

**SARDAR PATEL UNIVERSITY**  
**THIRD SEMESTER**  
**(EFFECTIVE FROM JUNE, 2019)**  
**SUBJECT : STATISTICS**  
**SKILL ENHANCEMENT COURSE**  
**COURSE CODE: US03SSTA21**  
**(FOUNDATION OF STATISTICS - I)**

Course credit: 2

No. of lectures per week: 2

All units carry equal Weightage

Weightage: Internal – 30%, External – 70%

Objectives:

The main objective of this course is to acquaint students with some basic concepts in Statistics. They will be introduced to some elementary statistical methods of analysis of data. At the end of this course students are expected to be able to analyze the data.

1. To tabulate statistical information given in descriptive form,
2. To use graphical techniques and interpret,
3. To compute various measures of central tendency, dispersion, skewness,
4. To apply statistics in the various fields.

Unit - I Collection of data - I

- Introduction, meaning, applications and limitations of Statistics
- Methods of collecting data : Survey Method and Experimental method
- Concept of a statistical population and sample from a population
- Advantages of sample survey
- Methods of sampling:
  - Simple random sampling
  - Stratified random sampling
  - Systematic sampling

Unit - II Collection of data - II

- Primary data
  - Methods of collecting primary data:
    - Direct personal inquiry method
    - Mailed Questionnaire method
    - Indirect oral investigation method
  - Secondary data
    - Chief sources of secondary data
    - Difference between Primary and Secondary data
- Types of characteristics (data)
  - Attributes: Nominal and Ordinal
  - Variables: Discrete and Continuous

Unit - III Presentation of data

- Classification: Definition, Purpose, Rules and Types of classification

- Tabulation: Meaning & importance, Parts of a table, Requisites of good table
- Types of table
  - Simple or one way table
  - Two way table
  - Manifold table (Up to four) (with examples)
- Diagrammatic and Graphical presentation of data:
  - Importance and its uses
- Types of diagrams
  - Bar diagram: Simple, Sub-divided ( Component), Percentage, Multiple
  - Pie chart
- Graphical presentation of data:
  - Histogram (with uniform class-width)
  - Frequency polygon
  - Frequency curves
  - Ogives
  - Determination of median and mode from graphs

#### Unit - IV Analysis of Quantitative data

- Measures of central tendency (Mean, Median, Mode)
- Measures of dispersion: Range, Quartile Deviation, Standard Deviation and Coeff. of Variation
- Skewness (Bowley's and Karl-Pearson's coeff. of skewness)

#### References:

1. Gupta S.C. and Kapoor V.K. : Fundamentals of applied statistics
2. Ken Black, Business Statistics (4<sup>th</sup> edition ) Willey student edition
3. Gupta S.C. : Fundamentals of statistics

**SARDAR PATEL UNIVERSITY**  
**THIRD SEMESTER**  
**(EFFECTIVE FROM JUNE, 2019)**  
**SUBJECT: STATISTICS**  
**SKILL ENHANCEMENT COURSE**  
**COURSE CODE: US03SSTA22**  
**(OPERATIONS RESEARCH – I)**

**Course credit: 2**

**No. of lectures per week: 2**

**All units carry equal Weightage**

**Weightage: Internal – 30%, External – 70%**

**Unit - I Linear Programming - I**

- Introduction
- Formulation of LPP
- Solution of LPP using Graphical method

**Unit - II Linear Programming - II**

- Solution of LPP using Simplex method ( Big M method)
- Duality

**Unit - III Transportation Problems - I**

- Introduction
- Mathematical formulation of Transportation problem
- Methods of finding i.b.f. solution
  - North West Corner Method (N-W Corner Method)
  - Row Minima Method
  - Column Minima method
  - Matrix Minima Method ( Least Cost Entry Method)
  - Vogel's Approximation method (VAM)

