BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
INSTRUCTION DIVISION
FIRST SEMESTER 2018-19
Course Handout Part II

Date: 02/08/2018

In addition to part -I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. Course Title : **PHA F211**
: **Pharmaceutical Analysis**
Instructor-in-Charge : **Dr. Sandeep Sundriyal**
Instructors : **Mr. Sridhar SNC, Mr. Ginson George, Mr. Samrat Mazumdar and Mr. Sharatlal**

1. Course Description:
Basic techniques of pharmaceutical analysis, data handling and analysis, sources of error in analysis.
The analytical methods would comprise of various titrimetric methods, such as acid-base, complexometric, non-aqueous, oxidation-reduction, precipitation, conductometric; physical and instrumental analysis such as gravimetric, polarography, nephelometry, amperometry, turbidometry, potentiometry; chromatographic separations such as TLC, column, ion-exchange, extraction methods such as gel-filtration, fractionation processes, analysis of metallic and non-metallic elements;
water content, as well as evaluation of drug constituents in various pharmaceutical preparation.

2. Scope and Objective:
The objective of this course is to provide students with knowledge of basic principles of quantitative analytical chemistry necessary for use and interpretation of pharmaceutical methods of analysis especially those methods official in the Indian, United States and British Pharmacopoeias.

3. Prescribed Text Book:
1. A.H. Beckett and J.B. Stenlake. "Practical Pharmaceutical Chemistry" 4th ed., Part 1 & 2

4. Reference Books:
1. Remington's Pharmaceutical Sciences 18th ed.
2. A Textbook of Pharmaceutical Analysis – Kenneth A Connors.
3. A textbook of quantitative inorganic analysis-Arthur. I. Vogel.

5. Course Plan:

Lec. No	Learning Objectives	Topics to be covered	Reference	Learning Outcome
1-3	Introduction to pharmaceutical analysis	Pharmacopoeia, Sources of impurities in medicinal agents. Assays, Limit tests, Titration methods	TB:1 (Part 1)	Information about various sources of impurities in pharmaceuticals and testing their prescribed limit, etc
4-6	Study of acid-base titrimetric methods	Standard volumetric solutions, direct titration of acids, bases, back titration.	TB:5 (1)	Standardization, Estimation of drugs using acidimetry / alkalimetry titrations.
7-8	Study of titrations in non-aqueous solvents	Theory, titration of amine and amine salts, titration of halogen acid salts of bases and acidic substances	TB:6 (1)	Standardization, Estimation of drugs using non-aqueous titrations.
9-10	Study of oxidation-reduction titrations	Determination involving the use of potassium permanganate, iodine, iodine-sodium thiosulphate, iodine value of fixed oil	TB: 7(1)	Standardization, Estimation of drugs using redox titrations.
11-12	Study of precipitation titrations	Argentometric titration, ammonium thiocyanate titration of silver salts	TB:8 (1)	Standardization, Estimation of drugs using precipitation

		and mercury compounds		method.
13-15	Study of complexometric methods	Theory of complexometric analysis, pH indicators, direct titration with disodium edetate, back titration and displacement titration	TB: 8 (1)	Standardization, Estimation of drugs using complexometric titrations.
16	Study of gravimetric analysis	Determination of medicinal compounds by gravimetric method	TB: 8 (1)	Estimation of drugs using gravimetry method.
17-20	Study of electrochemical methods	Introduction, conductometric titration, potentiometry and amperometric titration	TB:5 (Part 2)	Application of various electrochemical methods involved in drug analysis.
21	Study on nephelometry and turbidimetry	Introduction, instrumentation and application of nephelometric and turbidometry	RB: 3:12	Application of various instrumental methods involved in drug analysis.
22-26	Study on chromatography methods	Theory, mobile phases, stationary phases, thin layer chromatography, paper chromatography and column chromatography	TB:4 (2)	Information about various separation / purification techniques involved in drug analysis.
27-28	Study on advances in Pharmaceutical analysis	Analysis of metallic and non-metallic elements, determination of water content etc.	TB:10 (1)	Information about determination of various elements and moisture present in drugs.

Practicals:

1. In practical classes, in addition to limit tests, experiments related to quantitative and qualitative analysis of pharmaceuticals by titrimetry and chromatography will be performed.
2. Students should maintain and bring updated record notebooks for every practical class.
3. Make-ups for practical are not ordinarily possible. However, depending on the genuineness of the situations, students may be permitted to perform backlog experiments, if any Instructor is free, outside regular class hours.
4. It is imperative that all students come prepared for the experiment in terms of principles and protocols involved.

6. Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Remarks
Mid Term	90 Min	35	13/10 9:00 - 10:30 AM	CB
Continuous assessment*		30		CB
Comprehensive Exam	180 Min	35	5/12 FN	CB / OB

* Continuous assessment topics and number will be announced in class. It will be in terms of Laboratory Day to Day work, Viva-Voce, Tutorials, Home assignment, Quizzes and Lab Compre etc.

Closed Book Exam: No reference material of any kind will be permitted inside the exam hall.

Open Book Exam: Use of any printed / written reference material (books and notebooks) will be permitted inside the exam hall. Loose sheets of paper / Photo copied material will not be permitted. Computers of any kind will not be allowed inside the exam hall. Use of calculators will be allowed in all exams. Exchange of any material will not be allowed.

7. Further Information:

Attendance: Although attendance is not compulsory, regularity in theory and practical classes will be decisive factor during final grading, especially in borderline cases as well as make-up's.

Grading Procedure: It is not mandatory to award all the eight grades (A to E); subjective judgment will be exercised while awarding grades. In borderline cases subjective judgment will be exercised to decide the final

grade. The student shall not be considered exposed to the course, unless he/she demonstrates appreciable skill in both laboratory and theory component of the course.

Make-up: Generally make-up's are not given as a routine. It is solely dependent on the "genuineness" of the circumstance under which a student fails to appear in a scheduled evaluation component. However, the make-up application should be personally given to Instructor-in-Charge and not slipped into the chamber of the Instructor-in-Charge. It is expected that students shall avoid misuse of this feature. However, the decision of the Instructor-in-Charge in the above matter will be final. Prior permission for Make-up should be taken.

Chamber Consultation Hour: To be announced in the class.

Notices: Notices pertaining to this course will be displayed only on Department of Pharmacy notice board.

Instructor-in-Charge
PHA F211