisition of skill in diagnosing separated compounds

Teaching and Learning Methods

Power Point Presentation, Tutorials (Pen and Whiteboard),
Problem Solving, Practicalities, Scientific researchs, Laboratory teaching

Assessment methods

Quizzes
reports
Mid term Exam
Final Exam

C. Affective and value goals

C1.The use of modern methods in presenting lectures in the form of slides

C2. Video clips and diagrams

C3. Visiting pharmaceutical factories, if possible, and submitting scientific reports

C 4. Assigning students to do homework.

Teaching and Learning Methods
Power Point Presentation, Tutorials (Pen and Whiteboard), Problem Solving, Practicalities
Assessment methods
Quizzes reports Mid term Exam Final Exam
D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)

D 1. Practical experiments

D 2. Acquisition of computer skills

D 3. Granting confidence to the student through discussing seminars

10. Course Structure					
Stage	Hours	ILOs	Unit/Module or course Title	Teaching Method	Assessment Method
First	2	Theory	Principle of pharmacy practice	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
	2 2	Theory Lab.	Pharmaceutical calculation	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
Second	3 2	Theory Lab.	Physical pharmacy I	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
	3 2	Theory Lab.	Physical pharmacy II	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
Third	3 2	Theory Lab.	Pharmaceutical technology I`	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
	3 2	Theory Lab.	Pharmaceutical technology II	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
Fourth	2 2	Theory Lab.	Biopharmaceutics	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
	3 2	Theory Lab.	Industrial Pharmacy I	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
Fifth	3 2	Theory Lab.	Industrial Pharmacy II	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
	2	Theory	Dosage form design	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
	1	Theory	Pharmaceutical Biotechnology	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam

Curriculum Skills Map

lease tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

se e	Course Title	Core (C) Title or Option (O)	Programme Learning Outcomes													
			Knowledge and understanding				Subject-specific skills				Thinking Skills				General a Skills (relevant and perso	
			A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D

102	Principle of pharmacy practice	C	√	√	√	√	√	√	√		√	√	√	√	√	√
109	pharmaceutical calculation	C	√	√	√	√	√	√	√		√	√	√	√	√	√
218	Physical pharmacy I	C	√	√	√	√	√	√	√		√	√	√	√	√	√
225	Physical pharmacy II	C	√	√	√	√	√	√	√		√	√	√	√	√	√
334	Pharmaceutical technology I	C	√	√	√	√	√	√	√		√	√	√	√	√	√
339	Pharmaceutical technology II	C	√	√	√	√	√	√	√		√	√	√	√	√	√
447	Biopharmaceutic	C	√	√	√	√	√	√	√		√	√	√	√	√	√
454	Industrial pharmacy I	C	√	√	√	√	√	√	√		√	√	√	√	√	√
557	Industrial pharmacy II	C	√	√	√	√	√	√	√		√	√	√	√	√	√
568	Dosage form	C	√	√	√	√	√	√	√		√	√	√	√	√	√
569	Pharmaceutical biotechnology	C	√	√	√	√	√	√	√		√	√	√	√	√	√

11. Infrastructure	
1. Books Required reading:	Pharmaceutical Calculation by Stoklosa
2. Main references (sources)	Pharmaceutical Calculation by Stoklosa
A- Recommended books and references (scientific journals, reports…).	Maths skills for pharmacy by chris langley, Pharmacy practice by Jason hall,
B-Electronic references, Internet sites…	Oxford university press
12. The development of the curriculum plan	
Personal development - increasing knowledge - scientific discussions - cultural events	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION/pharmaceutics/principle of pharmacy practice

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of Pharmacy
2. University Department/Centre	Al-Nahrain University
3. Course title/code	***Principles of Pharmacy Practice/ 10301102***
4. Modes of Attendance offered	Theory/ attendance
5. Semester/Year	1st semester/ 1st year
6. Number of hours tuition (total)	30
7. Date of production/revision of this specification	12/7/2023
8. Aims of the Course:	
1/ Learn the rules of mathematic calculations.	
2/ Learn the rules of measurement systems and the relation between them.	
3/ Learn the rules of components and types of prescriptions.	
4/ Learn the rules of calculating doses and reducing or enlarging formulas.	
5/ Learn the rules of values description in percentage and ratio strength.	
6/ Learn the rules of calculating density and specific gravity.	
9· Learning Outcomes, Teaching ,Learning and Assessment Methode	

A- Cognitive goals

A1. Identify the types and forms of medicines.

A2. Methods for preparing the active substances in the form of full drug doses

A3. Studying the stability of doses prepared in various forms.

A4. Studying the pharmacological effect, its effectiveness, and its mechanism of action inside the body.

B. The skills goals special to the course.

B1. Acquisition of skill in installation and preparation methods

B 2. Acquiring the skill of knowing how to maintain stability for as long as possible

B 3. Acquisition of skill in diagnosing separated compounds

Teaching and Learning Methods

Power Point Presentation, Tutorials (Pen and Whiteboard),
Problem Solving, Practicalities

Assessment methods

Quizzes
reports
Mid term Exam
Final Exam

C. Affective and value goals

C1.The use of modern methods in presenting lectures in the form of slides

C2. Video clips and diagrams

C3. Visiting pharmaceutical factories, if possible, and submitting scientific reports

C 4. Assigning students to do homework.