**Unit - IV Transportation Problems - II**

- uv method of obtaining optimum solution of TP
- Unbalanced TP
- Degenerate TP

**References:**

1. KantiSwarup Gupta, P.K. and Manmohan : Operations Research, Sultan Chand and Sons
2. Sharma J.K. : Operations Research
3. Taha Hamdy A. : Operations Research

**SARDAR PATEL UNIVERSITY**  
**B.SC. (SEM.3) STATISTICS**  
**US03SSTA23 : BIOSTATISTICS - I SKILL ENHANCEMENT COURSE**  
**(EFFECTIVE FROM JUNE, 2019)**

**Course credit: 2**

**No. of lectures per week: 2**

**All units carry equal Weightage**

**Weightage: Internal – 30%, External – 70%**

**Note: Simple/Scientific calculator is allowed for calculation.**

**Unit - I Collection and Presentation of data**

- Variables used in biology
- Collection and tabulation of quantitative and qualitative data
- Diagrammatic representation of data
  - Bar Diagram : Simple, Sub-divided (Component), Percentage, Multiple
  - Pie Chart
- Graphical representation of data
  - Histogram
  - Frequency polygon
  - Frequency curves
  - Ogives
  - Determination of median and mode from graph

**Unit - II Analysis of Quantitative data - I**

- Measures of central tendency
  - Mean
  - Median
  - Mode
  - Partition values
  - Applications in the field of Biosciences

**Unit - III Analysis of Quantitative data - II**

- Measure of dispersion
  - Range
  - Quartile deviation (Q.D)
  - Standard deviation (S.D)
  - Coefficient of Variation (C.V)
- Skewness
  - Karl-Pearson's coefficient of skewness
  - Bowley's coefficient of skewness

**Unit - IV Introduction to probability**

- Basic concepts of probability
- Various definitions of probabilities
- Laws of probabilities and Examples
- Discrete Probability Distributions: Binomial, Poisson and Examples

**References:**

1. Gupta S.C : Mathematical Statistics
2. Mahajan B.K. : Methods in Biostatistics
3. Sancheti D.C. and Kapoor V.K. : Statistics
4. Wayne W. Daniel : Biostatistics - A foundation for analysis in the health sciences

**SARDAR PATEL UNIVERSITY**  
**B. Sc. Computer Science III Semester**  
**Course: US03SICT21 Information and Communication Technology - I**  
**Effective from June-2019**

**Credits : 2**  
**Lectures per week : 2**  
**University examination duration: 2 Hours**  
**All units carry equal weightage.**

<b>Unit 1</b>	<b>Basics of Computer System</b> <ul style="list-style-type: none"> <li>- Introduction to Computer System and its characteristics</li> <li>- Basic Terminology: Hardware, Software, Firmware</li> <li>- Components of general purpose computer system: I/O devices, CPU, Memory</li> <li>- Generations of computer languages</li> <li>- Introduction to Operating System: Windows, Linux</li> </ul>
<b>Unit 2</b>	<b>Input and Output Devices</b> <ul style="list-style-type: none"> <li>- Input Devices: Keyboards, Numeric keypads, Pointing Devices (Mouse, touch pad), Joysticks, Touch screen, Scanner, Sensor Magnetic strip reader, Microphone, Barcode reader, Webcam, Light pen</li> <li>- Output Devices: Monitors (CRT, TFT, LCD), Projectors, Printers (laser, desk jet, dot matrix), Speaker, Plotter</li> </ul>
<b>Unit 3</b>	<b>Storage Devices</b> <ul style="list-style-type: none"> <li>- Importance and need of backup</li> <li>- Storage Devices: Hard Disk, CD, DVD, Pen Drive, Memory Cards</li> <li>- Comparative advantages and disadvantages of using different backing storage media.</li> <li>- Difference between main(internal) memory and backing storage.</li> </ul>
<b>Unit 4</b>	<b>Computer Networks</b> <ul style="list-style-type: none"> <li>- Introduction to analog and digital data</li> <li>- Need for conversion between analog and digital data</li> <li>- Modem and its purpose</li> <li>- Advantages and disadvantages of Computer Network</li> <li>- Different types of network (LAN, MAN, WAN)</li> <li>- Network Topology: (Bus, Star, Ring, Mesh, Hybrid)</li> </ul>

**REFERENCE BOOKS:**

- Tanenbaum A.S. : Structured Computer Organization, Prentice-Hall of India Pvt. Ltd.
- Rajaraman V. : Computer Fundamentals, Prentice-Hall of India Pvt. Ltd.
- Tanenbaum A. S., Computer Networks, Prentice-Hall of India Pvt. Ltd., New Delhi, 1997.

