

॥ 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 प्रथम वर्षाचे CBCS Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९-२० पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, दिनांक ०८ जून २०१९ रोजी संपन्न झालेल्या ४४व्या मा. विद्या परिषद बैठकीतील ऐनवेळचा विषय क्र.११/४४-२०१९ च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी स्तरावरील प्रथम वर्षाचे खालील विषयांचे C.B.C.S. (Choice Based Credit System) Pattern नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०१९-२० पासून लागू करण्यात येत आहेत.

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|---|---------------------------------------|
| 1. Agricultural Microbiology | 18. Dyes and Drugs |
| 2. Agrochemicals & Fertilizers | 19. Electronics |
| 3. Analytical Chemistry | 20. Environmental Science |
| 4. B.C.A. | 21. Fishery Science |
| 5. B.Voc. (Food Processing, Preservation and Storage) | 22. Food Science |
| 6. B.Voc. (Web Printing Technology) | 23. Geology |
| 7. Biochemistry | 24. Horticulture |
| 8. Bioinformatics | 25. Industrial Chemistry |
| 9. Biophysics | 26. Information Technology (Optional) |
| 10. Biotechnology (Vocational) | 27. Mathematics |
| 11. Biotechnonology | 28. Microbiology |
| 12. Botany | 29. Network Technology |
| 13. Chemistry | 30. Physics |
| 14. Computer Application (Optional) | 31. Software Engineering |
| 15. Computer Science (Optional) | 32. Statistics |
| 16. Computer Science | 33. Zoology |
| 17. Dairy Science | |

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

‘ज्ञानतीर्थ’ परिसर,
विष्णुपुरी, नांदेड - ४३१ ६०६.
जा.क्र.: शैक्षणिक-०१/परिपत्रक/पदवी-सीबीसीएस अभ्यासक्रम/
२०१९-२०/२९२

दिनांक : ०३.०७.२०१९.

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.

स्वाक्षरित / -

उपकुलसचिव

शैक्षणिक (१-अभ्यासमंडळ) विभाग

Swami Ramanand Teerth Marathwada University, Nanded



SYLLABUS

B. Sc. First Year (Dyes & Drugs)

Semester-I & II

C B C S

In force from June - 2019

Distribution of credits for B.Sc. Dyes and Drugs (optional)

Under Faculty of Science

B. Sc. Syllabus structure

Semester Pattern effective from June, 2019

Subject: Dyes and Drugs

B. Sc. First Year (Semester I & II)

Total credits semester I and II: 12

Semester	Paper No.	Name of the Course	Instruction Hrs/ week	Total period	Internal Evaluation	Marks of Semester	Total Marks	Credits
I	CCDD I (Section A)	Introduction to Dyes, P-I	03	45	10	40	50	2
	CCDD I (Section B)	Introduction to Drugs P-II	03	45	10	40	50	2
II	CCDD II (Section A)	Introduction to Dye Intermediates, P-III	03	45	10	40	50	2
	CCDD II (Section B)	Dosage forms, Purity of Drugs and Biostatistics, P-IV	03	45	10	40	50	2
	CCDD P-I (CCDD- I & II), (section A&B)	Practical's based on Section A & Section B of (CCDD- I & II) (P-V)	04	20 Practicals	20	80	100	4
Total credits semester I and II:								12

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.

Swami Ramanand Teerth Marathwada University Nanded
Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. First year (Semester - I)
Semester Pattern effective from -2016

DYES AND DRUGS
CCDD I (Section-A)
Introduction to Dyes (P-I)

Credits: 02 Marks: 60

Periods: 45

Objectives	To acquire basic knowledge about the subject Dyes and Drugs, Introduction Textile fibers, Dyeing processes, Basic operation in dyeing. Historical Evaluation of Drug, classification of drug, Chemistry pro-drug, medicinal micro biology and immunity. Raw materials in dye industries, dyestuff intermediates, dosage forms, routes of administration, purity of drug and limit test, assay of drugs and biostatistics.
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UNIT I

1. Introduction to Dyes:

08 p

- a) Introduction - Definition of dye. Difference between dye and other colouring matter. Requisites of true dye.
- b) Historical development from natural to synthetic dyes.
 - i) Era of natural dyes.
 - ii) Era of synthetic dye.
 - iii) Pollution problems
- c) Nomenclature of dyes.
 - i) Commercial naming of dyes.
 - ii) Colour index and naming of dyes.

