

॥ सा विद्या या विमुक्तये ॥



स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

“ज्ञानतीर्थ” परिसर, विष्णुपुरी, नांदेड - ४३१६०६ (महाराष्ट्र)

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY NANDED

“Dnyanteerth”, Vishnupuri, Nanded - 431606 Maharashtra State (INDIA)

Established on 17th September 1994 – Recognized by the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'A' Grade

ACADEMIC (1-BOARD OF STUDIES) SECTION

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संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील तृतीय वर्षाचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२१-२२ पासून लागू करण्याबाबत.

परिपत्रक

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, मा. विद्याशाखेने दिनांक ३१ मे २०२१ रोजीच्या बैठकीतील केलेल्या शिफारशीप्रमाणे व दिनांक १२ जून २०२१ रोजी संपन्न झालेल्या ५१ व्या मा. विद्या परिषद बैठकीतील विषय क्र. २६/५१-२०२१च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील तृतीय वर्षाचे खालील विषयांचे C.B.C.S. (Choice Based Credit System) Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२१-२२ पासून लागू करण्यात येत आहेत.

1. B.Sc.-III Year-Biophysics
2. B.Sc.-III Year-Bioinformatics
3. B.Sc.-III Year-Biotechnology
4. B.Sc.-III Year-Biotechnology (Vocational)
5. B.Sc.-III Year-Botany
6. B.Sc.-III Year-Horticulture
7. B.Sc.-III Year-Agro Chemical Fertilizers
8. B.Sc.-III Year-Analytical Chemistry
9. B.Sc.-III Year-Biochemistry
10. B.Sc.-III Year-Chemistry
11. B.Sc.-III Year-Dyes & Drugs Chemistry
12. B.Sc.-III Year-Industrial Chemistry
13. B.C.A. (Bachelor of Computer Application)-III Year
14. B.I.T. (Bachelor of Information Technology)-III Year
15. B.Sc.-III Year-Computer Science
16. B.Sc.-III Year-Network Technology
17. B.Sc.-III Year-Computer Application (Optional)
18. B.Sc.-III Year-Computer Science (Optional)
19. B.Sc.-III Year-Information Technology (Optional)
20. B.Sc.-III Year-Software Engineering
21. B.Sc.-III Year-Dairy Science
22. B.Sc.-III Year-Electronics
23. B.Sc.-III Year-Environmental Science
24. B.Sc.-III Year-Fishery Science
25. B.Sc.-III Year-Geology
26. B. A./B.Sc.-III Year-Mathematics
27. B.Sc.-III Year-Microbiology
28. B.Sc.-III year Agricultural Microbiology
29. B.Sc.-III Year-Physics
30. B. A./B.Sc.-III Year Statistics
31. B.Sc.-III Year-Zoology

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या www.srtmun.ac.in या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

‘ज्ञानतीर्थ’ परिसर,

विष्णुपुरी, नांदेड - ४३१ ६०६.

जा.क्र.: शैक्षणिक-१/परिपत्रक/पदवी-सीबीसीएस अभ्यासक्रम/
२०२१-२२/७५

दिनांक : १२.०७.२०२१.

प्रत माहिती व पुढील कार्यवाहीस्तव :

- १) मा. कुलसचिव यांचे कार्यालय, प्रस्तुत विद्यापीठ.
- २) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
- ३) प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
- ४) साहाय्यक कुलसचिव, पदव्युत्तर विभाग, प्रस्तुत विद्यापीठ.
- ५) उपकुलसचिव, पात्रता विभाग, प्रस्तुत विद्यापीठ.
- ६) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.
- ७) अधीक्षक, परीक्षा विभाग विज्ञान व तंत्रज्ञान विद्याशाखा प्रस्तुत विद्यापीठ.