**SARDAR PATEL UNIVERSITY**  
**SECOND YEAR B. Sc. (THIRD SEMESTER)**  
**Skill Enhancement Course**  
**US03SMED21 (T): MEDICAL DIAGNOSTICS**  
**(Two Credit Course, Two hours per week)**  
**(Effective from June – 2019)**  
**(Total Marks-50, Internal-15 marks, External -35 marks)**

**Unit 1: Medical Diagnostics -Introduction**

Scope and Importance

Diagnostics Methods Used for Analysis of Blood

Blood composition, Preparation of blood smear and Differential Leucocyte Count (D.L.C) using Leishman's stain, Platelet count using Haemocytometer, Erythrocyte Sedimentary Rate (E.S.R), Packed Cell Volume (P.C.V.)

**Unit 2:Non-infectious Diseases**

Causes, types, symptoms, complications, diagnosis and prevention of Diabetes (Type I and Type II), Hypertension (Primary and secondary), Testing of blood glucose using Glucometer/Kit

**Unit 3: Infectious Diseases**

Causes, types, symptoms, diagnosis and prevention of Tuberculosis and Hepatitis  
**Contagious diseases-** HIV, TB, Measles

**Unit 4: Tumours**

Types (Benign/Malignant), Detection and metastasis; Medical imaging: X-Ray of Bone fracture, PET, MRI and CT Scan (using photographs).

( \* Designed following UGC Curriculum)

**SUGGESTED READINGS**

- Park, K. (2007), *Preventive and Social Medicine*, B.B. Publishers
- Godkar P.B. and Godkar D.P. *Textbook of Medical Laboratory Technology*, II Edition, Bhalani Publishing House
- Cheesbrough M., *A Laboratory Manual for Rural Tropical Hospitals, A Basis for Training Courses*
- Guyton A.C. and Hall J.E. *Textbook of Medical Physiology*, Saunders
- Robbins and Cortan, *Pathologic Basis of Disease*, VIII Edition, Saunders
- Prakash, G. (2012), *Lab Manual on Blood Analysis and Medical Diagnostics*, S. Chand and Co. Ltd.

BACHELOR OF SCIENCE  
Industrial Chemistry Vocational – Sardar Patel University  
Semester-III  
SUBJECT CODE : US03SICV22  
TITLE: Industrial Pollution, Its Control And Safety  
(02 Credits, 2 Hours; 35 External Marks & 15 Internal Marks)  
(Effective from June 2019)

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Unit1:

Atmosphere, Eco-System and Air Pollution, Sources and Effect of Air Pollutants, Green House Effect, Air Pollution control Technique.

Unit 2:

Water Pollution and its source, Types of water pollutants and their adverse effects, Waste water treatment, BOD and COD tests, Pesticide Pollution and sound pollution.

Unit 3:

Solid Waste Management, Collection and Disposal of solid waste, Radio activity and Radiation Pollution, Pollution Statutory limits. Biomedical waste and e-waste-generation and its management.

Unit 4:

Industrial hazards, Safety consideration in chemical industries, Chemical, Electrical and mechanical hazards, Fire and explosion hazard, Health hazard, Laboratory Safety, Safety Practice, Factory acts.

