



# SS INSTITUTE OF PHARMACY

*(A unit of VS Educational & Charitable Trust)*

Approved by Tamilnadu Government & Pharmacy Council of India, New Delhi.  
Affiliated to the Tamilnadu Dr. M.G.R. Medical University,  
and The Directorate of Medical Education, Chennai.

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## VISION

- To establish a premier, globally recognized institute excelling in pharmacy education, to nurture highly competent pharmacy professional to the society

## MISSION

- Our mission is to empower students from rural regions, transforming them into skilled and responsible citizens who will play a key role in advancing our nation.
- To collaborate with leading pharmacy organization to develop their skills and to train students in pharmaceutical science to meet both national and global demands.
- To lead in pharmaceutical education by combining critical thinking, problem-solving, and professional skills.
- To develop and support emerging pharmacy professionals who can excel and lead in the pharmaceutical industry.



  
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## BP 304 T: PHARMACEUTICAL ENGINEERING (Theory)

**Total Hours: 45**

### Scope:

This course is designed to impart fundamental knowledge of the art and science of various unit operations used in the pharmaceutical industry.

### Objectives:

Upon completion of the course, students shall be able to:

1. Understand various unit operations used in pharmaceutical industries.
2. Comprehend material handling techniques.
3. Perform processes involved in pharmaceutical manufacturing.
4. Conduct tests to prevent environmental pollution.
5. Appreciate and understand the significance of plant layout design for optimum resource use.
6. Recognize various preventive methods for corrosion control in pharmaceutical industries.

### UNIT-I

**10 Hours**

**Flow of fluids:** Types of manometers, Reynolds number and its significance, Bernoulli's theorem and its applications, Energy losses, Orifice meter, Venturimeter, Pitot tube and Rotometer.

**Size Reduction:** Objectives, Mechanisms & Laws governing size reduction, factors affecting size reduction, principles, construction, working, uses, merits and demerits of Hammer mill, ball mill, fluid energy mill, Edge runner mill & end runner mill.

**Size Separation:** Objectives, applications & mechanism of size separation.



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official standards of powders, sieves, size separation Principles, construction, working, uses, merits and demerits of Sieve shaker, cyclone separator, Air separator, Bag filter & elutriation tank.

## UNIT-II

10 Hours

**Heat Transfer:** Objectives, applications & Heat transfer mechanisms. Fourier's law, Heat transfer by conduction, convection & radiation. Heat interchangers & heat exchangers.

**Evaporation:** Objectives, applications and factors influencing evaporation. differences between evaporation and other heat process. principles, construction, working, uses, merits and demerits of Steam jacketed kettle, horizontal tube evaporator, climbing film evaporator, forced circulation evaporator, multiple effect evaporator & Economy of multiple effect evaporator.

**Distillation:** Basic Principles and methodology of simple distillation, flash distillation, fractional distillation, distillation under reduced pressure, steam distillation & molecular distillation

## UNIT-III

08 Hours

**Drying:** Objectives, applications & mechanism of drying process, measurements & applications of Equilibrium Moisture content, rate of drying curve. principles, construction, working, uses, merits and demerits of Tray dryer, drum dryer spray dryer, fluidized bed dryer, vacuum dryer, freeze dryer.

**Mixing:** Objectives, applications & factors affecting mixing, Difference between solid and liquid mixing, mechanism of solid mixing, liquids mixing and semisolids mixing. Principles, Construction, Working, uses, Merits and Demerits of Double cone blender, twin shell blender, ribbon blender, Sigma



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blade mixer, planetary mixers, Propellers, Turbines, Paddles & Silverson Emulsifier

## UNIT-IV

**08 Hours**

**Filtration:** Objectives, applications, Theories & Factors influencing filtration, filter aids, filter medias. Principle, Construction, Working, Uses, Merits and demerits of plate & frame filter, filter leaf, rotary drum filter, Meta filter & Cartridge filter, membrane filters and Seidtz filter.


**Centrifugation:** Objectives, principle & applications of Centrifugation, principles, construction, working, uses, merits and demerits of Perforated basket centrifuge, Non-perforated basket centrifuge, semi continuous centrifuge & super centrifuge.