UNIT II

1. Classification of dyes:

14 p

- a) Introduction to classification of dyes
- b) Classification of dyes on the basis of application to fiber.
 - i) Acid dyes ii) Basis of cationic dyes iii) Direct dyes iv) Mordant or adjective dyes v) Azoic dyes vi) Oxidation dyes vii) Ingrain dyes. viii) Vat dyes ix) Sulphur dyes x) Disperse dyes xi) Reactive dyes xii) Solvent dyes xiii) synthetic fibre dyes xiv) Solubilised vat dyes xv) Sulphurised vat Dyes xvi) Disperse reactive dyes.

UNIT III

1. Textile fibers: 06 p

- i) Different types of fibers:
 - a) Cotton b) Wool c) Silk d) Cellulose acetate e) Polyamide f) Polyester g) Polyacrylonitrile h) Polyolefin.

2. Dyeing process:

05 p

- a) Interaction of dye with fibers
 - i) Ionic interaction.
 - ii) Hydrogen bonds.
 - iii) Vander Waal's interaction.
 - iv) Covalent bonds.
- b) Cross Dyeing

UNIT IV

1) Basic Operation in dyeing process and Methods of dyeing:

- a) Basic Operation in dyeing process.
 - i) Preparation of the fibers.
 - ii) Preparation of the dye bath.
 - iii) Application of the dye.
 - iv) Finishing.
- b) Methods of Dyeing –
 - i) Direct dyeing.
 - ii) Vat dyeing.
 - iii) Mordant dyeing.
 - iv) Disperse dyeing.
 - v) Formation of dye on fibers.
 - vi) Dyeing of the wool with acid dyes.
 - vii) Dyeing with reactive dyes.

Swami Ramanand Teerth Marathwada University Nanded
Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. First year (Semester - I)
Semester Pattern effective from -2016

DYES AND DRUGS
CCDD I (Section-B)
Introduction to Drugs (P-II)

Marks: 50

Periods: 45

UNIT I

- 1. Introduction to drugs:** **05 p**
- a) Concept of drug and qualities of an ideal drug,
 - b) Some important terms used in study of drugs –
 - i) Pharmacy, pharmacology and pharmacophore, pharmacodynamics and pharmacodynamic agents.
 - ii) Metabolite and anti-metabolite.
 - iii) Pathogen, pathogenicity, chemotherapy and chemotherapeutic agents.
- 2. Historical evolution from natural to synthetic drugs.** **03 p**
- 3. Classification of drugs on the basis of their therapeutic actions** **08 p**
- a) Drugs acting on central nervous system.
 - b) Drugs stimulating or blocking the peripheral nervous system.
 - c) Drugs acting on the cardiovascular, hematopoietic and renal system.
 - d) Chemotherapeutic drugs.
 - e) Vitamins.
 - f) Hormones.

UNIT II

- 1. Chemistry of Pro-drug** **04p**
- a) Introduction
 - b) Application of pro-drug
 - c) Ideal Requirement of pro-drug.
 - d) Classification of Pro-drug
- 2. Physical and chemical factors and biological activity** **10p**
- a) Introduction
 - b) Physical factors:
 - i) Structurally specific and non-specific drugs.
 - ii) Relation of functional group and biological activity:
Effect of i) alkyl group ii) Hydroxyl group iii) Acidic (-COOH and -SO₃H) Groups iv) Halogen v) nitro and nitrite group vi) amino group vii) nitrile group viii) unsaturation ix) structural isomerism and x) stereoisomerism
 - iii) Chemical factors: Molecule Negentropy, Hammett correlation.

