॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with'B++' grade

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विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत राष्ट्रीय शैक्षणिक धोरण २०२० नुसार पदवी द्वितीय वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, दिनांक २७ मे २०२५ रोजी संपन्न झालेल्या मा. विद्यापरिषद बैठकीतील विषय क्रमांक १६/६१–२०२५ च्या ठरावानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील राष्ट्रीय शैक्षणिक धोरण–२०२० नुसारचे पदवी द्वितीय वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्यास मा. विद्यापरिषदेने मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील बी. एस्सी द्वितीय वर्षाचे खालील विषयाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्यात येत आहेत.

01	B.Sc. II year Zoology
02	B.Sc. II year Chemistry (General)
03	B.Sc. II year Biotechnology (Vocational)
04	B.Sc. II year Dyes & Drugs
05	B.Sc. II year Biotechnology
06	B.Sc. II year Bioinformatics

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.:शै–१/एनइपी/विवत्रंविपदवी/२०२५–२६/134
दिनांक १६.०६.२०२५

सहाय्यक कुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत : माहितीस्तव तथा कार्यवाहीस्तव.

१) मा. कुलगुरू महोदयांचे कार्यलय, प्रस्तुत विद्यापीठ.
२) मा. प्र. कुलगुरू महोदयांचे कार्यलय, प्रस्तुत विद्यापीठ.
३) मा. आधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
४) मा. संचालक, परीक्षा व मुंल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
५) मा. प्राचार्य, सर्व संबधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
६) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, परिपत्रक अभ्यासक्रम संकेतस्थळावर प्रसिध्द करण्यात यावेत.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED - 431 606 (MS)

UNDERGRADUATEPROGRAMMEOF

SCIENCE & TECHNOLOGY

B.Sc.SECOND YEAR

SUBJECT–Dyes and Drugs

With EffectivefromtheAcademic Year2025-2026

(As per NEP-2020)

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

Credit Framework for B.Sc.II Year

Multidisciplinary Degree Program with Multiple Entry and Exit

Subject: Dyes and Drugs (Major) / Dyes and Drugs (Minor)

Year & Level	Semester	**Major** *(From the same Faculty)*	**Minor 1** *(From the same Faculty)*	**(Minor 2)** *(From the same Faculty)*	**Generic Elective (GE)** (select from **Basket 3** of *Faculties other than Science and Technology*)	**Vocational & Skill Enhancement Course**	**Ability Enhancement Course (AEC)** **(Basket 4)** **Value Education Courses (VEC) / Indian Knowledge System (IKS)** **(Basket 5)** *(Common across all faculties)*	**Field Work / Project/Internship/ OJT/ Apprenticeship / Case Study Or Co-curricular Courses (CCC)** **(Basket 6 for CCC)** *(Common across all faculties)*	Credits
1	2	3	4	5	6	7	8	9	10
2 (5.0)	III	SDYECT1201 (2cr) SDYECT1202 (2cr) SDYECP1201 (2cr) SDYECP1202 (2cr) 8 Credits	SDYEMT1201 (2Cr) SDYEMP1201 (2Cr) 4 Credits		SDYEGE1201 (2cr)	SDYEVC1201 2 Credits	ACEENG1201 (2cr) ACEMIL1201 (2Cr) 4 Credits	CCCXXX1201(2Cr) *(NCC/NSS/SPT(sports)/ CLS(Cultural Studies)/HWS(Health Wellness)/ YGE(Yoga Education) / FIT(Fitness)* 2 Credits	22
	IV	SDYECT1251 (2cr) SDYECT1252 (2cr) SDYECP1251 (2cr) SDYECP1252 (2cr) 8 Credits	SDYEMT1251 (2Cr) SDYEMP1251 (2Cr) 4Credits		SDYEGE1251 (2cr)	SDYEVC1251 2 Credits	ACEENG1201 (2cr) ACEMIL1201 (2Cr) VECEVS1251 (2Cr) 6 Credits		22
	Cum. Cr.	24	16	08	08	08	22	02	44

