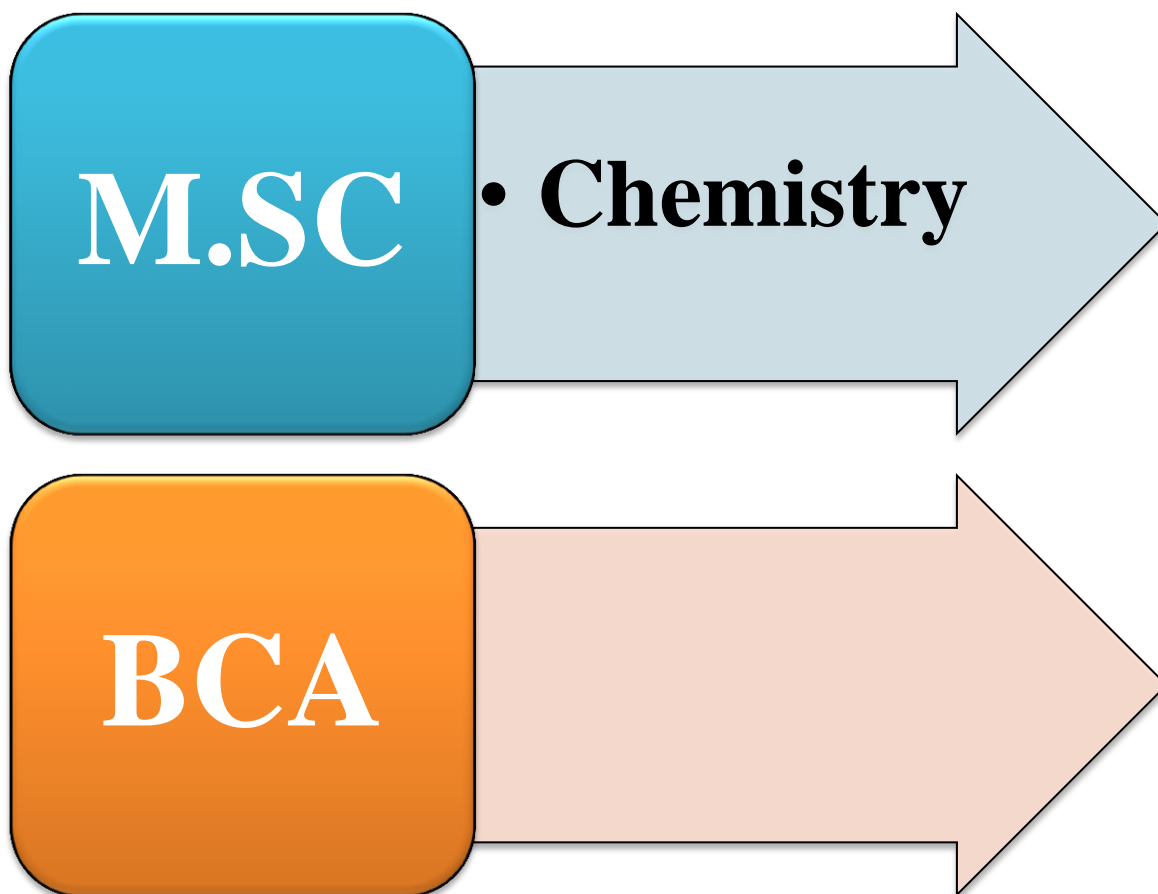


Syllabus of Courses with Experimental Learning



M.Sc.
Sem-I to IV(Chemistry)

Prospectus No. 2015125

संत गाडगे बाबा अमरावती विद्यापीठ

SANT GADGE BABA AMRAVATI UNIVERSITY

विज्ञान विद्याशाखा
(FACULTY OF SCIENCE)

अभ्यासक्रमिका
विज्ञान पारंगत परिक्षा (रसायनशास्त्र)
सत्र-१ ते सत्र -४

PROSPECTUS
OF
MASTER OF SCIENCE EXAMINATION
IN
CHEMISTRY
Semester -I & III, Winter 2014,
Semester -II & IV, Summer 2015,



2014

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- 3) McCabe and Smith, Unit operations of Chemical Engineering, McGraw Hill.
- 4) Budger and Banchemo, Introduction to Chemical Engineering McGraw Hill. McGraw Hill.
- 5) Text Book of Industrial Chemistry Pragti Agencies Pune 2
- 6) Engineering Chemistry By Dr. S. S. Dara.
- 7) Catalysis in theory and practices, Ridder E. K. and Taylor H. S.
- 8) Phase transfer catalysis, Principles and techniques, Starles C.
- 9) Surface Chemistry by J. J. Bikermann, Academic Press.
- 10) Physical Chemistry of Surfaces, A. W. Aclamson.
- 11) Material science, O. P. Khanna, Khanna Publishers, Delhi

