

REGISTRAR



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No.ANU/Acad./U.G/CBCS/III B.Sc/Chemistry/SEM-VI/Syllabus/2017 Date: 18-10-2017

PROCEEDINGS OF THE VICE-CHANCELLOR

Sub:- ANU - Academic -UG courses -CBCS - III year B.Sc Chemistry VI semester
Syllabus - Approval - Orders - Issued.

Ref:- 1. Minutes of the meeting of the Board of Studies (UG) in Chemistry
held on 25-09-2017.

2. Vice-Chancellor's orders dated 12-10-2017.

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ORDER:-

The Vice-Chancellor, after having considered the minutes 1st cited, has approved the III year B.Sc Chemistry VI semester syllabus and Model Question Papers for the academic year 2017-18 prepared by the Board of Studies (UG) in Chemistry. The titles of the papers are mentioned below.

Semester-VI

1. Paper VII(A)- **Elective:** Analytical Methods in Chemistry

OR

2. Paper VII(B)- **Elective:** Environmental Chemistry

3. Paper VIII(B) **Cluster Electives.**

VIII-B-1: Fuel Chemistry and Batteries

VIII-B-2: Inorganic Materials of Industrial Importance

VIII-B-3: Analysis of Applied Industrial Products

OR

4. Paper VIII(C)- **Cluster Electives.**

VIII-C-1: Organic Spectroscopic Techniques

VIII-C-2: Advanced Organic Reactions

VIII-C-3: Pharmaceutical and Medicinal Chemistry

5. **Common Practicals for Elective paper VII: A or B:**


i. Determination of carbonate and bicarbonate in water samples.

ii. Determination of hardness of water using EDTA

iii. Determination of Zn using EDTA

iv. Determination of Alkalinity of water samples.

(BY ORDER)


JOINT REGISTRAR
Academic

To
The Chairman and all members, Board of Studies (UG) in Chemistry, ANU.
All the Principals of the Affiliated Colleges under ANU area.
Copy to:
The Dean, Faculty of Physical Science, ANU.
The Dean, CDC, ANU.
The Coordinator, UG (Exams), ANU
The Addl. Controller of Examinations, ANU.
The P.A. to Vice-Chancellor/ Registrar/Rector, ANU.

S/2017/501-2018

SEMESTER-VI - Electives
ELECTIVE Paper – VII-(A) : ANALYTICAL METHODS
IN CHEMISTRY

45hrs (3h / w)

UNIT-I

Quantitative analysis:

10h

a) Importance in various fields of science, steps involved in chemical analysis, Principles of volumetric analysis : Theories of acid-base, redox, complexometric, iodometric and precipitation titrations - choice of indicators for these titrations.

b) Principles of gravimetric analysis: precipitation, coagulation, peptization, coprecipitation, post precipitation, digestion, filtration and washing of precipitate, drying and ignition.

UNIT-II

Treatment of analytical data:

7h

Types of errors, significant figures and its importance, accuracy - methods of expressing accuracy, error analysis and minimization of errors, precision.

UNIT-III

SEPARATION TECHNIQUES IN CHEMICAL ANALYSIS:

8h

SOLVENT EXTRACTION : Introduction, principle, techniques, factors affecting solvent extraction, Batch extraction, continuous extraction and counter current extraction, Synergism, Application - Determination of Iron (III)

UNIT – IV

10h

Chromatography: Classification of chromatography methods, principles of differential migration adsorption phenomenon, Nature of adsorbents, solvent systems, R_f values, factors effecting R_f values.

Paper Chromatography: Principles, R_f values, experimental procedures, choice of paper and solvent systems, developments of chromatogram - ascending, descending and radial, *applications*

UNIT -V

10h

Thin layer Chromatography (TLC): Advantages, Principles, factors effecting R_f values, Experimental procedures, Adsorbents and solvents, Preparation of plates, Development of the chromatogram, Detection of the spots, Applications.

HPLC : Basic principles and applications.

List of Reference Books

1. Analytical Chemistry by Skoog and Miller
2. A textbook of qualitative inorganic analysis by A.I. Vogel
3. Nanochemistry by Geoffrey Ozin and Andre Arsenaault
4. Stereochemistry by D. Nasipuri
5. Organic Chemistry by Clayden

LABORATORY COURSE - VI
Practical Paper - VII-(A) (at the end of semester VI) 30hrs (2 h / W)

50M

3. Determination of Zn using EDTA .

Common practical for Electives A & B are proposed and drafted in the University book.

1. Determination of carbonate & bicarbonate in water samples.
2. Determination of Hardness of water using EDTA.
4. Determination of alkalinity of water samples.

SEMESTER-VI
ELECTIVE PAPER – VII-(B) : ENVIRONMENTAL CHEMISTRY
45 hrs (3 h / w)

UNIT-I

Introduction

9h

Concept of Environmental chemistry-Scope and importance of environment in now adays – Nomenclature of environmental chemistry – Segments of environment – Natural resources – Reactions of atmospheric oxygen and Hydrological cycle.

UNIT-II

Air Pollution

9h

Definition – Sources of air pollution – Classification of air pollution – Acid rain – Photochemical smog – Green house effect – Formation and depletion of ozone – Bhopal gas disaster – Controlling methods of air pollution.

UNIT-III

Water pollution

9h

Unique physical and chemical properties of water – water quality and criteria for finding of water quality – Dissolved oxygen – BOD, COD, Suspended solids, total dissolved solids, alkalinity – Hardness of water – Methods to convert temporary hard water into soft water – Methods to convert permanent hard water into soft water.

UNIT-IV

Chemical Toxicology

9h

Toxic chemicals in the environment – effects of toxic chemicals – cyanide and its toxic effects – pesticides and its biochemical effects – toxicity of lead, mercury.

UNIT-V

Ecosystem and biodiversity

9h

Ecosystem

Concepts – structure – Functions and types of ecosystem – Abiotic and biotic components – Energy flow and Energy dynamics of ecosystem – Food chains – Food web – Trophic levels.

Biodiversity

Definition – level and types of biodiversity – concept – significance – magnitude and distribution of biodiversity – trends.

List of Reference books

1. Fundamentals of ecology by M.C.Dash
2. A Text book of Environmental chemistry by W. Moore and F.A. Moore
3. Environmental Chemistry by Samir k. Banerji