



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav School of Management

Choice Based Credit System (CBCS) in Light of NEP-2020

BBA (Hons.) - III SEMESTER (2021-2024)

ML307 ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
ML307	AECC	Environmental Management and Sustainability	60	20	20	0	0	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical: C - Credit; AECC- Ability Enhancement Compulsory Course

*Teacher Assessment shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

1. To create awareness towards various environmental problems.
2. To create awareness among students towards issues of sustainable development.
3. To expose students towards environment friendly practices of organizations.
4. To sensitize students to act responsibly towards environment.

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes

1. The course will give students an overview of various environmental concerns and practical challenges in environmental management and sustainability.
2. Emphasis is given to make students practice environment friendly behavior in day-to-day activities.

COURSE CONTENT

UNIT I: Introduction to Environment Pollution and Control

1. Pollution and its types (Air, Water, and Soil): Causes, Effects and Control measures
2. Municipal Solid Waste: Definition, Composition, Effects
3. Electronic Waste: Definition, Composition, Effects
4. Plastic Pollution: Causes, Effects and Control Measures

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BBA (Hons.) - III SEMESTER (2021-2024)

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UNIT II: Climate Change and Environmental Challenges

1. Global Warming and Green House Effect
2. Depletion of the Ozone Layer
3. Acid Rain
4. Nuclear Hazards

UNIT III: Environmental Management and Sustainable Development

1. Environmental Management and Sustainable Development: An overview
2. Sustainable Development Goals (17 SDGs)
3. Significance of Sustainable Development
4. Environment Friendly Practices At Workplace and Home (Three Rs' of Waste Management, Water Conservation, Energy Conservation)

UNIT IV: Environmental Acts

1. The Water (Prevention and Control of Pollution) Act, 1974: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
2. The Air (Prevention and Control of Pollution) Act, 1981: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
3. The Environment (Protection) Act, 1986: Objectives, Definition of important terms used in this Act, Details about the act.
4. Environmental Impact Assessment: Concept and Benefits

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***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT V: Role of Individuals, Corporate and Society

1. Environmental Values
2. Positive and Adverse Impact of Technological Developments on Society and Environment
3. Role of an individual/ Corporate/ Society in environmental conservation
4. Case Studies: The Bhopal Gas Tragedy, New Delhi's Air Pollution, Arsenic Pollution in Ground Water (West Bengal), Narmada Valley Project, Cauvery Water Dispute, Fukushima Daiichi Disaster (Japan), Ozone Hole over Antarctica, Ganga Pollution, Deterioration of Taj Mahal, Uttarakhand flash floods

Suggested Readings:

1. Rogers, P.P., Jalal, K.F. , Boyd, J.A.(Latest Edition) . **An Introduction to Sustainable Development.** Earthscan
2. Kalam, A.P.J. (Latest Edition) . **Target 3 Billion: Innovative Solutions Towards Sustainable Development.** Penguin Books
3. Kaushik , A. and Kaushik (Latest Edition). **Perspectives in Environmental Studies.** New Delhi: New Age International Publishers.
4. Dhameja, S.K. (Latest Edition). **Environmental Studies.** S.K. Kataria and Sons.New Delhi
5. Bharucha, E. (Latest Edition). **Environmental Studies for Undergraduate Courses.** New Delhi: University Grants Commission.
6. Wright, R. T. (Latest Edition). **Environmental Science: towards a sustainable future .**New Delhi: PHL Learning Private Ltd.
7. Rajagopalan, R. (Latest Edition). **Environmental Studies.** New York: Oxford University Press.

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B. Sc. Hons. Maths/Chemistry

III Sem

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
BSPH 302	DC	Electronics: Principles and Devices	60	20	20	30	20	3	1	0	4

Course Objectives	1. To develop the comprehensive understanding of laws of physics related to Electronics: Principles and Devices and ability to apply them for laying the foundation for research and development. 2. To work ethically as member as well as leader in a diverse team.
Course Ourcomes	1. Student will be able to understand and solve the problems related to Electronics: Principles and Devices. 2. Student will be able to determine physical parameter experimentally with optimal usage of resources and complete the assignments in time.