स्वाक्षरित

सहा.कुलसचिव

शैक्षणिक (१-अभ्यासमंडळ) विभाग

Swami RamanandTeerthMarathwada University,
Nanded



Faculty of Science & Technology
B. O. S. IN CHEMISTRY

B. SC. THIRD YEAR
(Dyes and Drugs)
SEMESTER- V & VI
CBCS Course

Effective from JUNE –2021

B. Sc. Third Year (Semester V & VI)

Total credits semester V and VI: 12

Semester	Paper No.	Name of the Course	Instruction Hrs/ week	Total period	Internal Evaluation	Marks of Semester	Total Marks	Credits
V	DSECDD I [(Section A) Elective]	Chemistry of Synthetic Dyes I(P-XII)	03	45	10	40	50	2
	DSECDD I (Section B)	Chemistry of Synthetic Drugs(P-XIII) B1 OR Natural Dyes For Industrial Applications B2	03	45	10	40	50	2
	DSECDDP-I (DECDD- I & II) (section A)	Practical's based on P-XII & PXIV (P-XVI)	04	20 Practicals	10	40	50	2
	DSECDD P-II (DSECDD- I & II) (section A)	SEC III (1Skill)			15x3=45			(02)*
VI	DSECDD II (Section A)	Chemistry of Synthetic Dyes II. (P-IVX)	03	45	10	40	50	2
	DSECDD II [(Section B) Elective]	Unit Operation and Pharmaceutical Dosage forms (P-XV) B1 OR Principles of Drug Design (PXV) B2	03	4 5	10	4 0	50	2
	DSECDDP-III (DSECDD- I & II) (section B)	Practical's based on P-XIII & PXV (P-XVII)	04	20 Practicals	10	40	50	2
	DSECDDP-IV (section B)	SEC IV			50		50	(02)*
Total credits semester I and II:								12(4)*

Note:

- The syllabus is based on six (3x2) theory periods and four practical periods per batch per week.
- Candidates should require passing separately in theory and practical examination.
- Theory examination 40 marks (30+10 MCQ for each paper).
- Internal evaluation 10 marks (test for assignment and attendance).
- At least twenty practical should be taken: 10 practical from Section A and 10 from Section B.

Objectives

- To acquire knowledge about relation between action of light and dyed fibers
- To study various aspects of disperse dyes including dispersion process.
- To study constitutional aspects of reactive dyes
- To get basic information about Mordant dyes and methods of its applications.
- Study synthesis and applications of different classes of drugs.
- To study an introductory approach of natural dyes for industrial application.
- To study chemistry of sulphur dyes.
- To know different methods of evaluation of dyes.
- To study basic chromatographic techniques for application to dyes.
- To study materials used for pharmaceutical plant preparation.
- To study principal and modes of unit operation.

Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. Third year (Semester - V)

Semester Pattern effective from -2021

DYES AND DRUGS

DSECDD I (Section-A) (Elective-1)

Chemistry of Synthetic Dyes- I (P-XII)

Credits: 02 Marks: 50

Periods: 45

UNIT I I. Action of light on dyes and dyed fibres

12 periods

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 II

I. Disperse dyes:

13 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

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. Dyers requirement

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.

Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. Third year (Semester - V)

Semester Pattern effective from -2021

DYES AND DRUGS

DSECDD I (Section-B)

Chemistry of Synthetic Drugs (P-XIII)

Credits: 02 Marks: 50

Periods: 45

UNIT I 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

c) Antiarrhythmic Agents, i) Dexpropranolol ii) Procainamide iii) Disopyramide iv) Propranolol

d) Vasopressor Drugs i) Isoxsupurine ii) Prenylamine

UNIT II I. Antineoplastic drugs: 08

Periods

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 I. Autonomic drugs: 08

Periods

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) Salbutamol d) Propranolol e) Acetylcholine f) Atropine

(Condensation of Tropic Acid and Tropine) g) Mecamylamine and h) Bethanidine UNIT IV

II. Diuretics 10 Periods

a. Introduction b. Classification c. Synthesis and application of the following

i) hlormerodrin ii) Meralluride iii) Chlorothiazide iv) Benzthiazide v) Acetazolamide

vi) Quinethazone vii) Chlortalidone viii) Furosemide

UNIT IV I. Anti tubercular drugs 07

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

Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. Third year (Semester - V)

Semester Pattern effective from -2021

DYES AND DRUGS

DSECDD I (Section-A) (Elective)

