

**Swami Ramanand Teerth Marathwada  
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**SYLLABUS**

**B. SC. THIRD YEAR  
CHEMISTRY (DYES AND DRUGS)  
SEMESTER-V & VI**

**IN FORCE FROM JUNE - 2013**

**B. Sc. Third Year (Semester V & VI)**  
**DYES AND DRUGS**

<b>Semester</b>	<b>Paper</b>	<b>Course No.</b>	<b>Course</b>	<b>Periods/ week</b>	<b>Total Periods</b>	<b>Marks</b>
V	XII	CHDD-301	Chemistry of Synthetic Dyes I	3	45	25
	XIII	CHDD-302	Chemistry of Synthetic Drugs	3	45	25
VI	XIV	CHDD-303	Chemistry of Synthetic Dyes II	3	45	25
	XV	CHDD-304	Pharmaceutical dosage forms and Unit operations	3	45	25
	XVI	CHDD-305	Laboratory Course-IV	4	120	50
	XVII	CHDD-306	Laboratory Course-V	4	120	50

**B.Sc. Third Year**  
**DYES AND DRUGS**  
**Semester – V**  
**Paper: XII**  
**Chemistry of Synthetic Dyes- I (CHDD-301)**

**Marks: 60**

**Periods:45**

**UNIT I**

**Action of light on dyes and dyed fibres**  
**periods**

**12**

1. Factors affecting fastness of dyed fibres
  - a. General consideration
  - b. fluorescence, phototropy, mechanism of fading
2. Constitution of dyes and light fastness with respect to Nitro dyes, Azo dyes, basic dyes, sulphur dyes, Indigo dyes, anthraquinones.
3. Light fastness of pigments

**UNIT I**

**Fluorescent brightening agents**

**10 periods**

1. Introduction
2. Fluorescence, mechanism of fluorescence
3. Characteristic properties of fluorescent brightening agents.
4. Fluorescent brighteners for
  - a. cellulosic fibers
  - b. acrylic fibers
5. Toxicity of fluorescent brightener.

**UNIT III**

**Sulfur dyes**

**13 periods**

1. Introduction
2. Classification of sulphur dyes on the basis of colour and application
3. Condition of thionation
4. General properties and application of sulphur dyes.
5. Fastness properties of sulphur dyes
6. Sulphur side chain in sulphur dyes
7. Carbon-carbon linkage in sulphur dyes

**UNIT IV**

**Mordant Dyes**

**10 periods**

1. Introduction
2. Natural mordant dyes
3. Synthetic mordant dyes
4. Methods of application (brief study)

- a. Chrome mordant process
- b. After chrome process
- c. Metachrome process.

**B.Sc. Third Year**  
**DYES AND DRUGS**  
**Semester – V**  
**Paper: XIII**  
**Chemistry of Synthetic Drugs (CHDD-302)**

**Marks: 60**

**Periods:45**

**UNIT I**

**Cardiovascular drugs :**

**12 Periods**

- 1) Introduction, classification.
  - a) Cardiac Glycosides
    - i) Study of Digoxin and Digitoxin, their Mechanism of Action.
  - b) Antihypertensive and Hypotensive Drugs: synthesis and applications of
    - i) Hydralaxine
    - ii) Minogdadil
    - iii) Lidocaine
    - iv) Methyl dopa
    - v) Diazoxide
    - vi) Sodium Nitroprusside
  - c) Antiarrhythmic Agents,
    - i) Dexpropranolol
    - ii) Procainamide
    - iii) Disopyramide
    - iv) Propranolol
  - d) Vasopressor Drugs
    - i) Isoxsupurine
    - ii) Prenylamine

**UNIT II**

**Antineoplastic drugs:**

**08 p**

1. Introduction
2. cancer causing agents
  - a. Environmental Risk Factors
  - b. Hereditary Risk Factors
3. cancer chemotherapy
  - a. Cytotoxic Agents
  - b. Antimetabolites
  - c. Hormones
  - d. Antibiotics
  - e. Alkaloids
  - f. Miscellaneous Drug

