

Course Syllabus



Ministry of Higher Education and Scientific Research

Paytext Technical Institute

Course Title:

Pharmaceutical Instrument

Academic Year: 2020/2021

Department: Pharmacy

Division:

Stage: 1st

Course system: Annual / 1st and 2nd Semester.

Number of weekly theoretical hours: 1 hours

Number of weekly practical hours: 2 hours

Total number of weekly hours: 3 hours

Instructor information:	
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Course description:	
<p>The student at the end of studying year could understand: General Rehabilitation works in the instrument and machine use from pharmaceutical manufacturing and contributes to the process of developing the pharmaceutical industry. Special: Equipment and machinery used in the pharmaceutical industry.</p>	
Course objectives:	
<p>The aims of this course are: Covers basic information about principles for drugs production and testing, pharmaceutical tools used manually and those instruments used in production line and quality control before/ during/ & after production.</p> <ul style="list-style-type: none"> • The students are required to continuously follow the lectures and to submit their home works and assignments and to prepare for quizzes at any time that will be done. This is a part of evaluation and 	

assessment.
Course textbook:
<p>1-Leon Lachman , the theory and practice of Industrial pharmacy 1976.</p> <p>2- Remington the science and practice of pharmacy by. Alfonso R. Gennaro 20th edition</p> <p>3-pharmaceutical technology Volume 1 theory and practical Sushama Talegaonkar ISBN 81-89747-18-5</p>
Other course reading list and references:
<ul style="list-style-type: none"> • Introduction to the pharmaceutical science by; Nita K. Pandit • Spectrometric identification of organic compounds"R. Silverstein and G.Bassler ,4th ed.john wiley and Sons, NEW YORK.
Learning materials and resources:
<p>Theory: lecture halls with computers equipment for lecture presentations, white board, overhead projector, posters, also machine and instrument are mention in the lecturer needed.</p> <p>General: library, computer suite with internet access</p>
Teaching and learning strategies:
<p>Theory: power point lecture, group discussion, seminar. Writing at boards, drawing figures to make students understand every information in details, power point slide show using data show, visits to drug manufacture like Awamedica in erbil And pioneer in Sulaymania.</p>

1. Course calendar (Theoretical Part):

Week	Unit	Outline	No. of Hours
1 st		Introduction to the manufacturing operations, General view about instrument used in manufacturing and analysis of pharmaceutical compound	1
2 nd		Friability instrument, purpose of using instrument, Operation process, affordable errors and maintenance	1

3 rd		Sieving instrument Particles Size. The meaning of the particle size, the definition of the particle size. Particle size separation distribution and analysis	1
4 th		Reduce the sizes, miller the subject of size reduction Energy required for size reduction, mechanical size reduction Methods of size reduction. Cutting, pressing, pressure, ways to reduce the size.	1
5 th		Hardness tester, purpose of using instrument, Operation process, affordable errors and maintenance	1
6 th		Disintegration apparatus, purpose of using instrument, Operation process, affordable errors and maintenance	1
7 th		Dissolution apparatus, purpose of using instrument, Operation process, affordable errors and maintenance	1
8 th		Melting point instrument, purpose of using instrument, Operation process, advantage, disadvantage and maintenance	1
9 th		Thin layer chromatography, purpose of using instrument, Operation process, advantage, disadvantage and maintenance	1
10 th		HPLC, to identify the device, its mode of operation.	1
11 th		Rotary evaporator, factors affecting the evaporation, Improve the efficiency of evaporation.	1
12 th		Filtration, properties and influencing factors.	1
13 th		Extraction, instrument used in Extraction the theory of extraction, extraction methods, circular extraction, multi-stage extraction, continuous extraction.	1
14 th		Tablet compression machine, tablet compressed pressure of tablet, tablet single-machine multi-punch and the rotating.	1
15 th		Ph meter	1
16 th		Polarimeter	1
17 th		Coating pan machine for tablet , calibration of compressed	1

