

Annexure – IV
Basket of Skill Enhancement Courses
(SEC)

SEC Basket Semester I

Faculty of Science and Technology

Sem.	Course Category	Name of Course	BoS	Course Code
I	SEC	Communicative Skills and Personality Development 1	Languages	BVS1P02
		Soil analysis and hydrobiology	Botany	
		Beekeeping	Zoology	
		Desk Top Publishing	Computer Science/ Computer Application	
		Aptitude and Reasoning	Mathematics	
		DNA Manipulation Techniques	Biotechnology	
		Quality control testing of fermented food	Microbiology	
		Food Adulteration Analysis	Chemistry	
		Food Adulteration Analysis	Biochemistry	
		Geo-statistics in Geology	Geology	
		Simulation and Modelling of Electronic Circuits 1	Electronics	
		Environmental Sampling and Monitoring	Environmental Science	
		PPT Presentation Course	Statistics	
		A. Chemical Laboratory Techniques B. General Practices in Forensic Biology C. Physics Workshop	Forensic Science	
		A. Elements of Art B. Hybrid Extension Methods C. Digital Literacy for Home Science	Home Science	
		Hand Painting 1	Fashion Design	
		Hand Painting 1	Textile Science	
		Product workshop I	Interior Design	
		Applied Chemistry I	Applied Electronics & Software Technology	
		Electric Wiring for Domestic Applications	Physics	

Skills Enhancement Course (BoS Languages)

Title of the Course: Communication Skills and Personality Development: 1

Semester -I (2 Credits each)

Introduction: The course is designed to inculcate basic communication skills among the learners and to help them to become confident individuals. Communication Skills is one of the essential attributes in today's world. This course will help the learners to understand the different aspects of communication skills in a professional scenario. This course is based on Bloom's Taxonomy and guides the learners to remember, understand, analyze, and apply the acquired language skills. Each section in this course has exercises based on experiential learning.

Course Outcomes:

1. By the end of this course, the learners will imbibe the basic Listening and Speaking skills.
2. They will develop basic business vocabulary and will be able to use them proficiently.
3. The learners will be able to successfully construct correct sentences and use them appropriately in different situations.
4. This course will reinforce basic communication etiquettes and values.

Semester I (2 Credits-30 hours)

Communication Skills and Personality Development: 1

Unit I: Oral and Aural Communication Skills-1 (6 Hours)

- 1.1 Importance of Listening Skills
- 1.2 Active and Effective Listening Skills
- 1.3 Reading Skills

Unit II: Oral and Aural Communication Skills-2 (6 Hours)

- 2.1 Understanding the Use of Formal and Informal Language
- 2.2 Oral Communication Skills: Monologues and Dialogues
- 2.3 Situational Conversation (Introducing Yourself, Greeting People, Leave Taking)

Unit III: Let's Add Word Power- 1 (6 Hours)

- 3.1 Commonly confused words (Homonyms, Homophones, Homographs)
- 3.2 Word list with their etymology
- 3.3 Academic Word List 1 (formation of nouns, adjectives, and adverbs)

Unit IV: Let's Add Word Power- I (6 Hours)

- 4.1 Academic Word List 2 (Compound words, one word substitution)
- 4.2 Professional Vocabulary with Meanings
- 4.3 Some Common Errors (Error recognition exercises on vocabulary)

Unit V: Written Communication (6 Hours)

5.1 Pamphlets (Describing Places of attraction)

5.2 Advertisements (Classified Ads: Sale of Property, Vehicles and Advertisement for Vacancies)

5.3 E-mail Writing (Official Mails)

Reference Books:

1. English Language Skills for Academic Purposes: A Textbook for College Students, Charul Jain, Pradyumansinh Raj, Yunus Karbhari, Macmillan Education.
2. Communicative English II: An Active Course of Phonetics and Grammar, Macmillan Education.
3. Essential English for Indian Learners: Foundation, Dr. Jitendra Kumar Singh, Macmillan Education
4. Introduction to Life Skills: A Textbook for College Students, Arvind Nawale, Macmillan Education.
5. English in Action: A Textbook for College Students, Editors: T. Vijaykumar, K, Durga Bhawani, Y.L.Shrinivas, Macmillan Education.
6. English in Use: A Textbook for College Students, Macmillan Education.
7. Stream: English Coursebook for College Students, Suresh Gadhavi. Mahendra Mishra, Macmillan Education
8. Meera Banerjee, Business Communication Skills, Macmillan Education.

Evaluation Scheme for SEC (Communication skills and Personality Development: 1)

DISTRIBUTION OF MARKS (Theory Examination)				
UNITS	MCQs	SAQs	VSAQs	Total Marks
Unit I	06	04	05	15
Unit II		04	05	09
Unit III		04	05	09
Unit IV			05	05
Unit V		04x3 (3 questions of 4 marks each)		12
				50

Internal Assessment will be based on a continuous evaluation. It should ideally follow the following marking scheme:

Assignments & Viva-voce (15+15), Attendance (10), Participation in Classroom Projects and Activities (10)

Framework for Internal Evaluation		
Assessment Criteria	Units	Marks
Assignment and Viva-voce	Based on the contents from all the units	15+15
Attendance and Participation in Activities	Based on the contents from all the units	10
Classroom Projects and Activities (Seminars, Mini Projects, Discussion Forums and Elocution, Role Plays, Cue cards, competitions, etc.)	Unit I,II, IV, V	10
		50

Pattern of the Question Paper (Theory Examination)

- Q1. (A) Six MCQs carrying 1 marks each from Unit I** [6 Marks]
- (B) One out of two SAQs with internal choice to be answered in 75 words from Unit I** [4 Marks]
- (C) One out of two SAQs with internal choice to be answered in 75 words from Unit II** [4 Marks]
- Q2. (A) One out of two SAQs with internal choice to be answered in 75 words from Unit III** [4 Marks]
- (B) 5 out of 6 VSAQs from Unit I (Carrying 1 mark each)** [5x1=5 Marks]
- (C) 5 out of 6 VSAQs from Unit II (Carrying 1 mark each)** [5x1=5 Marks]
- Q3. (A) Preparing a Tourist Pamphlet.** [4 Marks]
- (B) Draft an advertisement on any one of the given topics.** [4 Marks]
- (C) E-mail Writing.** [4 Marks]
- Q4. (A) 5 out of 6 VSAQs from Unit III (Carrying 1 mark each)** [5x1=5 Marks]
- (B) 5 out of 6 VSAQs from Unit IV (Carrying 1 mark each)** [5x1=5 Marks]

B. Sc. Semester-I SEC Botany (BVS1P02) Soil Analysis and Hydrobiology			
VSEC Practical	Hours: 4 Hours/Week	Marks: 50+50=100	Credit: 2
Unit-I			
Physical Properties of Soil 1. To study the different types of soils. 2. To find out moisture percentage of the soil. 3. To study the texture of given soil samples. 4. To determine the soil pH. 5. To determine the water holding capacity of the soil. 6. To measure temperature of soil. 7. To study the colour of given soil samples. 8. To determine the porosity of soil samples.			15 Hrs.
Unit-II			
Chemical Properties of Soil 1. To study the soil flora. 2. To study and mapping of soils in the fields. 3. To determine electrical conductivity of given soil samples. 4. To determine the presence of carbonates in the given soil samples. 5. To determine the presence of nitrates in the given soil samples. 6. To determine the presence of Phosphate in the given soil samples. 7. To determine the presence of Potassium in the given soil samples. 8. To determine the base deficiency of given soil samples.			15 Hrs.
Unit-III			
Properties of Water 1. To measure temperature and pH of given water samples. 2. To determine the Dissolved oxygen in given water samples. 3. To determine the BOD in given water samples. 4. To determine the COD in given water samples. 5. To determine the Turbidity in given water samples. 6. To determine the Nitrogen and Phosphates in given water samples. 7. To determine Total solids in given water samples.		15 Hours	15 Hrs.

Unit-IV	
1. To determine Boiling and Melting point of given water samples. 2. To determine conductivity of given water samples. 3. To determine Hardness of given water samples. 4. To determine Colour and odour of given water samples. 5. To determine Calcium and magnesium of given water samples. 6. Diversity of Hydrophytic plants of selected water bodies. 7. Count the density of phytoplanktons.	15 Hrs.

Note- (Minimum 5 Experiments should be conducted from each unit)

B.Sc. Semester-I BOTANY PRACTICAL
EXAMINATION SEC-1 Botany (BVS1P02)
Subject: Soil Analysis and Hydrobiology

TIME: FIVE HOURS

MAX. MARKS: 50

Q. 1:	To determine the Physical Properties of given soil samples	10 M
Q. 2:	To determine the Chemical Properties of given soil samples	10 M
Q. 3:	To determine the Physical and Chemical Properties of given Water samples	10 M
Q. 4:	To study Phytoplanktons and Hydrophytes of water bodies	10 M
Q. 5:	Practical Record, Viva Voce and Excursion report.	10 M

Suggested Readings:

1. Marc Pansu , Jacques Gautheyrou (2006), Handbook of Soil Analysis, Springer Berlin, Heidelberg.
2. Dr. D. K. Maharaj (2017), Laboratory Manual for Soil Testing, S.K. Kataria & Sons.
3. Bandyopadhyay, P. C. (2012), Soil analysis, Genetech.
4. P. D. Sharma (2013), Ecology and Environment, Rastogi Publ. New Delhi.
5. Dr. B. P. Pandey (2021), Modern Practical Botany, Vol-III, S. Chand Publishing, New Delhi.
6. Dr. R.S. Shukla and Dr. P.S. Chandel (2018), A text Book of Plant Ecology, S. Chand Publishing, New Delhi.
7. V.N. Sahai (2016), Fundamentals of Soil, 5th Edition, Kalyani Publishers.
8. S.K. Pal (2013), Soil Sampling and Methods of Analysis, New India Publishing Agency.
9. Dr. G.S. Wagh (1905), Experimental Methods for Water Analysis, Nirali Prakashan.
10. Priyanka Singh (2017), Practical Manual Of Water Analysis by SINGH,P, Agri Biovet Press.
11. Leo M.L. Nollet, Leen S. P. De Gelder (2013), Handbook of Water Analysis, 3rd edition, CRCPress.
12. Dr. Hem Raj (2021), Vinesh Aquatic Biology, S. Vinesh& Co.
13. Rajiv Tyagi (2011), Textbook of Hydrobiology, Discovery Publishing House Pvt Ltd.
14. Gelarld A. Cole (2015), Textbook of Limnology, CBS PUBLICATION.



SEC Basket Biochemistry (2 credit, 4-hour Practical) Semester 1

FOOD ADULTERATION ANALYSIS (BVS1P02)

Course Objective: The objective of this course is to impart practical skill enhancement in field of food adulteration testing. Completion of this course will enable the students to understand, learn and perform skills needed in Food Science/Quality Analysis laboratories.

1. General Laboratory Rules and Personal Safety Precautions
2. Detection of Added Starch / Cereal Flours/ Cellulose in Milk.
3. Detection test For Skimmed Milk Powder in Natural Milk.
4. Detection of Preservatives added to Milk.
5. Detection of Rancidity in edible oils and fats.
6. Detection of Argemone oil in edible oil and fats.
7. Detection of Cottonseed oil in edible oil.
8. Detection of Lead Salts in Turmeric Powder
9. Detection of Metanil Yellow in Turmeric Powder
10. Detection of Artificially Coloured Tea Dust Mixed with Genuine Tea or Used Tea Leaves
11. Detection of Artificial Invert Sugar Syrup in Honey (Fieh's Test)
12. Detection of Added Color in Chilli, Turmeric and Other Curry powders.

