Basic Analytical Chemistry

2 Credits

Unit I : Titrimetric Methods in Analysis

Introduction to Analytical Chemistry and its interdisciplinary nature, Definitions: Standard solutions, Equivalence Point, Indicators, End point, Titration General Aspects of: Primary standards, Desirable properties of standard solution. Volumetric calculations: Molarity, Normality, percentage concentration, parts per million, Neutralization Titration, Standard solution and acid-base indicators. Titration curve for strong acid-strong base Systematic equilibrium concentrations for SA-SB titration. Acid-Base indicators, colour change range of an indicator, Indicator error. Data Analysis: Analytical data evaluations: Errors, Accuracy and precision, Normal distribution curve, Mean and standard deviation.

UNIT II: Water & Soil pollutant

Water pollution: Introduction. Classification of water pollutants, Sources of water pollution. Origin of waste water, Effect of water pollutants, Water analysis: colour, turbidity, total dissolved solids, conductivity, acidity, alkalinity, hardness (total, permanent, temporary, calcium and magnesium hardness), chlorides, sulfates, fluorides and Dissolved Oxygen. Drinking water standards, Composition of soil, Concept of pH and pH measurement, Determination of pH of soil & water samples.

Reference Books:

1. Fundamentals of Analytical Chemistry, 7th Edition by skoog, west, Holler.
2. Quantitative Analysis 6th Edition - R.A. Day, Jr., A.L. Underwood.
3. Analytical Chemistry –Dr. Alka Gupta, Pragati Prakashan.
4. Analytical Chemistry : Principles, 2Ed –John H. Kennedy.
5. Analytical Chemistry –VIth Ed. Gary D. Christian.
6. Environmental Chemistry- *Anil Kumar* ***De*** ,Arnab Kumar ***De*** *7th Edition*
7. Vogel's Textbook of Quantitative Chemical Analysis- by G.H.Jeffory, J.Mendham, R.C.Denney, 5th edition,1998.

Suggested Applications:

a..Determination of Acetic acid in vinegar.

b..Determination of Alkalinity of soda ash

Suggested Instrumental demonstrations:

a. Estimation of Mn, Cr, Fluoride and Phosphates in water samples by Spectrophotometer

B.Sc. (Computer Science)

Semester -VI

Project/Optional	PHP with MySQL	BS606
Theory	3 Hours/Week	3credits
Practical	3 Hours/Week	1credit

Unit – I

Introducing PHP – What is PHP? Why use PHP? Evolution of PHP, Installing PHP, Other ways to run PHP, Creating your first script. PHP Language Basics – Using variables, Understanding Data Types, Operators and Expressions, Constants. Decisions and Loops – Making Decisions, Doing Repetitive Tasks with Looping, Mixing Decisions and Looping withHTML.

Strings – Creating and Accessing Strings, Searching Strings, Replacing Text with Strings, Dealing with Upper and Lowercase, Formatting Strings. Arrays – Creating Arrays, Accessing Array Elements, Looping Through Arrays with for-each, Working with Multidimensional Arrays, Manipulating Arrays.

Unit – II

Functions – What is a Function? Why Functions are useful? Calling Functions, Working with Variable Functions, Writing your own Functions, Working with References, Writing Recursive Functions.

Objects – Introduction OOP Concepts, Creating Classes and Objects in PHP, Creating and using Properties, Working with Methods, Object Overloading with _get(), _set() and _call(), Using Inheritance to Extend Power of Objects, Constructors and Destructors, Automatically Loading Class Files, Storing as Strings.

Handling HTML Forms with PHP – How HTML form works, Capturing Form Data with PHP, Dealing with Multi-Value Fields, Generating Web Forms with PHP, Storing PHP Variables in Forms, Creating File Upload Forms, Redirecting After a Form Submission.

Unit – III

Working with Files and Directories - Getting Information on Files, Opening and Closing Files, Reading and Writing to Files, Copying, Renaming, and Deleting Files, Working with Directories.