REFERENCE BOOKS:

1. Environmental Chemistry, B. K. Sharma (Krishna Prakashan Media (P) Ltd., Meerut).
2. Environmental Pollution Control Engineering, C. S. Rao (Wiley Eastern Ltd., New Delhi)
3. Engineering Chemistry, Jain and Jain ( Dhanpat Rai and Sons)
4. Introduction to Environmental Engineering and Science, G. M. Masters
5. Environmental pollution, H.N.DIX (J.W & Sons).
6. Chemical technology, Vol I, D.Venkateshwaraly (C.Chand & co)
7. Hand book of human factor and ergonomics by Salvendy, Jhon Wiley and sons.
8. Occupational safety and health by David L Goetsch.
9. Electronic waste management by Ronald E. Hester and Roy M Harrison.

BACHELOR OF SCIENCE  
Industrial Chemistry Vocational – Sardar Patel University  
Semester-III  
SUBJECT CODE : US03SICV21  
TITLE: SELECTED CHEMICAL PROCESS INDUSTRIES  
(02 Credits, 2 Hours; 35 External Marks & 15 Internal Marks)  
(Effective from June 2019)

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UNIT-1 Pulp & Paper- Pulp - Introduction, Manufacture of pulp, Sulphate or kraft pulp, Soda pulp, Sulphite pulp, Rag pulp, Beating, Refining, Filling, Sizing & colouring. Paper: Manufacture of paper, Calendering, Uses, Clean technologies in agro based industries, Ecological problems of Indian pulp and paper industries.

UNIT-2 Fermentation: Introduction, Physical conditions for cultivation of microorganisms, Development of inoculums, Characteristics of enzymes, Industrial alcohol, Absolute alcohol, Manufacturing of beers, wines, liquors, Distilled spirits, Acetone from isopropyl alcohol, Butyl alcohol, Citric acid from molasses by fermentation process, Ethyl alcohol from ethylene by catalytic hydration, Ethanol from ethylene by esterification and hydrolysis, ethanol from sugar, Manufacture of vinegar

UNIT -3 Sugar: Introduction, Manufacture of cane sugar, Extraction of juice, Purification of juice, Defection, Sulphitation & Carbonation, Concentration or Evaporation, Crystallization, Separation of crystals, Drying, Refining, Grades, Recovery of sugar from molasses, Bagasse,

UNIT -4 Insecticides: Introduction, Classification of insecticides, DDT (Di chloro di phynyl tri chloro ethane), BHC (Benzene hexachloride), Gammexane, Malathion, Carbaryl, P-dichlorobenzene, Fumigants, Rodenticides, Fugicides, Attractants and repellents, Growth regulators, Industrial biocides, Herbicides, Pesticides,

#### REFERENCE BOOKS

Industrial Chemistry by B.K. Sharma.

Chemical process industries by Shreve R.N, McGraw Hill



BACHELOR OF SCIENCE  
Industrial Chemistry – Sardar Patel University  
Semester-III  
SUBJECT CODE: US03SICH21  
TITLE: Chemical Process Industries  
(02 Credits, 2 Hours; 35 External Marks & 15 Internal Marks)  
(Effective from June 2019)

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UNIT-1 Pulp & Paper- Pulp - Introduction, Manufacture of pulp, Sulphate or kraft pulp, Soda pulp, Sulphite pulp, Rag pulp, Beating, Refining, Filling, Sizing & colouring. Paper: Manufacture of paper, Calendering, Uses, Clean technologies in agro based industries, Ecological problems of Indian pulp and paper industries.

UNIT-2 Fermentation: Introduction, Physical conditions for cultivation of microorganisms, Development of inoculums, Characteristics of enzymes, Industrial alcohol, Absolute alcohol, Manufacturing of beers, wines, liquors, Distilled spirits, Acetone from isopropyl alcohol, Butyl alcohol, Citric acid from molasses by fermentation process, Ethyl alcohol from ethylene by catalytic hydration, Ethanol from ethylene by esterification and hydrolysis, ethanol from sugar, Manufacture of vinegar