References:

1. FSSAI Manual of Methods of Analysis of Foods – Milk and Milk Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare
2. Government of India New Delhi FAO (2009). Milk Testing and Payment Systems Resource Book – A Practical Guide to Assist Milk Producer Groups. FAO, Rome. Pp. 38-43.
3. Roy, N.K. and Sen, D.C. (1994). Rapid Analysis of Milk. In Textbook of Practical Dairy Chemistry. Kalyani Publishers. New Delhi. Pp. 85-118. FSSAI Manual of Methods of Analysis of Foods – Oils and Fats (2015) Food Safety and

SEC (Biotechnology)

SEMESTER – I

DNA MANIPULATION TECHNIQUES (BVS1P02)

Course Code: BVS1P02

Total Contact Hours: 60

Course Outcomes:

After successful completion of this Course, students will be able to:

- CO 1. Perform isolation of DNA from different sources
- CO 2. Appreciate changes in DNA migratory properties by agarose gel electrophoresis
- CO 3. Describe applications of restriction enzymes in DNA manipulation methods
- CO 4. Compare effect of changes in DNA sequence and solution conditions on spectrophotometric properties of DNA
- CO 5. Plan and analyse experiments pertaining to DNA manipulations.

PRACTICALS

1. Genomic DNA isolation from Bacteria
2. Genomic DNA isolation from Plant Cells
3. Genomic DNA isolation from Animal Cells
4. Total DNA isolation from soil
5. Check the homogeneity of isolated DNA by Agarose gel electrophoresis
6. Restriction digestion of lambda phage DNA and agarose gel electrophoresis
7. Comparison of different restriction enzyme digests of lambda DNA by agarose gel electrophoresis
8. Melting curve analysis of Lambda DNA
9. Effect of salt concentration on T_m value of lambda DNA
10. Demonstration of southern hybridisation
11. DNA ligase activity analysis by ligation of lambda DNA RE digests
12. Monitoring changes in lambda DNA T_m values on UV irradiation
13. DNA methyltransferase activity assay
14. DNA methylation analysis by restriction fragment analysis
15. DNA methylation quantification by ELISA

References:

1. Sambrook, Joseph, Edward F. Fritsch, and Tom Maniatis. *Molecular cloning: a laboratory manual*. No. Ed. 2. Cold spring harbor laboratory press, 1989.
2. Scarlett, Garry, ed. *DNA Manipulation and Analysis*. Vol. 2633. Springer Nature, 2023.
3. Davis, Leonard. *Basic methods in molecular biology*. Elsevier, 2012.
4. Chawla, H. (2011). *Introduction to plant biotechnology (3/e)*. CRC Press.
5. Doyle, Jeffrey. "DNA protocols for plants." *Molecular techniques in taxonomy* (1991): 283-293.

B.Sc. Semester – I
SEC (Chemistry)
BVS1P02: Food Adulteration Analysis
Practical 2 credits

Course Outcomes

By the end of this course, students will be able to:

1. *Get basic knowledge on various foods and about adulteration.*
2. *Understand the adulteration of common foods and their adverse impact on health*
3. *Comprehend certain skills of detecting adulteration of common foods.*
4. *Be able to extend their knowledge to other kinds of adulteration, detection and remedies.*
5. *Know the basic laws and procedures regarding food adulteration and consumer protection.*

List of Experiments

1. Collection of information on adulteration of some common foods from local market
2. Adulteration detection for Milk and Milk products
 - Detection of water in milk
 - Detection of detergent in milk
 - Detection of starch in milk and milk products (khoya, chenna, paneer)
 - Detection of mashed potatoes, sweet potatoes and other starches in ghee/butter
3. Adulteration detection for Oil and Fats
 - Detection of other oils in coconut oil
 - Detection of TOCP (Tri-Ortho-Cresyl-Phosphate) in oils and fats
 - Proper winterization of refined winterized salad oils
4. Adulteration detection for Sugar & Confectionery
 - Detection of sugar solution in honey
 - Detection of chalk powder in sugar/pithi sugar/jaggery
 - Detection of aluminium leaves in silver leaves
5. Adulteration detection for Food Grains & Its Products
 - Detection of extraneous matter (dust, pebble, stone, straw, weed seeds, damaged grain, weevilled grain, insects, rodent hair and excreta) in food grains
 - Detection of dhatura in food grains
 - Detection of excess bran in wheat flour
6. Adulteration detection for Salt, Spices & Condiments
 - Detection of foreign resin in asafoetida (hing)
 - Detection of papaya seeds in black pepper
 - Detection of light black berries in black pepper
7. Adulteration detection for Fruits & Vegetables
 - Detection of malachite green in green vegetables like bitter gourd, green chilli and others.
 - Detection of artificial colour on green peas.
 - Detection of rhodamine B in sweet potato.
8. Adulteration detection for Beverages
 - Detection of clay in coffee powder
 - Detection of chicory powder in coffee powder
 - Detection of exhausted tea in tea leaves
 - Detection of iron filings in tea leaves

9. Adulteration detection for chilli powder
 - Detection of Brick powder in chilli powder
 - Detection of salt powder in chilli powder
 - Detection of talc. powder in chilli powder
10. Invited lecture/training by local expert /Visit to a related nearby laboratory/ Assignments, Group discussion, Quiz etc.

Note: Minimum 10 experiments should be performed.

References

1. A first course in Food Analysis–A.Y.Sathe, New Age International (P) Ltd., 1999
2. <https://eatrightindia.gov.in/dart/>
3. Choudhary A., Gupta N., Hameed F., Choton S. An overview of food adulteration: Concept, sources, impact, challenges and detection. Int. J. Chem. Stud. 2020;8:2564–2573. doi: 10.22271/chemi.2020.v8.i1am.8655.
4. Ayza A., Yilma Z. Patterns of milk and milk products adulteration in Boditti town and its surrounding, South Ethiopia. J. Agric. Sci. 2014;4:512–516.
5. El-Loly M.M., Mansour A., Ahmed R. Evaluation of raw milk for common commercial additives and heat treatments. Internet J. Food Saf. 2013;15:7–10.
6. Everstine K., Spink J., Kennedy S. Economically motivated adulteration (EMA) of food: Common characteristics of EMA incidents. J. Food Protection. 2013;76:723–735. doi: 10.4315/0362-028X.JFP-12-399.
7. Food Safety, case studies–Ramesh.V.Bhat, NIN, 1992
8. https://old.fssai.gov.in/Portals/0/Pdf/Draft_Manuals/Beverages and confectionary.pdf
9. <https://cbseportal.com/project/Download-CBSE-XII-Chemistry-Project-Food-Adulteration#gsc.tab=0> (Downloadable e material on food adulteration)
10. <https://www.fssai.gov.in/>

SEC Basket

B.Sc. Sem-I (Computer Science/ Computer Application)

BVS1P02

DESK TOP PUBLISHING

Credits: 2

Duration : 60 Hours

Course Objectives:

1. To understand the fundamentals & concepts of Page Maker
2. To give the students a hands-on experience on Page Maker
3. To understand the fundamentals & concepts of Adobe Photoshop
4. To give the students a hands-on experience on Adobe Photoshop.

Course Outcomes:

After completing this course satisfactorily, a student will be able to:

1. understand the fundamentals & concepts of Page Maker
2. create book works, building booklets.
3. create animations
4. work with multiple layers

Unit I

Page Maker: Creating & opening publications, using the tool box, working with Palettes, text & Graphics, starting a publication from a template, saving & closing a publication

Drawing & Shaping Objects: Positioning ruler guides, typing text, formatting graphics, creating columns, creating styles, changing type style & alignment, rotating & moving of text block & graphics , placing text file ,setting tab, indents, leaders, copying graphic between publications ,positioning & resizing the logo.

Unit II

Page Maker: Setting up pages, changing document setup, using master pages, choosing a measurement system & setting up rulers, adjusting layout, numbering pages, rearranging pages, creating running header & footers, importing text, threading text blocks, balancing columns, edit story, customizing the dictionary, hyphenation, layers, frames, locking object, wrapping text around graphics, cropping a graphic

Unit III

Photoshop: Introduction to Adobe Photoshop, History of Photoshop, Hardware requirements of Adobe Photoshop, installation of Adobe Photoshop, Features of Photoshop, Interface Layout of Photoshop, Fundamentals: Digital Image, pixels, resolution, DPI, raster images/bitmaps, vector images/graphics, various file formats: PSD, JPEG, GIF, TIF, PNG etc., colour modes Exploring the workspace: Application bar, Menu Bar, Options Bar, Workspace, Document Window, Document ,Title Bar, Status Bar, Toolbox.

Unit IV

Photoshop: Getting Familiar with Palettes: layers, channels, colors, history, Opening an existing file, Creating a new document, Saving files, Reverting Files, Closing Files, Getting Familiar with different Workspaces, Selecting a Workspace, Saving & Deleting Workspace & quitting the Application, Tools: brushes, Move Tool, Eyedropper Tool, Zoom Tool, Hand Tool, Type Tool, Quick Selection Tool Editing Images, Making Colour adjustments, working with Selection tools: Marquee Tool, Lasso Tool, Magic Wand Tool, making a selection based on colour Range, Modifying a Selection.

Books

- 1.Desk Top Publishing from A to Z by Bill Grout and Osborne, McGraw Hill
2. Desk Top Publishing for PC user by Houghton, Galgotia public.
- 3.Adobe Pagemaker 6.5 by Shashank Jain and Satish Jain, BPB public.
4. Desk Top Publishing on PC by M. C. Sharma, BPB public.
- 5.Adobe Photoshop CS2 Classroom, Adobe Press.

Semester – 1; SEC : Simulation and Modelling of Electronic Circuits 1

(BVS1P02)

Course outcome:

- At the end of this course students will have ability to
- 1 Understand importance of simulation
 - 2 Acquittance with simulation modules , software and limitations
 - 3 Drawing and testing simple circuit
 - 4 Learning concepts through simulation

Syllabus

- 1 Introduction to circuit simulation software, Basics Accessing tools and features, file management , Drawing Schematic, Analog Simulation
- 2 Different Analysis parameters
- 3 Digital logic simulation
- 4 Mix mode simulation

Books:

User Manual : CircuitMaker, Proteus, Tinkercad, Easyeda

Environmental Sampling and Monitoring (BVS1P02)

Unit-I: Weather and Air Monitoring

Introduction to weather system and parameters: Light, Rainfall, Wind direction, Wind velocity, (Movement of pollutants), Temperature, Pressure, Humidity, Weather Monitoring tools / instruments and their working principle.

Air sampling: types, techniques, site and parameter selection, National standards for ambient air quality, Monitoring of particulate matter, SO_x and NO_x, Ambient and stack air monitoring techniques, air monitoring tools/instruments used for air and their working principle.

Unit-II: Water and Soil Monitoring / Sampling and its Analysis

Water Monitoring and its Analysis: Objectives of water monitoring, Collection of samples, sample preservation, Physical, chemical, biological parameters of water & its monitoring, General effluent standards, stream standards Drinking water standard (IS10500 and WHO Standards).

Soil Monitoring and its Analysis: Objectives of soil monitoring / testing, Types of soil sampling and sample units, Site selection, important soil quality indicators Instruments / equipment's used in soil monitoring.

Unit-III: Noise and Radiation Monitoring

Noise and Radiation Monitoring Introduction of noise & vibration, National standard for noise Sound Exposure Level (SEL), Equivalent Sound Level [Leq(h)] Noise Index, Radiation types and measurement, G. M counter, scintillation counter, personal dosimetry, Units of measurements, Half-life period, and radiation dose measurement

Instruments used in Environmental Monitoring: pH meter, Conductivity meter, Colorimeter, UV Spectrophotometer, Atomic Absorption Spectrophotometer (AAS), Flame photometer, Hot air oven, autoclave, Laminar flow, RDS, RSPM 2.5, Handy sampler, Gas chromatography, Mass spectroscopy, Scanning electron microscopy.