Introducing Databases and SQL – Deciding How to Store Data, Understanding Relational Databases, Setting Up MySQL, A Quick Play with MySQL, Connecting MySQL fromPHP.

Retrieving Data from MySQL with PHP – Setting Up the Book Club Database, Retrieving Data with SELECT, Creating a Member Record Viewer. Manipulating MySQL Data with PHP – Inserting, Updating, and Deleting Records, Building a Member Registration Application.

Text Book

Matt Doyle, *Beginning PHP 5.3* (Wrox – WileyPublishing)

Reference s

Ellie Quigley, *PHP and MySQL by Example*
Joel Murach, Ray Harris, *Murach's PHP and MySQL*
Brett McLaughlin, *PHP & MySQL: The Missing Manual*
Luke Welling, Laura Thomson, *PHP and MySQL Web Development*

W. Jason Gilmore, *Beginning PHP and MySQL From Novice to Professional* Andrew Curioso, Ronald Bradford, Patrick Galbraith, *Expert PHP and MySQL*

B.Sc. (Computer Science)

Semester -I

PHP with MySQLLab **BS606**

Practical 3 Hours/Week 1credit

1 a) Write a PHP script to find the factorial of a given number.
b) Write a PHP script to find the sum of digits of a given number.

2 a) Write a PHP script to find whether the given number is a prime or not.
b) Write a PHP script to demonstrate the use of break, continue statements using nested loops.

3 a) Write a PHP script to display the Fibonacci sequence with HTML page.
b) Write a PHP script to create a chessboard.

4 a) Write a PHP script using built-in string function like strstr(), strops(), substr_count(), etc...
b) Write a PHP script to transform a string to uppercase, lowercase letters, make a string's first character uppercase

6 a) Write a PHP script that inserts a new item in an array in any position.
b) Write a PHP function to check whether all array values are strings or not.

7 a) Write a PHP script to count number of elements in an array and display a range of array elements.
b) Write a PHP script to sort a multi-dimensional array set by a specific key.

8 a) Write a PHP script using a function to display the entered string in reverse.
b) Write a PHP script using function for sorting words in a block of text by length.

9 a) Write a PHP script for creating the Fibonacci sequence with recursive function.
b) Write a PHP script using pass by value and pass by reference mechanisms in passing arguments to functions.

10 a) Write a PHP script to demonstrate the defining and using object properties.
b) Write a PHP script to demonstrate the inheritance.

11 a) Write a PHP script to demonstrate the object overloading with _get(), _set(), and_call().
a. Write a PHP script to demonstrate the overloading property accesses with _get() and _set().

12 a) Write a PHP script to demonstrate the method overloading and method overriding mechanisms.
a. Write a PHP script to demonstrate the use of final classes and final methods.

13 a) Write a PHP script to demonstrate the use interfaces.
a. Write a PHP script using constructors and destructors.

14 Write a PHP application to handling HTML forms with PHP script.

15 a) Write a PHP script to create a file, write data into file and display the file's data.
a. Write a PHP script to check and change file permissions, copying, renaming and deleting files.

16 a) Write a PHP application for connecting to MySQL and reading data from database table.
a. Write a PHP application for inserting, updating, deleting records in the database table.

17 Write a PHP application for student registration form.

B.Sc. (Physics) - III
Year Semester – V
Renewal energy & Energy harvesting
(GE)

Total: 56 Hrs
(4 Hrs / week)

Unit I: Principles of Solar Radiation and Collection (Qualitative only) (14Hrs)

Non-renewable energy resources – Principles of power generation and transmission. A model of conventional thermal power plant. Advantages and disadvantages of conventional power plants. Role and potential of new and renewable sources, the solar energy option, environmental impact of solar power, physics of the sun, the solar constant, solar radiation on tilted surface, instruments for measuring solar radiation and sun shine, solar radiation data.