Natural Dyes For Industrial Applications (P-XIII)

Credits: 02 Marks: 50

Periods: 45

UNIT I I. History of natural dyes **10**
periods

- a) Promotion of Natural Dyes
- b) Sources of Natural Dyes
- c) Constitutional aspects
- d) Requisites of a True Dye
- e) Types of Dye
- f) Chemical Entities Responsible for Colors
- g) Classification i) Based on Chemical Nature ii) Classification Based on Colors

UNIT II **10 periods**

I. Basics of Natural Dyeing

- 1. Advantages of Natural Colors/Vegetable Dyes
- 2. Natural Dyeing Principles
 - a. Nature of Material to be Dyed
 - b. Measurements of Mordants and Dyestuffs
 - c. Temperature
 - d. Agitation
 - e. Wet Fibers Look Darker
 - f. Rinsing

UNIT III **10 periods**

Natural Colorants in Textile Dyeing

- 1 Introduction
- 2 Reasons for Natural Coloration
- 3 Dyeing Technology a) Mordanting b) Standardization of the Coloration Process c) Mixtures of Plant Material

UNIT IV

I. Natural Dyes on an Industrial Scale **15 periods**

- a) Hank Dyeing of Woolen Yarn and Production of Woolen Caps
- b) Dyeing of Cones in a Yarn Dyeing Machine
- c) Dyeing of Cotton Fabric on a Jet Dyeing Machine
- d) Dyeing of Cotton Fabric on a Jig Dyeing Machine
- e) Fabric Dyeing on a Garment Dyeing Machine
- f) Dyeing of Polyamide Tights in a Paddle Dyeing Machine

Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. Third year (Semester - VI)

Semester Pattern effective from -2021

DYES AND DRUGS

DSECDD II (Section-A)

Chemistry of Synthetic Dyes- II (P-XIV)

Credits: 02 Marks: 50

Periods: 45

UNIT I I. 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 II I. Fluorescent brightening agents 10 periods

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

UNIT III

I. Identification and Evaluation of dyes: 12 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

Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. Third year (Semester - VI)

Semester Pattern effective from -2021

DYES AND DRUGS

DSECDD II (Section-B)

Unit Operation and Pharmaceutical Dosage forms (P-XV)

Credits: 02 Marks: 50

Periods: 45

UNIT I Material used for pharmaceutical plant construction 06

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.

UNIT II

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

12 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.

UNIT IV

Pharmaceutical Dosage forms

I. Principles of Drug Formulations:

5

Periods

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

II. Preparation of dosage forms:

12 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: cacia, cocoa, simple syrup, ferrous sulphate.
3. **Elixirs**: Introduction, preparation of medicated and non-medicated elixiers.
4. **Suspensions**: Preparation of antacid, antihelminthicantibacetiral suspension.
5. **Emulsions** : Methods of prepration of emulsion.
6. **Tablets**: Methods of preparation of tablets.

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Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. Third year (Semester - VI)

Semester Pattern effective from -2021

DYES AND DRUGS

DSECDD II (Section-B) (Elective)

Principles of Drug Design (P-XV)

Credits: 02 Marks: 50

Periods: 45

UNIT I

I. A Rational Approach to Drug design

8 periods

1. Introduction
2. Analogues and Prodrugs
3. Concept of Lead
4. Factors Governing Drug-Design
5. Rational Approach to Drug-Design
 - a). Quantum Mechanical Approach
 - b) Molecular Orbital Approach
 - c) Molecular Connectivity Approach

UNIT II

Method of Drug design

10 periods

1. Drug-Design : The Method of Variation
 - a) Drug Design Through Disjunction
 - b) Drug Design Through Conjunction
2. Drug Design and Development:
3. Molecular Hybridization
4. Rigidity and Flexibility Vs Drug Design
5. Tailoring of Drugs