Unit-IV: Unit-IV: Field work/Assignment/ Training/Seminar related to:

Ambient Air Quality Monitoring, Stack Monitoring, Water Sampling & Monitoring Noise/ Quality Monitoring, Analysis of Water and Wastewater, Soil Monitoring

Books for References:

1. Handbook of Methods in Environmental Studies: Vol.1 By Maiti, Subodh. (2003)
2. Handbook of Methods in Environmental Studies: Vol 2 (Air, noise, soil and overburdenanalysis). By Maiti, Subodh. (2003).
3. Waste Water Engineering, Metcalf and Eddy, INC, Tata McGraw Hills
4. Indian Standard for Drinking Water, BSI, New Delhi. Environmental Pollution Control, S.Rao, Wiley Eastern Ltd.,1993
5. Air Pollution Control and Engineering, De Nevers, McGraw Hills, 1993, 10.
6. Fundamentals of Air Pollution, Samuel, J. W., 1971, Addison Wesley Publishing
7. Fundamentals of Environmental Pollution, Krishnan Khannan, S. Chand and CompanyLtd., 1994.
8. Noise Pollution, Vandana Pandey, Meerut Publishers, 1995. Environmental PollutionControl, C. S. Rao, Wiley Eastern Ltd., 1993.
9. Air Pollution Control and Engineering, De Nevers, McGraw Hills, 1993.
10. Fundamentals of Environmental Pollution, Krishnan Khannan, S. Chand and CompanyLtd.,1994.
11. Environmental Chemistry, A. K. De., New Age Intl. Pub Co, New Delhi, 1990.
12. Environmental Pollution Analysis - S. M. Khopka.

SEC (Forensic Chemistry)

A. Chemical Laboratory Techniques (BSV1P02)

Course Outcome: By the end of this Course, the learners will be able to:

1. Gain hands-on experience in various laboratory techniques and analytical methods.
2. Perform purification, separation, measurement, and analysis of substances using appropriate instruments and procedures.
3. Develop practical skills in purification, separation, measurement, and analysis.
4. Apply these techniques and methods to conduct experiments, analyze data, and draw conclusions.

List of Practical

1. Purification by Crystallization Distillation, Centrifuge, and Washing.
2. Evaporation, Sublimation.
3. Measuring MP & BP.
4. Measurements of Flash point and Fire point.
5. Detecting solubility.
6. Measurement of Viscosity.
7. Determination of rate of a reaction (kinetics).
8. Volumetric analysis.
9. Titration experiments -Determining strength of acid, Saponification & Iodine value of fat/oil.
10. Solvent extraction.
11. Paper Chromatography.
12. Thin layer chromatography.

SEC (Forensic Biology)

B. General Practices in Forensic Biology (BSV1P02)

Course Outcome: By the end of this Course, the learners will be able to:

1. Demonstrate proficiency in measuring pH of solutions using appropriate techniques and instruments, and interpret the results to assess the acidity or alkalinity of the solution.
2. Prepare commonly used buffers and understand their composition and purpose, and evaluate their effectiveness in maintaining stable pH conditions.
3. Perform the preparation of agarose gel and polyacrylamide gel, understanding the principles and procedures involved, and demonstrate proficiency in gel preparation techniques.
4. Conduct electrophoresis of proteins and DNA on agarose or polyacrylamide gels, analyze the resulting gel patterns, and interpret the migration behavior of biomolecules based on their size or charge.
5. Apply spectrophotometric techniques to measure the concentration of proteins and DNA,

List of Practical:

1. Measurement of pH of the solution.
2. Preparation of commonly used buffers (Phosphate Buffer Saline, Glycine buffer)
3. Preparation of agarose gel.
4. Preparation of Polyacrylamide gel.
5. Electrophoresis of protein.
6. Electrophoresis of DNA.
7. Spectrophotometric measurement of protein.
8. Spectrophotometric measurement of DNA.
9. Paper Chromatographic separation of amino acids.
10. Thin layer Chromatographic separation of lipids.
11. Determination of Isoelectric point of protein.
12. Preparation of silica gel column.

SEC (Forensic Physics)

C. Physics Workshop (BSV1P02)

Course Outcome: By the end of this Course, the learners will be able to:

1. Develop practical skills in the use of laboratory instruments and tools, data analysis, electrical circuitry, electronic component soldering, and the application of various measurement devices.
2. Gain a comprehensive understanding of the functioning and principles of the travelling microscope, spectrophotometer, and various electrical components used in laboratory experiments.
3. Design and construct electronic switches using transistors and relays, and study the operation of timer circuits
4. Gain a solid foundation in experimental techniques and electrical principles.

List of Practical

1. Familiarization with Meter Scale, Vernier Calliper, Screw Gauge and their Utility
2. Study of Travelling Microscope
3. Study of Spectrophotometer
4. Study of Pulleys and Levers
5. Study of Cutting and Drilling Tools
6. Determination of Thickness of Thin Wires and Metal Sheets
7. Study of Electrical Components
8. Study of Transformer Characteristics
9. Study of Ammeters, Voltmeters and Ohm-meters
10. Study of Digital Multimeter for Measuring Voltage
11. Study of CRO as a Versatile Measuring Device
12. Soldering of electrical circuits having discrete components and ICs on PCB
13. Making regulated power supply
14. Study of Electronic Switch using Transistor and Relay Study of Timer Circuit using IC 555

SEC (Geology)
Geostatistic in Geology (BVS1P02)

Practical:

Practicals on arithmetic mean, mode, median, range, variance, frequency, skewness, kurtosis, standard deviation of grain sizes; identification of depositional environment based on grain size distribution; CM plot, depositional environment based on grain size distribution from probability ordinate paper.

Books Recommended:

- 1) Blatt, H., Middleton, G.V. and Murray, R.C. (1980) Origin of Sedimentary Rocks, Prentice-Hall Inc.
- 2) Reineck, H.E. and Singh, I.B. (1973) Depositional Sedimentary Environments, Springer-Verlag.
- 3) Isaaks, E.A. and Srivastava, R.M. (1990) An Introduction to Geostatistics, Oxford University Press.
- 4) Morrison, D.F. (1967) Multivariate statistical methods, McGraw-Hill.
- 5) Tucker, M.E. (1981) Sedimentary Petrology: An Introduction, Wiley and Sons, New York.

B.Sc. Mathematics (Major): SEMESTER 1

SEC-Aptitude and Reasoning (BVS1P02)

Course Outcome

On successful completion of the course the students will be able to:

1. Understand the basic concepts of quantitative ability
2. Understand the basic concepts of logical reasoning Skills
3. Acquire satisfactory competency in use of reasoning
4. Solve campus placements aptitude papers covering Quantitative Ability, Logical
5. Reasoning Ability

TOPICS:

1. Logarithm
2. Permutation and Combinations
3. Profit and Loss
4. Time, Speed and Distance
5. Time & Work
6. Ratio and Proportion
7. Data Interpretation
8. Tables
9. Column Graphs
10. Bar Graphs
11. Line Charts
12. Pie Chart
13. Venn Diagrams
14. Analogy
15. Blood Relation
16. Directional Sense
17. Number and Letter Series
18. Coding – Decoding
19. Calendars
20. Clocks

Reference books:

1. A Modern Approach To Verbal & Non Verbal Reasoning By R S Agarwal
2. Analytical and Logical reasoning By Sijwali B S
3. Quantitative aptitude for Competitive examination By R S Agarwal
4. Analytical and Logical reasoning for CAT and other management entrance test By Sijwali B S
5. Quantitative Aptitude by Competitive Examinations by Abhijit Guha 4th edition
6. <https://prepinsta.com/>
7. <https://www.indiabix.com/>
8. <https://www.javatpoint.com/>

Quality Control Testing of Fermented Food Course Code: (BVS1P02)			
SEC	Hours: 04 Hours /Week	Marks: SEE= 50 CIE= 50	Credit: 02
LIST OF EXPERIMENTS (Perform at least 10 practical) A) 1. Chemical quality 1) Determination of titrable acidity 2) Determination of Protein by Macro Kjeldahl method 3) Determination of fats 4) Determination of ash 5) Determination of moisture, fibre & carbohydrate 6) Quantitative estimation of reducible sugar by DNSA colorimetric method 7) Estimation of sodium by flame photometry. 8) Estimation of potassium by flame photometry. 9) Estimation of iron by colorimetry. 10) Estimation of ascorbic acid by titrimetric method. 11) Estimation of phosphates/phosphorus by colorimetric method. 12) Assay of Niacin B) Microbiological quality 1) Assessing sanitary of contact surface by swabbing method. 2) Assessing air of processing facility of air for microbial load. 3) Bacteriological analysis of water intended for fermented food preparation. 4) Determination viable bacterial count by SPC in finished food product. 5) Determination of yeast & mold count in finished product. 6) Detection of <i>E.coli</i> in finished product. 7) Detection of <i>Salmonella</i> in finished products 8) Detection of <i>Bacillus cereus</i> in finished product. 9) Detection of <i>Staphylococcus aureus</i> in finished product. 10) Detection of Aflatoxin in finished product by TLC 11) Detection of anaerobic spore formers in finished product. Perform at least five experiments from section A & B each.			60 Hrs
Scheme of Practical Examination: 1. Two long expt.-----, 15 Marks each 2. Viva-voce-----, 10 Marks 3. Record----- 10Marks Total Marks = 50			

Reference Books:

- 1) Manual of Methods of Analysis of Microbiological Examination of Food and Water-FSSAI Manual-2016
- 2) Manual of methods of analysis of foods milk and milk products -fssai-2016
- 3) Manual of methods of analysis of foods food safety and standards authority of india ministry of health and family welfare government of india new delhi 2015 beverages (coffee, tea, cocoa, chicory) sugar and sugar products & confectionery products -lab manual-2015
- 4) Manual of Methods of Analysis of Foods- Alcoholic Beverages- FSSAI-2021
- 5) Manual of Methods of Analysis of Foods- Spices,Herbs & Condiments-FSSAI-2021
- 6) Manual of Methods of Analysis of Foods- Cereal & Cereal products- FSSAI-2016
- 7) Manual of Methods of Analysis of Foods-Mycotoxins,FSSAI-2021
- 8) Manual of Methods of Analysis of Foods- Meat & Fish products- FSSAI-2016
- 9) General guidelines for Sampling for Microbiological Analysis of Food-FSSAI-2022
- 10) Manual of Methods of Analysis of Foods- FOOD ADDITIVES- FSSAI-2016
- 11) Manual of Methods of Analysis of Foods-Water-FSSAI-2016
- 12) A Manual of Laboratory Techniques-National Institute of Nutrition-ICMR-Hyderabad

Course outcomes

After this course the students will be able to

Sr. No.	Course outcome
1.	Student will learn the basic knowledge of different types of quality control testing of fermented foods.
2.	The knowledge is very useful for opting job in industries.

	Semester I (SEC)	BOS (Statistics)
	Paper code – BVSIP02	2 Credits (4 hrs practical per week)
	NAME OF THE PAPER - PPT PRESENTATION COURSE	
	List of Practicals	
1	Introduction to PowerPoint: This section will cover the basics of PowerPoint, including the interface, tools, and functions. Student will learn how to create new slides, add content, and use themes.	
2	Design principles : In this section, student will learn about design principles and how to apply them to PowerPoint presentations. Student will learn about layout, color, typography, and more	
3	Content creation: This section will cover how to create compelling content for PowerPoint presentations. You'll learn how to structure the presentation, use images and videos, and incorporate data effectively.	
4	Animation and transitions: In this section, student 'll learn how to use animations and transitions to make the PowerPoint presentations more engaging. Student will learn about the different types of animation and transition effects and how to use them effectively	
5	Delivery and presentation skills: This section will cover how to deliver PowerPoint presentation effectively. Student will learn about public speaking skills, body language, and how to engage audience.	
6	Advanced features: This section will cover some of the more advanced features of PowerPoint, such as using macros, customizing templates, and creating interactive presentations.	
7	Tips and tricks: In this section, student will learn some tips and tricks for making PowerPoint presentations more effective and professional.	
8	Conclusion: The course will end with a conclusion that summarizes what is learned and provides tips for continuing to improve PowerPoint presentations	

B.Sc. Sem. I (Zoology) - SEC
Course: Bee Keeping (BVS1P02)
Credit: 2

Course outcomes: After completion of course, students will

- Able to identify queen, drones and workers of honey bee.
- Able to handle artificial bee hive.
- Understand the economic importance of honey bee.
- Identify and recognized enemies of honey bee.
- Able to do internship in commercial bee keeping unit.