Unit II: Solar Energy Storage and Applications (14Hrs)

Solar energy collectors - Flat plate and concentration collectors, classification of concentration collectors and orientation, advanced collectors. Different sensible, latent heat and stratified storage, solar ponds. Solar Applications – solar heating/ cooling technique, solar distillation and drying, photovoltaic energy conversion.

Unit III: Wind and Bio-Mass Energy (14Hrs)

Resources and potentials, horizontal and vertical axis windmills, performance characteristics. Principles of Bio-Conversion, Energy from waste, types of bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, LPG and CNG.

Unit IV: Geothermal and Ocean Energy (14Hrs)

Resources, types of wells, methods of harnessing the energy, potential in India. OTEC, principles of utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy, Potential and conversion techniques, mini-hydel power plants, land and their economics.

Suggested Books:

1. Non-Conventional Energy Sources - G.D Rai, Khanna Publishers
2. Renewable Energy Resources - Twidell & Wier, CRC Press (Taylor & Francis)
3. Renewable energy resources - Tiwari and Ghosal, Narosa.
4. Renewable Energy Technologies - Ramesh & Kumar, Narosa
5. Non-Conventional Energy Systems - K Mittal, Wheeler
6. Renewable energy sources and emerging technologies - D.P. Kothari, K.C. Singhal.

CHAIRMAN,
Board of Studies in Physics,
Mahatma Gandhi University
NALGONDA-508 254. (T.S.)

B.Sc. Chemistry III Year
Semester –VI
Optional for Chemistry Stream
Advanced Chemistry **60Hrs**

Unit-I (Inorganic Chemistry) **15 Hrs**
S6-O-I-1:Inorganic reaction mechanisms **4h**
Labile and inert complexes, Thermodynamic and kinetic stability based on VBT & CFT: ligand substitution reactions –S_{N^1} and S_{N^2} in Octahedral complexes; substitution reactions of square planar complexes – Trans effect and applications of trans effect. Reactions of tetrahedral complexes - Hydrolysis of silicon halides and phosphorous oxides.

S6-O-I-2: Boranes and Carboranes **2 h**
Definition of clusters. Structures of boranes and carboranes- Wade's rules, closo, nido, arachno boranes and carboranes

S6-O-I-3: Symmetry of molecules **5 h**
Symmetry operations and symmetry elements in molecules. definition of axis of symmetry types of c_n, plane of symmetry (σ_h, σ_v, σ_d), center of symmetry and improper rotational axis of symmetry (S_n). Explanation with examples.

S6-O-I-4: Non – aqueous solvents **4 h**
Classification and characteristics of a solvent. Reactions in liquid ammonia – physical properties, auto-ionisation, examples of ammono acids and ammono bases. Reactions in liquid ammonia – precipitation, neutralization, solvolysis, solvation - solutions of metals in ammonia, complex formation, redox reactions. Reactions in HF – autoionisation, reactions in HF – precipitation, acid – base reactions, protonation.

Unit-II (Organic Chemistry) **15 Hrs**
S6-O-O-1: Pericyclic Reactions **5 h**
Concerted reactions, Molecular orbitals of ethene, 1,3-butadiene and allyl radical. Symmetry properties, HOMO, LUMO, thermal and photochemical pericyclic reactions. Types of pericyclic reactions – electrocyclic, cycloaddition and sigmatropic reactions – one example each and their explanation by FMO theory.

S6-O-O-2: Synthetic Strategies **5 h**
Terminology – Target molecule (TM), Disconnection approach – Retrosynthesis, Synthon, Synthetic equivalent (SE), Functional group interconversion (FGI), Linear, Convergent synthesis. Retrosynthetic analysis of the following molecules: 1) acetophenone 2) cyclohexene and 3) 2-phenylethanol.

S6-O-O-3: Asymmetric synthesis **5 h**
Definition and classification of stereoslective reactions: substrate, product stereoselective reactions, enantio and diastereo selective reactions. Stereospecific reaction – definition –example – dehalogenation of 1,2-dibromides induced by iodide ion. Enantoselective reactions – definition – example –Reduction of Ethylacetoacetate by Yeast. Diastereoselective reaction- definition-

example:Acid catalysed dehydration of 1-phenylproponal and Grignard addition to 2-phenyl propanal. Definition and explanation of enantiomeric excess and diastereomeric excess.

