

SARDAR PATEL UNIVERSITY
FOURTH SEMESTER
(EFFECTIVE FROM JUNE, 2019)
SUB: STATISTICS
SKILL ENHANCEMENT COURSE
COURSE CODE: US04SSTA21
(FOUNDATION OF STATISTICS – II)

Course credit: 2

No. of lectures per week: 2

All units carry equal Weightage

Weightage: Internal – 30%, External – 70%

Unit - I Correlation and regression

- **Meaning**
- **Types of correlation**
- **Methods of studying correlation**
 - **Scatter diagram(plot) method**
 - **Karl-Pearson's correlation coefficient method**
 - **Spearman's rank correlation coefficient method**
- **Properties of correlation coefficients (without proof)**
- **Examples**
- **Regression**
 - **Meaning**
 - **Properties of regression coefficients (without proof)**
 - **Examples**

Unit – II Association of Attributes

- **Theory of attributes**
- **Consistency of data**
- **Independence and association of attributes**
- **Measures of association and contingency**

Unit - III Discrete probability distributions

- **Binomial and Poisson**
- **Applications**

Unit – IV Continuous probability distribution

- **Normal distribution**
- **Applications**

References:

- 1. Gupta S.C. and Kapoor V.K. : Fundamentals of applied statistics**
- 2. Gupta S.C.: Fundamentals of statistics**

FOURTH SEMESTER
(EFFECTIVE FROM JUNE , 2019)
SUBJECT: STATISTICS
SKILL ENHANCEMENT COURSE
COURSE CODE: US04SSTA23
(BIOSTATISTICS - II)

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 Correlation and regression

- **Meaning**
- **Types of correlation**
- **Methods of studying correlation**
 - **Scatter diagram(plot) method**
 - **Karl-Pearson's correlation coefficient method**
 - **Spearman's rank correlation coefficient method**
- **Properties of correlation coefficients (without proof)**
- **Applications**
- **Regression**
 - **Meaning**
 - **Properties of regression coefficients (without proof)**
 - **Applications**

Unit - II Continuous Probability distributions

- **Normal distribution**
 - **Definition**
 - **Properties (without proof)**
 - **Area under normal curve**
 - **Applications**

Unit - III Test of Significance - I

- **Test of Independence**
- **Large sample test**
 - **Test for population proportion**
 - **Test for difference between two population proportions**
 - **Test for population mean**
 - **Test for difference between two population means**

Unit - IV Test of Significance - II

- **Small sample test**
 - **Test for population mean**
 - **Test for difference between two population means (Unpaired t - test)**
 - **Test for difference between two population means (Paired t - test)**

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
SECOND YEAR B.Sc. (FOURTH SEMESTER)
Skill Enhancement Course
US04SHTE21 (T) Herbal Technology
(Two Credit Course, Two hours per week)
Effective from June-2019
(Total Marks-50, Internal -15 marks, External-35 marks)

Unit 1: Herbal medicines: history of medicine in India , definition of medical terms - role of medicinal plants in Siddha systems of medicine; cultivation - harvesting - processing - storage - marketing and utilization of medicinal plants. Medicinal plant banks, micropropagation of imp species

Unit 2: Pharmacognosy – Definition, History and scope of Pharmacognosy, classification of drugs of natural origin, Scheme for Pharmacognostic study of a drug, Botanical source, geographical distribution, chemical constituents and medicinal uses of the following in curing various ailments: Tulsi, Ginger, Fenugreek, Amla and Ashoka.