Abbreviation		Teacher Assessment (Theory) shall be based on following components: Quiz/Assignment/ Project/Participation in class (Given that no component shall be exceed 10 Marks).
Th	Theory	
T	Tutorial	
P	Practical	Teacher Assessment (Practical) shall be based on following components: Viva/ File/ Participation in Lab work (Given that no component shall be exceed 50% of Marks).

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Dr. UTTAM SHARMA
Professor & Head
Department of Chemistry
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BSPH 302: Electronics : Principles and Devices

UNIT I: Classical FE Model, Debye Model, Sommerfeld FE Model, Band Model, Kronig-Penney Model, Effective Mass, Formulation of Energy Bands, Gap in Solids, Motion of e^- in Metals, Density of States, Fermi Level, Fermi Velocity and Fermi Dirac Distribution of e^- Inside a Matter.

UNIT II: Semiconductors; Intrinsic and extrinsic semiconductors, mobility and charge density of charge carriers, Fermi Level, Temperature dependence of electron and hole concentrations, Doping: impurity states, n and p type semiconductors, conductivity, Hall Effect, Hall Coefficient. Semiconductor devices: Metal-semiconductor junction, p-n junction, majority and minority carriers,

UNIT III: Zener and tunnel diodes, light emitting diode, Schottky diode, solar cell Diode, load line concept, rectification, Half wave and full wave rectifier, ripple factor, voltage stabilization, IC voltage regulation, Transistors, Characteristics of a transistor in CB, CE and CC mode, h-parameters.

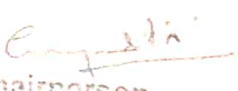
UNIT IV: FETs: Field effect transistors, n-channel FET, p-channel FET, JFET, MOSFET, Amplifiers, Small signal amplifiers; General Principle of operation, classification, distortion, RC coupled amplifier, gain frequency response, input and output impedance, multistage amplifiers, Transformer coupled amplifiers, Equivalent circuits at low, medium and high frequencies, emitter follower, low frequency common source and common drain amplifier, Noise in electronic circuits.

UNIT V: Oscillators, Feedback in amplifiers, principle, its effects on amplifiers, characteristics Principle of feedback amplifier, Barkhausen criteria, Hartley, Colpitt and Wein bridge oscillators. Condition for oscillations and frequency derivation – Crystal oscillator, Monostable, Bi-stable and Astable multivibrators, propagation of radio waves in the absence of magnetic field, role of ionosphere, elementary idea of microwave, optical and satellite communication, basic theory of amplitude modulation.


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Dr. UTTAM SHARMA
Professor & Head
Department of Physics
Shri Vaishnav Institute of Science


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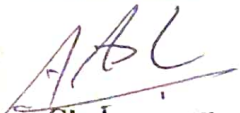
Choice Based Credit System (CBCS)

B.Sc. Chemistry/Maths Hons. III Sem

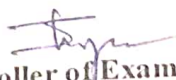
B.Sc. Chemistry/Maths Hons. III Sem											
Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teacher's Assessment				
BSCHPRP3 06	DC	Physics Laboratory III	60	20	20	30	20	0	0	2	1

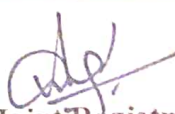
Course Objectives	To work ethically as member as well as leader in a diverse team.
Course Outcomes	Student will be able to determine physical parameter experimentally with optimal usage of resources and complete the assignments in time.

