



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3163613

Semester-VI

Subject Name: Formulation Technology of Liquids, Topicals & Solid Dosage Forms

Type of Course: Chemical Technology

Prerequisite: Studied department electives of previous semesters. Basic knowledge of Pharmaceutics & Chemistry is required.

Rationale: The main objective of this subject is to study the Formulation technology of Liquids, Topicals & Solid dosage forms.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE (E)	PA (M)	ESE Viva(V)	PA (I)		
3	0	2	4	70	30	30	20	150

L-Lectures; T-Tutorial/Teacher Guided Student Activity; P-Practical; C-Credit; ESE-End Semester Examination; PA-Progressive Assessment

Content:

Sr. No.	Content	Total Hrs.
1	Technology of Liquid formulation: Preparation and evaluation of oral syrups, elixirs, tinctures, ear drops, nasal drops. Preparation and evaluation of suspensions/ dry syrup/emulsions of containing hydrophilic and hydrophobic drug.	10
2	Technology of Topical Formulation: Preparation and evaluation of topical liniments and lotion, Preparation and evaluation of ointments representing each type of base, and gel, Preparation of suppositories (any 2 base)	10
3	Layout design and Unit operations related to above dosage forms	4
4	Technology of Solid Dosage Forms- Tablets Pre-formulation, formulation, evaluation, large scale manufacture and packing with focus on equipment with reference to tablets, Coated tablets	10
5	Technology of Solid Dosage Forms-Capsules Pre-formulation, formulation, evaluation, large scale manufacture and packing with focus on equipment with reference to Hard gelatin capsule, Soft gelatin capsule & Microcapsule.	10
6	Layout design and Unit operations related to above dosage forms	4

Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	10	10	5	5



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Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Reference Books:

1. Pharmaceutical Dosage Forms & Drug Delivery Systems, Ansel, Philadelphia, Fea&Febiger, 1985
2. Introduction to Pharmaceutical Dosage Forms, Ansel, Henry Kimpton Publishers, 1976.
3. Pharmaceutics: The Science of Dosage Form Design, Aulton, New Delhi, B.I. Naverly Pvt.Ltd. 1995.
4. Dermatological Formulations, B.W. Barry, New York, Marcel Dekker 1983.
5. Modern Pharmaceutics, G.S. Banker, New York, Marcel Dekker 1990.
6. Textbook of Pharmaceutics, Rawlins, Bentely Cassell Ltd, 8th Ed., 1977.
7. Fundamentals of Pharmacy, Blome H.E., Philadelphia, Fea&Febiger, 1985.
8. Pharmaceutical Production Facilities: Design & Applications, G.C. Cole, New York Ellis Horwood 1990.
9. Husa's Pharmaceutical Dispensing, Martin E.W., Easton Mack Pub. Co. 1971.
10. Transdermal Delivery of Drugs, A. Kydonieus, Florida, CRC Press, 1987.
11. Textbook of Pharmaceutics, A C Bentley, Oxford University Press, 1969.
12. The Theory and Practice of Industrial Pharmacy, Lachman Bombay, K. M. Warghese Co. 1976.
13. Remington's Pharmaceutical Sciences, A.R. Gennaro Mac Pub. Co. Easton, Pennsylvania 1990.
14. Coated Pharmaceutical Dosage Forms, K.H. Bauer, CRC Press, Boca Raton. Med Pharm. 1998.
15. Indian pharmacopoeia, British Pharmacopoeia, United States Pharmacopoeia.
16. Pharmaceutical Coating Technology, G.C. Cole, New York, Ellis, Horwood, 1990.
17. Pharmaceutical Dosage Forms Vol. I & II, Liebermann, New York, Marcel Dekker, 1996.
18. Hard Capsules : Development & Technology, K. Ridgway, London Pharmaceutical Press, 1987.

Course Outcomes:

Sr. No.	CO statement	Marks% weightage
1	To describe the liquid, topical and solid Pharmaceutical dosages forms and study their preparation.	33
2	To illustrate large scale manufacture and packing with focus on equipment with reference to liquid, topical and solid dosage forms.	24
3	To demonstrate the layouts and unit operations involved in liquid, topical and solid dosage forms	13
4	To analyse the formulation methods of liquid, topical and solid dosage forms.	13
5	To explain the pre-formulation methods of liquid, topical and solid dosage forms.	10
6	To evaluate the liquid, topical and solid dosage forms.	7



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List of experiments:

1. To prepare Chloroform water B.P
2. To prepare concentrated Peppermint water
3. To prepare Simple syrup I.P
4. To prepare non staining Iodine ointment
5. To prepare antacid suspension
6. To study the pre formulation characteristics of active pharmaceutical ingredients
7. To prepare and evaluate Paracetamol granules and tablet
8. To prepare effervescent granules.
9. To study the disintegration and dissolution studies of solid dosage forms
10. To prepare and evaluate Amoxicillin trihydrate capsule

Major Equipment:

1. Disintegration apparatus
2. Dissolution apparatus
3. UV Spectrophotometer

List of Open Source Software/learning website:

- 1) Literature available in any laboratory manual of Pharmaceutical Industries.
- 2) Literature available on internet
- 3) Medical dictionaries
- 4) Delnet
- 5) Pharmacopoeia