UNIT III

1. Medicinal Microbiology.

08 p

- a) Introduction to medicinal microbiology.
- b) Classification of bacteria, pathogenic and non-pathogenic bacteria.
- c) Study of pathogenicity and chemotherapy of bacteria i) *Salmonella* ii) *Clostridium* iii) *Pseudomonas* iv) *Shigella* v) *Mycobacterium* d) Study of pathogenicity and chemotherapy of protozoans i) Trypanosome ii) Leishmania iii) Plasmodium and iv) *Entamoeba histolytica*

UNIT IV

1. Immunity.

07P

- a) Introduction and importance.
- b) Immunity –
 - 1) Innate immunity, consideration at species, race and individual level. Factors deciding innate immunity.
 - 2) Acquired immunity.
 - a. Active immunity (Vaccines, types of vaccines)
 - i) Prophylactic ii) Curative iii) Diagnostic.
 - b. Passive immunity (Serum, preparation of immune sera)

Swami Ramanand Teerth Marathwada University Nanded
Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. First year (Semester - II)
Semester Pattern effective from -2016

DYES AND DRUGS

CCDD II (Section-A)

Introduction to Dye Intermediates (P-III)

Marks: 50

Periods: 45

UNIT I

1. Study of raw material used in dye industries. 03 p

Source of primaries –

- i) Coal tar- Extraction of coal tar primaries by fractional distillation.
- ii) Petroleum - extraction of primaries from petroleum source.

2. Dyestuff intermediates: 12 p

Aliphatic compounds – Synthesis and use of following in Dye industries.

- a) methyl alcohol b) ethyl alcohol c) ethylene glycol d) glycerol e) chloroform
- f) chloroacetic acid g) ethyl acetate h) acetic anhydride i) maleic anhydride
- j) acetyl chloride k) acetaldehyde l) acetone

UNIT II

1. Dyestuff intermediates (Aromatic): 12 p

Synthesis and use of aromatic compounds as dyestuff intermediates -

- a) nitrobenzene from benzene.
- b) dinitrobenzene from nitrobenzene
- c) benzene sulphonic acid from benzene
- d) naphthalene-1 -sulphonic acid and naphthalene-2-sulphonic acid from naphthalene
- e) 1-naphthol-4- sulphonic from 1-naphthol
- f) crocein acid and schaffer acid
- g) sulphanillic acid
- h) naphthionic acid
- i) p-nitroaniline
- j) aniline by reduction of nitrobenzene
- k) chlorobenzene from benzene
- l) phenol from chlorobenzene
- m) salicylic acid from phenol
- n) acetophenone from benzene
- o) benzyl alcohol from toluene
- p) benzaldehyde from toluene.

UNIT III

1. Colour and chemical constitution of dyes: 12 p

- a) Study of Bathochromic, Hypsochromic, hypochromic and hyperchromic effect with examples.
- b) Colour and chemical constitution - Definition of colour, colour and wavelength of radiation, colour absorbed and colour visualized with respect to wavelength region.
- c) Relation between colour and chemical constitution —
 - i) Armstrong theory (quimionoid theory) and its limitations.
 - ii) Witt's theory (Chromophore-Auxochrome theory. – Chromophore, Independent Chromophore, Dependent Chromophore, Chromogenes, Auxochromes and type of Auxochromes

UNIT IV

1. Non textile uses of dyestuff. 06 p

- a) Leather dyes
- b) Paper dyes
- c) Food colours
- d) Solvent
- e) Wood dyes
- f) Medicinal dyes
- g) Dyes for photography
- h) Cosmetic dyes.
- i) Dyes as indicators and reagents,
- j) Fluorescent dyes.
- k) Coloured smokes.
- l) Camouflage colours.

