University of Mumbai

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

No. AAMS_UGS/ICC/2025-26/75 Date: 23rd July, 2025

CIRCULAR:-

Attention of all the Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Head, University Departments is invited to this office Circular No. AAMS_UGS/ICC/2024-25/115 dated 23rd August, 2024 relating to the introduction of the syllabus of M3 Pattern (Scheme –III) Major 4 Credits of Science Programs.

They are hereby informed that the recommendations made by the Board of Studies in Chemistry and subsequently passed by the Board of Deans at its meeting held on 19th May, 2025 vide item No. 6.1 (R) have been accepted by the Academic Council at its meeting held on 20th May, 2025 vide item No. 6.70 (R) and that in accordance therewith revised syllabus for **B.Sc. (Chemistry) (Scheme –III) (Sem – I & II)** (NEP 2020) with revision of VSC & SEC as per appendix with effect from the academic year 2025-26.

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

MUMBAI – 400 032
23rd July, 2025

(Dr. Prasad Karande)
REGISTRAR

To,

The Principals of the Affiliated Colleges, Directors of the Recognized Institutions.

AC 6.70 (R)/20/05/2025

Copy forwarded with Compliments for information to:-

1) The Chairman, Board of Deans,
2) The Dean, Faculty of Science & Technology,
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, Admissions, Enrolment, Eligibility & Migration Department (AEM).

AC No.- 20/05/2025
Item No. -6.70 (R)

As Per NEP 2020

University of Mumbai

Revised Syllabus for
B.Sc. (Chemistry)

Syllabus for

Semester – Sem.- I & II

(Scheme – III)

Ref: GR dated 20th April, 2023 for Credit Structure of UG

(With effect from the academic year 2025-26)

University of Mumbai

(As per NEP 2020)

Sr. No.	Heading	Particulars
1	**Title of program** **O:**_____	**B.Sc. (Chemistry)**
2	**Exit Degree**	**U.G. Certificate in 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-525A (III) SU- 525B (III)**	**Attached herewith**
6	Semesters	**Sem. I & II**
7	**Program Academic Level**	**5.00**
8	**Pattern**	**Semester**
9	**Status**	**Revised**
10	**To be implemented from Academic Year**	**2025-26**

Sd/-	**Sd/-**	**Sd/-**
Sign of **Dr. Sunil Patil** **Coordinator,** **Board of Studies in Chemistry**	**Sign of** **Prin. (Dr.) Madhav Rajwade** **Offg. Associate Dean,** **Faculty of Science and Technology**	**Sign of** **Prof. (Dr.) Shivram Garje** **Offg. Dean,** **Faculty of Science and Technology**

5) Credit Structure of the Program (Sem I, II, III, IV, V & VI)

Under Graduate Certificate in Chemistry

Credit Structure (Sem. I & II)

	R: SU-525 A (III)								
Level	**Semester**	**Major**		**Minor**	**OE**	**VSC, SEC (VSEC)**	**AEC, VEC, IKS**	**OJT, FP, CEP, CC, RP**	**Cum. Cr. / Sem.**	**Degree/ Cum. Cr.**
		Mandatory	**Electives**							
4.5	I	4 **M3-1** Basics in Physical, Inorganic and Organic Chemistry I **M3CHP1:** Chemistry Practical 1 **(M3 of other two Subjects of 4 + 4 Credits)**	-	-	-	**VSC:2, VSCCH1:** Laboratory Techniques: Solution Preparation and Calibration of Equipment **SEC:2** Sampling Techniques **OR** Basic Statistical Tools in Chemistry	AEC:2, VEC:2, IKS:2	-	22	**UG Certificate 44**
	R: SU-525 B (III)									
	II	4 **M3-2:** Basics in Physical, Inorganic and Organic Chemistry II **M3CHP2:** Chemistry Practical 2 **(M3 of other two Subjects of 4 + 4 Credits)**			2	**VSC:2, VSCCH2:** Commercial Analysis of Food Samples **SEC:2** Data Analysis in Chemistry **OR** Softwares in Chemistry	AEC:2,	CC:2	22	
	Cum Cr.	24	-	-	2	4+4	4+2+2	2	44	

Exit option: Award of UG Certificate in Major with 40-44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Majorand Minor

