



Re- accredited with A ++ Grade (CGPA 3.65) by NAAC
Category- I University Status awarded by UGC

No. 2026/June/AAMS/C- 161/48209

Date: 5th June, 2026

CIRCULAR:-

Attention of all the Principals of the Affiliated Colleges, all Academic Heads of University Departments, the Directors of the Recognized Institutions/Centres, Director, Centre for Distance & Online Education, Director, Dharmaveer Anand Dighe Thane Sub-Campus, Co-ordinator, School of Engineering and Applied Sciences, Kalyan Sub-Campus, Director, Chitrakar Padmabhushan Dr.Dhananjay Keer Ratnagiri Sub-Campus, Director, Sindhudurg Sub-Campus, Principal, Vishwabhushan Bharatratna Dr. B. A. Ambedkar College, Ambadave, Ratnagiri and Principal, V.V. Dalvie College, Talere, Sindhudurg is invited to this office Circular No. AAMS/ICD/2025-26/ 37 of dated 27 May, 2025 relating to the NEP UG Syllabus.

They are hereby informed that the recommendations made by the **Board of Studies in Chemistry** at its meeting held on 28th March, 2026 and subsequently passed by the Board of Deans at its meeting held on 15th May, 2026 vide item No.1 (c) have been accepted by the Academic Council at its meeting held on 18th May, 2026 vide item No.6.3 (N). In accordance therewith syllabus of **B.Sc. (Chemistry) (Scheme - III) (Sem V & VI) (NEP 2020)** is introduced as per appendix with effect from the academic year 2026-27.

(The said circular is available on the University's website www.mu.ac.in).

MUMBAI – 400 032

05th June, 2026

To


(Dr. Prasad Karande)
REGISTRAR

All the Principals of the Affiliated Colleges, all Academic Heads of Departments, the Directors of the Recognized Institutions/Centres, Director, Centre for Distance & Online Education, Director, Dharmaveer Anand Dighe Thane Sub-Campus, Co-ordinator, School of Engineering and Applied Sciences, Kalyan Sub-Campus, Director, Chitrakar Padmabhushan Dr.Dhananjay Keer Ratnagiri Sub-Campus, Director, Sindhudurg Sub-Campus, Principal, Vishwabhushan Bharatratna Dr. B. A. Ambedkar College, Ambadave, Ratnagiri and Principal, V.V. Dalvie College, Talere, Sindhudurg

AC./6.3 (N)/18/5/2026

Copy forwarded with Compliments for information to:-

- 1) The Chairman, Board of Deans,
- 2) The Dean, Faculty of Science,
- 3) The Chairman, **Board of Studies in Chemistry**
- 4) The Director, Board of Examinations and Evaluation,
- 5) The Director, Department of Students Development,
- 6) The Director, Department of Information & Communication Technology,
- 7) The Director, Centre for Distance and Online Education (CDOE)Vidyanagari,
- 8) The Deputy Registrar, Admission, Enrolment, Eligibility & Migration Department (AEM).

As Per NEP 2020

University of Mumbai



Syllabus for Major Vertical – 1, 4 & 6 (Scheme – III)

Faculty of Science & Technology		
Board of Studies in Chemistry		
Name of the Programme – B.Sc. (Chemistry)		
U.G. Third Year Programme	Exit Degree	B.Sc. (Chemistry)
Semester	V & VI	
From the Academic Year	2026-27	

University of Mumbai



(As per NEP 2020)

Sr. No.	Heading	Particulars
1	Title of program O: _____	B.Sc. (Chemistry)
2	Exit Degree	B.Sc. (Chemistry)
3	Scheme of Examination R: _____	NEP 40% Internal 60% External, Semester End Examination Individual Passing in Internal and External Examination
4	Standards of Passing R: _____	40%
5	Credit Structure R: SU- 525 E (III) R: SU- 525 F (III)	Attached herewith
6	Semesters	Sem. V & VI
7	Program Academic Level	5.5
8	Pattern	Semester
9	Status	New
10	To be implemented from Academic Year	2026-27

