Swami Ramanand Teerth Marathwada University, Nanded

Choice Based Credit System (CBCS) Course Structure

Faculty of Science

B. Sc. Second Year Syllabus

Semester Pattern effective from June 2017

Subject: Dyes and Drugs

Semester	Course No.	Name of the Course	Instruction Hrs/ week	Total period	CA	ESE	Total Marks	Credits
III	CCDD III (Section A)	Study of Pigments, azo, and azoic Dyes. (PVI)	03	45	10	40	50	2
	CCDD III (Section B)	Synthesis and Application of Drugs acting on CNS.(P-VII)	03	45	10	40	50	2
	CCDDP II [CCDDIII & IV (Section A)]	Practical's based on P-VI & P-VIII (P-X)	04 04	Practicals 08 08	05 05	20 20	25 25	1 1
	SECDD I	SEC I (Anyone Skill from optional)	03	45	25	25	50	(02)*
IV	CCDD IV (Section A)	Synthesis and application of methane, anthraquinone, xanthenes and Heterocyclic Dyes. (P-VIII)	03	45	10	40	50	2
	CCDD IV(Section B)	Synthesis and Application of Chemotherapeutic Drugs (P-IX)	03	45	10	40	50	2
	CCDDP III [CCDD III & IV (Section B)]	Practicals based on P-VII & P-IX (P-XI)	04 04	Practicals 08 08	05 05	20 20	25 25	1 1
	SECDD II	SEC II (Anyone Skill from optional)	02	02	25	25	50	(02)*
Total credits semester III and IV								**12(04)***

Note: ESE of CCDDPII, CCDDPIII & SECDD I, SECDDSECDD II should be evaluated annually

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Choice Based Credit System (CBCS) Course Structure
B. Sc. second year (Semester- III)
Semester Pattern effective from June -2017

DYES AND DRUGS

CCDD III (Section A)

STUDY OF PIGMENTS, AZO AND AZOIC DYES (PVI)

Credits: 02 (Marks: 50) Periods: 45

UNIT I

Azo-Dyes – Synthesis and applications : 10 periods

(i) Methyl orange (ii) Methyl red (iii) Orange I (iv) Orange II
(v) Orange IV (vi) Fast red A (vii) Metanil yellow (viii) Aniline yellow
(ix) Butter yellow (x) Congo red (xi) Diamond black F
(xii) Chromotrope 2B (xiii) Erichrome black T

UNIT II

Dyeing and fastness properties of azo dyes : 10 periods

1) General consideration, dyeing and fastness properties of
a) Azodyes for wool b) Azodyes for silk c) Azodyes for leather d) Direct cotton dyes
e) Acid colours on cotton

UNIT III

Azoic Dyes : 15 periods

1) Introduction, Chemical constitution of napthols.
2) Preparation of Napthols, Napthols for yellow shade, azoic shades.
3) Steps involved in azoic dyeing.
4) Application of azoic dyes on fibres other than cotton (wool, silk, cellulose, acetate)
5) Fastness properties of azoic shades top light, chlorine, rubbing, alkali.
6) Azoic colours in printing, printing composition. Types of azoic colours in printing.

UNIT IV

Pigments: 10 periods

a. Introduction
b. Use of synthetic organic pigments
c. Requirements of organic pigments
d. Types of pigments
e. Methods of pigment prinking
f. Styles of printing
g. Pigment printing, advantages and disadvantages of pigment application
h. Chemical nature of pigments
i. Binders and fixers, thickners.

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DYES AND DRUGS

CCDD III (Section B)

SYNTHESIS AND APPLICATION OF DRUGS ACTING ON CNS (P-VII)

Credits: 02 (Marks: 50) Periods: 45

UNIT I

I. Anaesthetics : **15 periods**

1) Introduction and Classification of anesthetics.
2) Characteristics of ideal anesthetics.
3) Study of volatile general anesthetics: i) Diethyl ether ii) methyl-n-propyl ether iii) divinyl ether iv) ethylene v) cyclopropane vi) nitrous oxide vii) chloroform viii) fluothane, ix) trilene x) viadril
4) Study of non-volatile general anesthetics
i) Avertin and ii) pentothal Sodium
5) Study of local anaesthetics
i) _ - Eucatine, ii) orthocaine, iii) Benzocaine, iv) procaine v) xylocaine