Syllabus
B.Sc. (Chemistry)
SEMESTER I

Sr.No.	Heading	Particulars
1	**Description the Course:**	This program is designed to provide a basic understanding of Chemistry. The B.Sc (Chemistry) is framed to equip students with a basic theoretical foundation, practical skills, and critical thinking abilities necessary to address the challenges and opportunities in the diverse fields of the subject. There is continuous evaluation of students based on quizzes, class tests and assignments. Emphasis is given to conceptual understanding of theoretical concepts followed by inclusion of the same in practicals. B.Sc. (Chemistry) programme offers two majors , one minor, VSCs, SECs, IKS, AECs, OEs VEC and CC. After successful completion of the first year B.Sc. programme the learner will be awarded a UG Certificate in Chemistry.
2	**Vertical:**	Major
3	**Type:**	Theory and Practical
4	**Credits:**	Credits per Semester Theory: 2 Credits (1 Credit = 15 Hours for Theory) Practicals: 2 Credits (1 Credit = 30 Hours for Practicals)
5	**Hours Allotted:**	Hours per Semester Theory: 30 Hrs. Practicals: 60 Hrs.
6	**Marks Allotted:**	Marks per Semester Theory: 50 Marks Practicals: 50 Marks
7	**Course Objectives (CO):**	
	CO 1.	To understand the basic concept of viscosity, preparation of solutions, kinetics, rate laws and determination of orders of reactions.
	CO 2.	To understand basic concepts of electrochemistry, thermodynamics and surface tension
	CO 3.	To comprehend the history of atomic structure, periodicity and properties of elements.
	CO 4.	To distinguish the qualitative methods for identification of inorganic compounds; types of chemical bonds in molecule/ compounds and theories.
	CO 5.	To develop critical thinking about different types of organic compounds and about stereochemical approach of organic compounds
	CO 6.	To develop understanding in organic reaction mechanisms, bonding and structure of organic compounds.
8	**Course Outcomes (OC):**	
	OC 1.	The learner will be able to learn concepts related to state of matter and different methods of concentration expressions and rate laws
	OC 2.	The learner will be able to acquire the knowledge related to electrochemistry, thermodynamics and surface tension
	OC 3.	The learner will be able to classify the elements on the basis of theory learnt and will understand the historical perspective of atomic structure.

	OC 4.	The learner will be able to identify different methods of qualitative analysis and various theories of chemical bonds.
	OC 5.	The learner will be able to identify the organic compounds on the basis of nomenclature and stereochemistry
	OC 6.	The learner will be able to exemplify different organic reaction mechanisms and hybridization involved in organic compounds.

9	**Modules**

Semester	Paper	Module	Description	Credits
I	**M3-1** Basics in Physical, Inorganic and Organic Chemistry I	**I**	**Physical Chemistry** 1.1 Liquid State 1.2 Chemical Calculations 1.3 Chemical Kinetics	**02**
		II	**Inorganic Chemistry** 2.1 Atomic Structure 2.2 Periodic Table and Periodicity	
		III	**Organic Chemistry** 3.1 Classification and Nomenclature of Organic Compounds 3.2 Stereochemistry	
	M3CHP1: Chemistry Practical 1		**Practical Component**	**02**
II	**M3-2:** Basics in Physical, Inorganic and Organic Chemistry II	**I**	**Physical Chemistry** 1.1 Liquid State 1.2 Gaseous State 1.3 Electrochemistry 1.4 Chemical Thermodynamics	**02**
		II	**Inorganic Chemistry** 2.1 Concept of Qualitative Analysis 2.2 Chemical Bond and Reactivity	
		III	**Organic Chemistry** 3.1 Fundamentals of Organic Reaction Mechanism 3.2 Bonding and Structure of Organic Compounds	
	M3CHP2: Chemistry Practical 2		**Practical Component**	**02**