Sd/-
Sign of the BOS
Dr. Sunil Patil
Co-ordinator
BOS in Chemistry

Sd/-
Sign of the
Offg. Associate Dean
Dr. Madhav R. Rajwade
Faculty of Science &
Technology

Sd/-
Sign of the Offg. Dean
Prof. Shivram S. Garje
Faculty of Science &
Technology

Credit Structure (Sem. V & VI)

	R: SU- 525 E (III)									
Vertical		1	2		3	4	5	6		
Level	Semester	Major 1	Major 2 (Minor)	Major 3 (Minor)	OE	VSC, SEC (VSEC)	AEC, VEC, IKS	OJT, FP, CEP, CC,RP	Cum. Cr. / Sem.	Degree/ Cum. Cr.
		M1	M2	M3						
5.5	V	10+4 (Mandatory + Elective) Advanced Physical and Analytical Chemistry - Paper I (2) Advanced Analytical and Inorganic Chemistry – Paper II (2) Advanced Inorganic and Organic Chemistry – Paper III (2) Practicals in Advanced Chemistry – I (2) IKS in Chemistry (2) Elective Drugs and Dyes / Heavy and Fine Chemicals/ Petrochemicals – I (2) Practicals in Drugs and Dyes / Heavy and Fine Chemicals/ Petrochemicals – I (2)	2	----	----	VSC (Practical) : 2 Techniques in Chemical Analysis and Synthesis (2)	----	CC:2 CEP:2	22	UG Degree 132
R: SU- 525 F (III)										

	VI	14+4 (Mandatory + Elective) Advanced Physical and Analytical Chemistry - Paper IV (2) Advanced Analytical and Inorganic Chemistry – Paper V (2) Advanced Inorganic and Organic Chemistry – Paper VI (2) Practicals in Advanced Chemistry II (2) Practicals in Advanced Chemistry III (2) Elective Drugs and Dyes / Heavy and Fine Chemicals/ Petrochemicals – II (2) Practicals in Drugs and Dyes / Heavy and Fine Chemicals/ Petrochemicals – II (2)	----	----	----	----	----	OJT :4	22	
	Cum Cr.	52	18	8	10	8+2+2	6+4+2	8+6+4	132	
Exit option: Award of UG Degree in Major with 132 credits OR Continue with Major										

[Abbreviation - OE – Open Electives, VSC – Vocation Skill Course, SEC – Skill Enhancement Course, (VSEC), AEC – Ability Enhancement Course, VEC – Value Education Course, IKS – Indian Knowledge System, OJT – on Job Training, FP – Field Project, CEP – Community Engagement Project, CC – Co-Curricular, RP – Research Project]

[* 2 Credit IKS Major paper (Core Subject Specific Theory may be included in Sem III or V)]

Program Structure for Sem. V & VI (NEP 2020)

Vertical No		Paper Title	Credits
Sem. V			
1.	Mandatory	1. Advanced Physical and Analytical Chemistry - Paper I	2
		2. Advanced Analytical and Inorganic Chemistry – Paper II	2
		3. Advanced Inorganic and Organic Chemistry – Paper III	2
		4. Practicals in Advanced Chemistry - I	2
		5. IKS in Chemistry	2
	Electives	1. Drugs and Dyes / Heavy and Fine Chemicals/ Petrochemicals – I	2
		2. Practicals in Drugs and Dyes / Heavy and Fine Chemicals/ Petrochemicals - I	2
2.	Minor (To be selected from other discipline)		4 (2+2)
4.	VSC (Practical)	Techniques in Chemical Analysis and Synthesis	2
6.	CEP (To be selected from CEP topic list)		2
Credits			22
Sem. VI			
1.	Mandatory	1. Advanced Physical Chemistry – Paper IV	2
		2. Advanced Inorganic Chemistry – Paper V	2
		3. Advanced Organic Chemistry – Paper VI	2
		4. Advanced Analytical Chemistry – Paper VII	2
		5. Practicals in Advanced Chemistry - II	2
		6. Practicals in Advanced Chemistry - III	2
		7. Practicals in Advanced Chemistry - IV	2
	Electives	1. Drugs and Dyes / Heavy and Fine Chemicals/ Petrochemicals – II	2
		2. Practicals in Drugs and Dyes / Heavy and Fine Chemicals/ Petrochemicals - II	2
6.	VI	OJT	4
Credits			22
Total Credits			44