***Exit option*: UG Diploma in Major Dyes and Drugs and Minor Dyes and Drugs on completion of 88 credits and** additional **4 credits NSQF / internship in Dyes and Drugs**

B. Sc. Second Year Semester III*(Level 5)*

Teaching Scheme

	Course Code	CourseName	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Major	SDYECT1201	**STUDY OF PIGMENTS, AZO AND AZOIC DYES**	02	--	**04**	02	--
	SDYECP1201	**Practical based on SDYECT 1201**	-	02			04
	SDYECT1202	**SYNTHESIS AND APPLICATION OF DRUGS ACTING ON CNS**	02	--	**04**	02	--
	SDYECP1202	**Practical based on SDYECT 1202**	-	02			04
Minor	SDYEMT1201	**Nutrition and Health Education**	02	--	**04**	02	--
	SDYEMP1201	**Practical based on SCHEMT 1201**	-	02			04
Generic Electives *(from other Faculty)*	SDYEGE1201	**(Basket 3)**	02	--	**02**	02	--
Vocational Course (related to Major)	SDYEVC1201	**Prepration of natural dyes from plant vegetable and fruit sources.**	--	02	**02**	--	04
Ability Enhancement Course	AECENG1201	L1 – Compulsory English	02	--	**02**	02	--
Ability Enhancement Course	**ACEMIL1201**	**(MAR/HIN/URD /KAN/PAL)**	02	--	**02**	02	--
(NCC/NSS/SPT(sports)/ CLS(Cultural	**CCCXXX1201**	Select from **Basket 5**	02	--	**02**	02	--

Studies)/HWS(Health Wellness)/ YGE(Yoga Education) / FIT(Fitness) **2 Credits**							
Total Credits			**14**	**08**	**22**	**14**	**16**

B. Sc. Second Year Semester III*(Level 5)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

(For illustration we have considered a paper of 02 credits, 50 marks, need to be modified depending on credits assigned to individual paper)

Subject (1)	**Course Code (2)**	**Course Name (3)**	**Theory**				**Practical**		**Total Col (6+7) Col (8+9) (10)**
			Continuous Assessment (CA)			**ESA**			
			Test I (4)	**Test II (5)**	**Average of T1 & T2 (6)**	**Total (7)**	**CA (8)**	**ESA (9)**	
Major	SDYECT1201	**STUDY OF PIGMENTS, AZO AND AZOIC DYES**	10	10	10	40	--	--	50
	SDYECP1201	**Practical based on SDYECT 1201**	--	--	--	--	20	30	50
	SDYECT1202	**SYNTHESIS AND APPLICATION OF DRUGS ACTING ON CNS**	10	10	10	40	--	--	50
	SDYECP1202	**Practical based on SDYECT 1202**	--	--	--	--	20	30	50

Minor	SDYEMT1201	**Nutrition and Health Education**	10	10	10	40	--	--	50
	SDYEMP1201	**Practical based on SCHEMT 1201**	--	--	--	--	20	30	50
Generic Electives	SDYEGE1201	**(Basket 3)**	10	10	10	40	--	--	50
Vocational Course	SDYEVC1201	**Prepration of natural dyes from plant vegetable and fruit sources.**	--	--	--	--	20	30	50
Ability Enhancement Course	AECENG1201	L1 – Compulsory English	--	--	--	--	20	30	50
Ability Enhancement Course	ACEMIL1201	**(MAR/HIN/URD /KAN/PAL)**	--	--	--	--	20	30	50
(NCC/NSS/SPT(sports)/ CLS(Cultural Studies)/HWS(Health Wellness)/ YGE(Yoga Education) / FIT(Fitness) **2 Credits**	CCCXXX1201	Select from **Basket 5**	10	10	10	40	--	--	50