Practical:

1. Introduction to Apiculture.
2. To demonstrate construction of bee hive and different species of bees.
3. To study the morphology and anatomy of bee.
4. To study the life cycle and division of labour.
5. To analyse the social behaviour of bees.
6. To study the handling of artificial bee hive and its maintenance.
7. To collect and preserve the bee pasture.
8. To study the seasonal management of colony (Season: Vasant, Grishma, Sharad and Shishir).
9. Manipulation for honey production.
10. Economics of bee keeping.
11. To study the queen rearing.
12. To find out and study bee enemies and their control.

Suggested reading:

1. **Goud R (2022).** Practical Manual on Apiculture, Sericulture and Lac culture. Jaya Publication House
2. **Jayashree KV, Tharadevi CS, Arumugam N. (2014).** Apiculture. Saras Publication, pp. 360.
3. **Brett J (2012).** Apiculture and Bee keeping simplified. Alfa one Publishing Company, pp. 106.
4. **Elumalai D, Mohan C, Poovizhiraja B, Ramamurthy R (2012).** Principles and practices of apiculture. Jaya Publishing House.
5. **Petterson J (2016).** Beekeeping: Everything You Need to Know to Start Your First Beehive. Weldon Owen Publisher, pp. 192.
6. **Sathe TV (2018).** Fundamentals of bee keeping. Daya Publishing House.

B.Sc. Home Science Semester –I (SEC)

BVS1P02(A)

Elements of Art

Total Marks	100
Practical	Marks
SEE	50
CIE	50

PRACTICALS:

1. Types of Line

- Vertical,
- Horizontal,
- Zigzag,
- Diagonal
- Curved

2. Types of design

- Structural and Decorative,
- Naturalistic and stylized,
- Geometric and Abstract,
- Modern and Traditional

3. Principles of Art/design

- Harmony, Balance, Proportion, Rhythm and Emphasis

Total Marks- SEE	50
Type of Lines	10
Type of Design	20
Principle of Art	10
Record Book	10

Total Marks - CIE	50
Workshop	20
Project work	20
Presentation of Relevant topics	10

B.Sc. Home Science Semester –I (SEC)

BVS1P02(B)

HYBRID EXTENSION METHODS

Total Marks	100
Practical	Marks
SEE	50
CIE	50

CIE -50 Marks

PRACTICALS:

1. Prepare innovative chart for community on any developmental issue. **10 Marks**
2. Collection and capture of photographs on developmental aspects through camera. **10 Marks**
3. Prepare album on rural\urban development issues or prepare power-point presentation on developmental news through newspaper.
10 Marks
4. Method demonstration for communication for community. **10 Marks**
5. Plan and perform extension activity for community development programme using ICT material\ digital media. **10 Marks**

Total Marks - SEE	50
Presentation	20
Innovative chart	20
Record	10

B. Sc. (Home Science) Semester II

Skill Enhancement Course (SEC) – Home Science Course Code [BVS1P02 (C)]

Digital Literacy for Home Science

SEC Practical	04 hours/week	Marks: 100	Credit: 02
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Course Outcomes:

- 1) Comprehend the basic components and block diagram of a computer, including the CPU, memory, input/output devices, and storage.
- 2) Develop practical skills in using input devices such as the keyboard and mouse for various tasks, including text entry in note pad and drawing in Paint.
- 3) Gain experience in scanning documents and saving them in different formats, such as JPEG and PDF.
- 4) Develop proficiency in using MS Office applications, including Word, Excel, and PowerPoint, for document creation, data entry, and presentation enhancement.
- 5) Learn to create and manage an email account, including sending and receiving emails.
- 6) Students will learn to create and share Google Forms for data collection and acquire basic web development skills to create and enhance a personal website.

LIST OF PRACTICALS: (Any 10 experiments to be performed)

1. Introduction to different blocks of computer and study its characteristics.
2. Study block diagram of computer with its functioning.
3. Use of keyboard as an input device for computer to enter text in note pad. Save and print the file.
4. Use of mouse as an input device for computer to draw different shapes in 'Paint'. Save and print the file.
5. Scan a document, save it in JPEG (Joint Photographic Experts Group) format and print it.
6. Scan a document, save it in PDF (Portable Document Format) and print it.
7. Open MS-Office, create file in MS Word and perform various operations in it.
8. Open MS-Office, create file in MS Excel and enter given data in it, creating a worksheet in excel.
9. Creating and enhancing Power Point Presentation with MS-Office.
10. Create slides using different slide layouts.
11. Creating e-mail id and use of internet to send/ receive e-mails.
12. To learn how to create, customize, and share a Google Form for collecting data or conducting surveys.
13. Creating and enhancing self-website.

Bachelor of Fashion Design/Textile Science

Four Year (Eight Semester Degree Course)

Semester – I

Hand Painting I

SEC

BVS1 PO2

Theory Marks	: --	Practical	: 100	Total Credits	: 2
SEE	: --	SEE	: 50	Theory	: -
CIE	: --	CIE	: 50	Practical	: 2

Time Required: 60Hours

Practical (60 Hours)

Objectives -

- To become familiar with the basic methods, techniques and tools of drawing.
- Identify different tones made with different value or textures.

UNIT I (15 Hours)

- 1.1 Basic Brush Handling Techniques for Painting.
- 1.2 Understanding edges, spaces, light and shadow relations, these basic skills of drawing make up the components of finished works of art.

UNIT II (15 Hours)

- 2.1 How to hold brush (Hard brush, soft brush and dry brush)
- 2.2 The most basic stroke is the line. It is also one of the most versatile.
- 2.3 How to use a water brush and handle any given paint brush (washbrush, flat brush, round brush, liner brush)

UNIT III (15 Hours)

- 3.1 Shading techniques for drawing
- 3.2 Rendering, hatching, random line, striping
- 3.3 Shading is the process of adding value to create the illusion of form, space and light in a drawing.

UNIT IV (15 Hours)

- 4.1 Observe and record 10 texture patterns in pen, color and ink.
- 4.2 Figurative gestures
- 4.3 2D and 3D perspective. Create a sense of depth and perspective.

Portfolio :

This will make up the majority of your work in the class.

Practice above mentioned techniques.

Sketchbook-

Students will be responsible for keeping a sketchbook throughout the semester.

References:

Fundamentals of Visual art

Author: Muneesh Kumar

Art is Fundamental

Author: Eileen S. Prince.

Bachelor of Science (Honors / Research) 4 yr. 8 Semester Degree Program
B.Sc. Sem I (Interior Design – Major)

BVS1P02 PRODUCT WORKSHOP I

UNIT - I CLAY WORKSHOP

Introduction to mud and clay as a material. Process and techniques of forming and decorating using clay as a material. Having feel of materials and creating innovative products. Interior finishes with mud.

UNIT - II COLOUR WORKSHOP

Colour as an important part of our environment and its importance in design and colour as a scientific base.

- Study of colour as science. Light and the spectrum. Different Wave lengths of coloured light.
- Colour as a system and its application.
- Colour perception. Harmony in vision and basic principles of Harmony.
- Colour and textures of various natural materials.
- Modifying factors to colours and their depiction; namely, light, depicting the ability of reflection / absorption of colours in different material, surface quality, distance and scale.
- Manifestation of colours in various cultures. Colours symbolism basic characteristic of various hues.

UNIT – III PRESENTATION TECHNIQUE WORKSHOP

Introduction to various tools used for sketching such as pencil, charcoal, crayons, water colour etc. Line drawing of nature by using various techniques as shades of pencil. Introduction of light and shade in nature drawing. Line drawing of exterior of building. Building,. Perspective drawing , Landscape elements by using various mediums. Introduction of colour is the same i.e. poster ,pencil & water colour.

UNIT – III CERAMIC WORKSHOP

Understanding of ceramic products by working with materials, having feel of material and creating innovative products.

- A brief study of ceramics of various cultures.
- Process and techniques of forming and decorating.
- Colour pigments and design qualities.
- Site visits to ceramic product factories, sample collection, documentation, display of creative work.

PRACTICAL WORK:

- Assignments based on colouring technique
- Assignments based on graphic representations of interior and exterior buildings
- Assignments based on exterior& interior Landscape.
- Assignments based on sketching technique
- Assignments based on peispelhres of exterior buildings.
- Assignments based on exterior & interior Landscape

REFERENCES:

1. Rendering with Pen and Ink by Gill
2. Ching Francis D.K.: Architectural Graphics

Product Workshop -I

S. No	Course Outcomes
CO1	Develop application of various tools used for sketching
CO2	Develop techniques of forming and decorating using clay.
CO3	Develop understanding of colour theory and its application.
CO4	Develop techniques of forming and decorating using ceramic.
CO5	Develop application of nature drawing by using various techniques including the play of light and shade
CO6	Develop application of drawing Building in perspective.
CO7	Develop application of Landscape elements by using various mediums

B. Sc (Applied Electronics & Software Technology) – Semester I (SEC)

BVS1P02

APPLIED CHEMISTRY I

Scheme of Examination (Practical)

SEE – 50

CIE - 50

Total - 100

1. Preparation and analysis of soap.
2. To determine the total hardness of hard water.
3. To determine the temporary hardness of hard water.
4. Determination of surface tension of liquid using stalagmometer.
5. Preparation of buffer solutions and determination of pH of buffer solution

Reference Books :

1. Engineering Chemistry – Jain and Jain
2. Physical Chemistry - Bahl & Tuli
3. Organic Chemistry - Finer
4. Organic Chemistry – Bahl and Bahl

B. Sc. Semester-1

Skill Enhancement Course (SEC - 1) - PHYSICS (BVS1P02)

Electric Wiring for Domestic Applications

SEC-1	04 Hours/Week	Total Hours: 60	Marks: 100	Credit: 02
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Name of Experiments (Any 10 experiments to be performed):

- 1) To study the various safety tools, equipment, symbols and precautions for practicing electric wiring.
- 2) To study the various electrical wiring accessories (one way switches, two way switches, bell switches, sockets, power plug, indicators, speed regulator, fuses, MCBs, energy meter, PVC pipe, Casing-Capping, color coding for line, neutral and earth wires).
- 3) To study the various tools use for wiring (combination plier, nose plier, cutter, screw driver, star screw driver, hammer, mallet, hacksaw, files, line tester, measuring tap, drill machine, grinder, level, safety gloves).
- 4) Identify various types of wiring and different electrical accessories.
- 5) To study of various domestic energy consuming appliances and calculate electric energy consumption.
- 6) To study and design test board/test lamp (200W lamp).
- 7) To study and identify line, neutral and earth wire by using test lamp.
- 8) To study and Measurement of A.C, D.C voltage and current by respective voltmeters and ammeters.
- 9) Prepare extension board.
- 10) To prepare wiring for a fluorescent tube light with a switch control.
- 11) To draw and wire up to control speed of fan by using speed regulator.
- 12) Install and wire an electric water heater with power plug (16 A /32 A).
- 13) To draw and wire up for Connecting lamps in series, parallel and series-parallel circuits
- 14) To Wire up PVC conduit wiring to control one lamp from 2 different places (stair case wiring).
- 15) Wire up PVC conduit wiring to control one lamp from 3 different places (godown wiring).
- 16) Draw layouts and practice in PVC casing – capping wiring with minimum two points (fan & lamp).
- 17) Draw layouts and practice in PVC conduit open wiring with minimum two points (fan & lamp).
- 18) Wire up PVC Conduit wiring and practice control of a socket, a Lamp, a fan from a single board using single way switches.
- 19) To study and verify KVL and KCL in series and parallel circuits.
- 20) To demonstrate and draw electrical supply system from pole to switch board through energy meter.
- 21) To measure Energy consumed in a single phase circuit using Energy meter.
- 22) Prepare and mount the energy meter board with MCB.
- 23) Draw and wire up the consumers main board with ICDDP switch and distribution fuse box.
- 24) Prepare pipe earthing and measure earth resistance by earth tester/megger.
- 25) Prepare plate earthing and measure earth resistance by earth tester/megger.