Abbreviation		Teacher Assessment (Theory) shall be based on following components: Quiz/Assignment/Project/ Participation in class (Given that no component shall be exceed 10 Marks).
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BSCHPRP306: Physics Laboratory III

List of Experiments (Any Five)

1. To find V-I characteristics of P-N junction diode.
2. To find V-I characteristics of Zener diode.
3. To find V-I characteristics of Tunnel diode.
4. To find V-I characteristics of photo diode.
5. To find input/output characteristics of common base PNP/NPN transistor.
6. To find input/output characteristics of common emitter PNP/NPN transistor.
7. To determine energy band gap using PN junction diode.
8. To study frequency of Hartley oscillator.
9. To study frequency of Wein bridge oscillator.
10. To Study RC coupled amplifiers.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMHMA 302	DC	Algebra III (Linear Algebra)	60	20	20	-	-	4	1	-	5

Course Objective

To introduce the students with the Algebra of Matrices and Inner Product Spaces.

Course Outcomes

After the successful completion of this course students will be able to:

- 1. understand the applications of Matrices*
- 2. know the fundamentals of the Vector Space*
- 3. know the fundamentals of the Inner Product Space*
- 4. analyse and apply the basics of the Matrices and Vector spaces.*

Course Content:

Unit I : Vector spaces: subspaces and quotient spaces; homomorphism and isomorphism theorems.

Unit II: Linearly dependence and independence of vectors, bases and dimension of a vector space.

Unit III : Linear transformations and their matrices; row and column spaces of a matrix; Rank- Nullity theorem; system of linear equations.

Unit IV : Eigen-values and eigenvectors; Caley-Hamilton theorem.

Unit V : Binary and quadratic forms and reduction into canonical forms. Inner product spaces; orthogonal basis; Gram-Schmidt orthogonalization process.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMHMA 302	DC	Algebra III (Linear Algebra)	60	20	20	-	-	4	1	-	5



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Name of the Program: B. Sc. (Mathematics Honours)

Reference Books :

1. M. Artin: Algebra, Pearson.
2. S. D. Dummit and M. R. Foote: Abstract Algebra, Wiley.
3. I. N. Herstein: Topics in Algebra, Wiley.
6. K. Hoffman and R. Kunze: Linear Algebra, Prentice Hall of India.
7. F. E. Hohn: Elementary Matrix Algebra, Dover Publications.
8. P. R. Halmos: Finite Dimensional Vector Spaces, Springer New York.
9. S. Lang, Introduction to Linear Algebra, Wellesley - Cambridge Press.
10. S. Kumaresan, Linear Algebra- A Geometric Approach, Prentice Hall of India.

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Name of the Program: B. Sc. (Mathematics Honours)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMHMA 303	DC	Metric Topology	60	20	20	-	-	4	0	-	4

Course Objective

To introduce the students with the Topology of Metric Spaces.

Course Outcomes

After the successful completion of this course students will be able to:

- 1. understand the fundamental of metric spaces.*
- 2. know the fundamentals of sequences in metric spaces*
- 3. apply the metric spaces in existence and iteration problems*
- 4. create and evaluate fundamentals problems in metric space theory.*

Course Content:

Unit I:

Elements of metric space theory, sequences and Cauchy sequences and the notion of completeness.

Unit II:

Construction of real numbers, elementary topological notions for metric spaces i.e. open sets, closed sets, compact sets and connectedness.

Unit III:

Continuous and uniformly continuous functions on a metric space. The Bolzano - Weierstrass theorem, supremum and infimum on compact sets.

Unit IV:

Separability. completeness. The Baire category theorem. $\mathbb{R}^n$ as a metric space.

Unit V:

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMHMA 303	DC	Metric Topology	60	20	20	-	-	4	0	-	4

Contractions on metric spaces and their examples, Banach contraction principle, $C(X)$ as a complete metric space, Picard's existence theorem.

Reference Books :

1. S. Kumaresan, Topology of Metric Spaces, Narosa Publishing House.
2. W. Rudin: Principles of Mathematical Analysis, Mac Graw Hill Education.
3. Tom Apostol: Mathematical Analysis, Pearson.
4. Tom Apostol: Calculus I and II, Pearson.
5. Terence Tao : Analysis I, II, Springer Singapore.
6. W. Rudin: Real and Complex Analysis, Mac Graw Hill Education.