B. Sc. Second Year Semester IV *(Level 5)*

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Major	SDYECT1251	**STUDY OF DYES FROM SOME IMPORTANT CLASSES**	02	--	**04**	02	--
	SDYECP1251	**Practical based on SDYECT 1201**	-	02			04
	SDYECT1252	**SYNTHESIS AND APPLICATION OF CHEMOTHERAPEUTIC DRUGS**	02	--	**04**	02	--
	SDYECP1252	**Practical based on SDYECT 1202**	-	02			04
Minor	SDYEMT1251	**Dyes in Food and Cosmetics**	02	--	**04**	02	--
	SDYEMP1251	**Practical based on SDYEMT 1251**	-	02			04
Generic Electives *(from other Faculty)*	SDYEGE1251	**(Basket 3)**	02	--	**02**	02	--
Vocational Course (related to Major)	SDYEVC1251	***Oil Technology***	--	02	**02**	--	04
Ability Enhancement Course	AECENG1251	L1 – Compulsory English	02	--	**02**	02	--
Ability Enhancement Course	**ACEMIL1251**	**(MAR/HIN/URD /KAN/PAL)**	02	--	**02**	02	--
(NCC/NSS/SPT(sports)/ CLS(Cultural Studies)/HWS(Health Wellness)/ YGE(Yoga Education) / FIT(Fitness) **2 Credits**	**CCCXXX1251**	Select from **Basket 5**	02	--	**02**	02	--
Total Credits			**14**	**08**	**22**	**14**	**16**

B. Sc. Second Year Semester IV*(Level 5)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

(For illustration we have considered a paper of 02 credits, 50 marks, need to be modified depending on credits assigned to individual paper)

Subject (1)	Course Code (2)	Course Name (3)	Theory				Practical		Total Col (6+7) / Col (8+9) (10)
			Continuous Assessment (CA)			ESA			
			Test I (4)	Test II (5)	Average of T1 & T2 (6)	Total (7)	CA (8)	ESA (9)	
Major	SDYECT1251	**STUDY OF DYES FROM SOME IMPORTANT CLASSES**	10	10	10	40	--	--	50
	SDYECP1251	**Practical based on SDYECT 1201**	--	--	--	--	20	30	50
	SDYECT1252	**SYNTHESIS AND APPLICATION OF CHEMOTHERAPEUTIC DRUGS**	10	10	10	40	--	--	50
	SDYECP1252	**Practical based on SDYECT 1202**	--	--	--	--	20	30	50
Minor	SDYET1251	**Dyes in Food and Cosmetics**	10	10	10	40	--	--	50
	SDYEMP1251	**Practical based on SDYEMT 1251**	--	--	--	--	20	30	50
Generic Electives	SDYEGE1251	**(Basket 3)**	10	10	10	40	--	--	50
Vocational Course (related to Major)	SDYEVC1251	***Oil Technology***	--	--	--	--	20	30	50
Ability Enhancement Course	AECENG1201	L1 – Compulsory English	--	--	--	--	20	30	50

Ability Enhancement Course	**ACEMIL1201**	**(MAR/HIN/URD /KAN/PAL)**	--	--	--	--	20	30	50
(NCC/NSS/SPT(sports)/ CLS(Cultural Studies)/HWS(Health Wellness)/ YGE(Yoga Education) / FIT(Fitness) **2 Credits**	**CCCXXX1201**	Select from **Basket 5**	10	10	10	40	--	--	50

Swami RamanandTeerthMarathwada University, Nanded
Faculty of Science and Technology
B.Sc. Second Year (ThirdSemester)
Subject**: Dyes and Drugs**
STUDY OF PIGMENTS, AZO AND AZOIC DYES

Course Code**: SDYECT 1201**

Credits: 02 **Periods:** 30

Course pre-requisite:

The study of dyes and drugs is important because it underpins a wide range of industries and has significant implications for human health. The worldwide demand for natural dyes is nowadays of great interest due to the increased awareness on therapeutic properties of natural dyes in public. Natural dyes are derived from naturally occurring sources such as plants, insects, animals and minerals.

Dyes and drugs. Both part of the chemical industry, but one might be excused for thinking that they were at opposite ends of the spectrum. Certainly traditional chemical synthesis in the two areas is quite different, as are ideas concerning product purity. However, the two parts are closely linked, much more so than is popularly believed, and the links cannot lie too far in the past, since the chemical industry is not much more than 150 years old. In fact, the pharmaceutical industry grew out of the dye industry just before World War II.

