

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's
New Arts, Commerce and Science College
Ahmednagar (Autonomous)
(Affiliated to Savitribai Phule Pune University, Pune)



National Education Policy (NEP)
Choice Based Credit System (CBCS)

Programme Framework and Syllabus for

Open Elective: Chemistry

खुला वैकल्पिक विषय: रसायनशास्त्र

(For Students of Arts and Science Faculty)

(कला व वाणिज्य शाखेतील विद्यार्थ्यांकरिता)

Implemented from

Academic Year 2024-25

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's
New Arts, Commerce and Science College, Ahmednagar
(Autonomous)

Board of Studies in Chemistry

Sr. No.	Name	Designation
1.	Prof. Dr. D. R. Thube	Chairman
2.	Asso. Prof. P. S. Mutkule	Member
3.	Asso. Prof. S. B. Dare	Member
4.	Dr. S. J. Takate	Member
5.	Asst. Prof. P. B. Gaikwad	Member
6.	Asst. Prof. A. V. Karande	Member
7.	Dr. N. R. Dhattrak (SPPU)	Vice-Chancellor Nominee
8.	Dr. B. B. Shingate (BAMU, Aurangabad)	Academic Council Nominee
9.	Dr. S. S. Kolekar (Shivaji University, Kolhapur)	Academic Council Nominee
10.	Dr. P. C. Mhaske (S. P. College, Pune)	Alumni
11.	Dr. D. N. Sawant (NCL, Pune)	Industry Expert

1. Prologue/ Introduction of the programme:

Academics and research in India is a priority which depends upon the quality of education. Quality higher education includes innovations that can be useful for efficient governance of higher education institutions, systems and society at large. Fundamental approach to learning outcome-based curriculum emphasizes upon demonstration of understanding, knowledge, skills, attitudes and values in particular programme of study. This approach is intended to follow flexibility and innovation in design of the programme, its assessment and expect graduate attributes demonstrating the level of learning outcome. It is expected to provide effective teaching – learning strategies including periodic review of the programme and its academic standard. The learning outcome-based curriculum for B.Sc. degree in Chemistry is designed to address the needs of the students with chemistry as the core subject of study. The curriculum is expected to assist in the maintenance of the standard of chemistry degrees/programmes and periodic programme review within a broad framework of agreed/expected graduate attributes qualification descriptors, programme learning outcomes and course-level learning outcomes. The framework is intended to allow flexibility and innovation in programme design, syllabi development, teaching-learning process and quality assessment of students learning levels.

This curriculum for the bachelor-level program in Chemistry is developed keeping in view of the student centric learning pedagogy, which is entirely outcome-oriented and curiosity-driven. To avoid rote-learning approach and foster imagination, the curriculum is more leaned towards self-discovery of concepts. The curriculum focuses on pragmatist approach whereby practical application of theoretical concepts is taught with substantial coverage of practical and field works. The platform aims at equipping the graduates with necessary skills for Chemistry-related careers, careers with general graduate-level aptitude and for higher education in Chemistry and allied subjects. Augmented in this curriculum are graduate attributes including critical thinking, scientific reasoning, moral ethical reasoning, qualification descriptors that are specific outcomes pertinent to the discipline of chemistry, learning outcomes for individual courses, pedagogical methods and assessment methods. While designing syllabus, emphasis is given on the objectively measurable teaching-learning outcomes to ensure employability of the graduates. In line with recent trends in education section, this syllabus foster implementation of modern pedagogical tools and concepts such as flip-class, hybrid learning, MOOCs and other e- learning platforms. The framework is designed such a way to enable the learners implementing the concepts to address the real world problems. The curriculum focuses on issues pertinent to India and also of the west; for example, green chemistry and biomaterials etc. Curriculum are holistic and aim to mould responsible Indian citizen to have reflective thinking, scientific temper, and digital literacy in order to acquire requisite skill to be self-employed entrepreneurial.

2. Programme outcomes for B.Sc. Chemistry

Students enrolled in the program complete a curriculum that exposes and trains students in a full range of essential skills and abilities. They will have the opportunity to master the following objectives.

Programme Outcomes

- To understand the basic facts and concepts in Chemistry
- To understand the importance of Chemistry in daily life.
- To develop a better understanding and reasoning of facts.
- Gain the knowledge of Chemistry through theory and practicals.
- To skill-up for basic analytical tools.
- To skill-up for various laboratory techniques used in pharmaceutical laboratories and chemical industries.
- To make efficient for various spectrometric analyses
- Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.
- Solve the problem and also think methodically, independently and draw a logical conclusion.
- Employ critical thinking and the scientific knowledge to design, carry out, record and analyses the results of chemical reactions.
- Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.
- Find out the green route for chemical reaction for sustainable development.
- To inculcate the scientific temperament in the students and outside the scientific community.
- To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.
- Identify chemical formulae and solve numerical problems.
- Know structure-activity relationship.
- Understand good laboratory practices and safety.