Swami Ramanand Teerth Marathwada University Nanded
Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. First year (Semester - II)
Semester Pattern effective from -2016

DYES AND DRUGS

CCDD II (Section-B)

Dosage forms, Purity of Drugs and Biostatistics (P-IV)

Marks: 50

Periods: 45

UNIT I

1. Dosage form and Routes of Administration; 10 p

- a) Introduction to dosage forms.
- b) Variety of dosage forms.
- c) Importance of dosage forms
- d) Routes of administration of drugs.
- e) Advantages and disadvantages of oral route of administration,
- f) Advantages and disadvantages parenteral route of administration.

UNIT II

1. Purity of pharmaceutical substances and limit test: 08 p

- a) Introduction.
- b) Permissible impurities in pharmaceutical substances.
- c) Test for purity
- d) Limit test for - i) Chloride ii) Sulphate iii) Lead iv) Iron v) Arsenic.

UNIT III

1. Assay of drugs. 07 p

- 1) Introduction.
- 2) Types of assay. a) Chemical assay b) Biological assay
i) principles of bio-assay ii) Methods of bio-assay iii) Types of biological systems.
- 3) Comparison of chemical assay and biological assay.
- 4) Immunological assay.

UNIT III

1. Bio-Statistics. 15 p

- a) Introduction to bio-statistics and its importance.
- b) Explanation of the terms with examples: i) Population ii) Biological variables
iii) Mean iv) Mode v) Median vi) Accuracy vii) Precision viii) Arithmetic mean
ix) Geometric mean x) Standard deviation xi) Mean deviation xii) Range xiii) Normal
distribution xiv) Probability xv) Sampling

2. Numericals on: 05 p

- i) Mean ii) Mode iii) Median iv) Standard deviation v) Mean deviation vi) Arithmetic
mean vii) Probability

Swami Ramanand Teerth Marathwada University Nanded
Choice Based Credit System (CBCS) Course Structure (New scheme)

B. Sc. First year

Semester Pattern effective from June -2016

DYES AND DRUGS

Practical Paper: CCDDP-I (P-V)

(Annual practical Based on [CCDD I & II (Section A & B)])

Credits: 04 (Marks: 100)

Marks: 100

Periods: 1200

A . Dyes

1 . Preparation of dye intermediates

- a) Acetanilide b) m-dinitrobenzene c) p-bromoacetanilide
b) d) dibenzal acetone e) 2,4,6 –tribromo aniline,
f) p-nitro acetanilide.

2 . Preparation of dyes

- a) Phenyl azo- β -naphthol b) Picric acid c) Orange II d) Methyl red
e) Aniline yellow f) Butter yellow

B . Drugs

1) Assay of following commercial samples

- a) Boric acid b) Sodium bicarbonate c) Ferrous sulphate d) Hydrogen peroxide e) Iodine solutions (strong and weak) f) Ascorbic acid

2) Preparation of drugs

- a) Aspirin b) Iodoform c) Paracetamol d) Acetanilide

Note: Minimum sixteen Experiments are to be covered.

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. Fundamental Processes of Dye Chemistry by Fierz-David.
9. Synthetic Drugs By Rajbir Singh
10. Synthetic Drugs by Dr. Gurdeep R. Chatwal
11. Synthetic Drugs by S.K. Agarwal Publisher
12. Principles of Organic Medicinal Chemistry by Rama Rao Nadendla
13. Practical Pharmaceutical Chemistry – I By Dr. A. V. Kasture, Dr. S. G. Wadodkar, Mr. S. B. Gokhale
14. Vogel's Textbook of Practical Organic Chemistry
15. British Pharmacopea
16. Indian Pharmacopea
17. Pharmacology and pharmacotherapeutics : Satoskar and Bhandarkar
18. Practical Pharmaceutical chemistry A.H. Beckett and J.B. Stelnake

Course Outcome :

CO1	Learn the introduction and classification of dyes, textile fibers
CO2	Know the processes of dyeing and basic operations in dyeing.
CO3	Explaining theories of Color and chemical constitution of Dyes
CO4	To Explore the chemistry of pro-drug and role of medicinal micro biology.
CO5	To understand dosage forms, routes of administration and practical knowledge assay of drug.
CO6	Know the application of biostatistics in drug chemistry.