The use of dyes in therapy is again gaining credence today, given the efficacy of light-activated drugs based on dye molecules against drug-resistant organisms. In addition, older drugs developed from dye chromophores may again be of use in the clinic due to the continuing rise of the “Superbugs.

Recent trends in dyes and drugs research include the development of new reactive dyes with improved fixation and fastness properties. Additionally, there's growing interest in using dyes for light-activated drug delivery systems, particularly against drug-resistant organisms. Another area of focus is the synthesis of new dye-based molecules for applications in areas like dye-sensitized solar cells, sensors, and DNA targeting.

Course objectives:

1.Introduction to the field of drugs:

Students will gain a foundational understanding of drug classification, nomenclature, and different routes of administration.

2.Understanding drug mechanisms:

Students will learn about the mechanisms of action of various drugs, including analgesics, antipyretics, and anti-inflammatory agents.

3. In-depth study of chemotherapeutic agents:

The course will cover antibiotics, antivirals, and anti-tuberculosis drugs.

4.Understanding the classification and properties of dyes:

Students will learn about the classification of dyes based on substrate fibers and dyeing methods, as well as their chemical constitution and color theory, according to some documents.

5.Students will learn the dyes used in food and cosmetics.

6.Students will learn the procedures regarding extraction and purification of dyes from various natural sources .

7.Students will learn to make a PPT on natural dyes used in Food and Cosmetics.

8. Students will learn to Preprae of natural dyes from plant vegetable and fruit sources.

Module I
Azo-Dyes – Synthesis and applications : 08 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

Module II
Dyeing and fastness properties of azo dyes : 07 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.

Module III
Azoic Dyes : 08 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.

Module IV

Pigments Chemistry **07 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.

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (ThirdSemester)

Subject**: Dyes and Drugs**

SYNTHESIS AND APPLICATION OF DRUGS ACTING ON CNS **(Theory)**

Course Code**: SDYECT 1202**

Credits: 02 **Periods:** 30

Module I

I. Anaesthetics : **08 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

Module II

I. Study of sedatives and hypnotics and Anticonvulsants 07 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

Module III

I. Study of Tranquillizer (selective Modifiers of CNS) 08 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.

Module IV

I. Study of analgesics, antipyretics 07 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

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (ThirdSemester)

Subject**: Dyes and Drugs**

Practical based on SDYECT 1201 **(Practicals)**

Course Code**: SDYECP1201**

Credits: 02 **Periods:** 30

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1. Preparation of dye intermediates **10hr.**

a. Anthraquinone

b. m-nitroaniline

c. P-Bromo acetanilide

d. Succinic anhydride

e. Sulphanillic acid

f. Benzoquinone g.Nitrobenzene

2. Preparation of dyes : **10hr**

a. Fluorescein

b. Eosin

c. Methyl orange

d. Mordant Yellow

e. Fast green O

f Orange I g.Eosin

3. Estimation of following Aryl amines by using NaNO2 solution. **10hr**

a. Aniline

b. P-Nitroaniline

c. P-chloro aniline

1. .

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (ThirdSemester)

Subject**: Dyes and Drugs**

Practicals based on SDYECT1202

Course Code**: SDYECP1202**

Credits: 02 **Periods:** 30

1.Dyeing methods. **14 hr**

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 dye.

g. Estimation of Ibuprofen (back titration method)

h. Separation of components of natural pigments by paper chromatography (eg chlorophyll). **4hr**

i Strengths, Weaknesses, Opportunities and Challenges of the Dyestuff industry in India .short Project **8hr**

j Make in India - Future Prospects of the Dye Industry PPT **4hr**

Swami RamanandTeerthMarathwada University, Nanded
Faculty of Science and Technology
B.Sc. Second Year (ThirdSemester)
Subject**: Dyes and Drugs (Minor)**
Nutrition and Health Education (Theory)
Course Code**: SDYEMT1201**