UNIT -3 Sugar: Introduction, Manufacture of cane sugar, Extraction of juice, Purification of juice, Defecation, Sulphitation & Carbonation, Concentration or Evaporation, Crystallization, Separation of crystals, Drying, Refining, Grades, Recovery of sugar from molasses, Bagasse,

UNIT -4 Insecticides: Introduction, Classification of insecticides, DDT (Di chloro di phynyl tri chloro ethane), BHC (Benzene hexachloride), Gammexane, Malathion, Carbaryl, P-dichlorobenzene, Fumigants, Rodenticides, Fugicides, Attractants and repellents, Growth regulators, Industrial biocides, Herbicides, Pesticides,

#### REFERENCE BOOKS

Industrial Chemistry by B.K. Sharma.

Chemical process industries by Shreve R.N, McGraw Hill

BACHELOR OF SCIENCE  
Industrial Chemistry – Sardar Patel University  
Semester-III  
SUBJECT CODE: US03SICH22  
TITLE: Industrial Pollution and Safety  
(02 Credits, 2 Hours; 35 External Marks & 15 Internal Marks)  
(Effective from June 2019)

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Unit1:

Atmosphere, Eco-System and Air Pollution, Sources and Effect of Air Pollutants, Green House Effect, Air Pollution control Technique, Noise pollution and its control Technique.

Unit 2:

Water Pollution and its source, Types of water pollutants and their adverse effects, Waste water treatment, BOD and COD tests, Pesticide Pollution and sound pollution.

Unit 3:

Solid Waste Management, Collection and Disposal of solid waste, Radio activity and Radiation Pollution, Pollution Statutory limits. Biomedical waste and e-waste generation, Characteristics, classification, collection, transportation and disposal, Noise pollution.

Unit 4:

Introduction to occupational health and safety, Workplace hazards, Hazard assessment techniques in chemical industry. Ergonomics hazard. Control of work place hazards - work equipment hazards, electric, chemical, biological and psychological hazards. Laboratory Safety, Safety Practice, Factory acts.

REFERENCE BOOKS:

1. Environmental Chemistry, B. K. Sharma (Krishna Prakashan Media (P) Ltd., Meerut).
2. Environmental Pollution Control Engineering, C. S. Rao (Wiley Eastern Ltd., New Delhi)
3. Engineering Chemistry, Jain and Jain ( Dhanpat Rai and Sons)
4. Introduction to Environmental Engineering and Science, G. M. Masters
5. Environmental pollution, H.N.DIX (J.W & Sons).
6. Chemical technology, Vol I, D.Venkateshwaraly (C.Chand & co)
7. Hand book of human factor and ergonomics by Salvendy, Jhon Wiley and sons.
8. Occupational safety and health by David L Goetsch.
9. Electronic waste management by Ronald E. Hester and Roy M Harrison.



**SARDAR PATEL UNIVERSITY**  
**Vallabh Vidyanagar**  
**B.Sc Information Technology**  
**Semester – 3**  
**US03SINT21 – Computer Architecture**  
**(w. e. f. June-2019)**

**Credits** : 2

**Exam Duration: 2hrs**

**Lectures per week** : 2

**All units carry equal weightage.**

**Unit Description in detail**

**1 Basic Computer Organization**

Instruction Code, Computer Register, Computer Instructions  
Timing and Control, Instruction Cycle, Register Reference Instructions, Memory  
Reference Instructions

Input – Output Interrupt

**Types of Interrupt:** External Interrupt, Internal Interrupt, Software Interrupt

**2 Central Processing Unit & Input – Output Organization**

Introduction, General Register Organization, Stack Organization

Register Stack, Memory Stack, Reverse Polish Notation

Instruction Formats: Zero-Address Instructions, One-Address Instructions, Two-  
Address Instructions, Three-Address Instructions

Peripheral Device: Input – Output Interface, I/O Bus and Interface Modules, I/O  
versus Memory Bus