Unit 3: Natural drugs of therapeutic value-
Laxatives,Cardiotonics, Astringents, Drugs acting on nervous system, Antirheumatics, antitumor, antidiabetics, Diuretics, Antidysenterics, Antimalarial (with two examples in each)

Unit 4: Analytical pharmacognosy –
Drug adulteration - methods of drug adulteration, methods of evaluation –Significance of Phrmacopoeial standards
Properties, chemistry, classification and distribution of Alkaloids, Glycosides, Volatile oils, Tannins, Resins, fixed oils
Herbal foods-future of pharmacognosy

Suggested Readings :

1. Glossary of Indian medicinal plants, R.N.Chopra, S.L.Nayar and I.C.Chopra, 1956. C.S.I.R, New Delhi.
2. The indigenous drugs of India, Kanny, Lall, Dey and Raj Bahadur, 1984. International Book Distributors.
3. Herbal plants and Drugs Agnes Arber, 1999. Mangal Deep Publications.
4. Ayurvedic drugs and their plant source. V.V. Sivarajan and Balachandran Indra 1994. Oxford IBH publishing Co.
5. Ayurveda and Aromatherapy. Miller, Light and Miller, Bryan, 1998. Banarsidass, Delhi.
6. Principles of Ayurveda, Anne Green, 2000. Thomsons, London.

(* Designed following UGC curriculum)

BACHELOR OF SCIENCE
Industrial Chemistry – Sardar Patel University
Semester-IV
SUBJECT CODE: US04SICH21
TITLE: SPECIALITY CHEMICALS
(02 Credits, 2 Hours; 35 External Marks & 15 Internal Marks)
(Effective from June 2019)

UNIT-1 Oil, Fat & Wax: Introduction, Distinction between oils and fats, Manufacturing of cotton seed oil by expression, Solvent extraction, Refining of vegetable oils,

Unit -2 Soaps & Detergents: Shops- Manufacture of soaps, Toilet & transparent soap, Cleansing action of soaps,
Detergents - Classification of surface active agent, Anionic detergent, Alkyl sulphates, Alkyl aryl sulphonates, Cationic detergents, Amphoterics detergents, Non- ionic detergents, Detrimental effect of detergents

UNIT -3 Fertilizer: Introduction, Classification of fertilizer, Nitrogenous fertilizer, Ammonium nitrate, Ammonium sulphate, Ammonium sulphate nitrate, Urea, Calcium ammonium nitrate, Super phosphate, Single Super phosphate, Triple Super phosphate, Ammonium phosphate, NPK fertilizers,

UNIT -4 Catalysis: Introduction, type of catalysts, basic principles, mechanism and factors affecting the performance, Enzyme catalyzed reactions and industrially important catalytic reactions.

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-IV
SUBJECT CODE: US04SICH22
TITLE: Introduction to Green Chemistry
(02 Credits, 2 Hours; 35 External Marks & 15 Internal Marks)
(Effective from June 2019)

Unit:1

Introduction to the concepts of Green Chemistry, Principles of Green Chemistry, Steps to Design Green synthesis, Choice of starting material, reagents, catalyst, solvents for green synthesis, Concept of Atom economy.

Unit:2

Study of Green Catalyst (Viz. Acidic, Basic, Polymer supported catalyst, Biocatalyst), Introduction , application Phase transfer catalyst, Crown ethers.

Unit :3

Introduction and Application to various green techniques of Green Synthesis viz. Electrochemical, Photochemical, Microwave, Ultrasound. Aqueous phase reaction and solid phase reaction.

Unit :4

Synthesis of: Adipic Acid, Catechol, Methyl Methacrylate, Urethane, Furfural from biomass, Ibuprofen, Paracetamol. Application of Green Chemistry in day to day life
Dry cleaning of clothes, versatile bleaching agent, Ionic liquids as versatile green solvent

Reference Book:

1. Green Chemistry by V.K. Ahluwalia.
2. Principles of Green Chemistry by

SARDAR PATEL UNIVERSITY

B. Sc. Computer Science

IV Semester

US04SICT21 Information and Communication Technology - II

Effective from June-2019

Credits : 2

Lectures per week : 2

University examination duration: 2 Hours

All units carry equal weightage.