**UNIT III**

**Autonomic drugs:**

**08 p**

1. Introduction, classification.

- a) Sympathomimetic Drugs.
  - b) Antiadrenergic Drugs.
  - c) Cholinomimetic Drugs.
  - d) Antimuscarinic Drugs.
  - e) Ganglionic Blocking Agents.
  - f) Adrenergic Neurone Blocking Agents.
2. Synthesis and uses of following-
- a) Ephedrine
  - b) Epinephrine
  - c) Isoprenaline
  - d) Methoxamine
  - e) Metaraminol
  - f) Naphazoline
  - g) Xylometazoline
  - h) Oxymetazoline and henylpropanolamine.

#### **UNIT IV**

##### **I. Anti tubercular drugs**

**06**

###### **Periods**

- a. Introduction
- b. Characteristics of antitubercular drugs
- c. Synthesis and application of the following
  - i) p-amino salicylic acid (PAS)
  - ii) Isoniazide
  - iii) Ethambutol
  - iv) Pyrazinamide

##### **II. Material used for pharmaceutical plant construction**

**07**

###### **Periods**

- 1. Factors affecting the selection of material for pharmaceutical plant construction
- 2. Metallic and non metallic materials used for construction of pharmaceutical plant:
  - a) Metallic materials: Cast Iron, Steel, Copper, Aluminium, Chromium, Nickel, Silver, Lead, and tin.
  - b) Non-metallic materials: i) Inorganic: Glass, stonewares, bricks, concrete, asbestos. ii) organic: Timber, rubber, plastic.

**B.Sc. Third Year  
DYES AND DRUGS  
Semester – VI  
Paper: XIV  
Chemistry of Synthetic Dyes- II (CHDD-303)**

**Marks: 60**

**Periods:45**

**UNIT I**

**Reactive dyes**

**10 periods**

1. Introduction
2. Constitutional aspects of reactive dyes (flexibility through chromogen, reactive group)
3. Study of vinyl sulfone dyes, sulphatoethyl sulfone dyes, acryl amide dyes
4. Reactive mordants
5. Cross linkage agents
6. Dyes requirement

**UNIT II**

**Disperse dyes:**

**12 periods**

1. Introduction
2. Ionamines, disperse acetate dyes and solacet dyes
3. Chemical structure of disperse dyes
4. Dispersion process
5. Function of dispersing agents
6. Disperse dyeing process
7. Fiber swelling in dyeing
8. Use of carriers in dyeing
9. Use of heat energy in dyeing

**UNIT III**

**Identification and Evaluation of dyes:**

**13 periods**

1. Identification and purification of commercial dyes
2. Separation of azo, basic and vat dyes
3. Evaluation of dyes by
  - a) chemical analysis
  - b) colorimetry,.
  - c) Experimental dyeing.

**UNIT IV**

**Application of Chromatography technique in analysis of dyes: 10 periods**

1. Concept of chromatography
2. Types of chromatography
  - a. Adsorption chromatography
  - b. Partition chromatography

- i) Paper chromatography
  - ii) Thin layer chromatography
3. Chromatography of Dyes

**B.Sc. Third Year  
DYES AND DRUGS  
Semester – VI  
Paper: XV**

**Pharmaceutical dosage forms and Unit operations (CHDD-304)**

**Marks: 60**

**Period**

**Hours: 45**

**UNIT I**

**Principles of Drug Formulations:**

**8**

**Periods**

1. Introduction to drug formulation.
2. Principal pharmaceutical ingredients used in drug formulation
3. General consideration in drug product formulation.