**3 Computer Arithmetic & Memory Organization**

Direct Memory Access: DMA Controller, DMA Transfer

Multiplication & Division using Register Methods

Memory Hierarchy, Memory Unit

Random-Access Memory, Read Only Memory

Virtual Memory, Address Space and Memory Space

Cache Memory, Associative Mapping

**4 Microprocessor and Multiprocessor**

Microprocessor evolution, 8086 internal architecture : the execution unit, the bus  
interface unit,

Characteristics of Multiprocessor, Interconnection Structure, Time – Shared  
Common Bus, Multiport Memory, Crossbar Switch, Multistage Switching  
Network

**Basic Text & Reference Books:**

1. Computer System Architecture by M. Morris Mano PHI Publication
2. Computer Organization and Architecture, 4th Edition By William Stallings
3. Microprocessor Architecture, Programming and Applications with the 8085 - Third Edition by Ramesh S. Gaonkar Penram International
4. Andrew S. Tanenbaum: Operating System design & Implementation, Prentice Hall International
5. Hall, D. V.: “Microprocessor & Interfacing: programming and Hardware”, Tata McGraw-Hill, 2003.

**SARDAR PATEL UNIVERSITY**  
**SECOND YEAR B.Sc. (THIRD SEMESTER)**  
**Course code---US03SBMT21 (Bio Mathematics---I)**  
**(Two Credit Course, Two hours per week)**  
**(Effective from June – 2019)**  
**(Total Marks-100, Internal-30 marks, External -70 marks)**

**Unit:1**

Set operations, Algebra of sets: Finite sets, power sets, Mathematical induction, Symmetric differences, Functions: Composition functions, one to one, onto and invertible function, Recursively defined functions, Polynomial functions

**Unit:2**

Relations, Pictorial representation of relations, Composition of relations, Types of relations, closure properties, Equivalence relations, Basic logical operations, Propositions and truth tables, Tautologies and Contradictions, Logical equivalence, algebra of propositions, Conditional and Biconditional statements, Arguments, Propositional functions, Quantifiers, Existential quantifier, Negation of quantified statements.

**Unit:3**

Vectors in  $\mathbb{R}^n$ , dot product and norm, Matrix addition and scalar multiplication, Properties of Determinants, Cofactor Expansions and Cramer's rule.

**Unit:4**

Introduction of MATLAB, Basic operations of MATLAB (Practical), Types of Matrices, Matrix Operations (Addition, Subtraction and Multiplication), Examples: Applications of matrices and determinants in life science, Transpose of matrix, square matrices : Diagonal, upper and lower triangular, symmetric, skew symmetric, orthogonal matrices, Inverse of matrices.

Reference Books:

- (1) S. Lipschutz and Marc Lars Lipson : Discrete Mathematics, Schaum's series (International edition, 1992).
- (2) Vinay Kumar: Discrete Mathematics (BPB Publication, First edition-2002)
- (3) S. C. Gupta, Fundamentals of Statistics, Himalaya Publishing House, 2004.

**SARDAR PATEL UNIVERSITY**  
**SECOND YEAR B.Sc. (FOURTH SEMESTER)**  
**Course code---US04SBMT21 (Bio Mathematics---II)**  
**(Two Credit Course, Two hours per week)**  
**(Effective from June – 2019)**  
**(Total Marks-100, Internal-30 marks, External -70 marks)**

- UNIT-1** Basic Statistical techniques, Frequency distribution. Forming of Frequency distribution & cumulative distribution for discrete and continuous data, Graphic representation of data, Histogram and frequency curves.
- UNIT-2** Measures of central tendency (for grouped & ungrouped data), Mean, Median, Mode, Harmonic mean, Geometric mean, Weighted mean, Relation between Arithmetic mean, Geometric mean and Harmonic mean, Range, Percentile and Quartile, deviation, Standard deviation, Quartile Deviation.
- UNIT-3** Method of least squares, Least-square line, correlation coefficients, rank correlation coefficients, Karl's Pearson coefficients of correlation, Linear regression, Introduction to non linear regression.
- UNIT-4** Permutations and combinations, Elementary Probability, Conditional Probability, Independent and dependent events, mutually exclusive events, Probability distribution, Mathematical expectation,.