Teaching and Learning Methods

Power Point Presentation, Tutorials (Pen and Whiteboard), Problem Solving, Practicalities Scientific researchs Laboratory teaching
Assessment methods
Quizzes reports Mid term Exam Final Exam
D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)
D 1. Practical experiments **D 2. Acquisition of computer skills** **D 3. Granting confidence to the student through discussing seminars**

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Review on some mathematic process	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
2	2		Explicit the types of measurement systems	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
3	2		Solving the problems	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
4	2		Explain the components and types of prescription	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
5	2		Solving the problems	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
6	2		Describe the ratio, proportion and percentage	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
7			Solving the problems	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam

8			Mid term Exam		
9	2		Estimate the Density, specific gravity.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
10	2		Solving the problems	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
11	2		Compute the doses of the drug	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
12	2		Solving the problems	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
13	2		Explicit how can reduce or enlarge the formula	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
14			Final Exam		

11. Infrastructure	
1. Books Required reading:	Pharmaceutical Calculation by Stoklosa
2. Main references (sources)	Pharmaceutical Calculation by Stoklosa
A- Recommended books and references (scientific journals, reports…).	Pharmacy practice by Jason hall
B-Electronic references, Internet sites…	Oxford university press
12. The development of the curriculum plan	
Personal development - increasing knowledge - scientific discussions - cultural events	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION/pharmaceutics/pharmaceutical calculation

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of Pharmacy
2. University Department/Centre	Al-Nahrain University
3. Course title/code	**Pharmaceutical Calculation/ *10301109***
4. Modes of Attendance offered	Theory-laboratory/ attendance
5. Semester/Year	2nd semester/ 1st year
6. Number of hours tuition (total)	60
7. Date of production/revision of this specification	12/7/2023
8. Aims of the Course:	
1/ Learn the rules of mathematic calculations.	
2/ Learn the rules of components and types of prescriptions.	
3/ Learn the rules of calculating doses and reducing or enlarging formulas.	
4/ Learn the rules of values description in percentage and ratio strength.	

9· Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Cognitive goals .

A1. Identify the types and forms of medicines.

A2. Methods for preparing the active substances in the form of full drug doses

A3. Studying the stability of doses prepared in various forms.

A4. Studying the pharmacological effect, its effectiveness, and its mechanism of action inside the body.

B. The skills goals special to the course.

B1. Acquisition of skill in installation and preparation methods

B 2. Acquiring the skill of knowing how to maintain stability for as long as possible

B 3. Acquisition of skill in diagnosing separated compounds

Teaching and Learning Methods

Power Point Presentation, Tutorials (Pen and Whiteboard),
Problem Solving, Practicalities
Scientific researchs
Laboratory teaching

Assessment methods

Quizzes
reports
Mid term Exam
Final Exam

C. Affective and value goals

C1.The use of modern methods in presenting lectures in the form of slides

C2. Video clips and diagrams

C3. Visiting pharmaceutical factories, if possible, and submitting scientific reports

C 4. Assigning students to do homework.

Teaching and Learning Methods

Power Point Presentation, Tutorials (Pen and Whiteboard),
Problem Solving, Practicalities

Assessment methods

Quizzes reports Mid term Exam Final Exam
D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)
D 1. Practical experiments **D 2. Acquisition of computer skills** **D 3. Granting confidence to the student through discussing seminars**

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1-5	10		Dilution and concentration of pharmaceutical preparations.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
6-8	6		Isotonic solutions.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
			Mid term Exam		
9-11	6		Electrolyte solutions (milliequivalents, millimoles and milliosmoles).	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
12-15	8		Constituted solutions, I.V admixtures and flow rate calculations.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
			Final Exam		

11. Infrastructure	
1. Books Required reading:	Pharmaceutical Calculation by Stoklosa

2. Main references (sources)	Pharmaceutical Calculation by Stoklosa
A- Recommended books and references (scientific journals, reports…).	Maths skills for pharmacy by chris Langley
B-Electronic references, Internet sites…	Oxford university press
12. The development of the curriculum plan	
Personal development - increasing knowledge - scientific discussions - cultural events	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of pharmacy

2. University Department/Centre	Al-Nahrain University
3. Course title/code	Dosage form design 5212
4. Modes of Attendance offered	Theory/ attendance
5. Semester/Year	2nd semester / 5th year
6. Number of hours tuition (total)	30 hours
7. Date of production/revision of this specification	7/17/2023
8. Aims of the Course:	
1/ To help students understand the principles and factors that influence the designing of dosage forms	
2/ Learn the applications of these principles to the practice of pharmaceutical industry	
3/ Learn the Pre-formulation studies ; physical description, microscopic examination, Melting point; phase rule; particle size; polymorphism; solubility.	
4/ Learn the Formulation consideration: Excipients; definition and types.	
5/ Learn the Biopharmaceutical considerations.	
6/ Learn Bioavailability and bioequivalancy; FDA requirements	
7/ Learn the Pharmacokinetic principles	

9· Learning Outcomes, Teaching ,Learning and Assessment Method
A- Cognitive goals. A1. Familiar with reading skills A2. Communicate with other researchers A3. Help other researchers A4. Academic writing
B. The skills goals special to the course. B1. Communication skills B2. Education skills B3. Critical thinking skills
Teaching and Learning Methods

Power Point Presentation, Tutorials (Pen and Whiteboard), Problem Solving
Assessment methods
1- Quizzes 2- Reports 3- Mid term Exam 4- Final-term Exam
C. Affective and value goals C1. The use of modern methods in presenting lectures in the form of slides C2. Video clips and diagrams C3. Assigning students to do homework.
Teaching and Learning Methods
Power Point Presentation, Whiteboard , Problem Solving
Assessment methods
1- Quizzes 2- Reports 3- Mid term Exam 4- Final-term Exam

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)