Unit 1	Introduction to Internet and Communication technology <ul style="list-style-type: none">- Introduction to Internet and web browser- Search Engine, uploading and downloading files- Email: writing and sending to single and multiple users- Concept of CC and BCC, attachment to email- Fax and Mobile communication
Unit 2	Introduction to HTML <ul style="list-style-type: none">- Basics of HTML, HTML tags, Structure of HTML document- Text and paragraph formatting, Hyperlink- Ordered and Unordered lists- HTML table- Image tag
Unit 3	Introduction to E-Commerce <ul style="list-style-type: none">- Definition, communication perspective, business process perspective, service perspective- Classification by nature of transaction: B2B, B2C, C2C, C2B, Non business EC, Intra-business EC- Benefits to organization, consumers and society- Limitations and future of EC
Unit 4	Effects of Using IT <ul style="list-style-type: none">- Computer virus and Anti-virus- Effect of ICT: Increasing and Decreasing Employment- Capabilities and Limitations of IT- Issues related to Information found on net: unreliability, undesirability, security of data transfer- Potential health problems: Repetitive Strain Injury (RSI), Neck and Back problems, Eye problems- Simple strategies for preventing health problems.

REFERENCE BOOKS:

- Ivan Bay ross, "Web Enabled Commercial Applications Development using HTML, DHTML, Java script, Perl CGI", BPB, 2004
- Introduction to Internet and HTML scripting 2nd edition, Bhaumik Shroff.
- Douglas E Comer: The Internet, PHI, Second Edition, May 2000
- E-Commerce – Business, Technology, Society Kenneth C Laudon, Carol Guercio Traver (Pearson Education)

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
B.Sc Information Technology Semester – 4
US04SINT21 : R Programming
(w.e.f June 2019)

Credits : 2

Exam Duration: 2hrs

Lectures per week : 2

All units carry equal weightage.

Unit	Description in detail	Weightage
I	Introduction to R <ul style="list-style-type: none"> - History of R, Features of R, How to install R, How to run R, Comments in R, Reserved words, Identifiers, Constants, Variables - Operators: Arithmetic, Relational, Logical, Assignment, Miscellaneous, - Basic Data Types: Numeric, Integer, Complex, Logical, Character - Vectors: Creating Vectors, Combining Vectors, Accessing Vector Elements, Modifying Vectors, Deleting Vectors, Vector Arithmetic & Recycling, Vector Element Sorting, Reading Vectors 	25%
II	Data Structure in R <ul style="list-style-type: none"> - Matrices: Creating Matrices, Accessing Matrix Elements, Matrix Manipulation, Matrix Operations - Arrays: Creating Arrays, Accessing Array Elements, Array Element Manipulation, Array Arithmetic - Lists: Creating Lists, Accessing List Elements, Updating List Elements, Merging Lists, List to Vector Conversion - Factors: Creating Factors, Accessing Factor Components, Merging Factors - Data Frames: Creating Data Frames, Accessing Data Frame Components, Modifying Data Frames, Aggregating Data, Sorting Data, Merging Data, Reshaping Data, Subsetting Data 	25%
III	Flow Control & Functions in R <ul style="list-style-type: none"> - Decision Making: if statement, if..else statement, Nested if..else statement, switch statement, - Loops: for Loop, while Loop, repeat Loop, Loop Control Statements: break Statement, next Statement - Built-in Functions: Mathematical Functions, Character Functions, Statistical Functions, Date and Time Functions - Functions Definition, Function Calling: Function without arguments, Functions with named arguments, Function with default arguments. 	25%
IV	Connecting R to External interfaces <ul style="list-style-type: none"> - Packages: Installing a Package, Loading a Package - Charts and Graphs: Bar Charts, Line Graph, Pie Chart, Scatter Plots, Dot Plots - CSV Files: Reading from a CSV File, Writing to a CSV File - Microsoft Excel: Reading from a xlsx File, Writing to xlsx File - Databases: Connecting R to MySQL, Creating Tables, Inserting Rows, Updating Rows, Deleting Rows, Querying Tables, Dropping Table 	25 %