**Reference Books:**

1. Fundamental of statistics – S.C. GUPTA– Himalaya Pub. House.
2. Statistics –D.C. Sancheti, V. K. Kapoor, Sultan Chand & Sons.

SARDAR PATEL UNIVERSITY , VALLABH VIDYANAGAR  
SYLLABUS FOR B.Sc. SEMESTER - 4  
US04SMTH21(T)(NUMBER THEORY - 2)  
TWO HOURS PER WEEK (2 CREDIT)  
Effective from June 2019  
Marks:-50( 15 internal + 35 external)

**UNIT-1**

Linear indeterminate equations and its solution ,General solution of Linear indeterminate equation with three unknown , Pythagoras (Shang-gao indeterminate) equation and its solution.

**UNIT-2**

Congruences : Definition and examples , Properties of congruences ,Necessary and sufficient condition for a positive integer can be divided by 3,9,4,7,11 or 13 .

**UNIT-3**

Complete residue system(mod m) and its properties , Reduced residue system(mod m) and its properties , Euler's theorem,Fermat's theorem , Properties of Euler's function .

**UNIT-4**

Congruence in one unknown , Solution of Linear congruence in one unknown and two unknown, Chinese theorem ,Solution of system of congruences.

**Recommended texts :**

C.Y.Hsiung, Elementary Theory of numbers, Allied publishers Ltd.(1992)

**Reference Books:**

- (1) D.Burton , elementary Number Theory, 6th Ed , Tata McGraw-Hill Edition,Indian reprint.
- (2) I.Niven And H.Zuckermar , An Introduction to the theory of Numbers, Wiley-Eastern Publication.
- (3) S.Barnard and J.N.Child , Higher Algebra, Mc Millan and Co. Ltd.
- (4) Neville Robinns, Beginning Number Theory , 2nd Ed.,Narosa Publishing House Pvt.Ltd. Delhi,2007

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SARDAR PATEL UNIVERSITY  
Vallabh Vidyanagar  
B.Sc. (Semester-3) Skill enhancement Course  
US03SPUH21 : Public health

Unit 1:

Definition of public health,  
General concept of Public health  
Determinant of public health  
Indicator of public health

Unit 2:

Community diseases  
Bacterial diseases: Typhoid, Cholera, Diarrhea ,TB  
Viral Diseases: Jundice, Small pox, Rabies, Polio  
Protozoan Diseases: Malaria  
Sexually transmitted diseases: syphilis, Gonorrhoea, AIDS

Unit-3

Main pillar of public health

Air: Composition of Air, Environmental factor which purify air naturally,air pollution,air purification,  
disease transmitted by polluted air,

Water: Composition of water, Sources of water, water pollution, diseases transmitted by water.

Solid waste Hazards: Definition of solid waste hazards, Dumping of solid hazards, Recycling & reuse of  
it. Sewage treatments.

Unit 4:

Factor influencing Health

Vaccination

Definition of vaccination, types of vaccines, important of vaccine

Family planning, General concept of planning

Different method of family planning

Reference :

Public Health by J B Vaidya

Public health by B J Trunock [4<sup>th</sup> ed]

A guide to hygiene & public health by Dr. AK Sharma & V R Bhatia.

Principles of public health practice [2<sup>nd</sup> ed] by Douglas, Sctuchfied, and William keck C.

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SARDAR PATEL UNIVERSITY  
B.Sc. SEMESTER-III  
US03SCHE21  
POLYMER SCIENCE – I  
(Effective from June 2019)

Credit-02

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UNIT-I

Introduction, classification of polymers, Nomenclature of polymers, Chain growth polymerization, Mechanism of free-radical, Cationic and Anionic polymerization, polycondensation polymerization.

UNIT-II

Polymerization Techniques, Concept of Averages-Number average molecular weight, Weight average molecular weight, Viscosity average molecular weight, Molecular weight and Degree of polymerization, Poly-dispersity and molecular weight distribution.

