



SYLLABUS

Course title	INDUSTRIAL PHARMACY
Course Code	PH701
Course Credit	Lecture : 3
	Practical : 0
	Tutorial : 0
	Total : 3

Course Objectives

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

- Decide various instruments required in industrial manufacturing of solid, liquid and parenteral preparation.
- Understand technology transfer parameters and pilot plant scale up techniques.
- Know various strategies for prevention of industrial hazards.
- Know and understand need of QbD and PAT in pharmaceutical industry.

Detailed Syllabus

Sr. No.	Name of Chapter & Details	Hours Allotted
	Section-I	
1	Human Resource Development: Personal training, job specification, job enlargement and enrichment, blue and white - collar jobs. Labor welfare	05

2	Preparation of qualitative and quantitative departmental layout with equipments required for different dosage forms like solid, liquid and semisolid dosage forms.	06
3	Technology transfer: Introduction, importance and process steps for technology transfer, Reason for technology transfer, factors influencing technology transfer, Barriers of technology transfer, Issues in technology transfer. Pilot plant & scale up technique.	09
4	Automation in Pharmaceutical Industry: Importance, Objective, automation of tablet compression machine.	03
	Section-II	
5	Importance and Preparation of standard operative procedure (SOPs) for equipments like rapid mixer granulator, tablet compression machine, autoclave, dissolution apparatus and manufacturing or processing steps like granulation, compression and tablet coating.	06
6	Industrial Hazards and Pollution Management: Industrial safety management. Water pollution, water Pollution abatement and effluent treatment, Air pollution, air pollution control Devices, solid waste, Solid waste waste management, Noise Pollution, Noise Abatement, Effluent Analysis and Treatment Methods, Effluent Treatment in Formulation Plants, Effluent Treatment in Synthetic Drugs Industry, Effluent Treatment in Fermentation Industry. Industrial effluent treatment: Physicochemical measurements of effluents, BOD, COD, Determination of some contaminants. Effluent treatment procedure, treatment of some	10

	<p>characteristic effluent.</p> <p>Environmental considerations of packaging and recycling of packaging materials along with national and international regulations.</p>	
7	<p>QbD and PAT: Elements of QbD, QbD tools, significance of QbD, Design of experiments –Methods and applications of optimization techniques to assure quality in product, critical quality attributes, critical process, Process analytical technology (PAT) in Pharmaceutical manufacturing. Goal of PAT, Benefits of PAT, PAT tools, Process Analyser, Application of PAT in chemical and pharmaceutical industry,</p>	06
<p>Instructional Method and Pedagogy:</p>		
<ul style="list-style-type: none"> ▪ Lectures will be conducted with the aid of multi-media projector, black board, OHP etc. ▪ Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. ▪ Surprise tests/Quizzes/Seminar/Tutorials will be conducted. 		
<p>Students Learning Outcomes:</p>		
<p>At the end of the course the students will be able to:</p> <ul style="list-style-type: none"> ▪ Understand various strategies for prevention of industrial hazards. ▪ Prepare standard operative procedure for equipments and manufacturing process. ▪ Understand various critical steps involved in technology transfer. 		
<p>Text Books:</p>		
<ol style="list-style-type: none"> 1. Lachman “The theory and Practice of Industrial Pharmacy 2. Remingtons “Pharmaceutical Sciences” 3. Bentley’s Pharmaceutics. 4. Pilot plants model and scale-up methods, by Johnstone and Thring. 5. Pharmaceutical Process Validation by Loftus and Nash. 		

Reference Books:

1. J. F. Despautz: Automation and validation of information in pharmaceutical processing; Marcel Dekker.
2. G. C. Cole: Pharmaceutical production facilities, Design and applications; Taylor and Francis

Additional Resources

- Soft copies of books title bearing Industrial Pharmacy operations are available on <http://www.pharmatext.org>
- Latest information regarding to Industrial Pharmacy updates are available on <http://www.pharmainfo.net>