Course Outcomes:

After the completion of this course students will be able to

- 1) Identify the line, neutral and earth wire by using test lamp.

- 2) Describe basic safety rules in his/her words.
- 3) Describe KVL and KCL in his/her words.
- 4) Calculate electric energy consumption by domestic appliances.
- 5) Perform to control lamp, fan by switches.
- 6) Differentiate between PVC Conduits and Casing-Capping wirings.
- 7) Apply the practical knowledge in conducting various practical during graduation.
- 8) Compare the rating of switches as per appliances.
- 9) Evaluate estimate cost for electric wiring.
- 10) *Design a test lamp and extension board.*

References:

- 1) Principle of Electronics; V.K. Mehta
- 2) Electrical Engineering and Electronics; B.L. Theraja
- 3) Electronic circuits: Handbook of design and applications, U. Tietze, Ch. Schenk.
- 4) Household Electricity and Appliances; S C Bhargava
- 5) Electrical Wiring Residential; Phil Simmons, Ray Mullin
- 6) Textbook of Electric Wiring; S. Samaddar.
- 7) Textbook of Electrical Design Estimating and Costing; Surjit Singh.
- 8) Basic Electrical Engineering; T K Nagsarkar and M S Sukhija.
- 9) Abc of Electrical Engineering ; Theraja B L and Theraja A K
- 10) Electric Wiring for Domestic Installers; Brian Scaddan
- 11) Electrical Wiring: An Introduction; Satheesh Kumar
- 12) Electrical Home Appliances with Electric Wiring; S.Kumar Jain, Amit Aggarwal.
- 13) Modern Basic Electrical & House Wiring Servicing; M Lotia
- 14) Basic Electricity & Practical Wiring; Thomas Hoerner
- 15) Basic of Home Electrical Wiring: Home Wiring Instructions for Beginners; David Blaise
- 16) Electrical Installation Work; Trevor Linsley

SEC Basket Semester II (BVS2P04)
Faculty of Science and Technology

Sem.	Course Category	Name of Course	BoS	Course Code
II	SEC	Communicative Skills and Personality Development 2	Languages	BVS2P04
		Plant Pathology and Disease Management	Botany	
		Tally	Computer Science/ Computer Application	
		Financial Mathematics	Mathematics	
		Wine Technology	Biotechnology	
		Tools and Techniques in Geology	Geology	
		Water and wastewater analysis	Chemistry	
		Lac culture	Zoology	
		Testing of food adulteration	Microbiology	
		A. Innovative Community practices B. Food Preservation C. Cosmetic Preparation	Home Science	
		Blood Processing Techniques	Biochemistry	
		File Handling in C	Electronics	
		Entrepreneurship Development and Services by Environmental Consultancy	Environmental Science	
		Financial literacy	Statistics	
		A. Security Features of Security Documents B. General Techniques and Recombinant DNA Technology in Microbial Forensics C. Mobile App Development	Forensic Science	
		Hand Painting-II	Fashion Design	
		Hand Painting-II	Textile Science	
		Product Workshop II	Interior Design	
		Applied Chemistry II	Applied Electronics & Software Technology	
		Fundamentals of Data Analysis and Data Interpretation	Physics	

Title of the Course: Communication Skills and Personality Development: 2

Semester -II (2 Credits-30 Hours)

Unit I: Communication Skills: Concepts and Context (6 Hours)

1.1 Communication Skills: Definition and Importance

1.2 Communication Process

1.3 Situational Conversation

(Making announcements, Giving Statements, Giving Commands and making requests, Asking questions and Expressing surprises.)

Unit II: Building Confidence and Self-esteem (6 Hours)

2.1 Developing Self-awareness (Activity Based)

2.2 Social Awareness and Civic Skills (Elocution and Extempore Activity)

2.3 Developing Critical Thinking (Group Discussions and Case Studies)

Unit III: Communication Focus: Writing with a purpose. (6 Hours)

3.1 Reading and Comprehension

3.2 Creative Writing (Writing a review of a Movie or a book review)

3.3 Paragraph Writing (Describing People and Places)

Unit IV: Professional Etiquettes and Manners (6 Hours)

4.1 Asking and Giving permission.

4.2. Use of Courtesy Words (“please”, “excuse me”, “sorry” “Thank you” etc.)

4.3 Greetings and Salutations (Verbal and Non-verbal Communication)

Unit V: Brush up on your Interview Skills (6 Hours) (Activities on Mock-interviews and Telephonic Interviews)

5.1 Preparing a Professional CV

5.2 Grooming for the interview (Non-verbal and Verbal Skills)

5.3 Spotting the errors (Subject Verb Agreement, Use of Appropriate Words, Use Prepositions)

Reference Books:

1. English Language Skills for Academic Purposes: A Textbook for College Students, Charul Jain, Pradyumansinh Raj, Yunus Karbhari, Macmillan Education.
2. Communicative English II: An Active Course of Phonetics and Grammar, Macmillan Education.
3. Essential English for Indian Learners: Foundation, Dr. Jitendra Kumar Singh, Macmillan Education
4. Introduction to Life Skills: A Textbook for College Students, Arvind Nawale, Macmillan Education.
5. English in Action: A Textbook for College Students, Editors: T. Vijaykumar, K, Durga Bhawani, Y.L.Shrinivas, Macmillan Education.
6. English in Use: A Textbook for College Students, Macmillan Education.
7. Stream: English Coursebook for College Students, Suresh Gadhavi. Mahendra Mishra, Macmillan Education

Evaluation Scheme for SEC (Communication skills and Personality Development: 2)

DISTRIBUTION OF MARKS (Theory Examination)				
UNITS	MCQs	SAQs	VSAQs	Total Marks
Unit I	06	04	05	15
Unit II		04	05	09
Unit III		4x3 (3 questions of 4 marks each)		12
Unit IV			05	05
Unit V		04	05	09
				50

Internal Assessment will be based on a continuous evaluation. It should ideally follow the following marking scheme:

Assignments & Viva-voce (15+15), Attendance (10), Participation in Classroom Projects and Activities (10)

Framework for Internal Evaluation		
Assessment Criteria	Units	Marks
Assignment and Viva-voce	Based on the contents from all the units	15+15
Attendance and Participation in Activities	Based on the contents from all the units	10
Classroom Projects and Activities (Seminars, Mini Projects, Discussion Forums and Elocution, Role Plays, Cue cards, competitions, etc.)	Unit I,II, IV, V	10
		50

Pattern of the Question Paper (Theory Examination)

Q1. (A) Six MCQs carrying 1 marks each from Unit [6 Marks]

(B) One out of two SAQs with internal choice to be answered in 75 words from Unit I [4 Marks]

(C) One out of two SAQs with internal choice to be answered in 75 words from Unit II [4 Marks]

Q2. (A) 5 out of 6 VSAQs from Unit I (Carrying 1 mark each) [5x1=5 Marks]

(B) 5 out of 6 VSAQs from Unit II (Carrying 1 mark each) [5x1=5 Marks]

Q3. (A) Comprehension. [4 Marks]

(B) Write a review of a book/ a movie

[4 Marks]

(C) Paragraph Writing

[4Marks]

Q4. (A) CV writing.

[4 Marks]

(B) 5 out of 6 VSAQs from Unit IV (Carrying 1 mark each)

[5x1=5 Marks]

(C) 5 out of 6 VSAQs from Unit V (Carrying 1 mark each)

[5x1=5 Marks]

B. Sc. Semester-II SEC Botany (BVS2P04) Plant Pathology and Disease Management			
VSEC Practical	Hours: 4 Hours/Week	Marks: 50+50=100	Credit: 2
Unit-I			
1. Acquaintance with various laboratory equipment: (Laboratory equipment and their use: pH meter, autoclave, hot air oven, laminar flow, spectrophotometer, electrophoresis, light and electron microscopy, incubator, Centrifuge / ultracentrifuge, ELISA Reader, Freeze dryer, GC-MS, HPLC, Thermocycler, {Practical to be conducted from available instruments}). 2. Methods of sterilization, Methods of inoculation. 3. Nutritional media and their preparations. Preservation of microorganisms in pure culture. 4. Enumeration of microbial population in soil- bacteria, fungi. 5. Methods of isolation and purification of microbial cultures			15 Hrs.
Unit-II			
6. General study of different Vegetative and reproductive structures of fungi. 7. Study of symptoms of various plant diseases. (Fungal diseases of cereals, millets, oilseeds, pulses, fruits, vegetables, plantations, fibers, spices, medicinal and ornamental crop with special reference to etiology, disease cycle, perpetuation, epidemiology and management). 8. Measurement of plant disease 9. Study of representative fungal genera <i>Colletotrichum</i> , <i>Alternaria</i> , <i>Cercospora</i> , <i>Aspergillus</i> , <i>Helminthosporium</i> , <i>Curvularia</i> , <i>Penicillium</i> , <i>Rhizopus</i> , <i>Mucor</i> , <i>Trichoderma</i> etc.			15 Hrs.
Unit-III			
10. Staining and identification of plant pathogenic bacteria 11. Study of phanerogamic plant parasites 12. Transmission of plant viruses 13. Study of morphological features and identification of plant parasitic nematodes. 14. Extraction of nematodes from soil			15 Hrs.
Unit-IV			
15. Koch's postulates 16. Study of fungicides and their formulations 17. Methods of pesticide application and their safe use. 18. Calculation of fungicide sprays concentrations. 19. Collection and preservation of disease specimen. 20. Detection and Diagnosis of pathogens in seeds and other planting materials: Nucleic acid probes, Southern, Northern and Western hybridization, ELISA, ISEM and PCR. Nucleic acid probes, Southern, Northern and Western hybridization, ELISA, ISEM and PCR (Methodology only)			15 Hrs.