VSC (2) (Practical)

Syllabus B. Sc. (Chemistry) (Sem.- V)

Title of Paper : Techniques in Chemical Analysis and Synthesis

Sr. No.	Heading	Particulars
1	Description of the course : Including but Not limited to :	Techniques in Chemical Analysis and Synthesis provides practical training in separation of organic compounds, organic synthesis, and quantitative chemical analysis using instrumental and non-instrumental techniques. The course develops skills in systematic separation of binary organic mixtures, purification and characterization of compounds, and synthesis using conventional and green chemistry approaches. It also includes spectrophotometric, pH-metric, colorimetric and titrimetric methods for estimation of analytes in pharmaceutical and industrial samples. Emphasis is placed on experimental accuracy, yield determination, data interpretation and application of good laboratory practices relevant to research and chemical industries.
2	Vertical :	VSC
3	Type :	Practical
4	Credit:	2 credits
5	Hours Allotted :	60 Hours
6	Marks Allotted:	50 Marks
7	Course Objectives: The course aims to: COB1: Develop understanding of principles involved in separation of binary organic mixtures based on solubility and acid–base properties. COB2: Provide knowledge of systematic separation schemes and selection of suitable reagents for isolation of organic compounds.	

	COB3: Develop skills in identification of organic compounds using functional group characteristics and determination of percentage yield. COB4: Introduce instrumental analytical techniques such as spectrophotometry, pH-metry and colorimetry for quantitative analysis. COB5: Provide training in volumetric analytical methods such as redox, precipitation and complexometric titrations. COB6: Develop analytical ability for quantitative determination of pharmaceutical and industrial analytes using appropriate chemical methods.
8	Course Outcomes: At the end of the course, students will be able to: CO1: Classify components of binary organic mixtures as acidic, basic or neutral using solubility behaviour and functional group properties. CO2: Apply systematic separation scheme to isolate components from at least six binary organic mixtures using appropriate reagents. CO3: Identify separated organic component using characteristic functional group tests and calculate percentage yield of the second component. CO4: Determine concentration of analytes such as fluoride, vitamin C and dextrose using spectrophotometric, pH-metric and colorimetric methods with appropriate calculations. CO5: Estimate Fe(II), chloride and magnesium using redox, precipitation and complexometric titration methods and calculate quantitative results. CO6: Select appropriate analytical method based on chemical properties of the analyte and justify the choice using experimental results.
9	Modules: Module 1: 1.1 Separation of Binary solid-solid mixture (2.0 gms mixture to be given) (Minimum 6 mixtures) - Each student shall complete the analysis of a minimum of six binary organic mixtures. - The components of the mixtures shall include water-soluble and water-insoluble carboxylic acids, water-insoluble phenols (1-naphthol and 2-naphthol), water-insoluble bases (nitroanilines), water-soluble neutral compounds (thiourea), and water-insoluble neutral compounds such as anilides, amides, m-dinitrobenzene, and hydrocarbons. - After identification of the chemical nature of the components, the appropriate separating reagent shall be selected by the student. - The systematic separation scheme shall then be carried out using the bulk sample of the given binary mixture.