Semester III

Paper XII

Sp. Paper-II

Industrial Chemistry (Processes Economics And Industrial Management)

60hrs (4hrs/week). 12hrs/unit

50 Marks

- Unit-I : Manufacture of Heavy Chemicals 12L**
 Chemical processes for the manufacture of Heavy chemicals like- soda ash, bicarbonates, chlorine, caustic soda, bleaching power, calcium carbides and acids like H_2SO_4 , HCl, HNO_3 , H_3PO_4 .
- Unit-II : 12L**
- A) Industrial Gases: Heavy chemicals and production of gases. Chemistry, manufacture, storage, hazards & uses.- Hydrogen, Oxygen, nitrogen, carbon dioxide, chlorine, fluorine, SO_2 , phosgene, acetylene, argon, neon & helium.
 - B) Fertilizers: Fertilizer industries in India, Manufacture of Ammonium salts, Urea, nitrates, Ammonia, Nitrogenous fertilizers, phosphatic fertilizers, superphosphates, complex fertilizers, nitrogen fixation.
- Unit-III: 12L**
- A) Cement: Types of cement, manufacture- processes, and setting of cements.
 - B) Glass: Types, their composition & properties, manufacture of glass fitness, optical glass, coloured glasses, lead glass and neutron absorbing glass.
 - C) Ceramics: Introduction, types, manufacturing process, applications & refractories.
- Unit-IV : Chemical Process Economics 12L**
 Factors involved in project cost, estimation methods employed for the estimation of capital investment.

Methods of determining depreciation.
 Competitive & monopoly markets, some aspects of marketing profitability criterion.
 Economics of selecting alternatives.
 Break even point, production scheduling

Unit-V: A) Industrial Management 12L

Concept of scientific management in industry.
 Functions of management : Decision making, planning, organizing, Material management, Inventory control, Information system & decision making.

B) Safety :

General occupational safety, flammable materials, Handling, fuel fighting equipments, control measures for Toxic chemicals. Safety with chemical engineering operations, hazardous chemicals process. Safety in Laboratories and pilot plant. Safety in transportation & storage of chemicals, management of safety & loss prevention.

List of Books-

1. Charles E. Dryden, Outline of Chemical Technology Edited by M. Gopal Rao and Marshall Siting, East West Press 2nd Edition 1973.
2. Manual of Chemical Technology VOL I & II by Venkatesharul Educational Development Center. IIT Madras, 1977.
3. Chemical Process Industries by R. N. Shreve and M. J. A. Brink. McGraw Hill Ltd. 4th Edition 1977.
4. Economics of chemical industry, Hempel E. M.
5. Industrial organization and management, Bethal L. L.

Semester III

Paper XI

Analytical Chemistry
 (Advance Separation Techniques)

Total Lectures: 60Hrs, 4Hrsper week, 12Hrs/unit Total Marks-80

Unit-I : 12L

Separation Methods: Filtration, precipitation, distillation, molecular sieve, dialysis, Reverse osmosis, Ring oven methods, relative merit & demerit. Purification Techniques (Solid organic compounds, liquids etc.) Criteria of purity. Theory of chromatography, Classification, principles of chromatography, Van Deemeters Equation, Plate theory, significance of E, D_v, D_w . Techniques of

chromatographic separation gradient, isocratic, selective specific separation, types of chromatographic methods

Unit-II : **12L**

Gas Chromatography:-

Introduction to different types of gas chromatography, How does it differ from liquid chromatography. Principles of gas chromatography, plate theory of gas chromatography, Instrumentation for gas chromatography, working gas chromatography, application of gas chromatography, programmed temperature chromatography, flow programming chromatography, gas-solid chromatography, Columns for Gas Chromatography, choice of columns, polarity indices, Gas chromatography and Chirality.

Ion chromatography - Principle, structure and characteristics of resins, eluent, suppressor columns and detectors used in ion chromatography, analytical applications, environmental speciation by ion chromatography and applications. Hyphenated techniques in Chromatography.

Unit-III : **12L**

Gel Filtration:-

Introduction, types of gels, techniques used in equilibrium studies, estimating size parameters, molecular wt. determinations separating plant aspects.

Electrophoresis-Theory and classification, factors affecting mobility, macromolecular size and charge interactions with supporting electrolyte, pH and concentration discontinuities, Factors affecting electrophoresis phenomena-electrolysis, electrosomosis, temperature and supporting media. Instrumentation, methodology, Preparation of gel staining and destaining, preparative zone electrophoresis, continuous electrophoresis and Applications.

Capillary Electrophoresis-Principle, theory, instrumentation, sample preparation and applications, Capillary electrochromatography and Miscellar electrokinetic capillary chromatography

Unit-IV : **12L**

Membrane-Based Methods:-Dialysis-working of techniques, membranes, general consideration of diffusion, Donnan Membrane equilibrium and Applications.