Basic Text & Reference Books:

1. R Programming for Data Science, Roger D. Peng (2015), Leanpub publisher
2. Statistics Using R Purohit, G.S., Gore, S.D. and Deshmikh, S.R. (2008), Narosa Publishing House
3. Data Analysis and Graphics Using R: An example-based approach , Maindonald J. and Braum, J. (2007) Second Edition, Cambridge Series in Statistical and Probabilistic Mathematics.
4. An R Companion to Linear Statistical Models , Hey-Jahans, C.(2012), CRC Press

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
B.Sc. (Semester-4) Skill enhancement Course
US04SFND21 : Food & Nutrition & Dietetics

Unit 1:

Outline of food & nutrition
Different types of nutrients & importance of it
Classification & function of food
Outline of digestion & used of food in body

Unit 2:

Energy yielding
Body building
Protective & regulatory food
Balanced diet

Unit-3

Assessment of Nutritional status
Improvement of vitamins in nutrition
Improvement minerals in nutrition

Unit 4:

Definition :Dietetics
Diet in obesity & underweight
Diet in tuberculosis
Diet in malnutrition
Diet in Diabetes
Diet in anemia
Protein calories malnutrition
Diet in bone diseases
Diet in cancer

Reference :

Food & Nutrition by J B Vaidya
Applied nutrition by R Rajlaxmi [Oxford & IBH pub co 1981]
Dietetics 5th ed by B Shreelaxmi
Nutritional value & Indian food by G C Ramasastri & B Balasubramanyan S.

SARDAR PATEL UNIVERSITY
B.Sc. SEMESTER-IV
US04SCHE21
POLYMER SCIENCE – II
(Effective from June 2019)

Credit-02

UNIT-I

Co-polymerisation, Mechanism and kinetics of copolymerization, polymer processing techniques: Die Casting, Injection Moulding, Blow Moulding, Extrusion Moulding, Foaming, Reinforcing, Fiber spinning technique.

UNIT-II

Polymer Degradation: Introduction, Types of degradation, thermal degradation and factors affecting it, mechanical degradation, degradation by ultrasonic waves, photo degradation, oxidative degradation.

UNIT-III

Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene and styrene copolymers, poly(vinyl chloride) and related polymers, poly(vinyl acetate), acrylic polymers.

UNIT-IV

Brief introduction to preparation, structure, properties and application of the following polymers Phenol formaldehyde resins (Bakelite, Novalac), polyurethanes, silicone polymers, polydienes, Polycarbonates, Conducting Polymers, polyacetylene.

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.

SARDAR PATEL UNIVERSITY, VALLABH VIDYANAGAR
B. Sc. Semester-IV
US04SCHE22
MEDICINAL CHEMISTRY: FUNDAMENTALS
(Effective from June 2019)

Credits 02

UNIT: I Basic Principles of Medicinal Chemistry: basic terminology, Physico-chemical aspects (Optical, geometric and bioisosterism) of drug molecules and its biological action, Drug receptor interaction including transduction mechanisms.

UNIT: II Principles of Drug Design : Basic concept , Traditional analog (QSAR) and mechanism based approaches, applications of quantum mechanics, Computer Aided Drug Designing (CADD) and molecular modeling.

UNIT: III Mode of action and SAR of following class of drugs:
Antibacterial agents and Antibiotics, Sulphonamides and Antineoplastic Agents, Anti – mycobacterial and Antimalarial agents, Antifungal agents, Antiviral agents.

UNIT: IV Synthetic procedures and uses of selected drugs: Methicillin, Oxacillin, Cloxacillin, Trimethoprim, Melphalan, 6-mercaptopurine, Methotrexate, Thiotepe, Isoniazid, paraamino salicylic acid, pyrazinamide, ethambutol, Dapsone, Mefloquine, Amodiaquine, pyrimethamine.