D1. Critical thinking skills
D2. Communication skills
D3. Education skills

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Pharmaceutical consideration: The need for the dosage form.	Power point, Problem solving	Formative, summative, quiz
2	2		General consideration of the dosage form	Power point, Problem solving	Formative, summative, quiz
3	2		Pre-formulation; physical description, microscopic examination.	Power point, Problem solving	Formative, summative, quiz
4	2		Melting point; phase rule; particle size; polymorphism; solubility.	Power point, Problem solving	Formative, summative, quiz
5	2		Permeability; pH; partition coefficient; pka; stability; kinetics; shelf life	Power point, Problem solving	Formative, summative, quiz
6	2		Rate reaction; enhancing stability.	Power point, Problem solving	Formative, summative, quiz
7	2		Formulation consideration: Excipients; definition and types; appearance; palatability; flavoring	Power point, Problem solving	Formative, summative, quiz
8			Mid-Term exam		
9	2		Sweetening; coloring pharmaceuticals; preservatives; sterilization; preservatives selection.	Power point, Problem solving	Formative, summative, quiz
10	2		Biopharmaceutical considerations: Principle of drug absorption;	Power point, Problem solving	Formative, summative, quiz

			dissolution of the drugs.		
11	2		Bioavailability and bioequivalancy; FDA requirements	Power point, Problem solving	Formative, summative, quiz
12	2		Assessment of bioavailability; bioequivalence among drug products.	Power point, Problem solving	Formative, summative, quiz
13	2		Pharmacokinetic principles: Half life; clearance; dosage regimen considerations	Power point, Problem solving	Formative, summative, quiz
14	2		Drug discovery and drug design	Power point, Problem solving	Formative, summative, quiz
15			Final-term exam		

11. Infrastructure	
1. Books Required reading:	1- Pharmaceutical Dosage Forms and Drug Delivery Systems by Haward A. Ansel. Latest Edition.
2. Main references (sources)	1- Pharmaceutical Dosage Forms and Drug Delivery Systems by Haward A. Ansel. Latest Edition. 2- Handbook of pharmaceutical excipients, by Raymond C Rowe et al, Latest edition.
A- Recommended books and references (scientific journals, reports…).	1-Applied Biopharmaceutics & Pharmacokinetics, by leon shargel et al, seventh edition. 2- British pharmacopeia, latest edition.
B-Electronic references, Internet sites…	1-https://www.fda.gov/industry/structured-product-labeling-resources/dosage-forms.
12. The development of the curriculum plan	
Personal development - increasing knowledge - scientific discussions - cultural events	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of pharmacy
2. University Department/Centre	Al-Nahrain University
3. Course title/code	Pharmaceutical Biotechnology 5213
4. Modes of Attendance offered	Theory/ attendance
5. Semester/Year	2nd semester / 5th year
6. Number of hours tuition (total)	15 hours
7. Date of production/revision of this specification	7/17/2023
8. Aims of the Course:	
1/ Learn the Formulation of biotechnology products Microbiological considerations	
2/ Learn about the compounds found in parenteral formulation of biotech. products	
3/ Learn about the Delivery of proteins	
4/ Learn the routes of administration for proteins	
5/ Learn the absorption enhancement of proteins	
6/ Learn the Pharmacokinetics and pharmacodynamics of peptide and protein drugs	
7/ Learn the Elimination of protein drugs	

9· Learning Outcomes, Teaching ,Learning and Assessment Method
B- Cognitive goals. A1. Familiar with reading skills A2. Communicate with other researchers A3. Help other researchers A4. Academic writing
B. The skills goals special to the course. B1. Communication skills B2. Education skills B3. Critical thinking skills
Teaching and Learning Methods
Power Point Presentation, Tutorials (Pen and Whiteboard), Problem Solving
Assessment methods
5- Quizzes 6- Reports 7- Mid term Exam 8- Final-term Exam
C. Affective and value goals C1. The use of modern methods in presenting lectures in the form of slides C2. Video clips and diagrams C3. Assigning students to do homework.
Teaching and Learning Methods
Power Point Presentation, Whiteboard , Problem Solving
Assessment methods
1- Quizzes 2- Reports 3- Mid term Exam 4- Final-term Exam

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)

D1. Critical thinking skills
D2. Communication skills
D3. Education skills

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	1		Introduction to Biotechnology	Power point, Problem solving	Formative, summative, quiz
2	1		Introduction into microbial considerations in pharmaceutical biotechnology	Power point, Problem solving	Formative, summative, quiz
3	1		Study the Microbial considerations, the sterility in maunfactruing	Power point, Problem solving	Formative, summative, quiz
4	1		Study the Excipients used in parenteral formulations of biotech products	Power point, Problem solving	Formative, summative, quiz
5	1		Study the Freeze Drying and its application in Pharmaceutical Biotechnology	Power point, Problem solving	Formative, summative, quiz
6	1		Study the delivery of Proteins: Routes of Administration	Power point, Problem solving	Formative, summative, quiz
7	1		Study the delivery of Proteins: Absorption Enhancement	Power point, Problem solving	Formative, summative, quiz
8			Mid-Term exam		
9	1		Alternative Routes of Administration for proteins	Power point, Problem solving	Formative, summative, quiz

10	1		Introduction to Pharmacokinetics and Pharmacodynamics of Peptide and Protein Drugs	Power point, Problem solving	Formative, summative, quiz
11	1		Absorption of Protein Therapeutics	Power point, Problem solving	Formative, summative, quiz
12	1		Distribution of protein therapeutics	Power point, Problem solving	Formative, summative, quiz
13	1		Elimination of Protein Therapeutics	Power point, Problem solving	Formative, summative, quiz
14	1		Renal metabolism of protein therapeutics	Power point, Problem solving	Formative, summative, quiz
15			Final-term exam		