UNIT II

I. Study of sedatives and hypnotics and Anticonvulsants **10 periods**

1) Introduction and Classification of sedatives and hypnotics and Anticonvulsants
2) Synthesis and applications of
i) Ethchlorvynol ii) chloral iii) Paraldehyde, iv) Sulphonal,v) Trional vi) tetronal vii) Novonal, viii) persedon ix) trichloroethyl urethane, x) phenobarbitone, xi) Pentabarbitone

UNIT III

I. Study of Tranquillizer (selective Modifiers of CNS) **10 periods**

1) Introduction and Classification of Tranquillizer (selective Modifiers of CNS)
2) Synthesis and applications of
i) Chlorpromazine ii) Prochlorperazine iii) Chlorprothixene iv) Thiothixene v) Haldol vi) Diazepam vii) Oxazepam viii) Chlordiazepoxide.

UNIT IV

I. Study of analgesics, antipyretics **10 periods**

1) Introduction and classification of analgesics, antipyretics and anti-inflammatory.
2) Mechanism of action of analgesics
3) Mechanism of action of antipyretics
4) Synthesis and applications of : i) antipyrine ii) Novalgine iii) acetanilide iv) Phenacetin v) paracetamol vi) Aspirin, vii) salol, viii) Irgaphyrin

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Choice Based Credit System (CBCS) Course Structure
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DYES AND DRUGS

CCDD IV (Section A)

STUDY OF METHANE, ANTHRAQUINONE, XANTHENES AND HETEROCYCLIC DYES (P-VIII)

Credits: 02 (Marks: 50) Periods: 45

UNIT I

I. Diphenyl and triphenyl methane dyes : 15 periods

1) Diphenyl methane dyes : Introduction, synthesis and application of i). Auramine O and ii) Auramine G.
2) Triphenyl methane dyes : Introduction. Classification, General properties, constitution of Triphenyl methane dyes (w.r.t. pararosaniline)
3) Synthesis and applications of following triphenyl methane dyes i) Malachite green ii) Rosaniline iii) Pararosaniline iv) aniline blue v) Methyl violet vi) crystal violet
4) Phenolphthalein – Synthesis, properties and application.

UNIT II

I. Anthraquinone Dyes : 10 periods

1) Introduction and classification of Anthraquinone Dyes
2) Synthesis and applications of dyes i) Alizarin ii) Alizarin Red S iii) Alizarin orange iv) Alizarin blue v) Alizarin cyanine green vi) Indanthrone blue vii) Flavanthrone viii) Pyranthrone

UNIT III

I. Xanthene Dyes: 10 periods

1) Introduction, classification and General properties of Xanthene Dyes
2) Synthesis and applications of dyes i) Fluorescein ii) Eosin iii) Erythrosine iv) Rhodamine G v) Rhodamine B vi) Pyronine G.

UNIT IV

I. Heterocyclic Dyes : 10 periods

1) Introduction and Classification of heterocyclic dyes
2) Synthesis and applications of i) Indophenol blue ii) Phenylene blue iii) Methylene blue iv) Primuline v) Gallocyanine vi) Acridine yellow vii)Sensitol red viii) Quinolin blue ix) Sensitol red x) Ethyl Red xi) Safranine T.

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Choice Based Credit System (CBCS) Course Structure
B. Sc. second year (Semester- IV)
Semester Pattern effective from June -2017

DYES AND DRUGS

CCDD IV (Section B)

SYNTHESIS AND APPLICATION OF CHEMOTHERAPEUTIC DRUGS (P-IX)

Credits: 02 (Marks: 50) Periods: 45

UNIT I

I. Sulphonamides: **15 periods**

1) Introduction and discovery of sulphonamides.
2) Classification of sulphonamides.
3) Mechanism of action of sulpha drug.
4) Synthesis and applications of following sulphonamides: i) Sulphacetamide ii)Sulphapyridine, iii) sulphadiazine iv) Sulphamerazine v) Sulphamezathine, vi)Sulphamethoxazole vii) Succinyl Sulphathiazole, viii) Sulphaceamide ix)suphamylon

UNIT II

II. Antimalerials **10 periods**

1) Introduction and historical background of antimalerials Classification
2) Classification of antimalerials
3) Pathogenecity and Chemotherapy of malarial parasite
4) Study of the following antimalerials with uses : i) Camoquine ii) Mepacrine iii)Azacrine iv) Paludrine