**UNIT II**

**Preparation of dosage forms:**

**14 Periods**

1. Solvents for oral preparation,  
Preparation of
  - a. Potassium iodide solution
  - b. Strong Iodine solution
  - c. Magnesium citrate and citric acid oral solution
2. **Syrups:** components of syrups, different methods of preparation of syrups: acacia, cocoa, simple syrup, ferrous sulphate.
3. **Elixirs:** Introduction, preparation of medicated and non-medicated elixiers.
4. **Suspensions:** Preparation of antacid, antihelminthic antibacterial suspension.
5. **Emulsions :** Methods of preparation of emulsion.
6. **Tablets:** Methods of preparation of tablets.

**UNIT III**

**Principles of Unit operation**

**10**

**Periods**

1. Introduction, need for preparation of drugs on large scale
2. Concept of unit operation, basis of study of unit operation.
3. Fluid flow properties, mechanism of fluid flow by Reynold's experiment
  - a. Significance of Reynold's number, distribution of velocities of fluid across a tube, boundary layers.
4. Heat transfer: properties of steam, use of steam on heating medium

## UNIT III

### Modes of Unit operation

13 Periods

- a. **Distillation** : Principles of simple fractional distillation, molecular distillation types of fractionating column.
- b. Size reduction: objectives of size reduction and significance of particle size factors affecting size reduction, mechanism size reduction, methods of size reduction.
- c. **Crystallization**: Introduction, types of crystallizers
- d. **Mixing** : concept, objectives of mixing types of mixing.
- e. **Drying** : Types of dryers, dryers for dilute solution and suspension, construction, working advantages disadvantages of drum and spray dryers.

B.Sc. III year

### DYES AND DRUGS

Paper: XVI

#### LABORATORY COURSE-IV (CHDD-305)

Marks: 50

Periods: 120

(Any sixteen experiments are to be covered)

- i. Preparation of Dyes (any three)
  - a. Phenyazo-  $\beta$ -naphthol
  - b. Magneson II
  - c. Chrysoidine
1. Estimation of Dyes by reduction method using Titanu chloride (any Five)
  - a. Indigo carmine
  - b. Amarnath
  - c. Crystal Voilet
  - d. Eosine
  - e. Methylene Blue
  - f. Malachite Green
2. Estimation of coupling component by Diazonium salt solution (any Four)
  - a. R-Acid
  - b. B-Naphthol
  - c. Resorcinol
  - d. J-acid
3. Chomatography
  - a. Separation of given mixture by Thin layer Chromatography (Two Mixture)
  - b. Separation of given mixture by Paper Chromatography (Two Mixture)
  - c. Separation of given mixture by Column Chromatography (Two Mixture)
4. Separation of Azo, Basic and Vat dyes by chemical method (Two Mixture)



**B.Sc. III year**  
**DYES AND DRUGS**  
**Paper: XVII**  
**LABORATORY COURSE-V (CHDD-306)**

**Marks: 50**

**Periods: 120**

(Any sixteen experiments are to be covered)

1. To determine percentage purity of calcium gluconate in a given drug by complexometric titration

2 Assay of ascorbic acid as a given drugs.

3. Assay of isoniazide in a given drug.

4. Assay of Chloroquine in a given drug

5. Assay of Riboflavin in a given drug

6. Formulations ,

Preparation of representative examples of drugs in the following forms (Any seven) i)

Glycerines ii) Syrups

- Borax glycerine, Phenol

iii) Oral solution

- Simple syrup by IPS USP. Lemon syrup

i) Emulsion

- Sodium citrate and citric acid solution, KI oral solution .strong iodine solution

v) Lotions vi) Ointments vii)

- Cod liver oil emulsion, Turpentine Emulsion, Castor oil emulsion, Acacion emulsion.

Elixirs

- Calamine lotion, Zinc sulphate lotion

viii) Ear Drops

- Simple ointment, Sulphur ointment - Simple elixir

7. Preparation of granules of different powder drugs (Two drugs).  
- H<sub>2</sub>O<sub>2</sub> ear drops, sodium bicarbonate ear drops

8 Determination of refractive index of following drugs by refractometer

a. Methyl salicylate

b. Eugenol

c. Cinnamon Oil