Open Elective/ Generic Elective Framework and Course Distribution:

Subject: Chemistry (For Arts and Commerce Faculty)

Sr. No.	Year	Semester	Level	Course Type	Course Code	Title	Credits
1.	I	I	4.5	OE-01	OE-CH 01 T	Chemistry of Cosmetics	02
2.	I	II	5.0	OE-02	OE-CH 02 P	Practical Chemistry of Cosmetics	02
3.	II	III	5.5	OE-03	OE-CH 03T/P	MNO	02
4.	II	IV	6.0	OE-04	OE-CH 04T/P	MNO	02
Total							08

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Syllabus of Open Elective: Chemistry

Title of the Course: Chemistry of Cosmetics								
Year: I				Semester: I				
Course Type	Course Code	Credit Distribution		Credits	Allotted Hours	Allotted Marks		
		Theory	Practical			CIE	ESE	Total
OE-01	OE-CH 01T	02	00	02	30	15	35	50

Learning Objectives:

Students will-

1. learn basic principles of cosmetic chemistry.
2. know the manufacturing process.
3. learn formulation of various cosmetic products.

Course Outcomes (Cos):

After the completion of this course, student will be able to-

1. learn basic of cosmetics, various cosmetic formulation, ingredients and their roles in cosmetic products.
2. learn the use of safe, economic and body-friendly cosmetics.
3. prepare new innovative formulations.

Detailed Syllabus:

Unit 1: Cosmetics (04)

Definition, History, Classification, Ingredients, Nomenclature, Toxicity, Regulations.

Unit 2: Face Preparation (06)

Structure of skin, Face powder, Compact powder, Talcum powder.

Unit 3: Skin Preparation (05)

Face cream, vanishing cream, cold cream, suntan cream, lather shaving cream

Unit 4: Hair preparation (06)

Structure of hair, classification of hair, Hair dye- classification – temporary, semi-permanent, permanent formulation, hair sprays, shampoo- types, conditioners.

Unit 5: Coloured preparation (04)

Structure of nail, Nail paint preparation, Nail lacquers, Nail polish remover, Lipsticks

Unit 6: Personal hygiene products (05)

Antiperspirants and deodorants, oral hygiene products, fragrances and essential oils.

Suggested Readings / Materials:

1. Barel A. O.; Paye, M.; Maibach, H. I., Handbook of Cosmetic Science and Technology, CRC Press, 2014.
2. Garud A.; Sharma, P. K.; Garud, N. Text Book of Cosmetics, Pragati Prakashan, 2012.
3. Gupta P. K.; Gupta S. K., Pharmaceutics and Cosmetics, Pragati Prakashan 2011.
4. Butler, H. Poucher's Perfumes, Cosmetic and Soap, Springer, 2000.
5. Kumari R. Chemistry of Cosmetics, Prestige Publisher, 2018.
6. Flick, E. W. Cosmetic and toiletry formulations, Noyes Publications / William Andrew Publishing, 1990.
7. Natural Ingredients for Cosmetics; EU Survey 2005.
8. Formulation Guide for cosmetics; The Nisshin Oillio Group, Ltd.
9. Functional Ingredients and Formulated Products for Cosmetics and Pharmaceuticals; NOF Corporation.
10. Cosmetics – Formulation, Manufacture and quality control, P. P. Sharma, 4th edition
11. Handbook of cosmetic science and Technology A. O. Barel, M. Paye and H. I. Maibach. 3rd edition
12. “Cosmetic and Toiletries recent suppliers” catalogue.
13. CTFA Directory

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Syllabus of Open Elective: Zoology

Title of the Course: Practical Chemistry of Cosmetics								
Year: I				Semester: II				
Course Type	Course Code	Credit Distribution		Credits	Allotted Hours	Allotted Marks		
		Theory	Practical			CIE	ESE	Total
OE-02	OE-CH 02 P	00	02	02	60	15	35	50

Learning Objectives:

Students will-

1. learn basic principles of cosmetic chemistry.
2. know the manufacturing process
3. learn formulation of various cosmetic products.

Course Outcomes (Cos):

After the completion of this course, student will be able to-

1. learn basic of cosmetics, various cosmetic formulation, ingredients and their roles in cosmetic products.
2. learn the use of safe, economic and body-friendly cosmetics.
3. prepare new formulations.

Detailed Syllabus:

Perform any twelve experiments-

1. Preparation of Shampoo
2. Preparation of Cold cream
3. Preparation of Lipsticks
4. Preparation of Vanishing cream
5. Preparation of Floor cleaners
6. Preparation of Talcum powder.
7. Preparation of Enamels.
8. Preparation of Face cream.
9. Preparation of Nail polish and nail polish remover.
10. Preparation of Hand wash
11. Preparation of Hand sanitizer
12. Preparation of Body lotion
13. Preparation of Soap
14. Preparation of Tooth powder
15. Preparation of Tooth paste

Suggested Readings / Materials:

1. Barel A. O.; Paye, M.; Maibach, H. I., Handbook of Cosmetic Science and Technology, CRC Press, 2014.
2. Garud A.; Sharma, P. K.; Garud, N. Text Book of Cosmetics, Pragati Prakashan, 2012.
3. Gupta P. K.; Gupta S. K., Pharmaceutics and Cosmetics, Pragati Prakashan 2011.
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9. Functional Ingredients and Formulated Products for Cosmetics and Pharmaceuticals; NOF Corporation.