11. Infrastructure	
1. Books Required reading:	1- Pharmaceutical Biotechnology: Fundamentals and Applications, Fourth Edition
2. Main references (sources)	1- Pharmaceutical Biotechnology: Fundamentals and Applications, Fourth Edition
A- Recommended books and references (scientific journals, reports…).	1-Applied Biopharmaceutics & Pharmacokinetics, by leon shargel et al, seventh edition. 2- British pharmacopeia, latest edition
B-Electronic references, Internet sites…	1-https://www.fda.gov/industry/structured-product-labeling-resources/dosage-forms.
12. The development of the curriculum plan	
Personal development - increasing knowledge - scientific discussions - cultural events	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Ministry of higher education and scientific research
2. University Department/Centre	Al-Nahrain university-college of pharmacy- pharmaceutics department
3. Course title/code	Industrial pharmacy I
4. Modes of Attendance offered	fourth stage
5. Semester/Year	Second semester
6. Number of hours tuition (total)	45 hour
7. Date of production/revision of this specification	15/7/2023
8. Aims of the Course	
Industrial pharmacy's mission where the student studies the equipment used in pharmaceutical manufacturing facilities, including mixing, packaging, and mixing.	

9· Learning Outcomes, Teaching ,Learning and Assessment Methods

A- Cognitive goals

A1. To teach students the steps and lines upon which the preformulation processing of pharmaceutical dosage forms are based

A2. It provides the required principles to integrate knowledge of Pharmaceutical Technology in preformulation of perfect dosage form

A3. To achieve proper dosage form processing, it also entails milling, mixing, drying, filtration, and sterilization..

A4. To know all the devices related to grinding and mixing medicines and raw materials used in the pharmaceutical manufacturing process

B. The skills goals special to the course.

B1. Acquire skill in the methods of material mixing and grinding

B2. Knowing the method that are suitable for preparing each type of material

B3. Learn the necessary techniques and skills to use pharmaceutical equipment and machinery to produce various medicines on a large scale.

Teaching and Learning Methods

1. Theoretical lectures
2. Blackboard
3. Projector device
4. PowerPoint presentation
5. Educational laboratories
6. Electronic lectures
7. Scientific and practical research
8. Office Research

Assessment methods

1. Semi-semester exams and final exams
2. Oral and written exams
3. Laboratory and daily reports

C. Affective and value goals

C 1. Using modern methods in displaying lectures in the form of slides

C 2. Videos and diagrams

C 3. Visit pharmaceutical factories if possible and submit scientific reports

C 4. Assigning students homework.
Teaching and Learning Methods
1. Teaching and lecturing 2. Seminars and homework 3. Field visits
Assessment methods
Laboratory, oral and written exams

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)
D1. Practical experiences
D2. Acquire computer skills
D3. Give confidence to the student by discussing seminars
D4.Acquire skills in writing efficient reports

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title		
Week 1-2	7		The principles of pharmaceutical processing; mixing; fluid mixing; flow characteristics; mechanisms of mixing; mixing equipments; batch and continuous mixing; mixer selection; solid mixing theory and particulate solid variables; forces and mechanisms	Theoretical	Oral and writ
Week 3-4	7		Milling; pharmaceutical application; size measurement methods; theory and energy of commenution; types of mills; factors influencing milling; selection of mill techniques; specialized drying methods	Theoretical	Oral and writ
Week 5-6	7		Drying: definition; purpose; humidity measurement; theory of drying; drying of solids, and classification of dryer; specialized drying methods.	Theoretical	Oral and writ
Week 7-8	7		Clarification and filtration: Theory; filter media; filter aids; selection of drying method; non-sterile and sterile operations; integrity testing; equipments and systems (commercial and laboratory).	Theoretical	Oral and writ
Week 9-10	7		Sterilization; validation of methods; microbial death kinetics; methods of sterilization (thermal and non-thermal); mechanisms; evaluation.	Theoretical	Oral and writ
Week 11	3		Pharmaceutical dosage form design; pre-formulation; preliminary evaluation; bulk characterization; solubility and stability analysis.	Theoretical	Oral and writ
Week 12-13	7		Pharmaceutical dosage forms; sterile products; development; formulation; production; processing; quality control.	Theoretical	Oral and writ

11. Infrastructure

1. Books Required reading:	• Pharmaceutical Calculation by Stoklosa • Physical Pharmacy by Alfred Martin et al. • Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition. And Sprowel's American Pharmacy. • Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics. • The Theory and Practice of Industrial Pharmacy by Leon Lachman et al.
2. Main references (sources)	Encyclopedia of Pharmaceutical Technology
A- Recommended books and references (scientific journals, reports…).	British Pharmacopeia United state pharmacopeia European pharmacopia

B-Electronic references, Internet sites…	Slide share
12. The development of the curriculum plan	
Personal development - increasing knowledge - scientific discussions - cultural events	

The future development of industrial pharmacy is likely to see severeal significant advancement. There is some potential areas of growth and improvement like personalized medicine. Industrial pharmacy will continue to move toward personalized medicine, tailoring treatment to individual patient based on genetic makeup, life style and other factors.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Ministry of higher education and scientific research
2. University Department/Centre	Al-Nahrain university-college of pharmacy- pharmaceutics department
3. Course title/code	Industrial pharmacy II
4. Modes of Attendance offered	Fifth stage
5. Semester/Year	First semester
6. Number of hours tuition (total)	45 hour
7. Date of production/revision of this specification	15/7/2023
8. Aims of the Course	
Industrial pharmacy's mission where the student studies the equipment used in pharmaceutical manufacturing facilities, including mixing, blending, and Packaging.	

9· Learning Outcomes, Teaching , Learning and Assessment Methods

A- Cognitive goals

A1. To provide technical setup that coordinates the standards of formulating typical dosage
A2. To emphasize the principles needed to learn mass production of different pharmaceutic
A3. Milling, mixing, drying, filtration, and sterilizing are also required for effective dosage
A4. To prepare different dosage forms, such as tablets, capsules, aerosols, emulsion, etc, be enteric coating and micro-encapsulation.