Coating o

	tablet		1		Capsule: machines
18th	Capsule filling machine and manual : material for the production of capsules, capsule machines mobilization processes and packaging.		1		Emulsion Emulsion
19th	Liquid filling machine and filling of Emulsion		1		Semi-solid ointment Pastes, C
20th	Spectrophotometer purpose of using instrument, Operation process, advantage, disadvantage and maintenance		1		Pharmac
21st	Chromatography – identification – utilization		1		Supposito basis of t
22nd	Column chromatography		1		Fluids, fa Injection control.
23rd	Suppositories mold, prescription dose, therapeutic uses, the basis of types of suppositories, cocoa butter.		1		Packagin packagin
24th	Packaging machine, type of packaging, limits of pharmaceuticals packaging.		1		Cosmetic
25th	Cosmetics instrument used in pharmacy		1		Techniqu of antibio
26th	Gas chromatography		1		Antibiotic Antibiotic
27th	IR(infrared)		1		Methods
28th	NMR (nuclear magnetic resonance)analysis		1		Quality c
29th	X – ray		1		Final Exam
30th	3D printer used in pharmacy manufacturing				

1 st	Introduction risks and safety from laboratory	2
2 nd	Devices used in the pharmaceutical industry	2
3 rd & 4 th	Reduce the sizes miller	2
5 th	Isolation of sizes sieving machine	2
6 th	Extraction by machine	2
7 th	Evaporation by rotary evaporator	2
8 th	Tablet hardness tester	2
9 th	Tablet friability	2
10 th	Tablet disintegration	2
11 th	Dissolution	2

Practical part

12 th	Ph meter	2
13 th	Capsule filling	2
14 th	Fluid filling	2
15 th	Eye Solution filling	2
16 th	Suspension preparation and filling	2
17 th	Polarimetry	2
		2
18 th &19 th	Spectrophotometer	2
20 th	suppositories dose characteristics, main types therapeutic use	2
21 th &22 th	HPLC	2
23 th	3D Printing pharmaceutical product	2
24 st	NMR	2
25 nd	Visiting Awa PIONER Industrial Factory	2
26 rd	Visiting College of pharmacy	2
27 th	Visiting Awa medica Industrial Factory	2
28 th	IR	2
29 th	GAS Chromatography	2
30 th	X ray.	2

Allocation of marks

Student performance	First exam	Second Exam	Final exam	Total annual marks
Written theoretical test	10%	10%	20%	40%
Written practical test	15%	15%	30%	60%
Total marks	25%	25%	50%	100%

Examples of exams:

Theoretical:

Q1/ Put later (T) for true and (F) for false sentences . (25 mark)

1- Equipments are used in the mixing process :

- A.Turbulent flow.
- B.Air jets
- C.Fluid jets
- D.Baffles
- E.Impeller

2- Power may be supplied to the fluid mass in by means of an:

- A. Impeller.
- B. Air stream.
- C. liquid jet.
- D. Baffles.
- E.Air Jets

Q2/ Enumerate the below mention requirement: 25 mark

A-Mixing Mechanism in liquid materials?

C-Factor affecting the extraction process?

- a. Nature of the drug
- b. Therapeutic effect
- c. Thermal stability
- d. Solvent characteristics (volatile / non volatile)
- e. Type of products (conc. /Non conc.)

Q3/ Answer by short note?
mark)

(25

1- Extraction by Infusion.

Q4/Mach each one from A class with suitable one in B class?
25 mark

Class A

1-Used to mill dry materials and slurried

& wet cakes ointments.

2- used for wet or dry material, and sterilized
production of ophthalmic and parentral product.

3-used for material have low milting point
or thermo labile.

4- used to process suspensions and emulsions.

5- Used for tough fibrous materials.

Class B

1- Ball mill

2-Cutter mill

3- Colloid mill

4- Fluid Energy mill

5- Hammer mill