UNIT III

Physical-Chemical Factors and Biological Activities

15 periods

1. Introduction
2. Physical Properties
 - a) Features Governing Drug Action in Active Site
 - b). Structurally Specific and non-Specific Drugs
 - c) Meyer-Overton and Meyer-Hemmi Theory
 - d) Ferguson's Theory
 - e) Van der Waal's Constants
- 3) Factors Governing Ability of Drugs to Reach Active Site
 - a) Absorption
 - b) Distribution
 - c) Metabolism (Biotransformation)
- d) Excretion
- 4) Isosterism and Bio-Isosterism 44
- 5) Stereochemistry and Drug Action
- 6). Conformationally Flexible to Conformationally Rigid Molecule
7. Chemical Properties

UNIT IV

15

periodsMolecular Modeling and Drug Design

1. Introduction 60
2. Methodologies : Molecular Modeling
3. Known Receptor Sites
 - a) 3D Structure of Macromolecular Targets
 - b) Structure-Based Drug-Design
 - c) Ligand Receptor Recognition
 - d) Active Site for a Target Molecule
 - e) Meaning of Site
 - f) Characterization of Site
 - g) Hydrogen Bonding and Other Group Binding Sites
 - h) Electrostatic and Hydrophobic Fields
3. Design of Ligands
4. Unknown Receptor Sites
 - a) Pharmacophore Vs Binding-site Models
 - b) Pharmacophore Models
 - c) Binding-Site Models

Swami RamanandTeerthMarathwada University Nanded
Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. Third year

Semester Pattern effective from -2021

DYES AND DRUGS

Practical paper DSECDDP I (Section-A) (P-XVI)

Credits: 02

Marks: 50

(Any sixteen experiments are to be covered)

- i. Preparation of Dyes (any three)
 - a. Phenyazo- β -naphthol
 - b. Magneson II
 - c. Chrysoidine
1. Estmation 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. Estmation 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)

Swami RamanandTeerthMarathwada University Nanded
Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. Third year

Semester Pattern effective from -2021

DYES AND DRUGS

Practical paper DSECDDP III (Section-B) (P-XVII)

Credits: 02

Marks: 50

(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: - Borax glycerine, Phenol

ii) Syrups Simple syrup by IPS USP. - Lemon syrup

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

iv)Emulsion - Cod liver oil emulsion, Turpentine Emulsion, Castor oil emulsion, Acacion emulsion

v) Lotions - Calamine lotion, Zinc sulphate lotion

vi) Ointments - Simple ointment, Sulphur ointment

vii) Elixirs _ Simple elixi

viii) Ear Drops _H₂O₂ ear drops, sodium bicarbonate ear drops

7. Preparation of granules of different powder drugs (Two drugs).

8 Determination of refractive index of following drugs by refractometer

a. Methyl salicylate

b. Euginol

c. Cinnamon Oil

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Choice Based Credit System (CBCS) Course Structure
B. Sc. Third year (Semester- V)
Semester Pattern effective from June -2021

DYES AND DRUGS

Skill Enhancement Course (III) DSECDDP II (Section-A)

CHEMISTRY OF DYE (02 credits)

Basic Concept of Dyes Color Relation Between Color and Constitution Characterization of Natural Dyes Solubility Studies

1. Thin Layer & Column Chromatographic Studies (activity)
2. Ultra Violet-visible Spectrophotometric Studies (activity)
3. Fourier Transform Infra-red Studies (activity)
4. High Performance Liquid Chromatographic Studies
5. Gas Chromatography studies
6. Mass Spectro-photometric Studies
7. Mordants used in Dyeing (activity)
8. Mordant Tannins and Tannic Acid (activity)
9. Metal Salts or Metallic Mordants Oil (activity)
10. Mordants Techniques used for Dyeing (activity)
11. Mechanism of Dyeing Fastness Properties 12. Fastness Properties of Dyed Materials

OR

Photographic Dyes(02 credits)

I. Cyanine Dyes

- a) Introduction
- b) Fundamental Aspects
- c) Application of Sensitizing Dyes
- d) Production of Sensitizing Dyes
- e) Cyanine Dyes as Sensitizers (activity)

II. Merocyanine Dyes III. Oxonol Dyes IV. Azomethine and Indoaniline Image Dyes

- a) Introduction
- b) Color Developers
- i) Yellow Azomethine Dyes (activity)
- ii) Magenta Azomethine Dyes (activity)