## UNIT-V

**07 Hours**

Materials of pharmaceutical plant construction, Corrosion and its prevention: Factors affecting during materials selected for Pharmaceutical plant construction, Theories of corrosion, types of corrosion and there prevention. Ferrous and nonferrous metals, inorganic and organic non metals, basic of material handling systems



  
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## LESSON PLAN- THEORY

### B.PHARM 3<sup>RD</sup> SEMESTER

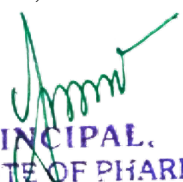
Subject: Pharmaceutical Engineering

Sl. No	Topic	Reference Book	Teaching Aids
1	Flow of Fluids	Reference 1	PPT
2	Size Reduction	Reference 3	Book
3	Size Separation	Reference 5	PPT
4	Heat Transfer	Reference 2	Book
5	Evaporation	Reference 6	PPT
6	Distillation	Reference 4	Book
7	Drying	Reference 7	PPT
8	Mixing	Reference 1	Book
9	Filtration	Reference 8	PPT
10	Centrifugation	Reference 2	Book
11	Materials of Pharmaceutical Plant Construction	Reference 5	PPT
12	Corrosion and Its Prevention	Reference 6	Book

#### Recommended Books: (Latest Editions)

1. Introduction to chemical engineering edition. Walter L Badger & Julius Banchero, Latest
2. Solid phase extraction, Principles, techniques and applications by Nigel J.K. Simpson- Latest edition.
3. Unit operation of chemical engineering - McCabe Smith, Latest edition.
4. Pharmaceutical engineering principles and practices - C.V.S Subrahmanyam et al., Latest edition.
5. Remington practice of pharmacy- Martin, Latest edition.
6. Theory and practice of industrial pharmacy by Lachmann., Latest edition.
7. Physical pharmaceutics- C.V.S Subrahmanyam et al., Latest edition.
8. Cooper and Gunn's Tutorial pharmacy, S.J. Carter, Latest edition.



  
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## LESSON PLAN- PRACTICAL B.PHARM 3<sup>RD</sup> SEMESTER Subject: Pharmaceutical Engineering

Sl. No	Topic
1	Radiation Constants of Brass, Iron, Glass
2	Efficiency of Steam Distillation
3	Overall Heat Transfer Coefficient
4	Drying Curves: Calcium Carbonate & Starch
5	Moisture Content & Loss on Drying
6	Humidity of Air: Dew Point Method
7	Pharmaceutical Machinery Overview
8	Size Analysis by Sieving
9	Size Reduction: Ball Mill Laws
10	Demonstration of Major Equipment
11	Factors Affecting Filtration & Evaporation
12	Effect of Time on Crystallization
13	Uniformity Index: Double Cone Blender



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## Academic work

A regular record of attendance both in Theory and Practical shall be maintained by the teaching staff of respective courses.

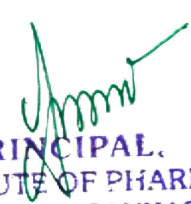
## Course of study

The course of study for B. Pharm shall include Semester Wise Theory & Practical as given in Table. The number of hours to be devoted to each theory, tutorial and practical course in any semester shall not be less than that shown in Table.

**Table-III: Course of study for semester III**

Course code	Name of the course	No. of hours	Tutorial	Credit points
BP301T	Pharmaceutical Organic Chemistry II – Theory	3	1	4
BP302T	Physical Pharmaceutics I – Theory	3	1	4
BP303T	Pharmaceutical Microbiology – Theory	3	1	4
BP304T	Pharmaceutical Engineering – Theory	3	1	4
BP305P	Pharmaceutical Organic Chemistry II – Practical	4	-	2
BP306P	Physical Pharmaceutics I – Practical	4	-	2
BP307P	Pharmaceutical Microbiology – Practical	4	-	2
BP 308P	Pharmaceutical Engineering –Practical	4	-	2
<b>Total</b>		<b>28</b>	<b>4</b>	<b>24</b>



  
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