B. The skills goals special to the course.

B1. Acquire skill in the methods of material mixing and grinding
B2. Understanding the best preparation techniques for each type of material
B3. Understand the procedures and skills required to operate pharmaceutical equipment an diverse medicines..

Teaching and Learning Methods

1. Theoretical lectures
2. Blackboard
3. Projector device
4. PowerPoint presentation
5. Educational laboratories
6. Electronic lectures
7. Scientific and practical research
8. Office Research

Assessment methods

1. Semi-semester exams and final exams
2. Oral and written exams
3. Laboratory and daily reports

C. Affective and value goals

C 1. Using modern methods in displaying lectures in the form of slides
C 2. Videos and diagrams
C 3. Visit pharmaceutical factories if possible and submit scientific reports
C 4. Assigning students homework.

Teaching and Learning Methods

1. Teaching and lecturing
2. Seminars and homework
3. Field visits

Assessment methods

Laboratory, oral and written exams

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)
D1. Practical experiences
D2. Acquire computer skills
D3. Give confidence to the student by discussing seminars
D4.Acquire skills in writing efficient reports

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title
	10		Pharmaceutical dosage forms: Tablets; role in therapy; advantages and disadvantages; formulation; properties; evaluation; machines used in tableting; quality control; problems; granulation, and methods of production; excipients, and types of tablets
	4		Tablet coating; principles; properties; equipments; processing; types of coating (sugar and film); quality control, and problems.
	3		Capsules: Hard gelatin capsules; materials; production; filling equipments; formulation; special techniques.
	2		Soft gelatin capsules: Manufacturing methods; nature of capsule shell and content; processing and control; stability
	2		Micro-encapsulation; core and coating materials; stability; equipments and methodology.
	3		Modified (sustained release) dosage forms; theory and concepts; evaluation and testing; formulation.
	3		Liquids: Formulation; stability and equipments.
	3		Suspensions: Theory; formulation and evaluation
	3		Emulsions: Theory and application; types; formulation; equipments and quality control
	3		Semisolids: Percutaneouse absorption; formulation; types of bases (vehicles)
	3		Semisolids: Percutaneouse absorption; formulation; types of bases (vehicles)
	6		Pharmaceutical aerosols: Propellants; containers; formulation; types and selection of components; stability; manufacturing; quality control and testing.

11. Infrastructure

1. Books Required reading:	• Pharmaceutical Calculation by Stoklosa • Physical Pharmacy by Alfred Martin et al. • Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest

	edition. And Sprowel's American Pharmacy. • Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics. • The Theory and Practice of Industrial Pharmacy by Leon Lachman et al.
2. Main references (sources)	Encyclopedia of Pharmaceutical Technology
A- Recommended books and references (scientific journals, reports…).	British Pharmacopeia United state pharmacopeia European pharmacopia
B-Electronic references, Internet sites…	Slide share
12. The development of the curriculum plan	
Personal development - increasing knowledge - scientific discussions - cultural events	

The development of industrial pharmacy in the future is expected to be significant. Quality control and manufacturing one example of a promising area for growth and improvement. With increasing complexity of pharmaceutical products,there will be a greater emphasis on quality control and ensuring the consistency of manufacturing processes . automated systems and artificial intelligence (AI) maybe employed to enhance batch-to-batch reproducibility and reduce human error.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Ministry of higher education and scientific research
2. University Department/Centre	Al-Nahrain university-college of pharmacy- pharmaceutics department
3. Course title/code	Pharmaceutical technology
4. Modes of Attendance offered	Third stage
5. Semester/Year	First semester
6. Number of hours tuition (total)	45 hour
7. Date of production/revision of this specification	15/7/2023
8. Aims of the Course	
The aim of pharmaceutical technology is to develop , manufacture safe, effective, and quality	

pharmaceutical products. It encompasses various aspects such as the design,
formulation, manufacturing, packaging, and quality control of pharmaceutical drugs.

9· Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Cognitive goals

A1. Developing an in-depth understanding of the Physcchemical properties and behavior of various drugs to optimize drug formulation, stability, and efficacy.

A2. Acquiring a strong foundation in various pharmaceutical sciences such as pharmacolog facilitate drug formulation and optimization

A3. Gaining knowledge about different drug delivery systems, including oral, parenteral, tr drug efficacy and patient compliance.

A4. Staying updated with the latest advancements in pharmaceutical technology, including personalized medicine, to foster innovation and improve drug development and delivery sy

A5. Creating different dosage forms, such as solution, Elixir, Spirit, and tincture, to ensure compliance.

A6 . Implementing efficient manufacturing processes to ensure consistent production of hig

B. The skills goals special to the course.

B1. Acquire skill in the methods of preparation and composition of medicines

B2. Knowing the importance of pharmaceutical forms and the suitability of each form to di

B3. Acquire sufficient skill and methods to use pharmaceutical devices and machines to ma

Teaching and Learning Methods

1. Theoretical lectures
2. Blackboard
3. Projector device
4. PowerPoint presentation
5. Educational laboratories
6. Electronic lectures
7. Scientific and practical research
8. Office Research

Assessment methods

1. Semi-semester exams and final exams
2. Oral and written exams
3. Laboratory and daily reports

C. Affective and value goals

C 1. Using modern methods in displaying lectures in the form of slides

C 2. Videos and diagrams

C 3. Visit pharmaceutical factories if possible and submit scientific reports

C 4. Assigning students homework.