Credits: 02 **Periods:** 30

Module I. Nutrition. **7hr**

1.1 Concept, objectives and importance of nutrition

1.2 Basic concept on Food, Nutrition and Nutrients.

1.3 Classification of Food, Classification of Nutrients.

Module II. Basic Food Science. **8hr**

2.1 Concept of balanced diet.

2.2 Importance of balanced Diet

2.3 Components of food.

2.4 Food and nutrition

2.5 Functions of Food

Module III. Food groups. **8hr**

3.1Cereals

3.2 Pulses

3.3Fruits and Vegetables

3.4Milk and milk products

3.5Eggs Meat poultry and fish

3.6 Fats and oils

Module IV. Diet and deficiency diseases. 7hr.

4.1 Defination and concept of diet.

4.2 Deficiency diseases caused by

a) carbohydrates

b) proteins

C)Vitamins**.**

(Discuss any two diseases in details with their symptoms and treatment.)

Referencese:

1 Normal and Therapeutic Nutrition - Robinson & Lawler, 176 edition, Mac Millan Publishers.

2 Textbook of Human Nutrition - Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy, 2nd edition, Oxford & IBH Publishing Co. Pvt. Ltd

3 Dietetics - B Srilakshmi, Tthedition, New Age lntemational Publishers

4 Textbook of Nutrition and Dietetics- Kumud Khanna, Sharda Gupta, Santosh Jain Passi, Rama Seth, Ranjana Mahna & Seema Puri, 2nd edition, latest reprint, Phoenix Publishing House (P) Ltd.

5 Principles of Nutrition and Dietetics, M. Swaminathan,1993, Bappeo 88, Mysore Road, Bangalore

6 Nutrition and Diet Therapy, William; Sue Rodwell (1985),56 edition, Mosbey Co.St. Louis

7 Sadasivan S and ManikamK(2007): Biochemical Methods, 3rd Ed. New Age International (P) Ltd

8 GopalanC , Rama Sastri BV and Balasubramanian SC(2016): Nutritive value of Indian Foods, Indian Council of Medical Research.

9 Anita FP and Abraham P: Clinical Dietetics and Nutrition, 4th Ed. Oxford University Press, Delhi.

10 Dietary Guidelines for Indians – 2024 (New Publication)

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (ThirdSemester)

Subject**:Dyes and Drugs (Minor)**

Practicals Based on SDYEMT 1201 (Practical)

Course Code**: SCHEMP1201**

Credits: 02 **Periods:** 60

Practicals to performe (Any 10)

Planning , preparation and nutritional assesment of diets and Nutrition.

1. Planning and preparation of a balanced diet for a pregnant woman.
2. Diet during complication of pregnancy.
3. Planning and preparation of a balanced diet for a lactating woman
4. Preparation of weaning foods.
5. Planning and preparation of a balanced diet for pre-school child.
6. Balanced diet for school going child. Preparation of packed lunch.
7. Planning and preparation of a balanced diet for adolescence.
8. Planning of meals for adult belonging to different income group.
9. Planning meal for senior citizen.
10. Diet and nutrition surveys: (Identified field area in the specific no. of families)
11. Preparation of visual aids.
12. Field visit to

(a) Observe the working of nutrition and health oriented programmes (survey based result).
(b) Hospitals to observe nutritional deficiencies.

Swami RamanandTeerthMarathwada University, Nanded
Faculty of Science and Technology
B.Sc. Second Year (Third Semester)
Subject**: Dyes and Drugs**
Generic Elective (GE) – Paper III
Application of Natural Dyes.
Course Code**: SDYEGE 1201**

Credits: 02 **Periods:** 30

Module No.	Unit No.		Hrs. Required to cover the contents
1.0		**Natural dyes**	
	1.1	**Introduction**	**08**
	1.2	**Sources**	
	1.3	**Status of Natural Dyes in India**	
	1.4	**Stake Holders of Natural Dyes**	
2.0		**Comparison between Natural and Synthetic dyes.**	**07**
	2.1	**Advantages and disadvantages of natural dyes.**	
	2.2	**Advantages and disadvantages of synthetic dyes.**	
3.0		**Applications of natural dyes in textiles and Printing industry.**	**07**
	3.1	**Introduction**	