Sem. - I

Mandatory

M3-1 Basics in Physical, Inorganic and Organic Chemistry I

Module I	Physical Chemistry (10L)
1.1	**Liquid State - I: (2L)** **Viscosity:** Introduction, coefficient of viscosity, relative viscosity, specific viscosity, reduced viscosity, determination of viscosity by Ostwald viscometer
1.2	**Chemical Calculations: (2L)** Methods of expressing concentration of solutions: Normality, Molarity, Molality, Mole fractions, ppm, ppb. Preparation of solutions (Dilution). (Numerical problems expected wherever necessary)
1.3	**Chemical Kinetics: (6L)** Rate of reaction, rate constant, measurement of reaction rates, order and molecularity of reaction, Integrated rate equation of first order and Second order reactions (with equal initial concentration of reactants) . Determination of order of reaction by a) Integration method b) Graphical method c) Ostwald's isolation method d) Half time method (Numerical problems expected wherever necessary).
Module II	**Inorganic Chemistry (10L)**
2.1	**Atomic Structure: (3L)** **Historical perspectives of the atomic structure;** J.J. Thomson Model, Rutherford's Atomic Model- alpha particle scattering experiment, Bohr's theory, Aufbau principle, Hund's rule of maximum multiplicity and Pauli exclusion principle
2.2	**Periodic Table and Periodicity: (2L)** **Long form of Periodic Table:** Classification for elements as main group, transition and inner transition elements. **Periodicity in the Following Properties (5L)** Atomic and ionic size, electron gain enthalpy, ionization enthalpy, effective nuclear charge (Slater's rule), electronegativity, Pauling and Mulliken methods. (Numerical problems expected, wherever applicable.)
Module III	**Organic Chemistry (10L)**
3.1	**Classification and Nomenclature of Organic Compounds: (5L)** **Nomenclature of mono and bi-functional aliphatic compounds on the basis of priority order of the following classes of compounds:** Alkanes, alkenes, alkynes, haloalkanes, alcohols, ethers, aldehydes, ketones, carboxylic acids.
3.2	**Stereochemistry: (5L)** Projection formulae: Flying Wedge projection, Fischer Projection, Newman and Sawhorse Projection formulae (erythro, threo isomers of tartaric acid and 2,3 - dichlorobutane) and their interconversions; **Geometrical isomerism in alkene**: cis–trans and syn-anti isomerism R/S nomenclature, E/Z notations with C.I.P rules. **Conformational analysis of alkanes** (ethane, and n-butane); Relative stability with energy profile diagrams

M3CHP1: Chemistry Practical 1

Physical Chemistry

1) To prepare 0.1 N succinic acid and standardize the NaOH solution of different concentrations.
2) To standardize Sodium thiosulphate solution.
3) To determine the rate constant for the hydrolysis of ester using HCl as catalyst.
4) Determination of viscosity of aqueous solutions of (i) polymer (ii) ethanol and (iii) sugar at room temperature (Any two solutions).

Inorganic Chemistry

1) Volumetric analysis

a) To determine the strength of commercial acid sample (HCl).
b) To estimate the content of Na_2CO_3 and $NaHCO_3$ in the given sample using double indicator.

2) Gravimetric analysis

a) To determine the percent purity of sample of $BaSO_4$ containing NH_4Cl
b) To determine the percent purity of ZnO containing $ZnCO_3$.

Organic Chemistry

1) Purification of organic compounds by recrystallization selecting suitable solvent (minimum 2 Organic compounds to be given)
   (Students are expected to report a) Solvent for recrystallization. b) Percentage Yield and the melting points of the purified compound.)
2) Basic principles involved in characterization of Organic compound (minimum 4 Solid Organic compounds)
   (Students should perform Preliminary Tests, Solubility Test, obtain melting point and recrystallize the compound with given solvent)

Sem. – II

Syllabus B.Sc. (Chemistry)
SEMESTER II
M3-2: Basics in Physical, Inorganic and Organic Chemistry II

Module I	Physical Chemistry
1.1	**Liquid State - II: (2L)** **Surface tension:** Introduction, methods of determination of surface tension by Drop number method (Numericals expected)
1.2	**Gaseous State (3L)** Kinetic theory of gases, Maxwell-Boltzmann's distribution of velocities (Qualitative discussion), Ideal gas laws, Deviation from ideal gas laws, Ideal and real gases, Reasons for deviation from ideal gas laws, Compressibility factor, Boyle's temperature, van der Waals equation of state (Derivation). (Numericals expected)
1.3	**Electrochemistry (2L)** Conductance, specific conductance, equivalent conductance, molar conductance, Variation of molar conductance with concentration of strong and weak electrolyte. (Numericals expected)
1.4	**Chemical Thermodynamics (3L)** **Thermodynamic Terms:** System, surrounding, boundaries, types of system, Intensive and Extensive properties, Thermodynamic processes. **First law of thermodynamics:** Concept of heat (q), work (w), internal energy (U), enthalpy, heat capacity, relation between heat capacities, sign conventions, calculations of heat, work, internal energy and enthalpy (H) (Numerical problems expected)
Module II	**Inorganic Chemistry**
2.1	**Concept of Qualitative Analysis: (5L)** Testing of Gaseous Evolutes, Role of Papers impregnated with Reagents in qualitative analysis (with reference to papers impregnated with starch iodide, potassium dichromate, lead acetate, dimethylglyoxime and oxine reagents). Precipitation equilibria, Formation of precipitates like AgCl, AgBr, AgI and $BaSO_4$ effect of common ions, uncommon ions, oxidation states, buffer action.
2.2	**Chemical Bond and Reactivity: (5 L)** Types of chemical bond, comparison between ionic and covalent bonds, polarizability (Fajan's Rule), shapes of molecules, Lewis dot structure, Sidgwick Powell Theory, basic VSEPR theory for AB_n type molecules with and without lone pair of electrons, applications and limitations of VSEPR theory.
Module III	**Organic Chemistry**
3.1	**Fundamentals of Organic Reaction Mechanism: (5L)** **Basic terms and concepts**: Homolytic and Heterolytic fission with curly arrows with suitable examples. Electrophiles and Nucleophiles. **Types (primary, secondary, tertiary, allyl, benzyl), shape and their relative stability of the following reactive intermediates**: i. Carbocations ii. Carbanions and iii. Free radicals **Introduction to types of organic reactions:** Addition, Elimination and Substitution reaction. (With one example of each)