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Name of the Program: B. Sc. (Mathematics Honours)

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMHMA 304	DC	Complex Analysis	60	20	20	-	-	3	1	-	4

Course Objective

To introduce the students with the Calculus of the Complex Variables.

Course Outcomes

After the successful completion of this course students will be able to:

- 1. understand the fundamentals of analytic functions*
- 2. apply the fundamental of complex numbers.*
- 3. know the applications of sequences and complex numbers.*
- 4. know and apply the basics of complex integrals.*

Course Content:

Unit I:

Limit, continuity and differentiability of functions of complex variables, analytic functions, Cauchy-Riemann equations, polar form of Cauchy-Riemann equations, harmonic functions, method of constructing an analytical function.

Unit II:

Complex line integrals, Cauchy's theorem, extension of Cauchy theorem, Cauchy's integral formula.

Unit III:

Liouville's theorem, zeros of analytic functions, the fundamental theorem of algebra. Singularities of an analytic function, types of singularities, power series, expansions of analytic functions as power series (Taylor and Laurent series).

Unit IV:

Poles and residues, Cauchy's residue theorem, the argument principle, evaluation of real definite integrals.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMHMA 304	DC	Complex Analysis	60	20	20	-	-	3	1	-	4

Unit V:

The maximum modulus principle, Schwarz's lemma, cross ratio, translation, magnification, rotation, inversion, reflection and Mobius (bilinear) transformations, fixed point, critical point, normal form of bilinear transformations. Conformal transformation.

Reference Books:

1. Elias M. Stein, Rami Shakarchi: Complex Analysis, Princeton University Press.
2. Lars Ahlfors, Complex Analysis, Mc-Graw Hill.
3. T. W. Gamelin, Complex Analysis, Springer.
4. J.B.Conway, Functions of One Complex Variable, Springer-Verlag New York.
5. S. Ponnusamy, Foundations Of Complex Analysis, Narosa Publishing House.

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B.Sc. (Hons)

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			END SEM University Exam	Two Term Exam	Teach ers Assess ment*	END SEM Unive rsity Exam	Teachers Assessment *				
BSHCH 305	HONS	ANALYTICAL CHEMISTRY & ADVANCED CONCEPTS OF GENERAL CHEMISTRY - I	60	20	20	0	0	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST Mid Sem Test.

***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class, given that no component shall exceed more than 10 marks.

Course Objective:

- To develop the understanding of fundamentals of Analytical Chemistry and General Chemistry.
- To give basic knowledge of Analytical Chemistry.

Course Outcomes: -

After completion of this course the students are expected to be able to demonstrate following knowledge, skills, and attitudes. The student will demonstrate capability of

- CO1 Fundamentals of Chemistry of s-block elements.
- CO2. Became aware of the importance of p- block elements and Chemistry of Aliphatic Hydrocarbons.
- CO3. Understanding the concept of Solid state and Chemical Kinetics.
- CO4. Demonstrate a fundamental/systematic understanding of the practical field of Chemistry.

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B.Sc. (Hons)

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment *				
BSHCH 305	HONS	ANALYTICAL CHEMISTRY & ADVANCED CONCEPTS OF GENERAL CHEMISTRY - I	60	20	20	0	0	3	0	0	3

Unit I: Periodicity of Elements:

s, p, d, f block elements, the long form of periodic table. Detailed discussion of the following properties of the elements, with reference to *s* & *p*- block.

- (a) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table.
- (b) Atomic radii (van der Waals)
- (c) Ionic and crystal radii.
- (d) Covalent radii (octahedral and tetrahedral)
- (e) Ionization enthalpy, Successive ionization enthalpies and factors affecting ionization energy.
- (f) Electron gain enthalpy, trends of electron gain enthalpy.
- (g) Electro negativity, Pauling's/ Mulliken's/ Allred Rachow's/ and Mulliken-Jaffe's Electro negativity scales. Variation of electro negativity with bond order, partial charge, hybridization, group electro negativity. Sanderson's electron density ratio.