Unit III (Physical Chemistry) **15 Hrs**
S6-O-P--1: Polymers
Definition of polymers – natural polymers and synthetic polymers examples classification as plastics, fibers, elastomers.
Thermosetting, thermoplastic polymers. Branched, cross-linked and co-polymers.
Definition of polymerization-addition and condensation polymerization with examples. Explanation :chain polymerization, step polymerization, co-polymerization and co-ordination polymerization. Kinetics of free radical polymerization. Tacticity, atacticity, stereo specific synthesis- Zeigler- Natta catalyst.
Molecular weight definitions- number average, weight average molecular weight. Determination of molecular weight of polymers using viscosity method, Osmometric method. Problems.
Preparation and industrial applications of polyethylene, poly vinyl chloride (PVC), nylon –66, teflon, polyacrylonitrile and terelene.
Introduction to biodegradability and examples of biodegradable polymers.

Unit IV: (General Chemistry) **15 Hrs**
S6-O-G--1:: Electroanalytical methods
Types of Electroanalytical Methods.
I) Interfacial methods – a) Potentiometry: Principle, Electrochemical cell, Electrodes- (i) Indicator and (ii) Reference electrodes – Normal Hydrogen Electrode, Quinhydrone Electrode, Saturated Calomel Electrode. Numerical Problems. Application of Potentiometry – Assay of Sulphanilamide
b) Voltametry – three electrode assembly; Intoduction to types of voltametric techniques, micro electrodes, Over potential and Polarization.

II) Bulk methods – Conductometry, Conductivity Cell, Specific Conductivity, Equivalent Conductivity. Numerical Problems. Applications of conductometry. Estimation of Cl – using $AgNO_3$. Determination of Aspirin with KOH.

Recommended Text Books and Reference books

1. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3 rd edn Wiley Publishers (2001).
2. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4 th edn. (2006)
3. Inorganic Chemistry by Shriver and Atkins 3 rd edn Oxford Press (1999).
4. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications (1996).
5. Symmetry and Spectroscopy of Molecules, K. Veera Reddy, Second Edition, New Age International (P) Limited Publishers
6. Textbook of Inorganic Chemistry by R Gopalan, Universities Press,(2012)
7. Text book of organic chemistry by Morrison and Boyd, Pearson Publishers (2009)
8. Text book of organic chemistry by Graham Solomons, Wiley(2015)

B.A Political Science

VI th Semester

Optional Paper / Project

Contemporary Political Theory

Unit- I : Liberal Theory :

Isaiah Berlin: Two concepts of Liberty

Hannah Arendt : On Totalitarianism

Unit- II : Neo Marxist theory

Antonio Gramsci: Hegemony and Passive Revolution

Sameer Amin: Critique of Globalization

Unit- III: Feminist Theory: I

Simone de Beauvoir: Issue of Equality

Betty Friedan : Feminine mystique

Unit-IV : Feminist Theory: II

Vandana Shiva : Eco-feminism

Cynthia Enloe: Women's Experience as politics

Paper : (BC 502) : INTRODUCTION TO INDIAN ECONOMY

Paper: BC502 Max. Marks: 40+10
PPW: 2 Hrs Exam Duration: 1½ Hrs

Objectives: 1) to provide an overview of Indian economy
2) to make the student acquaint with the latest developments in the economy

UNIT I: STRUCTURE OF THE INDIAN ECONOMY:

Indian Economy-Characteristics-Developmental issues-Structural changes in the Indian Economy-Human Development-concept and measures-Occupational distribution and economic development-Natural Resource: Land, Forest, Water & Minerals-Environmental degradation-Infrastructure: Energy, Power, Transport-Social infrastructure

UNIT II: POLICY ASPECTS OF INDIAN ECONOMY:

Liberalization - Privatization-Globalization-Poverty- Unemployment: nature and problems - The parallel economy – Industrial Policy.