B.Sc. Semester-II
PRACTICAL EXAMINATION
SEC Botany (BVS2P04)
Subject: Plant Pathology and Disease Management

TIME: FIVE HOURS

MAX. MARKS: 50

Q.1. Identify giving reasons two of the given plant pathology material and "A".	10 Marks
Q.2. Make suitable stained preparation of the given Fungal culture "B"	10 Marks
Q.3. Perform Gram staining of the given Bacterial culture/ Curd "C"	5 Marks
Q.4. Techniques of inoculation "D"	5 Marks
Q.5. Spotting:	10 Marks
E. One of the instruments of Micro biology laboratory.	
F. Whole specimen or a permanent slide of Fungal pathology specimen.	
G. Whole specimen or a permanent slide of bacterial.	
H. Whole specimen or a permanent slide of Plant disease studied Viral, phytoplasma.	
I. Instrumentation.	
Q.6. Viva-voce	5 Marks
Q.7. Practical Record and pathology field report,	5 Marks

Suggested Readings

1. Pathak, V. N. Essentials of Plant Pathology. Prakash Pub., Jaipur 2) Agrios, GN. 2010. PlantPathology. Acad. Press.
 2. Kamat, M. N. Introductory Plant Pathology. Prakash Pub, Jaipur 4) Singh RS. 2008. PlantDiseases.8th Ed. Oxford & IBH. Pub. Co.
 3. Singh RS. 2013. Introduction to Principles of Plant Pathology. Oxford and IBH Pub. Co.
 4. Alexopoulos, Mims and Blackwel. Introductory Mycology
 5. Mehrotra RS & Aggarwal A. 2007. Plant Pathology. 7th Ed. Tata McGraw Hill Publ. Co. Ltd.
 6. Gibbs A & Harrison B. 1976. Plant Virology – The Principles. Edward Arnold, London.
 7. Hull R. 2002. Mathew. S Plant Virology. 4th Ed. Academic Press, New York.
 8. Verma JP. 1998. The Bacteria. Malhotra Publ. House, New Delhi.
 9. Goto M. 1990. Fundamentals of Plant Bacteriology. Academic Press, New York.
 10. Dhingra OD & Sinclair JB. 1986. Basic Plant Pathology Methods. CRC Press, London, Tokyo.
 11. Nene YL & Thapliyal PN. 1993. Fungicides in Plant Disease Control. 3rd Ed. Oxford & IBH, New Delhi.
 12. Vyas SC. 1993. Handbook of Systemic Fungicides. Vols. I-III. Tata McGraw Hill, New Delhi.
 13. Rajeev K & Mukherjee RC. 1996. Role of Plant Quarantine in IPM. Aditya Books.
 14. Rhower GG. 1991. Regulatory Plant Pest Management. In: Handbook of Pest Management in Agriculture. 2nd Ed. Vol. II. (Ed. David Pimental). CRC Press.
 15. Singh RS & Sitaramaiah K. 1994. Plant Pathogens – Nematodes. Oxford & IBH, New Delhi.
 16. Thorne G. 1961. Principles of Nematology. McGraw Hill, New Delhi.
- Walia RK & Bajaj HK. 2003. Text Book on Introductory Plant Nematology. ICAR, New Delhi

SEC Basket Biochemistry (2 credit, 4-hour Practical) Semester 2

Blood Processing Techniques (BVS2P04)

Course objective: After completion of this course student will have practical knowledge of various skills needed for blood processing and handling.

1. Instrumentation and facilities required for blood processing laboratories.
2. Separation of plasma from a given blood sample.
3. To prepare fresh frozen plasma and its processing for use in patients.
4. Separation of Serum from a given blood sample.
5. Types and principal of working of autoanalyzer.
6. Demonstration of blood analysis using autoanalyzer.
7. Separation of blood components using centrifugation technique.
8. To perform capillary blood collection.
9. To perform venous blood collection.
10. Differential leucocyte count of blood.
11. To Perform WBC count
12. To perform RBC count
13. To perform ESR of blood.
14. To perform platelet count.

References:

1. [Dickens Weatherby](#). Blood Chemistry and CBC Analysis. Bear Mountain publisher.
2. [Diana Garza](#). Phlebotomy Handbook: Blood Specimen Collection from Basic to Advanced. Pearson publication.
3. [F.A. Davis Company](#). Blood Collection. 2nd Edition. FA Davis company publication.

Skill Enhancement Courses (Biotechnology)

SEMESTER – II

WINE TECHNOLOGY

Course Code: BVS2P04

Total Contact Hours: 60

Course outcomes:

On completion of this course, students will be able to:

- CO 1. Demonstrate an understanding of the basic concepts of wine chemistry and wine microbiology
- CO 2. Students will be able to learn wine production
- CO 3. Students will be able to check quality of grapes and wine
- CO 4. Students will be able to evaluate wine quality using chemical and sensory techniques

PRACTICALS

1. Introduction to Wine technology Laboratory and common Wine technology laboratory instruments e.g., Lab fermenter, Refractometer, Hydrometer Colorimeter, pH Meter, Distillation Unit and Chemical Balance
2. Preparation of Malt Extract Glucose Yeast extract Peptone (MGYP) medium for growth & identification of yeast.
3. Isolation of bacteria and yeast from fruits
4. Determination of reducing sugar in molasses sample
5. Identification of grape and wine varieties
6. Preparation of wine from fruits (grapes/apple)
7. Determination of viable count of yeast from fermenting wine sample by Neubaur's chamber
8. Determination of viable count of yeast from fermenting wine sample by Spread plate method.
9. Determination of alcohol content of wine by titrimetric/hydrometer/ specific gravity methods
10. To study the effect of alcohol concentration on yeast growth
11. To learn the techniques of Stem cuttings and its propagation
12. To learn the technique of "Whip" grafting for propagation of grape plants
13. To collect infected fruit samples and study the morphology of major disease-causing organisms
14. Sensory evaluation of white wine and red wine.
15. Determination of BOD of given sample (winery/distillery/brewing waste)
16. Determination of COD of given sample (winery/distillery/brewing waste)

Reference Books

- 1) Casida L. E. (Jr) (1993) Industrial Microbiology, 5th Reprint
- 2) Frobisher M. (1974) Fundamentals of Microbiology, 9th Edition
- 3) Patel A. H. Industrial Microbiology.
- 4) Prescott S. C. and Dunn C.G. (1983) Industrial Microbiology, Reed, g. (Ed.) AVI Tech books.
- 5) Stanbury P. F., Whitaker A. and Hall S. J., (1997) Principles of Fermentation, 2nd Edition
- 6) Boltan R. B. (1996) Principles and practice of winemaking, Chapman and Hall.
- 7) Glaudio Delfins & Formica J. V. (2001) Wine microbiology Science and Technology.
- 8) The microbial world – Stainer
- 9). General Microbiology – Volume I and II Power and Daginwala
- 10) Elements of Microbiology – Pelczar

B.Sc. Semester – II (Chemistry)
Skill Enhancement Course (SEC)
Water and wastewater analysis (BVS2P04)
Practical 2 credits

Course Outcomes

By the end of this course, students will be able to:

1. *Identify sampling locations for different types of water samples.*
2. *Carry out sampling of water and wastewater from various sources.*
3. *Analyze spot parameters at sampling location.*
4. *Carry out complete physico-chemical analysis of different types of water samples.*
5. *Suggest remedial measures for water detoxification.*

List of Experiments

A. Physicochemical analysis:

1. Determination of temperature of water sample.
2. Determination of pH of water sample using pH paper as well as pH meter.
3. Determination of electrical conductivity of water sample.
4. Determination of turbidity of water sample.
5. Determination of total dissolved solids (TDS) in water sample.
6. Determination of alkalinity (hydroxide, bicarbonate and carbonate) of water sample.
7. Determination of chloride content of water sample.
8. Determination of sulphate content of water sample.
9. Determination of hardness (total, temporary and permanent) of water sample.
10. Determination of calcium and magnesium hardness of water sample.

B. Demand analysis:

1. Determination of Dissolved Oxygen (DO) in water sample.
2. Determination of Chemical Oxygen Demand (COD) of water sample.
3. Determination of Biochemical Oxygen Demand (BOD) of water sample.

C. Heavy metals:

1. Estimation of iron by spectrophotometry using 1,10-phenanthroline.
2. Estimation of copper by solvent extraction with DDC.
3. Estimation of Cr(VI) by spectrophotometry using DPC.

Note: Minimum 10 experiments should be performed.

References:

1. William C. Lipps, Ellen Burton Braun-Howland, Terry E. Baxter (2012), Standard Methods for the Examination of Water and Wastewater, Amer Public Health Assn.
2. Ramteke, Moghe (1987), Laboratory manual of Water Analysis, CSIR-NEERI, Nagpur.
3. Leo M.L. Nollet, Leen S. P. De Gelder, (2014) Handbook of water analysis, CRC Press, Taylor and Francis.

SEC Basket

B.Sc. Sem-II (Computer Science/ Computer Application)

BVS2P04

TALLY

Credits: 2

Duration : 60 Hours

Course Objectives:

1. To understand the concepts of accounting.
2. To give the students a hands-on experience on Tally.
3. To understand the different features of Tally.

Course Outcomes:

After completing this course satisfactorily, a student will be able to:

1. understand the fundamentals of accounting
2. work on Tally Software
3. prepare Ledger, Voucher and Orders in Tally.
4. prepare balance sheet, payroll report and VAT report in Tally

UNIT I

Accounting Basics - Defining the need for accounting, Defining accounting, Exploring the branches of accounting, Describing the functions of accounting, Listing the advantages of accounting, Listing the limitations of accounting, Explaining important terms in accounting, Exploring the concepts of accounting, Understanding the conversions of accounting, Describing an account and its types, Explaining the rules of debit and credit, Describing a journal, Describing a ledger, Describing trial balance, Describing a financial entries, Understanding adjustment entries.

Introduction to Tally ERP 9 – Features of Tally, Enhancement in Tally. ERP 9, Installation procedure of Tally. ERP 9, Opening Tally. ERP 9, Components of the Tally. ERP 9 window, Creating a Company.

UNIT II

Stock and Godown in Tally ERP 9 – Stock groups, Stock categories, Stock items, Units of measure, Godowns. **Group, Ledgers, Vouchers and Orders** – Introducing groups, Introducing ledgers, Introducing vouchers, Introducing purchase orders, Introducing a sales order, Introducing invoices.

UNIT III

Reports in Tally ERP 9 – Working with balance sheet, Working with profit & loss A/c report, Working with stock summary report, Understanding ratio analysis, Working with trial balance report, Working with day book report. **Payroll** – Exploring payroll in Tally. ERP 9, Required features to create a pay slip, Description of payroll info, Working with payroll vouchers, Defining payroll reports, working with statements of payroll report, Describing salary disbursement.

UNIT IV

Taxation – Indian Tax Structure, Tax deducted at source in tally.ERP 9, Create a Tax Ledger, TDS Vouchers, Printing a TDS Challan, Tax collected at source in Tally.ERP 9, TCS reports in Tally ERP 9, Calculating VAT in Tally.ERP 9, VAT Classification, VAT Vouchers, VAT Reports in Tally ERP 9, Service Tax.

Books :

1. Business Accounting with MS Excel and Tally.ERP 9 Course Kit, Vikas Gupta, Dreamtech Press.
2. Computerised Accounting using Tally.ERP 9 1 , Sahaj Enterprise, Tally Education Private Ltd (TEPL).
3. SIMPLIFIED TALLY.ERP 9, Vishnu Priya Singh, Computech Publications Limited (Asian Publishers)
4. Mastering Tally Erp 9: Basic Accounts, Invoice, Inventory, A.K. Nadhani, BPB Publication
5. Tally 6.3 Tutorial, A.K. Nadhani, K.K. Nadhani BPB Publication.
6. Accounting Principles, Robert N. Anthony, James S. Reece, Irwin Professional Publishing

Course Outcome:

At the end of this course students will demonstrate the ability to

1. Handle various kinds of files.
2. Implement file Operations in C programming for a given application.

File handling: Streams in C, Types of Files, File Input/ Output Operations: Modes of file opening, Reading and writing the file, Closing the files.

Entrepreneurship Development and Services by Environmental Consultancy

Unit-I:

Introduction: Most popular business types and requirements for formation, Need for Government/ Professionals/ Licenses and Collaboration, Understanding psychology of sustainability and circular economy as a consultant, Current Projects and Thrust Area of CPCB/MPCB, Patents for Business Development, Copyrights and Logos for consultancies.

Development of Laboratory and Training Centre: Guidelines for Recognition of Environmental Laboratories under the Environmental (Protection) Act, 1986, Guidelines for Recognition as NABL Accredited Laboratory, Importance of Training Centre.

Unit-II:

Compliance Requirements by MPCB/CPCB: Detailed study of SPCB/CPCB/MoEFCC websites, Registration with MPCB and Application for consent Service (Maitri Portal), Consent under Water and Air Act, Authorization's required under rules of Environment Act, CEPI and categorization of the Industries.