UNIT III

I. Antiseptics: **10 periods**

1) Introduction and classification of antiseptics,
2) standardization of disinfactant (Phenol coefficient)
3) Study of following antispetics: i) Alcohols ii) Formaldehyde iii) Urotropine iv)merbromin v) Thiomersal vi) chlorine and dakin's solution vii) ChloramineT viii) Dichloroamine T ix) Halazone x) Chlorazodin xi) Iodoform xii) Vioform xiii)Thymol xiv) Dettol xv) Nitrofurazone

UNIT IV

I. Antibiotics: **10 periods**

1) Introduction, history of discovery of antibiotic.
2) classification of antibiotics
3) Study of following antibiotics with an introduction, production, isolation, properties, clinical uses and mechanism of action. i) Penicillin ii) Chloramphinicol
4) Structure, activity, relationship of chloramphenicol and penicillin

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DYES AND DRUGS

Practical Paper: CCDDP II [CCDD III & IV (Section A)]

Credits: 02 (Marks: 50)

(Any sixteen experiments are to be covered)

1. **Preparation of dye intermediates**

a. Anthraquinone b. m-nitroaniline

c. P-Bromo acetanilide d. Succinic anhydride

e. Sulphanillic acid f. Benzoquinone

2. Preparation of dyes :

a. Fluorescein b. Eosin

c. Methyl orange II d. Congo red

e. Fast green O

3. Estimation of following Aryl amines by using NaNO2 solution

a. Aniline b. P-Nitroaniline c. P-chloro aniline

4. Dyeing methods

a. Direct dyeing of wool and silk with Orange II

b. Direct dyeing of wool and silk with Eosin

c. Direct dyeing of wool and silk with Malachite green

d. Direct dyeing of wool and silk with Crystal violet

e. Direct dyeing of cotton with congo red

f. Dyeing of cotton with Malachite green by Mordant dyeing method

g. Acid dyeing or wool with Orange II

h. Dyeing of cotton by vat dyeing method

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Choice Based Credit System (CBCS) Course Structure

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DYES AND DRUGS

Practical Paper: CCDDP III [CCDD III & IV (Section B)]

Credits: 02 (Marks: 50)

(Any sixteen experiments are to be covered)

1. Preparation of Drug Intermediates

a. 3-methyl-1-phenylpyrazol-5-one b. Acetyl acetone
c. Ethyl acetoacetate d. Salicylaldehyde
e. 4-hydroxybenzoic acid

2. Preparation of Drugs

a. Chloramine-T b. Dichloramine-T
c. Methyl salicylate d. sulphonamide
e. phenacetin e. Benzocaine

3. Assay of Drugs

a. Aspirin b. Sulphonamide c. Paracetamol

4. Tests for Identity and purity of Drugs

a. Analgin, b. Aspirin, c. Vitamin C,
d. Pencillin G, e. Chlorocresol, f. Chloroform,
g. Chloroquinephosphate, h. Cresol h. Erythromycin,
i. Isoniazide, j. sulphadiazine

5. Qualitative Tests

a. Ephidrine b. Belladona c. Nicotine
d. Glucose e. sucrose f. Starch
g. Protein

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DYES AND DRUGS

Skill Enhancement Course SECDD-I (A)

STUDY OF NATURAL AND SYNTHETIC FOOD COLOURS (02 Credits)

1. Introduction to food colours

2. History of food colorants

3. Study of Natural food colours carotenoids, chlorophyll, anthocyanin, betanin and turmeric.
4. Preparation of Natural food colours (Red Pink, Green, Orange, yellow, Blue, Purle, Brown, Tan and Black.

Practical : Preparation of any four colours from natural source.
Introduction to Synthetic dyes approved for colouring food stuff
5. Synthesis and study of

a. Tartrazine,	b. Quinoline yellow,	c. Sunset yellow,
d. Amarnanth	e. erythrosine	f. Ponceau 4R
g. Indigo carmine	h. Green S	i. Black PN

6. Purity and requirement of colours for use in foodstuffs
7. Qualitative and qualitative analysis of synthetic colours in foodstuff.

Practical: Identification of synthetic food colours by paper chromatography and spectrophotometrically (In Jam, Burphy, Bundi etc.)

OR

Skill Enhancement Course SECDD-I (B)

STUDY OF NATURAL AND SYNTHETIC INK DYES (02 Credits)

1. Introduction to Natural and Synthetic Ink dyes, Application Principles
2. Ink-Jet printing Technology
    a. Dyes for Ink-Jet Application 1. Black dyes, 2. Yellow dyes,
    b. 3. Magenta dyes, 4. cyan ink-jet dyes and 5. Solvent dyes.
    c. Fields of Application for Ink-Jet Printing,
    d. Properties of Ink-Jet Prints
    e. Requirements for ink jet inks, formulation of ink-jet inks: aqueous, solvent,and hot melt.