SUGGESTED READINGS:

1) Meera Naidu "Introduction to Indian Economy" HPH
2) Ruddar Datt and K.P.M. Sundharam "Indian Economy", S. Chand & Company Ltd., New Delhi, 2013.
3) S.K.Misra & V.K.Puri "Indian Economy-Its Development Experience"Himalaya Himalya Publishing Company, New Delhi, 2013.
4) Introduction to Indian Economy: Dr. P. Venugopal Rao, PBP.
5) Vivek Mittal "Business Environment" Excel Publications, New Delhi, 2013.
6) Aswathappa.K. "Essentials of Business Environment – Text, cases & Exercises" Himalaya Himalya Publishing Company, New Delhi, 2013.
7) Economic Survey—Government of India, Ministry of Finance, Oxford University Press, New Delhi,
8) The Economic Times, News paper
9) Business Line, News paper

Paper PR : RESEARCH METHODOLOGY & PROJECT REPORT

Objective: *to introduce the basics of conducting research in social sciences.*

UNIT-I: INTRODUCTION, MEASUREMENT AND HYPOTHESIS TESTING:
Meaning of Research-Steps involved- Identification of Problem- Steps involved in the selection of problem-Research Design-Meaning and Types- Measurement Levels/Scales - Scaling Techniques-Hypothesis-Meaning - Types – Testing Procedure.

UNIT-II:PARAMETRIC AND NON PARAMETRIC TESTS AND RESEARCH REPORT:
Introduction - t- Test - F- Test - Chi Square Test - Anova (One Way Anova, Two Way Anova).concepts only Contents of a Research Report.

SUGGESTED READINGS:

1. Research Methodology: Himalaya Publications.
2. Methodology of Research in Social Sciences: Krishna Swamy,
3. Research Methodology: Kothari & Garg, New Age Publication
4. Research Methodology: Paneerselvam R, PHI
5. Research Methodology: Dr Vijay Upagade & Dr Arvind Shende, S. Chand Publications
6. Research Methodology: Ranjit Kumar, Pearson Publication
7. Reading in Research Methodology in Commerce & Business Management: Achalapathi KV,
8. Research Methodology: Sashi.K Gupta, Praneeth Rangi, Kalyani Publishers.

GUIDELINES FOR PROJECT WORK

1) Project work is a part of the prescribed curriculum to B. Com students.
2) Project work is allotted to a group of 4 students.
3) During the IV semester, students are expected to undergo internship at a business firm/ Government Department /Software organization/Voluntary organization as per the guidance of teacher concerned.
4) Students should get a certificate from the organization.
5) At the end of Semester-VI, the project reports would be evaluated by the external examiner designated by the Controller of Examinations, from the panel submitted by the Board of Studies in Commerce. The Examiner would evaluate the project reports for a maximum of 35 marks and conduct Viva-Voce examination for 15 marks. The award lists duly signed would be sent the Controller of Examinations.
6) Examiners will examine the following in the project report: i) Survey/Analysis on the topic chosen; ii) Method of data collection; iii) Presentation: Style, Comprehensiveness, graphs, charts etc.; iv) Analysis and inference and implications of the study; v) Bibliography.
7) Students must ensure that they maintain **regular contact with their supervisor** and also that they provide the supervisor with drafts of their work at regular intervals.
8) Students are required to submit a project report on a topic related/connected with trade, industry & commerce. Project can be done by taking the information from the select organization focusing on areas like marketing, finance, human resource, operations, general management etc.