UNIT-III

Methods for determination of molecular weight, Membrane Osmometry, Vapour Phase Osmometry, Viscometry, Light Scattering.

UNIT-IV

Glass Transition Temperature ( $T_g$ ), factors affecting glass transition temperature, glass transition temperature and molecular weight,  $T_g$  and melting point, crystallinity in polymers.

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Basic Text & Reference Books :-

- (I) Principles of polymers Science by P.Bahadur and N.V.Sastry. (Second Edition )
- (II) Polymer Science by V.R.Gowariker, N.V.Vashwanathan and Jaydev Shreedhar.

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SARDAR PATEL UNIVERSITY  
B.Sc. SEMESTER-III  
US03SCHE22  
QUANTITATIVE METHODS OF ANALYSIS  
(Effective from June 2019)

Credit-02

Unit :I

Titrimetric Methods in Analysis

Introduction, Definitions: Standard solutions, Equivalence Point, End point, Primary standards, Desirable properties of standard solution, Volumetric calculations: Molarity, Normality, percentage concentration, parts per million.

UNIT-II

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, Determination of Acetic acid in vinegar, Determination of Alkalinity of soda ash.

UNIT : III

Complexometric Titration : Introduction, terms involved in titration: complex, ligand, EDTA,buffer solution, Complexometric titration curve. Equilibria involved in EDTA titration, types of EDTA titrations,Indicators for EDTA titrations, Hardness of water.

UNIT :IV

Redox Titration :Introduction, Terms involved: oxidation, reduction. Single electrode potential, formal potential, Nernst Equation, Titration curve for Iron(II) and cerium (IV). Types of redox indicators and their selection, Structural chemistry of redox indicators

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.

SARDAR PATEL UNIVERSITY, VALLABH VIDYANAGAR  
B. Sc. Semester-III  
US03SCHE23  
PHARMACEUTICAL CHEMISTRY: FUNDAMENTALS  
(Effective from June 2019)

Credits 02

**UNIT: I** Introduction to Pharmaceutical Chemistry, pharmacopeia, pharmaceuticals, pharmacognosy. Impurities in Pharmaceuticals: Sources of impurities, tests for purity and identity, limit tests for iron, arsenic, lead, heavy metals, chloride, sulphate.

**UNIT: II** Basics of drugs and formulation analysis : Weights, balances, importance of analysis, quality control and quality assurance, analytical methods (classification, validation parameters), requirements –chemicals (types, purification, checking purity), glass wares (types, calibration, cleaning), sampling techniques, sampling error minimization. Units of concentrations. Errors science, errors minimization.

**UNIT: III** Introduction and Classification of drugs. Quality control of Drugs and Pharmaceutical Importance of quality control, significant errors, methods used for quality control.

**UNIT: IV** General discussion on the following inorganic compounds including important physical and chemical properties, medicinal and Pharmaceutical uses, storage conditions and chemical incompatibility.

A. Acids, bases and buffers Boric acid, Hydrochloric acid, strong ammonium hydroxide, Calcium hydroxide, Sodium hydroxide and official buffers.

B. Antioxidants-Hypophosphorous acid, Sulphur dioxide, Sodium bisulphite, Sodium metabisulphite, Sodium thiosulphate, Nitrogen and Sodium Nitrite.

C. Gastrointestinal agents : i) Acidifying agents Dilute hydrochloric acid. ii) Antacids-Sodium bicarbonate, Aluminium hydroxide gel, Aluminium Phosphate, Calcium carbonate, Magnesium carbonate, Magnesium trisilicate, Magnesium oxide, Combinations of antacid preparations.

**Text Books:**

1. Pharmaceutical chemistry-I by Anil Bhandari and G K Singh, CBS Publishers. 2018.
2. Inorganic Medicinal and Pharmaceutical Chemistry : J. H. Block, E. B. Roche, T. O. Soine, C. O. Wilson, Varghese Publishing House, First Indian Reprint, 1986.

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