	3.2	**Sources**	
	3.3	**Applications in Textile industry**	
	3.4	**Applications in printing industry**	
4.0		**Applications of natural dyes in food and plastic industry**	
	4.1	**Introduction**	**08**
	4.2	**Sources**	
	4.3	**Applications in food industry**	
	4.4	**Applications in plastic industry**	

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (ThirdSemester)

Subject**: Dyes and Drugs**

Prepration of natural dyes from plant vegetable and fruit sources

Course Code**: SDYEVC 1201**

Credits: 02 **Periods:** 60 Hrs

A) Some importance of Natural Dyes. 10hr

B) Prepration of natural dyes from plant vegetable and fruit sources.

1.Blue colour from red cabbage. 04hr.

2.Red colour from beet juice 04hr

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3.Orange colour from Carrot juice. 04hr

4.Green colour from spinach juice. 04hr

5.yellow colour from saffron. 04hr

6.Black colourn from activated charcoal. 04hr

7.Brown colour from coffe or cocoa powder. 04hr.

8.Pink colour from strawberry puree. 04hr

9.Purple colour from bluberry or grape juice. 04hr

B) Identification of different dyes by TLC.(Identification of any Four natural dyes) 04hr.

C) Group discussion on Prepration of natural dyes from plant vegetable and fruit sources. 10hr.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED - 431 606 (MS)

Faculty of Science and Technology

Syllabus

(*As Per NEP- 2020*)

Subject: Dyes and Drugs

B. Sc. Second Year

Semester- IV

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (FourthSemester)

Subject**: Dyes and Drugs**

STUDY OF DYES FROM SOME IMPORTANT CLASSES

Course Code – SDYECT1251

Credits: 02 **Periods:** 30

Mdule I

I. Diphenyl and triphenyl methane dyes : 08 hr

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.

Module II

I. Anthraquinone Dyes : 07hr

1) Introduction and classification of Anthraquinone Dyes

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

Module III

I. Xanthene Dyes: 8hr

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.

Mdule IV

I. Heterocyclic Dyes : 10 hr

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.

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (FourthSemester)

Subject**: Dyes and Drugs**

SYNTHESIS AND APPLICATION OF CHEMOTHERAPEUTIC DRUGS

Course Code – SDYECT1252

Credits: 02 **Periods:** 30

ModuleI

I. Sulphonamides: **08 hr**

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

ModuleII

II. Antimalerials **07hr**

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

ModuleIII

I. Antiseptics: **08 hr**

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

ModuleIV

I. Antibiotics: **07hr**

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

Swami RamanandTeerthMarathwada University, Nanded
Faculty of Science and Technology
B.Sc. Second Year (FourthSemester)
Subject**: Dyes and Drugs**
Practicals based on SDYECT1251

Course Code – SDYECP1251

Credits: 02 **Periods:** 30

1.Preparation of Drug Intermediates. **10hr**

a. 3-methyl-1-phenylpyrazol-5-one

b. Acetyl acetone

c. Ethyl acetoacetate d. Salicylaldehyde

e. 4-hydroxybenzoic acid

2. Preparation of Drugs. **10hr**

a. Chloramine-T

b. Dichloramine-T

c. Methyl salicylate

d. sulphonamide

e. phenacetin

f. Benzocaine

3. Assay of Drugs. **10hr**

a. Aspirin

b. Sulphonamide

c. Paracetamol

d. Chloramine-T

e.Methyl salicylate

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (FourthSemester)

Subject**: Dyes and Drugs**

Practicals based on SDYECT1252

Course Code – SDYECP1252

Credits: 02 **Periods:** 30

1. Tests for Identity and purity of Drugs. **20hr**

a. Analgin,

b. Aspirin,

c. Vitamin C,

d. Pencillin G,

e. Chlorocresol,

f. Chloroform,

g. Chloroquinephosphate,

i. Isoniazide,

h. Cresol

j. sulphadiazine

h. Erythromycin,

2. Qualitative Tests. **10hr**

a. Ephidrine

b. Belladona

c. Nicotine

d. Glucose

g. Protein

e. sucrose

f. Starch

Sami RamanandTeerthM wada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (Fourth Semester)