Unit II : Chemistry of Aliphatic Hydrocarbons

A. Carbon-Carbon sigma bonds

Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz- Fittig Reactions, Free radical substitutions: Halogenation - relative reactivity and selectivity.

B. Carbon-Carbon pi bonds

Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2 reactions. Saytzeff and Hofmann eliminations. Reactions of alkenes: Electrophilic additions their mechanisms (Markownikoff/ AntiMarkownikoff addition), mechanism of oxymercuration-demercuration, hydroboration-oxidation, ozonolysis, reduction (catalytic and chemical), syn and anti hydroxylation (oxidation). 1, 2- and 1, 4- addition reactions in conjugated dienes and, Diels-Alder reaction; Allylic and benzylic bromination and mechanism, e.g. propene, 1-butene, toluene, ethyl benzene.

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			END SEM University Exam	Two Term Exam	Teach ers Assess ment*	END SEM Unive rsity Exam	Teachers Assessment *				
BSHCH 305	HONS	ANALYTICAL CHEMISTRY & ADVANCED CONCEPTS OF GENERAL CHEMISTRY - I	60	20	20	0	0	3	0	0	3

Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes.

Unit III :Solid State:

Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, qualitative idea of point and space groups, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of rotating crystal method and powder pattern method. Analysis of powder diffraction patterns of NaCl, CsCl and KCl. Defects in crystals.

Unit IV: Chemical Kinetics

Order and molecularity of a reaction, rate laws in terms of the advancement of a reaction, differential and integrated form of rate expressions up to second order reactions, experimental methods of the determination of rate laws, kinetics of complex reactions (integrated rate expressions up to first order only): (i) Opposing reactions (ii) parallel reactions and (iii) consecutive reactions (iv) chain reactions.

Temperature dependence of reaction rates; Arrhenius equation; activation energy. Collision theory of reaction rates, Lindemann mechanism, qualitative treatment of the theory of absolute reaction rates.

Surface chemistry: Physical adsorption, chemisorption, adsorption isotherms. nature of adsorbed state. Catalysis: Types of catalyst, specificity and selectivity.

Unit V : Optical methods of analysis:

Origin of spectra, interaction of radiation with matter, fundamental laws of spectroscopy and selection rules, validity of Beer-Lambert's law.

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Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Sc. (Hons)

Choice Based Credit System (CBCS)(Batch 2021-2024)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CR EDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment *				
BSHCH 305	HONS	ANALYTICAL CHEMISTRY & ADVANCED CONCEPTS OF GENERAL CHEMISTRY - I	60	20	20	0	0	3	0	0	3

UV-Visible Spectrometry: Basic principles of instrumentation (choice of source, monochromator and detector) for single beam instrument; Basic principle of quantitative analysis: estimation of metal ions from aqueous solution, geometrical isomers, keto-enol tautomers. Determination of composition of metal complexes using Job's method of continuous variation and mole ratio method.

Infrared Spectrometry: Basic principles of instrumentation (choice of source, monochromator & detector) for single and double beam instrument; sampling techniques. Structural illustration through interpretation of data, Effect and importance of isotope substitution.

Books:

1. Lee, J.D. *Concise Inorganic Chemistry*, ELBS.
2. Douglas, B.E. and Mc Daniel, D.H., *Concepts & Models of Inorganic Chemistry*, Oxford.
3. Atkins, P. W. & Paula, J. de *Atkin's Physical Chemistry* 8th Ed., Oxford University Press.
4. Ball, D. W. *Physical Chemistry* Thomson Press, India.
5. Vogel, Arthur I: *A Test book of Quantitative Inorganic Analysis* (Rev. by GH Jeffery and others). The English Language Book Society of Longman.
6. Willard, Hobert H. *et. al: Instrumental Methods of Analysis*, Wardsworth Publishing Company, Belmont, California, USA.

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