V. Cyan Indoaniline Dyes VI. Azo Dyes (activity) VII Diffusion-Transfer Imaging Systems VIII. Silver Dye Bleach Processes (activity) IX. Color Masking (activity)

- a) Metallized Dyes
- b) Xanthene Dyes
- c) Triarylmethane Dyes
- d) Anthraquinone Dyes

Swami RamanandTeerthMarathwada University Nanded
Choice Based Credit System (CBCS) Course Structure
B. Sc. Third year (Semester- VI)
Semester Pattern effective from June -2021
DYES AND DRUGS
Skill Enhancement Course (IV)DSECDDP IV (Section-B)

Study Expectorants and Antitussives (02 credits)

1. Introduction 2.

Classification

- a) Sedative Expectorants b) Stimulant (Irritant) Expectorants
- c) Centrally Acting Antitussive Agents

3. Synthesis*/study and use and mechanism of action of following

- a) Noscapine b) cetylcysteine* c) Bromhexine d) Ammonium Chloride e) pecacuanha
- f) Cocillana g) Potassium Iodide h) Creosote* i) Eucalyptol j) Terpin Hydrate
- k) Sulfogaiacol* l) Benzonatate m) Carbetapentane* n) Dextromethorphan
- o) Levopropoxyphene*

Students are expected to perform Minimum six activities (Preparation)

OR

Study of Antiviral Drugs (02 credits)

1. Introduction a) Replication and Transformation

2. Classification

- a) Substances that Inhibit Early Stages of Viral Replication
- b) Substances that Interfere with Viral Nucleic Acid Replication
- c). Substances that Affect Translation on Cell Ribosomes

3. Synthesis*/study and use and mechanism of action of following

- a) Amantidine* b) Idoxuridine* c) Acyclovir d) Vidarabine e) Ribavirin
- f) Methisazone g) Arildone

Students are expected to perform Minimum six activities (Preparation of charts on mechanism of action)

Reference Books:

1. The Chemistry of Synthetic Dyes Vol I and II By K. Venkataraman
2. Synthetic Dyes By Rajbir Singh
3. Synthetic Dyes by Dr. Gurdeep R. Chatwal
4. Synthetic Dyes by M.S. Yadav
5. Dyes and their Intermediates by Chatwal.
6. Introduction to the Chemistry of Dyestuffs by V.A. Shenai,
7. Dyes and Dyeing by Charles E. Pellow;
8. Handbook on Natural Dyes for Industrial Applications by Dr. Padma S Vankar (Author)
9. Fundamental Processes of Dye Chemistry by Fierz-David.
10. Handbook of Natural Colorants by Thomas Bechtold and Rita Mussak
11. Synthetic Drugs By Rajbir Singh
12. Synthetic Drugs by Dr. Gurdeep R. Chatwal
13. Synthetic Drugs by S.K. Agarwal Publisher
14. Principles of Organic Medicinal Chemistry by Rama Rao Nadendla
15. Practical Pharmaceutical Chemistry – I By Dr. A. V. Kasture, Dr. S. G. Wadodkar, Mr. S. B. Gokhale
16. Vogel's Textbook of Practical Organic Chemistry
17. British Pharmacopea
18. Indian Pharmacopea
19. Pharmacology and pharmacotherapeutics :Satoskar and Bhandarkar
20. Practical Pharmaceutical chemistry A.H. Beckett and J.B. Stelnake

Course outcome

CO1	Know the effect of light on dye and dyed fibres including mechanism of fading.
CO2	Know chemistry of Disperse, Reactive and Mordant dyes
CO3	Synthesis and applications of different classes of synthetic drugs
CO4	Learning about applications of natural dyes in industry
CO5	Learn about sulphur dyes and fluorescent brightening agent.
CO6	Learn different methods of evaluation of dyes.
CO7	Learn basic methods of chromatography and their role in dye chemistry.
CO8	Learn basic principles and modes of unit operation
CO9	Learn the principle and preparation of dosages forms