Teaching and Learning Methods

1. Teaching and lecturing
2. Seminars and homework
3. Field visits

Assessment methods

Laboratory, oral and written exams

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)
D1. Practical experiences
D2. Acquire computer skills
D3. Give confidence to the student by discussing seminars
D4. Acquire skills in writing efficient reports

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title
Week1	2		Dispersed systems: their classification; comparisons between differen systems
Week1-2	2		Solutions and types of solutions
Week2-3	4		Solubility: Factors affecting solubility; expression of dissolution; dissolution rate versus solubility; preparation of solutions containing non-volatile materials
Week3-4	4		Official solutions; classification of official solutions; preparation and uses.
Week4-5	4		Aqueous solutions containing aromatic principles; aromatic waters; method of preparations; stability.
Week5-6	4		Syrups: sugar based syrups; artificial and sorbitol based syrups; stability of syrups
Week6-7	3		Definition and methods of clarification; filter aids in clarification
Week7-8	3		Preparation of solutions using mixed solvent systems; spirits, and elixirs.
Week8-9	3		Extraction; maceration and percolation
Week9-10	4		Tinctures; fluid extracts; extracts of resins and oleoresins.
Week10-11-12	6		Colloidal dispersions; lyophilic; lyophobic
Week13-14	6		Coarse dispersion; suspensions.

11. Infrastructure

1. Books Required reading:	• Pharmaceutical Calculation by Stoklosa • Physical Pharmacy by Alfred Martin et al. • Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition. And Sprowel's American Pharmacy. • Shargel L, Yu AB, (Eds.), Applied

	Biopharmaceutics and Pharmacokinetics. • The Theory and Practice of Industrial Pharmacy by Leon Lachman et al.
2. Main references (sources)	Encyclopedia of Pharmaceutical Technology
A- Recommended books and references (scientific journals, reports…).	British Pharmacopeia United state pharmacopeia European pharmacopia
B-Electronic references, Internet sites…	Slide share
12. The development of the curriculum plan	
Personal development - increasing knowledge - scientific discussions - cultural events	

The advancement and innovation of pharmaceutical technology is predicted to continue in the future. Here are some of the important areas where significant progress is expected like nanotechnology. Nanotechnology holds immense potential in drug delivery systems. Nanoparticles can be engineered to deliver drugs to specific targets in the body, improving their efficacy and reducing side effects. Pharmaceutical technology will continue to explore and refine nanotechnology-based drug delivery systems.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Ministry of higher education and scientific research
2. University Department/Centre	Al-Nahrain university-college of pharmacy- pharmaceutics department
3. Course title/code	Pharmaceutical technology II
4. Modes of Attendance offered	Third stage
5. Semester/Year	Second semester
6. Number of hours tuition (total)	45 hour
7. Date of production/revision of this specification	15/7/2023
8. Aims of the Course	
The aim of pharmaceutical technology is to create high-quality, safe products.	

It encompasses various aspects such as the design, formulation, manufacturing, packaging, and quality control of pharmaceutical drugs.

9· Learning Outcomes, Teaching ,Learning and Assessment Methods

A- Cognitive goals

A1. To teach theoretical bases for the technology of preparing different dosage forms with respect to their raw materials, composition, methods of preparation, stability, storage and uses

A2. To define and characterize the possible incompatibilities that may occur in dosage form

A3. Gaining knowledge about different drug delivery systems, including oral, parenteral, tr drug efficacy and patient compliance.

A4. Creating different dosage forms, such as Capsules, Suppositories, Semisolid dosage for accurate drug administration and patient compliance.

B. The skills goals special to the course.

B1. Acquire skill in the methods of preparation and composition of medicines

B2. Knowing the importance of pharmaceutical forms and the suitability of each form to di

B3. Acquire sufficient skill and methods to use pharmaceutical devices and machines to ma

Teaching and Learning Methods

1. Theoretical lectures
2. Blackboard
3. Projector device
4. PowerPoint presentation
5. Educational laboratories
6. Electronic lectures
7. Scientific and practical research
8. Office Research

Assessment methods

1. Semi-semester exams and final exams
2. Oral and written exams
3. Laboratory and daily reports

C. Affective and value goals

C 1. Using modern methods in displaying lectures in the form of slides

C 2. Videos and diagrams

C 3. Visit pharmaceutical factories if possible and submit scientific reports

C 4. Assigning students homework.

Teaching and Learning Methods

1. Teaching and lecturing
2. Seminars and homework
3. Field visits

Assessment methods

Laboratory, oral and written exams

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)

D1. Practical experiences
D2. Acquire computer skills
D3. Give confidence to the student by discussing seminars
D4. Acquire skills in writing efficient reports

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title
Week1-4	10		Emulsions; purpose of emulsification; methods of emulsification; emulsifying agents; HLB system; stability of emulsions.
Week4-5	5		Lotions; liniments and collodions.
Week-6-7	6		Suppositories.
Week8-11	10		Powdered dosage forms.
Week11-14	10		Semisolid dosage forms.
Week15-16	4		Incompatibilities in pharmaceutical dosage forms.

11. Infrastructure

1. Books Required reading:	• Pharmaceutical Calculation by Stoklosa • Physical Pharmacy by Alfred Martin et al. • Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition. And Sprowel's American Pharmacy. • Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics. • The Theory and Practice of Industrial Pharmacy by Leon Lachman et al.
2. Main references (sources)	Encyclopedia of Pharmaceutical Technology

A- Recommended books and references (scientific journals, reports…).	British Pharmacopeia United state pharmacopeia European pharmacopia
B-Electronic references, Internet sites…	Slide share
12. The development of the curriculum plan	
Personal development - increasing knowledge - scientific discussions - cultural events	

Drug Repurposing and Drug Combinations: Pharmaceutical technology will continue to explore drug repurposing, which involves finding new applications for existing drugs. Additionally, the development of drug combinations that target multiple disease pathways simultaneously is expected to gain traction, leading to more effective treatments for complex diseases.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programed specification.