3.2	**Bonding and Structure of Organic Compounds: (5L)** **Hybridization:** sp^3, sp^2, sp hybridization of carbon and nitrogen; sp^3 and sp^2 hybridizations of oxygen in Organic compounds (alcohol, ether, aldehyde, ketone, carboxylic acid, ester, cyanide, amine and amide) **Overlap of atomic orbitals:** Overlaps of atomic orbitals to form sigma and pi bonds, shapes of organic molecules. **Shapes of molecules:** Influence of hybridization on bond properties (as applicable to ethane, ethene, ethyne).

Semester II Practical
M3CHP2: Chemistry Practical 2

Physical Chemistry

1) To determine the amount of strong acid in the given solution by titrating against strong base conductometrically.
2) To determine the dissociation constant of weak acid (Ka) using Henderson's equation and the method of incomplete titration pH metrically.
3) To determine enthalpy of dissolution of salt (KNO_3)
4) To standardize commercial sample of HCl using borax and to write material safety data of the chemicals involved.

Inorganic Chemistry

Qualitative analysis of simple salts: (4 mixtures to be analyzed)

Semi-micro inorganic qualitative analysis of a sample containing two cations and two anions (from amongst):

Cations (from amongst): Pb^{2+}, Ba^{2+}, Ca^{2+}, Sr^{2+}, Mg^{2+}, K^+, $NH4^+$

Anions (from amongst): CO_3^{2-}, SO^{2-}, NO_2^-, NO_3^-, Cl^-, Br^-, I^-, SO_4^{2-}, PO_4

(Scheme of analysis should avoid use of sulphide ion in any form for precipitation/ separation of cations.)

Below are the representative mixture combinations, besides these any other combination will also be taken.

Probable mixture combination:

1) $MgSO_4 + KCl$
2) $CaCl_2 + KNO_3$
3) $CaCO_3 + Mg(NO_3)_2$
4) $BaSO_4 + NH_4Cl$

Organic Chemistry

Characterization of organic compounds containing C, H, (O), N, S, X elements (6 solid/liquid Organic compounds)

(Preliminary Tests, Solubility/Miscibility Test, Detection of Elements, Detection of Functional group and determination of Physical constant)

10. Reference Books:

Physical Chemistry

1) Concise Graduate Chemistry – I, II, III & IV, University Text Book of Chemistry, University of Mumbai.
2) Atkins, P. W. & Paula, J. de Atkin's Physical Chemistry 10th Ed., Oxford University Press (2014).
3) Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
4) Keith J. Laidler & John H. Meiser, Physical Chemistry, 2nd Ed. (2004)
5) Puri B. R., Sharma L. R. & Pathania M. S. Principles of Physical Chemistry, Vishal Publishing Company, 2008
6) Ball, D. W. Physical Chemistry Thomson Press, India (2007).
7) Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).
8) Engel, T. & Reid, P. *Physical Chemistry 3rd Ed.,* Prentice-Hall (2012).
9) McQuarrie, D. A. & Simon, J. D. *Molecular Thermodynamics* Viva Books Pvt. Ltd.: New Delhi (2004).
10) Levine, I .N. *Physical Chemistry* 6th Ed., Tata Mc Graw Hill (2010).
11) Laboratory Experiments in Chemistry I & II, University Practical Book of Chemistry, University of Mumbai.
12) Athawale, V. D. & Mathur, P. *Experimental Physical Chemistry* New Age International: New Delhi (2001).
13) Khosla, B. D.; Garg, V. C. & Gulati, A. *Senior Practical Physical Chemistry,* R. Chand & Co.: New Delhi (2011).
14) Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. *Experiments in Physical Chemistry 8th Ed*.; McGraw-Hill: New York (2003).
15) Halpern, A. M. & McBane, G. C. *Experimental Physical Chemistry 3rd Ed.;* W.H. Freeman & Co.: New York (2003).