	v) Upon separation into Component A and Component B, one component (as assigned by the examiner) shall be identified, while the yield of the other component shall be determined.		
	Module 2:		
	Instrumental: 1. Spectrophotometric analysis of fluoride in the given sample solution 2. Estimation of Vitamin C in a tablet by pH-metric titration with NaOH (Standardization is expected) 3. Colorimetric estimation of Dextrose Non-instrumental: 4. Estimation of Fe (II) against Cerium (IV) in tablet using diphenylamine indicator. 5. Determination of chloride content in saline sample using Mohr's method. Estimation of Magnesium content in talcum powder by complexometry using standardized EDTA solution.		
10	Reference Books: Module 1 : Organic Chemistry 1. Furniss, Hannaford, Smith & Tatchell, Vogel's Textbook of Practical Organic Chemistry, Pearson Education, 5th Edition, 1989 2. F. G. Mann & B. C. Saunders, Practical Organic Chemistry, Pearson Education, 4th Edition, 2009 3. John C. Gilbert & Stephen F. Martin, Experimental Organic Chemistry—Cengage Learning, 5th Edition, 2011 4. O. P. Agarwal, Practical Organic Chemistry, Krishna Prakashan Media (P) Ltd, 2014 Module 2: Analytical Chemistry 1. Vogel, A. I. Vogel's Textbook of Quantitative Chemical Analysis, 6th ed.; Pearson Education: London, 2000. 2. Harris, D. C. Quantitative Chemical Analysis, 9th ed.; W. H. Freeman and Company: New York, 2016. 3. Mendham, J.; Denney, R. C.; Barnes, J. D.; Thomas, M. J. K. Vogel's Quantitative Chemical Analysis, 6th ed.; Pearson Education: New Delhi, 2000. 4. Fifield, F. W.; Kealey, D. Principles and Practice of Analytical Chemistry, 5th ed.; Blackwell Science: Oxford, 2000. 5. Day, R. A.; Underwood, A. L. Quantitative Analysis, 6th ed.; Prentice Hall: New Delhi, 1991. 6. Jeffery, G. H.; Bassett, J.; Mendham, J.; Denney, R. C. Vogel's Textbook of Quantitative Chemical Analysis, 5th ed.; Longman Scientific: London, 1989.		
11	<table border="1"> <tr> <td data-bbox="264 1654 868 1770">Internal Continuous Assessment: 40%</td> <td data-bbox="868 1654 1451 1770">External, Semester End Examination 60% Individual Passing in Internal and External Examination</td> </tr> </table>	Internal Continuous Assessment: 40%	External, Semester End Examination 60% Individual Passing in Internal and External Examination
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QUESTION PAPER PATTERN (External)

Time: 1 Hour

Marks: 30

N.B.:

1. All Questions are Compulsory.
2. Draw neat and labelled diagrams wherever necessary.

Q. No	Type	Marks	Module
Q.1	Multiple Choice Question / Fill in the Blanks (Any 5 out of 10) (5 from each Module)	5	1 & 2
Q.2	Answer in 1–2 Sentences: (Any 5 out of 10) (5 from each Module)	5	1 & 2
Q.3	Answer any 2 of the following. (Any 2 out of 4)	10	1
Q.4	Answer any 2 of the following. (Any 2 out of 4)	10	2

Letter Grades and Grade Points:

Semester GPA/ Programme CGPA Semester/ Programme	% of Marks	Alpha-Sign/ Letter Grade Result	Grading Point
9.00 - 10.00	90.0 - 100	O (Outstanding)	10
8.00 - < 9.00	80.0 - < 90.0	A+ (Excellent)	9
7.00 - < 8.00	70.0 - < 80.0	A (Very Good)	8
6.00 - < 7.00	60.0 - < 70.0	B+ (Good)	7
5.50 - < 6.00	55.0 - < 60.0	B (Above Average)	6
5.00 - < 5.50	50.0 - < 55.0	C (Average)	5
4.00 - < 5.00	40.0 - < 50.0	P (Pass)	4
Below 4.00	Below 40.0	F (Fail)	0
Ab (Absent)	-	Ab (Absent)	0