1. Teaching Institution	College of Pharmacy
2. University Department/Centre	Al-Nahrain University
3. Course title/code	**Biopharmaceutics / 10301447**
4. Modes of Attendance offered	Theory and practical/ attendance
5. Semester/Year	1st semester/ 4th year
6. Number of hours tuition (total)	32
7. Date of production/revision of this specification	12/7/2023
8. Aims of the Course: the course should enable the student to:	
1. Understand the idea of biopharmaceutics and their aspect.	
2. Understand the idea of pharmacokinetic, linear and non linear	
3. Understand the idea of one compartment model and multi compartment model.	
4. Understand the idea of dosage form and multiple dosage regimens.	

5. Understand the idea of bioavailability and bioequivalence
6. Understand the idea of drug absorption and protein binding
7. Understand the idea of drug elimination by liver and by kidney.

Learning Outcomes, Teaching ,Learning and Assessment Method
A- Cognitive goals
A1. Studying the ways of absorbing drugs of all kinds and dosages, in addition to mechanism of their absorption, diffusion, metabolism and excretion inside and outside the body.
B. The skills goals special to the course. **B1. Acquisition of skill in installation and preparation methods** **B 2. Acquiring the skill of knowing how to maintain stability for as long as possible** **B 3. Acquisition of skill in diagnosing separated compounds**
Teaching and Learning Methods
Power Point Presentation, Tutorials (Pen and Whiteboard), Problem Solving, Practicalities
Assessment methods
Quizzes ,reports , Midterm Exam ,and Final Exam
C. Affective and value goals **C1.The use of modern methods in presenting lectures in the form of slides** **C2. Video clips and diagrams** **C3. Visiting pharmaceutical factories, if possible, and submitting scientific reports** **C 4. Assigning students to do homework.**

Teaching and Learning Methods
Power Point Presentation, Tutorials (Pen and Whiteboard), Problem Solving, Practicalities Scientific research's , Laboratory teaching
Assessment methods
Quizzes , reports , Midterm Exam , and Final Exam

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)
D 1. Practical experiments
D 2. Acquisition of computer skills
D 3. Granting confidence to the student through discussing seminars

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Introduction to biopharmaceutics.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
2-4	6		Biopharmaceutic aspects of products; drug absorption; mechanisms of absorption; physicochemical factors; dissolution rate; effects of excipients;type of dosage forms.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
5,6	4		One compartment open model., Multicompartment models.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
7,8	6		Pharmacokinetics of drug absorption. Bioavailability and bioequivalence.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
9-11	6		Clearance of drugs from the biological systems. Hepatic elimination of drugs ,Protein binding of drugs.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
12-15	8		Intravenous infusion, Multiple dosage regimens. Non-linear pharmacokinetics. Dosage adjustment in renal diseases	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
			Final Exam		

11. Infrastructure

1. Books Required reading:	***Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics.***

2. Main references (sources)	***Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics.***
A- Recommended books and references (scientific journals, reports…).	Applied Bio pharmaceutics and pharmacokinetics Shargel and yus
B-Electronic references, Internet sites…	
12. The development of the curriculum plan	
Addition of another references book and Personal development - increasing	
knowledge - scientific discussions - cultural events	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programed specification.

1. Teaching Institution	College of Pharmacy
2. University Department/Centre	Al-Nahrain University
3. Course title/code	***Physical pharmacy I / 10301218***
4. Modes of Attendance offered	Theory and practical/ attendance

5. Semester/Year	1st semester/ 2nd year
6. Number of hours tuition (total)	39
7. Date of production/revision of this specification	12/7/2023
8. Aims of the Course: the course should enable the student to:	
1. Recognize the perception of state of matter including gases, liquids, solid, liquid crystalline and condense system.	
2. Recognize the perception of two component system	
3. Recognize the perception of solutions containing electrolytes and non/electrolytes materials.	
4. Recognize the perception of thermodynamics laws.	
5. Recognize the perception of ionic strength and ionic equilibrium.	
6. Recognize the perception of PH, buffer and free energy.	

Learning Outcomes, Teaching ,Learning and Assessment Method
A- Cognitive goals
A1. Studying the physical, mathematical and chemical basis of all physical and chemical phenomena of materials in their solid, liquid and gaseous states..
B. The skills goals special to the course.
B1. Acquisition of skill in installation and preparation methods
B 2. Acquiring the skill of knowing how to maintain stability for as long as possible
B 3. Acquisition of skill in diagnosing separated compounds
Teaching and Learning Methods
Power Point Presentation, Tutorials (Pen and Whiteboard), Problem Solving, Practicalities
Assessment methods

Quizzes ,reports , Midterm Exam ,and Final Exam

C. Affective and value goals

C1.The use of modern methods in presenting lectures in the form of slides

C2. Video clips and diagrams

C3. Visiting pharmaceutical factories, if possible, and submitting scientific reports

C 4. Assigning students to do homework.