Inorganic Chemistry

1) Concise Graduate Chemistry – I, II, III & IV, University Text Book of Chemistry, University of Mumbai.
2) Lee, J.D. Concise Inorganic Chemistry ELBS, 1991.
3) Douglas, B.E. and McDaniel, D.H. Concepts & Models of Inorganic Chemistry, Oxford, 1970
4) Atkins, P.W. & Paula, J. Physical Chemistry, 10th Ed., Oxford University Press, 2014. Day, M.C. and Selbin, J. Theoretical Inorganic Chemistry, ACS Publications, 1962.
5) Rodger, G.E. Inorganic and Solid State Chemistry, Cengage Learning India
6) Laboratory Experiments in Chemistry I & II, University Practical Book of Chemistry, University of Mumbai.
7) Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
8) Advanced Inorganic Chemistry, 17th Edition, by Satyaprakash, G.D.Tuli and R. D. Madan, 2022.

Organic Chemistry

1) Concise Graduate Chemistry – I, II, III & IV, University Text Book of Chemistry, University of Mumbai.
2) Morrison, R. T. and Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt Ltd. (Pearson Education).2012
3) Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt Ltd. (Pearson Education).
4) Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt Ltd. (Pearson Education).
5) Eliel, E. L. and Wilen, S. H. Stereochemistry of Organic Compounds, Wiley: London, 1994
6) Kalsi, P. S. Stereochemistry Conformation and Mechanism, New Age International, 2005.
7) Mc Murry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013
8) Paula Y Bruice, Organic Chemistry, 7th Ed, Pearson education, Asia.2014
9) Graham Solomon, Fryhle, Dnyder, Organic Chemistry, Wiley publication. 12 th Ed,2016
10) Bahl and Bahl, Advanced Organic chemistry by S. Chand publication.2010
11) Peter Sykes. Guidebook to the mechanism in Organic chemistry ,6th edition
12) D. Nasipuri. Stereochemistry of Organic Compounds, Principles and Applications, Second Edition
13) Organic Chemistry: A problem solving approach by Lakshmi Ravishankar and Gomathi Shridhar, Narosa Publisher, 2023.
14) Laboratory Experiments in Chemistry I & II, University Practical Book of Chemistry, University of Mumbai.
15) Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
16) Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
17) Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., Textbook of Practical Organic Chemistry, Prentice-Hall, 5th edition, 1996.

Evaluation Pattern for Major Theory Course

MAJOR: 4 credits

Semester I

Theory/Practical	Credits	No. of Hours	Marks
Theory: **M3-1:** Basics in Physical, Inorganic and Organic Chemistry I	2	30	50
Practical: **M3CHP1:** Chemistry Practical 1	2	60	50

Semester II

Theory/Practical	Credits	No. of Hours	Marks
Theory: **M3-2:** Basics in Physical, Inorganic and Organic Chemistry II	2	30	50
Practical: **M3CHP2:** Chemistry Practical 2	2	60	50

Evaluation Pattern for semester I and II:

Theory Paper

Internal Continuous Assessment: 40% (20 Marks)	Semester End Examination: 60% (30 Marks)	Duration for End semester examination
Continuous Evaluation through: Quizzes, Class Tests, Presentations, Projects, Role Plays, Creative Writing, Assignments, etc.	As per paper pattern	1 hr.

Paper Pattern for 30 Marks:

Semester End Theory Examination:

1. Duration - These examinations shall be of **one hour** duration.
2. Theory question paper pattern:
    a. There shall be **03** questions each of **10 marks** on each unit
    b. All questions shall be compulsory with internal choice within the questions.

Question	Option	Marks	Questions Based on
Q.1	A) Objective questions 4 out of 6	04	Module I
	B) Subjective questions 2 out of 3	06	
Q.2	A) Objective questions 4 out of 6	04	Module II
	B) Subjective questions 2 out of 3	06	
Q.3	A) Objective questions 4 out of 6	04	Module III
	B) Subjective questions 2 out of 3	06	
	Total	**30**	

Evaluation Pattern for Major Practical Course

Internal Continuous Assessment: 40% (20 Marks)	Semester End Examination: 60% (30 Marks)	Duration for End Semester Examination:
Viva / Assignments / Objective Question Tests (15 Marks), Overall Performance (5 Marks) = 20 Marks	One experiment (25 marks for experiment and 5 Marks for Journal = 30 Marks)	3 hr.

PRACTICAL BOOK/JOURNAL

The students are required to perform 75% of the Practical for the journal to be duly certified. The students are required to present a duly certified journal for appearing at the practical examination, failing which they will not be allowed to appear for the examination.

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

Sd/-
Sign of
Dr. Sunil Patil Coordinator,
Board of Studies in Chemistry

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

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