Water and Wastewater Treatment/ Air Pollution Control: Design and Development of STP/ETP, Treatment and Maintenance Services, Phyto-remediation and Patents, Supply of Equipment's and Installation of Air Pollution Control Devices.

Unit-III:

Important Services Provided by Consultants: Remote Sensing and GIS Mapping Services, Energy Conservation Services, Restoration of Lands/Water bodies, Organic farming and Green Belt Development. Preparation of EMS reports, Green Building Certifications: LEED, WELL buildings, IGBC, TERI Griha, Life Cycle Assessment reports. Ecological and Carbon Footprints.

Establishment of an NGO: Cause and Mission of NGO, Board of Directors/members and name of your NGO, Memorandum Articles of incorporation/ Articles of Association, NGO registration, Fund's collection, Building a wide network.

Individual Start up in the field of Environment: Sole Proprietorship/Freelance – Minimum requirements and Registration, One Person Company (OPC): The Companies Act, 2013, Section 2(62), Section 3(1) (c), Sole Proprietorship vs OPC.

Unit-IV: Field Work/ Project/ Training/Assignment related to Entrepreneurship Development and Services by Environmental Consultancy.

B.Sc. Sem-II (Forensic Science - Major)

SEC (Forensic Science)

A. Security Features of Security Documents (BVS2P04)

Course Outcome: By the end of this Course, the learners will be able to:

1. Identify and describe security features of different currency notes.
2. Examine and explain security features of various identification documents.
3. Study and describe security features of educational documents, stamp papers and credit cards/debit cards.

List of Practical:

1. To study the security features of Indian Currency note INR 100.
2. To study the security features of Indian Currency note INR 500.
3. To study the security features of Indian Currency note INR 2000.
4. To examine the security features of Passport.
5. To examine the security features of Cheque.
6. To examine the security features of Pan card.
7. To study the security features of Aadhar card.
8. To study the security features of educational documents.
9. To study the security features of Stamp paper.
10. To study the security features of Credit Card/ Debit Card.

B.Sc. Sem-II (Forensic Science - Major)

SEC (Forensic Biology)

B. General Techniques and Recombinant DNA Technology in Microbial Forensics (BVS2P04)

Course Outcomes: By the end of this Course, the learners will be able to:

1. Demonstrate the ability to operate a high-speed cooling centrifuge machine effectively.
2. Perform the separation of serum and plasma from blood samples using centrifugation techniques.
3. Apply centrifugation methods to separate and collect bacterial cells from a broth.
4. Perform gradient centrifugation to separate components in a given sample effectively.
5. Conduct turbidimetric evaluation of bacterial suspensions to assess their optical density and growth characteristics.

List of Practical

1. To study the operation of high-speed cooling centrifuge machine.
2. Separation of serum from blood.
3. Separation of plasma from blood.
4. Separation and collection of bacterial cells from the broth using centrifugation.
5. To perform gradient centrifugation of the given sample.
6. To perform the turbidimetric evaluation of bacterial suspension.
7. To study the restriction enzyme activity.
8. To set the program of the PCR cycle.
9. To study negative staining of bacteria.
10. To perform the plasmid DNA isolation from bacteria.
11. To study Salient features of BAC
12. To study Salient features of YAC

B.Sc. Sem-II (Forensic Science - Major)

SEC (Digital & Cyber Forensics)

C. Mobile App Development (BVS2P04)

Course Outcome: By the end of this Course, the learners will be able to:

1. Gain a solid understanding of the Android Studio IDE, its features, and its role in Android application development.
2. Apply principles of user interface design to create visually appealing and user-friendly layouts using different layout types in Android applications.
3. Implement various features and functionalities in Android applications, such as displaying shapes, creating a calculator, handling notifications, and designing a BMI calculator.
4. Develop skills in implementing navigation within Android applications, allowing users to move between screens and interact with different activities.
5. Learn techniques for optimizing performance, such as implementing multithreading for smooth image display, ensuring responsive user experiences in Android applications.

List of Practical

1. Study of Android Studio IDE
2. Displaying “Welcome to Android Laboratory”
3. Designing Simple Toast
4. Designing User Interface based on Layouts
5. Displaying different Shapes
6. Designing Simple Calculator Application
7. Navigation in Android
8. Displaying the Notification
9. Creating an Alarm
10. Designing BMI Calculator Application
11. Displaying images using multi-threading

SEC (Geology)

Tools and Techniques in Geology (BVS2P04)

Practical:

Sample etching, staining and model count techniques; heavy mineral analysis and paleocurrent interpretation; use of computers in insertion of columns, line charts, pie charts, bar charts, scatter diagrams in geological reports.

Books Recommended:

No Textbook - only handouts and web pages

B.Sc. Mathematics (Major): SEMESTER II (SEC)

Financial Mathematics (BVS2P04)

Course Outcomes

1. Calculate variables using both simple and compound interest;
2. Calculate variables using annuities formulas, including bond market value calculations;
3. Describe the features of promissory notes, bonds, and annuities;
4. Judge if a project is viable based on a Net Present Value calculation;
5. Demonstrate the interaction between interest rates and market prices for bonds;
6. Communicate using financial terminology;
7. Solve common business problems employing mathematics of finance.

TOPICS:

1. Arbitrage and risk aversion
2. Interest (simple and compound, discrete and continuous),
3. Time value of money,
4. Inflation,
5. Net present value,
6. Internal rate of return,
7. Comparison of Net Present Value (NPV) and Internal Rate of Return (IRR)
8. Bonds, bond prices and yields. Floating-rate bonds
9. Immunization
10. Asset return
11. Short selling
12. Portfolio return, (brief introduction to expectation, variance, covariance and correlation) random returns
13. Portfolio mean return and variance
14. Diversification
15. Portfolio diagram
16. Feasible set

Reference BOOKS:

1. David G. Luenberger; Investment Science; Oxford University Press, Delhi, 1998.
2. John C. Hull; Options, Futures and Other Derivatives, 6th Ed.; Prentice-Hall India, Indian reprint, 2006.
3. Sheldon Ross; An Elementary Introduction to Mathematical Finance, 2nd Ed.; Cambridge University Press, USA, 2003.

SEC (Microbiology) Testing of Food Adulteration Course Code: (BVS2P04)			
SEC	Hours: 04 Hours /Week	Marks: SEE= 50 CIE= 50	Credit: 02
LIST OF EXPERIMENTS (Perform at least 12 practical) 1) Detection of starch in milk & milk products 2) Detection of developed acidity in milk 3) Detection of carbonates as neutralizers in milk 4) Detection of urea in milk. 5) Detection of Margarin or Vanaspati in ghee & butter 6) Detection of mineral oil in oils & fats. 7) Detction of Mentanil yellow in ice cream. 8) Detection of Mentanil yellow in beverages. 9) Detection of Mentanil yellow in pulses 10) Detction of Kesari dal in pulses. 11) Detection of Argimone seeds in mustard seeds. 12) Detection of aluminium in silver foil. 13) Detection of sugar solution in honey. 14) Detection of chicory in coffee. 15) Detection of artificial color (coal tar) dyes in tea 16) Detection of Talc powder in cardmum. 17) Detection of tamarind powder in coffee. 18) Detection of coloring matter in turmeric powder 19) Detection of RhodamineB in red chilly powder			60 Hrs
Scheme of Practical Examination: 1. Three expt. -----, 10 Marks each 2. Viva-voce----- 10 Marks 3. Record----- 10Marks Total Marks = 50			

Reference Books:

- 1) Manual of Methods of Analysis of Microbiological Examination of Food and Water- FSSAI Manual-2016
- 2) Manual of methods of analysis of foods milk and milk products -fssai-2016
- 3) Manual of methods of analysis of foods food safety and standards authority of India ministry of health and family welfare government of India new Delhi 2015 beverages (coffee, tea, cocoa, chicory) sugar and sugar products & confectionery products -lab manual-2015
- 4) Manual of Methods of Analysis of Foods- Alcoholic Beverages- FSSAI-2021
- 5) Manual of Methods of Analysis of Foods- Spices, Herbs & Condiments-FSSAI-2021
- 6) Manual of Methods of Analysis of Foods- Cereal & Cereal products- FSSAI-2016
- 7) Manual of Methods of Analysis of Foods-Mycotoxins,FSSAI-2021
- 8) Manual of Methods of Analysis of Foods- Meat & Fish products- FSSAI-2016
- 9) General guidelines for Sampling for Microbiological Analysis of Food-FSSAI-2022
- 10) Manual of Methods of Analysis of Foods- FOOD ADDITIVES- FSSAI-2016
- 11) Manual of Methods of Analysis of Foods-Water-FSSAI-2016
- 12) A Manual of Laboratory Techniques-National Institute of Nutrition-CMR- Hyderabad

Course outcomes

After this course the students will be able to

Sr. No.	Course outcome
1.	Student will learn the basic knowledge of food adulteration testing
2.	The knowledge is very useful for opting job in industries.

B.Sc. Home Science Semester –II (SEC)

BVS2P04 (A)

A. Innovative Community Practices

PRACTICALS:

Total Marks	100
Practical	Marks
SEE	50
CIE	50

CIE -50 Marks

1. Preparation of computerized or handmade advertisement on any use. **10 Marks**
2. Prepare innovative poster on any topic for rural development. **10 Marks**
3. Innovative practices for entrepreneurship development through natural resources.

(Compost making/agarbatti sticks or dhoop making)

10

Marks

4. Potential applicability of findings to social practices towards drama or puppet show. **10**

Marks

5. Report writing on latest community development programmes. **10 Marks**

Total Marks (SEE)	50
Advertisement	20
Pr Puppet making	20
Record	10

B.Sc. Home Science Semester II - (SEC Basket)

BVS2P04 (B)

Food Preservation

Objectives:

- To acquire knowledge of food preservation and preservation techniques.
- To know the importance and basic principles of food preservation.
- To understand the importance of preservation.

PRACTICAL:

Introduction of Food Preservation

1. Preparation of Squash/Syrup
2. Preparation of Pickle
3. Preparation of Jam and Jelly
4. Preparation of Chutney
5. Preparation of Sauce
6. Preparation of Tutti frutti and candy
7. Preparation of Murabba

CIE

Any two of the following:

- Scrap book related to methods of food preservation.
- To organize exhibition of food products.
- Visit to preservation units.

Total Marks	100
SEE	50
Cooking	20
Presentation	15
Record	15
CIE	50

References:

- B. Srilakshmi, Food Science, third edition, new age international (P) Ltd, New Delhi (2006).
- N Shakuntala Manay and M Shakuntala Manay, Foods Facts and Principles, New Age International (P) Ltd, New Delhi (1995).
- Rahman M S (2007) Handbook of Food Preservation 2nd ed CRC Press .
- Srivastava R P and Kumar S (2002) Fruits and Vegetables Preservations : Principles and Practices, 3rd Edition . International Book Distributing Co. Lucknow.
- Dubey,S.C.Basic Baking IV Edtion, The Society of Indian Bakers, New Delhi.

B.Sc. Home Science Semester – II

SEC Category Courses Code: BVS2P04 (C) (2 Credits)

Cosmetic Preparation

Total Marks	100
Practical	Marks
SEE	50
CIE	50

Course Content:

1. Chemistry laboratory standards and safety rules.
2. Demonstration and practice of handling of basic apparatus in chemistry laboratory (Burette, Pipettes, Volumetric cylinders, Volumetric flask, thermometer, Bunsen burner, and other common glassware.)
3. Working principles and practice of handling of basic equipment's of Chemistry laboratory (pH meter, Physical balance, electronic balance, etc.)
4. Preparation of 0.025 N solution of Sodium Hydroxide.
5. Preparation of 0.025 N solution of Oxalic Acid.
6. Preparation of 0.025 N solution of Hydrochloric Acid.
7. Preparation of 0.5% solution of starch.
8. Preparation of Herbal Extract.
9. Preparations of Shampoo base (simple).
10. Preparations of herbal Shampoo.
11. Preparation of colloidal solution of starch.
12. Colour reaction of starch.