Teaching and Learning Methods

Power Point Presentation, Tutorials (Pen and Whiteboard), Problem Solving, Practicalities Scientific research's , Laboratory teaching

Assessment methods

Quizzes , reports , Midterm Exam , and Final Exam

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)
D 1. Practical experiments
D 2. Acquisition of computer skills
D 3. Granting confidence to the student through discussing seminars

10. Course Structure					
Week	Hours	IL Os	Unit/Module or Topic Title	Teaching Method	Assessmen t Method
1	3		States of matter, binding forces between molecules,	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
2	3		State of gases,liquids, solid and crystalline matters; phase equilibria and phase rule; thermal analysis.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
3	3		Liquid crystalline state, liquid equilibrium, condense system	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
4	3		Two component system, (solid and liquid),solid dispersion, phase equilibrium	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
5	3		Solutions of non/electrolytes, properties.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
6	3		ideal and real colligative properties, molecular weight determination.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
7			Review and Solving the problems	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
8			Mid term Exam		
9	3		Thermodynamics, first law, thermochemistry, second law, third law, free energy function and application	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
10	3		Solution of electrolytes, properties, Arrhenius theory of dissociation, theory of strong electrolytes,	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
11	3		ionic strength, Debye/Huchle theory,	Power Point, Problem Solving,	Formative, summative, quize,

			coefficients for expressing colligative properties	Practicalities	exam
12	3		Ionic equilibrium, modern theories of acids, bases and salts, acid/base equilibrium,	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
13	3		calculation of pH, acidity constants, the effect of ionic strength and free energy	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
14	3		Buffered and isotonic solutions: Buffer equation; buffer capacity	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
15	3		methods of adjusting tonicity and pH; buffer and biological system	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
			Final Exam		

11. Infrastructure	
1. Books Required reading:	***Physical Pharmacy by Alfred Martin et al.***
2. Main references (sources)	***Physical Pharmacy by Alfred Martin et al.***
A- Recommended books and references (scientific journals, reports…).	***Theory and Practice of Physical Pharmacy*** *by Gaurav Jain, Roop Krishen Khar, Farhan J. Ahmad*
B-Electronic references, Internet sites…	https://www.kobo.com/us/en/ebook/theory-and-practice-of-physical-pharmacy-e-book
12. The development of the curriculum plan	
Addition of another references Personal development - increasing knowledge of student ,scientific discussions - cultural events	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programed specification.

1. Teaching Institution	College of Pharmacy
2. University Department/Centre	Al-Nahrain University
3. Course title/code	***Physical pharmacy II / 10301225***
4. Modes of Attendance offered	Theory and practical/ attendance
5. Semester/Year	2nd semester/ 2nd year
6. Number of hours tuition (total)	45
7. Date of production/revision of this specification	12/7/2023
8. Aims of the Course: the course should enable the student to:	
1. Recognize the perception of state of matter including gases, liquids, solid, liquid crystalline and condense system.	
2. Recognize the perception of two component system	
3. Recognize the perception of solutions containing electrolytes and non/electrolytes materials.	
4. Recognize the perception of thermodynamics laws.	
5. Recognize the perception of ionic strength and ionic equilibrium.	
6. Recognize the perception of PH, buffer and free energy.	

Learning Outcomes, Teaching ,Learning and Assessment Method
A- Cognitive goals
A1. Studying the physical, mathematical and chemical basis of all physical and chemical phenomena of materials in their solid, liquid and gaseous states..
B. The skills goals special to the course. **B1. Acquisition of skill in installation and preparation methods** **B 2. Acquiring the skill of knowing how to maintain stability for as long as possible** **B 3. Acquisition of skill in diagnosing separated compounds**
Teaching and Learning Methods
Power Point Presentation, Tutorials (Pen and Whiteboard), Problem Solving, Practicalities
Assessment methods
Quizzes ,reports , Midterm Exam ,and Final Exam
C. Affective and value goals **C1.The use of modern methods in presenting lectures in the form of slides** **C2. Video clips and diagrams** **C3. Visiting pharmaceutical factories, if possible, and submitting scientific reports** **C 4. Assigning students to do homework.**
Teaching and Learning Methods
Power Point Presentation, Tutorials (Pen and Whiteboard), Problem Solving, Practicalities Scientific research's , Laboratory teaching
Assessment methods

Quizzes , reports , Midterm Exam , and Final Exam

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)
D 1. Practical experiments
D 2. Acquisition of computer skills
D 3. Granting confidence to the student through discussing seminars

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1-3	9		Solubility and distribution phenomena, solvent-solute interactions, solubility of gases in liquids, solubility of liquids in liquids, solubility of non-ionic solids in liquids, distribution of solutes between immiscible solvents.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
4,5	6		Complexation, classification of complexes, methods of analysis , thermodynamic treatment of stability constants.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
6-8	9		Kinetics, rate and orders of reactions, influence of temperature and other factors on reactions rate, decomposition of medicinal agents and accelerated stability analysis	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
			Mid term exam		

9,10	6		Interfacial phenomena, liquid interfaces, surface free energy, measurement of interfacial tension, spreading coefficient, surface active agents and wetting phenomena.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
11	3		Colloids, dispersed system and its pharmaceutical application, types of colloidal systems, kinetic properties, diffusion,zeta potential, solubilization	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
12	3		Micrometrics, particle size, methods of determining particle size, particle shape and surface area, porosity, density.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
13,14	6		Rheology, Newtonian systems, thixotropy measurement, negative thixotropy,determination of thixotropy.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
15	3		Polymer science, definitions pharmaceutical applications, molecular weight averages.	Power Point, Problem Solving, Practicalities	Formative, summative, quize, exam
			Final Exam		

11. Infrastructure	
1. Books Required reading:	***Physical Pharmacy by Alfred Martin et al.***

2. Main references (sources)	***Physical Pharmacy by Alfred Martin et al.***
A- Recommended books and references (scientific journals, reports…).	***Theory and Practice of Physical Pharmacy*** *by* ***Gaurav Jain*****,** ***Roop Krishen Khar*****,** ***Farhan J. Ahmad***
B-Electronic references, Internet sites…	https://www.kobo.com/us/en/ebook/theory-and-practice-of-physical-pharmacy-e-book
12. The development of the curriculum plan	
Addition of another references Personal development - increasing knowledge of	
student ,scientific discussions - cultural events	