B.Sc. ZOOLOGY SYLLABUS UNDER CBCS 2019-20
OPTIONAL PAPER IN PLACE OF THE PROJECT
B.Sc. ZOOLOGY III YEAR
SEMESTER - VI
PAPER - VI: TOOLS AND TECHNIQUES IN BIOLOGY

Instructions: 4hrs per week No. of period: 60 No. of credits: 4

UNIT- I: Microscopy Centrifugation (15 Periods)

1.1 Microscopy -Basic principle of microscopy, types of microscopes and their application

1.2 Histopathological techniques - principle and its applications

1.3 Centrifugation -Basic principle of centrifugation; Preparatory and analytical centrifugation techniques and its applications

UNIT- II: Separation techniques (15 Periods)

2.1 Colorimetery and Spectrophotometry - Basic principle of colorimetry and its applications, Basic principle of spectrophotometry, and applications.

2.2 Chromatography - Basic principle of chromatography; Types of chromatography techniques and their applications

2.3 Electrophoresis - Basic principle of electrophoresis and their applications

UNIT- III: Advanced techniques (15 Periods)

3.1 Immunoassay-Principle andapplications of ELISA

3.2 PCR Techniques - DNA extraction and isolation; Principles and applications of PCR techniques

3.3 RIA and its applications

UNIT- IV: Statistical tools (15 Periods)

4.1 Data - Definition and types of data, Concept of variables; summarising data: averages (Mean, median, mode), dispersion (range, standard deviation, confidence limits);

4.2 Representing data - Arraying data, tabulation; graphical representation of data (Histogram, bar graph, line graph, scatter plot, pie diagram)

4.3 Non-parametric tests -Chi Square test and parametric tests -Correlation;

4.4 Student's t-Test; Regression analysis

22/3/2022

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ASST. PROFESSOR
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University College of Scie
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Nalgonda.

Women & Child Rights

2 Credits

Unit - I

1. Introduction: Definition, perspectives and foundations of Human Rights.
2. Universal Declaration of Human Rights (1948).
3. National Human Rights Commission of India.
4. Women's Rights as Human Rights; UN Convention on Elimination of all forms of Discriminations against Women (CEDAW). Crime Against Women – Domestic Violence – Dowry Related Harassment and Dowry Deaths – Molestation – Sexual Abuse and Rape – Loopholes in Practice – Law Enforcement.
5. Women Rights in Indian Constitution – Fundamental Rights and Directive Principles.
6. Protective legislation for women in India - SITA (1956), Dowry Prohibition Act (1961), PNDT (1994), Domestic violence (Prevention) Act (2005) and Prevention Sexual Harassment of women at Workplace Act (2013).
7. Women's Right to Property.

Unit – II

1. Children's Rights: Definitions, meaning and importance.
2. The United Nations **Convention on the Rights of the Child** (**UNCRC**) **-1990.**
3. Safeguards of Indian Constitution for Rights of Children.
4. Barriers to realization of Child Rights.
5. National Commission for Protection of Child Rights (NCPCR)

References:

1. Agarwal, H.O., Implementation of Human Rights Covenants with Special Reference to India(Allahabad: Kitab Mahal, 1983).
2. Bajwa, G.S. and D.K. Bajwa, Human Rights in India: Implementation and Violations (New Delhi: D.K. Publishers, 1996).
3. Nitya Rao "Good Women do not Inherit Land" Social Science Press and Orient Blackswan 2008
4. International Solidarity Network "Knowing Our Rights" An imprint of Kali for Women 2006
5. P.D.Kaushik "Women Rights" Bookwell Publication 2007
6. Aruna Goal "Violence Protective Measures for Women Development and Empowerment" Deep and Deep Publications Pvt 2004
7. Monica Chawla "Gender Justice" Deep and Deep Publications Pvt Ltd.2006
8. Preeti Mishra "Domestic Violence Against Women" Deep and Deep Publications Pvt 2007
9. ClairM.Renzetti, Jeffrey L.Edleson, Raquel Kennedy Bergen, Source Book on "Violence Against Women" Sage Publications 2001.
10. Diwan, Paras and Peeyushi Diwan, Children and Legal Protection (New Delhi: Deep and Deep, 1994).
11. Pachauri, S.K., Children and Human Rights (Delhi: APH Publications, 1999).