Subject**: Dyes and Drugs(Minor)**

Dyes in Food and Cosmetics. (Theory)

Course Code**: SDYEMT1251**

Credits: 02 **Periods:** 30

Module I. General introduction to Food Dyes 8hr

1.1 General introduction to Food Dyes

1.2 Food pigments

1.3 Properties and charecterstics of food pigment.

1.4 Study of natural Pigments found in food:(Chlorophyll,Carotenoids,Its structure and applications.

1.5 Introduction,Sources and applications of Anthocyanins

Module II. Study of Natural dyes used in food preparation. 7hr.

2.1 Sources and applications of following natural dyes

A.Turmeric

B.Indigo

C.Tea

D.Acorns

Module III. Study of Synthetic dyes used in food preparation. 8hr

3. 1 Sources and applications of following synthetic dyes

A.Allura Red AC(RED 40)

B.Sunset Yellow FCF (Yellow 6)

C.Erythrosine

Module IV. Natural Dyes used in Cosmetics industry. 7hr.

4.1 Introduction to cosmetics.

4.2 Natural Dyes used in cosmetics :Introduction scope and application

a.Turmeric

b.Hibiscus

c.Paprika

d.Pomegranate

4.3 Advantages of natural dyes over synthetic dye in food preparation.

Reference Books:

1. Flavor Research: Principles and Techniques, R. Teranishi, I. Hornstein, P. Issenberg, and E. L. Wick
2. Principles of Food Science Part I: Food Chemistry, edited by Owen R. Fennema Part II: Physical Methods of Food Preservation, Marcus Karel, Owen R. Fennema, and Daryl B. Lund
3. Protein Quality and the Effects of Processing, edited by R. Dixon Phillips and John W. Finley
4. Omega-3 Fatty Acids in Health and Disease, edited by Robert S. Lees and Marcus Karel 38. Food Emulsions: Second Edition, Revised and Expanded, edited by KlJre Larsson and Stig E. Friberg 3
5. Handbook of Food Engineering, edited by Dennis R. Heldman and Daryl B. Lund.
6. Fatty Acids in Foods and Their Health Implications, edited by Ching Kuang Chow.
7. Chemistry lab manual –Laxmi publication.
8. Gordon PF, Gregory P (1987) Organic chemistry in colour. Springer, Berlin.
9. Chakraborty JN (2010) Colouring materials. In: Chakraborty JN (ed) Fundamentals and practices in colouration of textiles New Delhi. Woodhead Publishing, India
10. .Synthetic Dyes –Gurdeep Chatwal.

Swami RamanandTeerthMarathwada University, Nanded
Faculty of Science and Technology
B.Sc. Second Year (FourthSemester)
Subject**: Dyes and Drugs (Minor)**
Practicals Based on SDYEMT 1251

Course Code**: SDYEMP 1251**

Credits: 02 **Periods:** 60

A.Extraction and purification of dyes from various natural sources using following steps.

a. Introduction
b. Gathering Materials
c. To Make the Dye-Bath
d. Preparing the Fibers
e. Dyeing.

Dyes to be used.
A.Turmeric

B.Indigo

C.Tea

D.Acorns.