Electrodialysis- working of techniques, membranes, Electrodialysis cells and Applications.

Ultrafiltration- working of techniques, membranes, non-gelatinous membranes and Applications. Dialysis compared with other membrane-separation methods.

Other Separation Methods:-Ultracentrifugation-Principle, sedimentation constant, sedimentation equilibrium, sedimentation velocity, methodology and applications.

Zone refining- Principle, zone leveling and applications

Unit-V : **12L**

Kinetic Methods of analysis-

Theoretical basis of kinetic methods of analysis, Rates of chemical reactions, rate laws, first order, second order kinetics, pseudo first order and second order reactions, factors affecting rate of reaction, methods of determining amount of the substance (tangent method) fix time and concentration method, addition method, oxidation reactions of H_2O_2 (thiosulphate, iodide, unimol), enzyme catalyzed reaction, inhibition and activation. Types of kinetic methods, differential and integral, applications.

Books Suggested :

1. Basic Concept in Analytical chemistry, by S.M. Khopkar.
2. Day & Underwood: Quantitative Analysis.
3. A. I. Vogel A Text book of Quantitative inorganic Chemistry, ELBS, London.
4. Analytical Chemistry, D.C. Das, PHI Learning Pvt. Ltd, New Delhi
5. Chromatography. By E Heftman, 5th edition, part-A and part-B, Elsewhere Science Publisher, 1992
6. S. Wilson & P. Jones: Chemical Analysis Vol I
7. Chromatography Today. By C F Poole and S K Poole, Elsewhere Science Publisher, 1991.
8. H.H. Willard, L.L. Merritt and J.A. Dean: Instrumental Methods of Analysis (Van Nostrand).
9. B. L. Krayner, H. H. Willard. L. Merritt, J. A. Dean & F. A. Settle: Instrumental Methods of Analysis (CBS Publishers, Delhi, 1986)
10. Analytical Chemistry. By G D Christian 4th edition, John Wiley and Sons, 1986. L. R. Snyder & C. H. Harvath: An Introduction to Separation Science (Wiley Interscience)
12. F. J. Wicher Robert: Standard Methods Chemical Analysis.
13. G. L. Davis Krupadanam, D. Vijaya Prasad, K. Varaprasad Rao, KLN Reddy, C. Sudhakar, Analytical chemistry.
14. R. D. Budhiraja Separation Chemistry, New Age.
15. R.L. Peesok and L.D. Shield: Modern Methods of Chemical Analysis.

B.C.A..Part-I,II & III
(Sem-I to VI)

Prospectus No. 20131221

संत गाडगे बाबा अमरावती विद्यापीठ
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(FACULTY OF SCIENCE)

PROSPECTUS
OF
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Choices in tuning queries and views, DBMS Benchmarking, Security.

Unit-II : Concurrency control transactions and schedule, Serializability, Lock based concurrency control lock management, specialized locking techniques, control without locking.

Crash Recovery, Introduction to crash recovery, Log, Check pointing, Recovery from a system crash.

Unit-III : Parallel and distributed databases. Architectures for parallel databases, Parallel query Evaluation and optimization, Parallelizing individual operations, Introduction to distributed databases, Architecture, Fragmentation and Replication, Catalog management, Distributed Query processing, updating distributed data, Distributed transaction management, Distributed Concurrency control, Distributed recovery.

Unit-IV : **Object database Systems** : Objects, Identity, inheritance, Database Design for an ORDBMS, Storage and access methods, Query processing and optimization, Comparing RDBMS with OODBMS and ORDBMS.

Unit-V : **Data Warehousing**
Introduction, DSS and OLTP, Metadata Management in Data Warehouse. Related data structures, OLAP and Data Warehousing environment.
Data mining.
Introduction and application areas.

Books :

- 1) Database Management System -Raghu Ramkrishna McGraw Hill. International Editions.
- 2) Introduction to Database System by C.G.Date.

6SP1: LAB I-6ST1+6ST2: Minimum 8 practical on each.

The distribution of marks in Practical examination is given as:

(1) Program writing/ execution based on 6ST1	15 marks.
(2) Program writing/ execution based on 6ST2	15 marks.
(3) Practical Record	10 marks.
(4) Viva-Voce	10 marks.

50 marks.

6SP2: LAB II-6ST3+6ST4: Minimum 8 practical on each.

The distribution of marks in Practical examination is given as:

(1) Program writing/ execution based on 6ST3	15 marks.
(2) Program writing/ execution based on 6ST4	15 marks.
(3) Practical Record	10 marks.
(4) Viva-Voce	10 marks.

50 marks.

6SP3: LAB III-Project work with Report.

The distribution of marks in Practical examination is given as:

(1) Project Work with Report	30 marks.
(2) Viva-Voce	20 marks.

50 marks.