Reference books:

- 1) Morrison, R. N.; Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- 2) Finar, I. L. Organic Chemistry (Volume 1 & 2), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- 3) Ahluwalia, V.K.; Dhingra, S. (2004), Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press.
- 4) Sharma, R.K., Sidhwani, I.T., Chaudhari, M.K. (2013), Green Chemistry Experiments: A monograph, I.K. International Publishing House Pvt Ltd. New Delhi.
- 5) Chandra, R.; Singh, S.; Singh, A. (2019), Basic Organic Chemistry, Arcler Press.

Course Outcome:

1. This course is designed to offer enhanced practical skills to the students.
2. After completion of this course student will have understand, learn and perform skills needed for preparation of cosmetics in a chemistry laboratory.

	Semester II (SEC) Statistics
	NAME OF THE PAPER – FINANCIAL LITERACY Understanding basic financial concepts can be incredibly helpful in both your personal and professional life. Consider taking courses on topics like budgeting, investing, and financial planning.
	Paper code – BVS2P04 2 Credits (4 hrs practical per week)
	List of Practicals
1	Budgeting: This topic covers the basics of creating and sticking to a budget, including tracking expenses, setting financial goals, and prioritizing spending.
2	Saving and investing: This topic covers the different types of savings accounts and investment vehicles available, as well as how to assess risk and build a diversified portfolio.
3	Credit and debt management: This topic covers the basics of credit scores and reports, as well as strategies for paying off debt and avoiding high interest rates.
4	Retirement planning: This topic covers the different types of retirement accounts available, as well as how to calculate retirement needs and develop a retirement savings plan.
5	Insurance: This topic covers the basics of different types of insurance (such as health, life, and auto insurance) and how to determine which types of insurance are necessary.
6	Taxes: This topic covers the basics of income taxes, including how to file a tax return, how to take advantage of deductions and credits, and how to plan for tax obligations.
7	Financial goal-setting: This topic covers strategies for setting and achieving short-term and long-term financial goals, as well as how to adjust goals as circumstances change.

B.Sc. Sem. II SEC
Course Name: Lac culture (BVS2P04)
Credit: 2

Course outcomes: After completion of the course, students will be able to-

- Identify, recognize, describe and explain male and female Lac insect and different stages of its life cycle.
- Identify, recognize, describe and explain various host plants of Lac insect.
- Handle different tools and materials involved in Lac culture.
- Separate Lac from sticks; dry and wash the crude Lac.
- Process the crude lac to Shellac.
- To do internship and work in commercial Lac cultivation unit.

Practical:

1. Study of systematic position of Lac insects, *Laccifer lacca*.
2. Identification and classification of host plants of Lac insect.
3. Identification of male and female lac insect and different life stages of Lac insects.
4. Study appropriate pruning tools, cutting tools and harvesting tools.
5. Estimation of male: female ratio in the brood.
6. Demonstration of manual scraping of rejected brood Lac and sticks.
7. Study of brood Lac with expected larval emergence.
8. Study of dead and living encrustation on brood lac.
9. Study of features of active and inactive brood
10. Demonstration of easy separation of Lac from the sticks.
11. Demonstration of drying of Lac in open air for optimum moisture content.
12. Demonstration of washing of stick Lac with an alkaline solution to clean off impurities.
13. Demonstration of processing of crude Lac to shellac by different methods (handmade, traditional native process, heat process and solvent process).

Suggested reading:

Glover PM (1931). A practical manual of lac cultivation. Criterion Printing Works, pp. 81.

Goud R (2022). Practical Manual on Apiculture, Sericulture and Lac culture. Jaya Publication House

Jaiswal AK, Sharma KK, Ramani R (2011). LAC Culture Operations When, why and How? Indian Institute of Natural Resins and Gums, pp. 18.

Ghorai N (2021). Lac culture in India. International Books and Periodicals Supply Service, pp.167.

Bachelor of Fashion Design/Textile Science

Four Year (Eight Semester Degree Course)

Semester – II

Hand Painting II

SEC (BVS2 PO4)

Theory Marks : --	Practical : 100	Total Credits : 2
SEE : --	SEE : 50	Theory : -
CIE : --	CIE : 50	Practical : 2

Time Required: 60Hours

Practical

(60Hours)

Objectives -

- Identify the appropriate different types of folk art of different states in India.
- Practice different techniques, mediums and styles of folk art.
- Develop the skills and aesthetic sense to appreciate folk art.
- Decorate their floors, walls, clothes, etc.

UNIT I

- 1.1 Introduction to folk and Tribal art
- 1.2 Forms of folk and tribal art
- 1.3 Medium, techniques and styles

UNIT II

- 2.1 Role of Proportion in drawing
- 2.2 Warli
- 2.3 Gond

UNIT III

- 3.1 Miniature painting
- 3.2 Madhubani art
- 3.3 Mandala art

UNIT IV

- 4.1 Floor painting (Chawk) festivals and ceremonies (different types of states)
- 4.2 Dhokra

Portfolio :

Fundamental painting techniques. Students need to get creating their own masterpiece.

Sketchbook-

Students will be responsible for keeping a sketchbook throughout the semester.

References:

Fundamentals of Visual art
Art is Fundamental

Author: Muneesh Kumar
Author: Eileen S. Prince.

Bachelor of Science (Honors / Research) 4 yr. 8 Semester Degree Program

**B.Sc. Sem II (Interior Design – Major
BVS2P04 PRODUCT WORKSHOP II**

UNIT – I

PLASTER OF PARIS WORKSHOP

Aim: Introduction to Plaster of Paris material, having feel of material and by creating products for interior spaces.

- Introduction to plaster as material.
- Process of mixing and its use in reproduction.
- mould making and casting.
- Use for plaster with other materials like cloth, thread, wires etc.

UNIT – II

BAMBOO AND CANE WORKSHOP

Aim: - Understanding of materials and preventive measures for bamboo and cane.

- The processing on bamboo (seasoning, treatment)
- Tools for working on bamboo
- Precautions for safety in workshops.
- Cutting, Joinery details, strength, finishes, Application to construction and furniture Interior.

UNIT III

PRESENTATION TECHNIQUES WORKSHOP

To understand colour as a media of representation, conceptual and preoperational skills & techniques. Sketching of transport elements, Human figures studies in line, drawings, shade & sculptural mass. Conceptual sketches using different media. Application of rendering techniques suitable for architectural & interior drawings. Rendering of two dimensional representations for eg. Plans & elevations.

UNIT IV:

RENDERING AND SKETCHING WORKSHOP

Perspective of forms, geometric solids, spaces: formal and informal (sketch views)
Rendering techniques and use of colour.

Assignments based on transfers elements

1. Assignments based on human figures
2. Assignments based on perspective of solids & spaces.

REFERENCES:

1. Rendering with Pen and Ink by Gill
2. Ching Francis D.K.: Architectural Graphics
3. Rendering with Pen and Ink by Gill
1. Ching Francis D.K.: Architectural Graphics

Product Workshop II

S. No	Course Outcomes
CO1	Practical application of forming and decorating using Plaster of Paris.
CO2	Practical application of working with cane and bamboo.
CO3	Develop application of line, drawings and the effect of light and shade
CO4	Develop application of rendering techniques using different media for architectural & interior drawings
CO5	Develop application of rendering to 3D solids.

B. Sc (Applied Electronics & Software Technology) – Semester II (SEC)

BVS2P04

APPLIED CHEMISTRY II

Scheme of Examination (Practical)

SEE – 50

CIE - 50

Total - 100

1. Preparation of an Azo dye and its application.
2. To study the heats of neutralization of
 - a) Strong acid by a strong base
 - b) Weak acid by a strong base
3. To study heat of solution of a salt in water
4. To study the first order kinetics of the hydrolysis of Methyl acetate in an acid medium
5. To study second order kinetics of reaction of $K_2S_2O_8$ with KI

Reference Books:

1. Engineering Chemistry – Jain and Jain
2. Physical Chemistry - Bahl & Tuli
3. Organic Chemistry - Finer
4. Organic Chemistry – Bahl and Bahl

B. Sc. Semester-II

Skill Enhancement Course (SEC - 2) - PHYSICS (BVS2P04)

Fundamentals of Data Analysis and Data Interpretation

SEC-2	04 Hours/Week	Total Hours: 60	Marks: 100	Credit: 02
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Name of Experiments (Any 10 experiments to be performed):

- 1) Generation of Google form to acquire data in Excel spreadsheet and to reshuffle / delete the columns / rows as per requirements.
- 2) To sort and filter data and find maximum, minimum, average, sum of range of numbers (set of 100 data points)
- 3) Using Microsoft Excel spreadsheet draw the frequency distribution table for the given data (data set should contain minimum 100 data points)
- 4) Using Microsoft Excel spreadsheet plot bar graph for the data collected from 100 students of your college (for example conduct a survey on the favourite sport among 5 – 6 different sports).
- 5) Using Microsoft Excel spreadsheet plot bar chart for the data collected from 100 students (for example, conduct a survey on the height/weight ratio with respect to their ages) in your college.
- 6) Using Microsoft Excel spreadsheet draw frequency polygon and frequency curve for the data collected from 100 students (for example, marks obtained by the students in Xth class in 5 subjects – namely Maths, Science, Marathi, English and Social Studies)
- 7) Using Microsoft Excel spreadsheet draw a Line graph for the given data (for example – using a set of 12 data points draw a V-I graph for a pure resistance). Report the slope and intercept.
- 8) Using Microsoft Excel spreadsheet draw a graph for the given (nonlinear) data (for example – using a set of 12 data points draw a V-I graph for a diode).
- 9) Using Microsoft Excel spreadsheet find the mean, mode and median for the given data and also represent them in histogram
- 10) Perform different arithmetic operations using Microsoft Excel spreadsheet.
- 11) Obtained the trend and analyse the given data using Microsoft Excel spreadsheet.
- 12) Draw the scatterplot of the given data and analyse it using Microsoft Excel spreadsheet

Course Outcomes:

After the completion of this course students will be able to

- 1) Collect a big data as per requirements and automatically get it in spreadsheet for further processing.
- 2) Navigate on the spread sheet to edit text and values by inserting and deleting the ranges.
- 3) Use various charts and formatting tables with row and column formatting.
- 4) Use various mathematical functions to explore the necessary interpretations.
- 5) Use various statistical functions to explore the necessary interpretations.
- 6) Perform line / curve fitting for analysis.

SEC Basket
Semester IV
Faculty of Science and Technology

Sem.	Course Category	Name of Course	BoS	Course Code
IV	SEC	English for Business Communication	Languages	BVS4P06
		Medicinal plants, cultivation, practices and marketing	Botany	
		Clinical Pathology	Zoology	
		Visual Basic Programming	Computer Science/ Computer Application	
		Logic and sets	Mathematics	
		Plant Transformation Techniques	Biotechnology	
		Phytochemistry	Chemistry	
		Mushroom Cultivation	Microbiology	
		Enzyme Kinetics	Biochemistry	
		Data Interpretation and Drafting of Geological Reports	Geology	
		Troubleshooting of Electronic Gadgets	Electronics	
		Biomedical Waste Management	Environmental Science	
		A. Forensic Psychology B. Law C. Forensic Biology	Forensic Science	
		A. Fabric Ornamentation Techniques B. Psychological Testing C. Soap and Detergent Making D. Digital Agricultural Technologies	Home Science	
		Embroidery Techniques-II	Fashion Design	
		Advance Computer Aided Textile Design	Textile Science	
		Graphics IV	Interior Design	
		Workshop	Applied Electronics & Software Technology	
		Advanced Experimentation	Physics	