B.To make a PPT on natural dyes used in Food and Cosmetics from students and seminars reletead to ppt.(At least two)

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (Fourth Semester)

Subject**: Dyes and Drugs**

Generic Elective (GE) – Paper IV

Nutrition and Balanced Diet

Course Code**: SDYEGE 1251**

Credits: 02 **Periods:** 30

1.0		Basics of Nutrition	
	1.1	**Introduction concepts in nutrition, including definitions, malnutrition (under and over).**	**08**
	1.2	**nutrition in health, factors affecting food choices**	
	1.3	**nutrient classifications**	
	1.4	**food group classifications by origin.**	
2.0		**Components of Balanced Diet.** **A.Carbohydrates**	**07**
	2.1	**Introduction**	
	2.2	**sources.**	
	2.3	**Functions.**	
	2.4	**Deficiency diseases.**	
3.0		**B.Fatsand Protiens .**	
	3.1	**Introduction**	**07**
	3.2	**sources.**	
	3.3	**Functions.**	
	3.4	**Deficiency diseases.**	

4.0		**Vitamins**	
	4.1	**Introduction**	**08**
	4.2	**sources.**	
	4.3	**Functions.**	
	4.4	**Deficiency diseases.**	

Text Books and Reference Books:

1.Textbook of Medical Biochemistry Dinesh Puri, Elsevier 3rd ed, 2011

2 Concise Medical Biochemistry Sucheta P Dandekar., Elsevier 3rd ed, 2010

3 Essentials of Biochemistry Pankaja Naik, Jaypee 1st ed, 2012

4 Biochemistry for B.Sc. Nursing students Harbans Lal, CBS Pub. 2nd ed, 2010

5 Biochemistry for Nurses S M Raju, Jaypee 1st ed, 2004.

6 Biochemistry for Nurses Jacob Anthikad, Jaypee 2nd ed, 2004. 7 Medical Biochemistry for Nurses Dr. Shweta Singla, Kumar Publishing House. 1st ed, 2010

RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

B.Sc. Second Year (Fourth Semester)

Subject: Dyes and Drugs

Limit test and identification test of pharmaceutical samples

Course Code: SDYEVC-1251

Credits: 02 **Periods:** 60 Hrs

A.Lmit test: Concept,theory and examples.	**10hr**
B.Identification test: Concept,theory and examples.	**10hr**
C.To perform limit test and identification test of following samples.	**40 hr.**

1. To perform a limit test for sulphate in a given sample of sodium dihydrogen phosphate dihydrate.
2. To perform a limit test for sulphate in a given sample of sodium citrate.
3. To perform a limit test for sulphate in a given sample of sodium bicarbonate.
4. To perform the limit test for chloride in a given sample of sodium acetate.
5. To perform the limit test for chloride in a given sample of sodium bicarbonate
6. To perform the identification tests for the given sample of ammonium chloride .
7. To perform the identification test of ammonium chloride.
8. To perform the identification test of sodium chloride
9. To perform the identification test of sodium bicarbonate.

Course Outcomes:

1.Understanding of drug classification, nomenclature, and administration routes:

Students will be able to classify drugs, understand their nomenclature, and be familiar with different routes of administration.

2. **Knowledge of drug synthesis:**

Students will learn about the synthesis of various drug intermediates and drugs.

3.Understanding of drug mechanisms:

Students will be able to explain the mode of action of different drug classes.

4.Application of knowledge to specific drug classes:

Students will be able to apply their knowledge to analgesics, antipyretics, antidiabetics, and anti-inflammatory drugs.

5.Students will be ready for Planning , preparation and nutritional assesment of diets and Nutrition.

6.Students will be ready to Observe the working of nutrition and health oriented programmes (survey based result).

7.Students will be able to make a PPT on natural dyes used in Food and Cosmetics.

8.Students will learn the procedures regarding extraction and purification of dyes from various natural sources .

9. Students will be able to Prepare of natural dyes from plant vegetable and fruit sources.

.10 Understanding of dye properties and applications:

Students will be able to explain the properties of dyes, including their classification, and how they are applied to different substrates.

11.Knowledge of synthetic and natural dyes:

Students will be able to differentiate between synthetic and natural dyes and understand their uses.

12.Familiarity with fiber types and dye application:

Students will learn about the types of fibers and how dyes are applied to them.

13.Understanding of Witt's theory and complementary color theory:

Students will understand these concepts related to color and chemical compounds, according to some documents.

14.Knowledge of unit processes and dye intermediates:

Students will be able to explain commercially important processes like nitration, sulfonation, and diazotization.