Text Books:

1. Ashutosh Kar, Medicinal Chemistry, New age international publisher. 2018
2. Harkishan Singh, V. K. Kapoor, Medicinal and Pharmaceutical chemistry, Delhi – Vallabh Prakashan, 2nd edition, reprint (2008).

SARDAR PATEL UNIVERSITY, VALLABH VIDYANAGAR

B. Sc. Semester - IV

US04SCHE23

GREEN CHEMISTRY: FUNDAMENTALS

(Effective from June 2019)

Credits 02

UNIT: I NEW TRENDS IN GREEN CHEMISTRY: Introduction and basic Principles of Green Chemistry: Prevention of waste/By products, Maximum incorporation of reactants into the final product., Prevention or minimization of hazardous products, Designing safer chemicals, Energy required for synthesis, Selection of appropriate solvents, selection of starting materials, Use of protecting groups, Use of catalyst, Products design should be bio-degradable, Designing of manufacturing plants, Strengthening of analytical techniques. Green Chemistry in day-to-day life: Dry cleaning of cloths, Versatile bleaching agents.

UNIT: II GREEN REAGENTS AND CATALYSTS : Introduction, Designing a Green Synthesis, Choice of starting materials, Choice of reagents, Choice of catalyst, Choice of Solvents. Environmental Pollution, Green Reagent, Dimethyl Carbonate, Polymer supported reagents, Green Catalysts, Acid Catalysts. Oxidation Catalyst, Basic Catalyst, Polymer Supported Catalyst.

UNIT: III BIO CATALYST IN ORGANIC SYNTHESIS: Introduction, Biochemical (Microbial) Oxidations, Biochemical (Microbial) Reductions, Enzymes, Catalyzed Hydrolytic Processes. Green Chemistry Using Bio Catalytic Reactions – Introduction - Fermentation and Biotransformations - Production of Bulk and fine chemicals by microbial fermentation- Antibiotics – Vitamins - Bio catalyses synthesis of industrial chemicals by bacterial constructs - Future Trends.

UNIT: IV ORGANIC SYNTHESIS IN SOLID STATE AND GREEN ANALYTICAL METHODS : Introduction, Solid phase organic synthesis without using any solvent, Solid supported organic synthesis. Future trends in Green Chemistry - Green analytical methods, Redox reagents, Green catalysts; Green nano-synthesis, Green polymer chemistry, Exploring nature, Biomimetic, Proliferation of solvent-less reactions; Non-covalent derivatization, Biomass conversion, emission control.

Text Books:

1. New Trends in Green Chemistry by V. K. Ahluwalia, M. Kidwai. Springer Science & Business Media. 2004.
2. V. Kumar, "An Introduction to Green Chemistry" Vishal publishing Co. Reprint Ed., 2010.
3. Rashmi Sanghi, M.M Srivastava "Green Chemistry" Fourth Reprint – 2009.

SARDAR PATEL UNIVERSITY
B.Sc. (Semester-4) Skills Enhancement
US04SSPN21 : Soil & Plant Nutrition

Unit - I Importance and Soil Characteristic

Importance, origin, classification and characteristics of soil

Unit - II Soil testing and amendments

Soil sampling, analysis and fertility, Fertilizers, chemical- organic, conservation

Unit -III Plant nutrition

Essential elements, deficiency symptoms, soil-root-microbe interaction, biological nitrogen fixation

Unit -IV Modern approaches

Soil-less cultures, nutrient solution, mycorrhiza, plant assimilation, tillage and sustainable agriculture

Suggested reading:

1. E J Plaster Soil Science, Cengage publication New Delhi (2009)
2. L Taiz and Zeiger E, Plant Phycology, Sinaure Association, Marsachusetts (1998)
3. Noggle G. R. and Fritz G. J. Introductory Plant Physiology, Prentice-Hall of India, New Delhi (1992)

SARDAR PATEL UNIVERSITY
SECOND YEAR B.Sc. (FOURTH SEMESTER)
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.