    Practical :

    i. Formulation of aqueous ink-jet inks.
    ii. Formulation Of solvent ink-jet inks.

3. Dyes for Writing, Drawing, and Marking
    a. Water-soluble dyes for fountain pen inks and fiber-tip pens
    b. Solvent dyes for ballpoint pen inks
    c. Solvent dyes for fiber-tip pens
    d. Water-soluble dyes for fluorescent marker inks
    e. Basic and solvent dyes for fluorescent marker inks
    f. Inks for Writing, Drawing, and Marking Inks

    Practical : (Any three)

    i. Formulation of a blue fountain pen ink
    ii. Formulation of fiber-tip pen ink
    iii. Formulation of ball point pen ink
    iv. formulation of a solvent-containing marking ink

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DYES AND DRUGS

Skill Enhancement Course SECDD-II (A)

STUDY OF ANTHELMINTIC AND ANTIPROTOZOAL AGENTS (02 Credits)

Introduction to natural and synthetic anthelmintic agents. Characteristics of anthelmintic agents.

Classification

According to their chemical structure

According to their action

Study of piperazine, Diethylcarbamazine Citrate, Albendazole, Mebendazole, Thiabendazole, oxamniquine, pyrantel pamoate and miracil D.

Activity : 1) Assay of albendazole Direct titrimetric and spectrophotometric method

2) Anthelmintic Activity of Tulsi Leaves (Ocimum Sanctum Linn) [An In-Vitro Comparative Study]

Antiprotozoal Agents

Introduction to antiprotozoal agents. Characteristics of antiprotozoal agents.

Study of Diloxanide furoate, Nitazoxanide, Furazolidone, metronidazole, tinidazole, norfloxacin, quinidochlor, diidoquin, carbarsone, acetarsone

Activity: 1) Assay of metronidazole by non-aqueous titration method

2) Assay of Diloxanide furoate by non-aqueous titration method

OR

Skill Enhancement Course SECDD-II (B)

STUDY OF RECENT HEMATOLOGICAL AGENTS (02 Credits)

Introduction and types of hematological agents.

Mechanisn of clotting.

Anticoagulant agents : 1) Heparine, 2) Dicoumarol, 3) Pelentan (ethyl biscoumacetate), 4) Warfarin, 5) phenindione, 6) citric acid salt, 7) Dabigatran, 8) Rivaroxaban and 9) Apixaban

Antiplatelet drug : 1) Aspirin, 2) Clopidogrel, 3) Prasugrel and Ticlopidine

Coagulants: Vitamin k and analogs, Proteins and oxidized cellulose

Antianemaic Drugs: 1) erythropoietin, 2) Iron preparations, 3) Deferoxamine, 4) Iron dextran, 5) Vitamin B-12 and 6) Folic acid

Activity: Assay of Aspirin, dicoumarol, pelentan and few contemporary iron preparations.

Reference Books:

1. Synthetic dyes : Grudeep R. Chatwal.
2. Synthetic Dyes : K. Venkatraman Vol. I, Academic Press , New York.
3. Synthetic Dyes : K. Venkatraman Vol. I, Academic Press , New York.
4. Chemistry of Dyes and Principles of Dying : V.A. Shenai, Sevak Publication, Bombay
5. Introduction to dyes : Rastogi
6. Industrial dyes : K. Hunger, Wiley-VCH publication
7. Fundamental process of dye chemistry: Hans Eduard, Fierz-david and and Louis Blangey, Inter science publishers, New York.
8. Synthetic Drugs : Grudeep R. Chatwal.
9. Medicinal Chemistry by Ashutosh Kar
10. An introduction to drugs , Singh and Rangnekar
11. British Pharmacopeia
12. Indian pharmacopeia
13. Pharmacology and pharmacotherapeutics : Satoskar and Bhandarkar
14. Practical Organic Chemistry : Singh , Gupta and Bajpai
15. Practical Organic chemistry : I Vogel
16. Practical Pharmaceutical chemistry A.H. Beckett and J.B. Stelnake
17. Advanced Practical Medicinal Chemistry by Ashutosh Kar
18. Pharmaceutical Drug Analysis by Ashutosh Kar.