ACADEMIC (1-BOARD OF STUDIES) SECTION

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Pariksha

या परीक्षा कार्यक्रमाने सर्व संबंधितांचा कल्पनापत्र मंत्रां मंत्रांत कों. डिनर 8 जून 2019 रेलवे संपन्न झालेल्या ४४व्या माहिल विद्या परिषद वैदिकत्विक ऐनवेबिज्या विषय क्र.९१/४४-२०१९ न्या उपविष्यावर प्रस्तुत विद्यापीठात संचलित महाविद्यालयांत विज्ञान व तंबाकू विद्याश्रेणीत पद्धती सर्वविद्यार्थी प्रश्न वर्षाचे C.B.C.S. (Choice Based Credit System) Pattern नुसाराचे अभ्यासांक्रम शैक्षणिक वर्ष २०१९-२० पासून लागू करण्यावरून आहेत.

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

सत्यार्थ पत्रिकेत व अभ्यासांक्रम प्रस्तुत विद्यापीठात www.srtmun.ac.in या संकेतस्थानात उपलब्ध आहेत. तरी सत्यार्थ बाबा ही सर्व संबंधितांचा निर्देशनास आणून घ्यावी.

अभ्यासांक्रम परिषद, विद्युपुरी, नांदेड - ४३१ ६०६.
आ.क्र.: शैक्षणिक-०९/परिषद/पद्धती-संबंधितांत्र्यामूळे/अभ्यासांक्रम/ २०१९-२०/२९२

dinakar : ०३.०६.२०१९.

प्रत माहिलीं को मुखी कार्यावस्था:
1) मा. कुलसंचित याचे कायतिक, प्रस्तुत विद्यापीठ.
2) मा. संसाधन, पोषण व मुक्तमाण मंडळ यांचे कायतिक, प्रस्तुत विद्यापीठ.
3) प्रशासन, सर्व संबंधित संचलित महाविद्यालये, प्रस्तुत विद्यापीठ.
4) साहाय्यक कुलसंचित, पद्धतीबाज विभाग, प्रस्तुत विद्यापीठ.
5) उपकुलसंचित, पात्र विभाग, प्रस्तुत विद्यापीठ.
6) सिस्टम एस्प्यूर्ज, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.
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)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Paper No.</th>
<th>Name of the Course</th>
<th>Instruction Hrs/ week</th>
<th>Total period</th>
<th>Internal Evaluation</th>
<th>Marks of Semester</th>
<th>Total Marks</th>
<th>Credits</th>
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<tr>
<td>I</td>
<td>CCDD I (Section A)</td>
<td>Introduction to Dyes, P-I</td>
<td>03</td>
<td>45</td>
<td>10</td>
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<td>I</td>
<td>CCDD I (Section B)</td>
<td>Introduction to Drugs P-II</td>
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</tr>
<tr>
<td>II</td>
<td>CCDD II (Section A)</td>
<td>Introduction to Dye Intermediates, P-III</td>
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<tr>
<td>II</td>
<td>CCDD II (Section B)</td>
<td>Dosage forms, Purity of Drugs and Biostatistics, P-IV</td>
<td>03</td>
<td>45</td>
<td>10</td>
<td>40</td>
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<td></td>
<td>CCDD P-I (CCDD-I &amp; II), (section A&amp;B)</td>
<td>Practical’s based on Section A &amp; Section B of (CCDD-I &amp; II) (P-V)</td>
<td>04 20 Practicals</td>
<td>20</td>
<td>80</td>
<td>100</td>
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</tbody>
</table>

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.
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.

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.

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.
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, Cammarata 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 protozones 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
UNIT I

1. Study of raw material used in dye industries.  
   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:  
   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):  
   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) napthonic 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 (qimionoid theory) and Us 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.
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

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) Arithmatic 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) Arithmatic
      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) Periods: 1200

Marks: 100

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-napthol  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;
9. Synthetic Drugs By Rajbir Singh
10. Synthetic Drugs by Dr. Gurdeep R. Chatwal
11. Synthetic Drugs by S.K. Agarwal Publisher
13. Practical Pharmaceutical Chemistry – I By Dr. A. V. Kasture, Dr. S. G. Wadodkar,
    Mr. S. B. Gokhale
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:**

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