Department of Pharmacy

Paitaxt Technical Institute

Subject: Quality control

Course Book – 2nd year student

Academic Year: 2018/2019

Course Book

1. Course name	Quality control
2. Lecturer in charge	Sarbast Muhammed / Hayman Sardar
3. Department/ College	Pharmacy/ Paitaxt Institute
4. Contact	
5. Time (in hours) per week	2 hours theoretical - 3 hours practical
6. Office hours	3 hours
7. Course code	
8. Teacher's academic profile	
9. Keywords	Quality control, Identification, separation

10. Course overview:

This course is intended to provide fundamentals of quality control procedures.The first part of the course covers an introduction into quality control and a short introduction into methods of quality control procedures, including qualitative tests. The second part provides, mainly, quantitative measures. By the end of the course; the important procedures that are followed to assure the quality of pharmaceuticals will be covered.

11. Course objective:

The goal of this course is to introduce principles of quality controlwith emphasis on the fundamental methods used for quality control to the students. The focus is on four important aspects: choosing sample, select the experiments, analyse data, and making decision depending on the resulted data. The objectives of the course are

1. Learn the principles of quality control.
2. Learn how to apply the qualitative (physical) tests to answer scientific questions.
3. Understand the principles of data analysis and use of the classical instruments available in the laboratory; from basic glassware to modern instruments when available.

12. Student's obligation

Students are obligated to be prepared for each lecture by reading the relevant reading assignment before class(see the lecture schedule). Students should study the materials and work problems after each lecture as they are meant to reinforce your understanding of the lecture material. Work extra problems for each topic in addition to the assignments. The more problems you practice, the better you will understand the material.

13. Forms of teaching

PowerPoint presentation, lecture notes, and white board.

14. Assessment scheme

Two exams during the course period: 20%

Quiz tests and homework: 5%

Practical Course 15%

Final Exam: 60% (45% for theoretical and 15% for practical)

15. Student learning outcome:

On successful completion of the course, students will be able:

1. To develop expertise relevant to the professional practice of chemistry.
2. To develop an understanding of the range and uses of procedures followed in chemistry.
3. To establish an appreciation of the role of chemistry in quality control measures.
4. To provide an understanding of chemical methods employed for elemental and compound analysis.
5. To provide experience in some scientific methods employed in organic chemistry.
6. To develop skills in the scientific method of planning, developing, conducting, reviewing and reporting test results.

16. Course Reading List and References:

1. Pharmaceutical Analysis A Textbook for Pharmacy Students and PharmaceuticalChemists by David G. Watson.
2. Introduction to Spectroscopy, fifth Edition Donald L. Pavia, Gary M. Lampman, George S. Kriz, and James R. Vyvyan.
3. Spectrophotometric identification of organic compounds, by Robert M. Silverstein, G. Clayton Bassler and Terence C. Morrill.
4. Fundamentals of Analytical Chemistry; Eighth Edition, by Douglas A. Skoog, Donald M. West, F. James Holler and Stanley R. Crouch.

17. The Topics:		Lecturer's name
An introduction to quality control.	Week1	
General evaluation for tablets.	Week2	
General evaluation of liquid dosage form.	Week3	
Ultra violet spectroscopy. General remarks concerning spectroscopy. Regions of electromagnetic spectrum – electronic transition.	Week4	
Ultra violet spectroscopy. Influence of solvent polarity on various electronic transition. Spectra in the identification of organic compounds.	Week5	
Ultra violet spectroscopy. Spectra in the identification of organic compounds.	Week6	
IR spectroscopy. Physical principles. Background. Theory of IR absorption spectroscopy.	Week7	
IR spectroscopy. Vibrational spectroscopy. Fundamental &non-fundamentalabsorption frequency. Instrumentation of IR.	Week8	
IR spectroscopy. Characteristic group vibrations. Factors determining the position & intensity of absorption bands. Problem solving.	Week9	

THE FIRST EXAME	Week10	
NMR (Nuclear Magnetic Resonance) Introduction. NMR phenomena.	Week11	
NMR (Nuclear Magnetic Resonance) Nuclear spin & the spectrometer.	Week12	
NMR (Nuclear Magnetic Resonance) Origin of the NMR spin. What does NMR spectrum tell you?	Week13	
NMR (Nuclear Magnetic Resonance) Shielding &Deshielding.	Week14	
NMR (Nuclear Magnetic Resonance) Quantitative analysis by H – NMR. Problem solving.	Week15	
NMR (Nuclear Magnetic Resonance) C 13 NMR. Problem solving.	Week16	
Mass spectroscopy Application of molecular mass spectroscopy. Instrumentation. Principles of measurement. Vaporization & ionization process.	Week17	
Mass spectroscopy Fragmentation processes. Isotopes. Rearrangement. McLaffertey rearrangement.	Week18	
Mass spectroscopy Mass analysis. Mass spectral data. Quantitative application of mass spectrometry. examples	Week19	
THE SECOND EXAME	Week20	

18. Practical Topics	Week
An introduction to quality control	1
Determination of sugar content in commercial beverages by density	2
Assay of Ibuprofen in ibuprofen tablets by Acid- basetitration	3
Assay of paracetamol in paractamol tablets by Iodemetric -titration	4
Assay of Furocemid (Lasix) in Furocemid tablets by Oxidation- reduction titration.	5
Importance and measurement of PH of Solutions	6
Qualitative determination of Aspirin using UV Spectrophotometric technique	7
Spectrophotometric determination of Iron in vitamin tablets	8
Spectrophotometric determination of acetyl salicylic acid in aspirin tablets	9
THE FIRST EXAME	10
Determination of L-ascorbic acid in pharmaceutical preparations using UV spectrophotometry	11
Two-Component analysis "Vierord method-simultaneous equation method" for a mixture of $KMNO_4$ and $K_2Cr_2O_7$	12

High performance liquid chromatography – principle	13
Quantitative estimation of amlodipine by HPLC	14
Quantitative estimation of dopsone by HPLC	15
Quantitative estimation of sulfamethoxazole by HPLC	16
FT-IR principle	17
FT-IR sample preparation	18
NMR-Priciple	19
THE SECOND EXAME	20
19. Examinations: Will be covered in the lectures	20
20. Extra notes:	
21. Peer review Curriculum and course scheduling were peer reviewed.	18
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