

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE



Faculty of Science
B. Sc. (Honors) Programmes
(W.E.F. 2024-25)

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Semester 2

B.Sc. (Hons)**Semester 2**

Sr. No.	Category	Course Title	Course Type
1	Major	Foundation Major in Applied Sciences 3	Compulsory
2		Foundation Major in Applied Sciences 4	Compulsory
3	Minor	Foundation Minor in Applied Sciences 2	Compulsory
4	SEC	Dairy Farmer	Elective
		Florist	
5	VAC	Indian Knowledge Systems (Chemistry)	Elective
		Indian Knowledge Systems (Health Science)	
		Indian Knowledge Systems (Antiquity of Bharat)	
6	AEC	IPDC-2	Elective
		MIL Gujarati-2	
7	Multidisciplinary	Energy Management and Audit in Green Schools	Elective
		Mastering Your Money: An Entry-Level course to Financial Planning and Smart Investments	
		Nutrition & Fitness	
		Aapnu Gujarat/State of Gujarat	

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Major
Subject: Foundation Major in Applied Sciences-3	Credits: 4
Semester: 2	
Course Description: The objectives of this course are able to apply the skills of basic Biotechnological, Chemistry, Environmental Science and Microbiology concepts. It will help students in creating a strong foundation necessary for science based careers.	
Student Learning Outcome: 1. Obtained ideas on application of various branches Biotechnology, Chemistry, Environmental Science and Microbiology. 2. Identify ways in which science is applied and used to solve local and global problems. 3. Apply the knowledge to explore how science and technology are interdependent. 4. To uncover the fundamental principles, developments and potential applications.	

References and Textbooks:

Biotechnology:

1. R.C. Dubey (2014) Advanced Biotechnology S.Chand ISBN 81-219-4290-X
2. Gupta, P. K. (2010). *Elements of biotechnology* (2nd ed), ISBN 8171339379, 9788171339372.
3. Singh, B. D. (2010). Biotechnology (4th ed), Kalyani Publicers, ISBN: 8127256390, 9788127256395.
4. India Bioeconomy Report-2022, BIRAC
5. Verma, Das and Singh (2014) Laboratory Manual for Biotechnology, S.Chand ISBN-978-93-83746-22-4

Chemistry:

1. Selected Topics in Inorganic Chemistry, By Wahid Malik, G.D. Tuli, R.D.Madan S.Chand ISBN: 81-219-0600-8
2. Satya Prakash's modern inorganic chemistry By Dr.R.D.Madan S.chand ISBN-9789352837298

Environmental Science:

1. P. D. Sharma (Rastogi Publications, New Delhi), Ecology and Environment. ISBN:8171338143.
2. Francois Ramade 1984. Ecology of Natural Resources. John Wiley & Sons Ltd ISBN-13: 978-0471906254.

Microbiology:

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

1. Brock, T. D., Madigan, M. T., Martinko, J. M., & Parker, J. (2014). Brock biology of microorganisms. 14th edi., Upper Saddle River (NJ): Prentice-Hall.

Science:

1. Buckingham, L. (2014). Fundamental Laboratory Mathematics: Required Calculations for the Medical Laboratory Professional. United States: F. A. Davis Company.
2. Cheesbrough, M. (2005). District laboratory practice in tropical countries, part 1. Cambridge university press.
3. Moorthy, K. (2007). Fundamentals of Biochemical Calculations. United States: CRC Press.

Unit-1 Preparation of Graphs and Standard curves

(8 hrs)

- 1.1 Types of Standards
- 1.2 Graphs and Graphing
- 1.3 Stock Standard and Plotting of Standard Curve
- 1.4 Determining concentration from graph
- 1.5 Use of Spreadsheets for graph plotting

Unit-2 Basic care and safety while preparing solutions

(7 hrs)

- 2.1 Chemical and reagent hazards in laboratory
- 2.2 Control of spillage in laboratory
- 2.3 Safety guideline for Compressed and Non-compressed gases
- 2.4 Safety Signs in Laboratory

Unit-3 Scope of Biotechnology

(8 hrs)

- 3.1 Recombinant DNA and Genetic Engineering
- 3.2 Vaccines
- 3.3 Monoclonal Antibodies
- 3.4 Mammalian Cell Culture
- 3.5 Plants and Plant Cell Culture

Unit-4 Elements and Periodicity

(7 hrs)

- 4.1 Genesis of periodic table
- 4.2 Classification of elements
- 4.3 Concept of atomic and ionic radii
- 4.4 Ionization energy
- 4.5 Electron affinity

Unit-5 Ecology and Environment

(8 hrs)

- 5.1 Types, classification, structure and function of Ecology
- 5.2 Classification, characterization and importance of population and population dynamics and population ecology
- 5.3 Concept of Community Ecology and Ecological Succession
- 5.4 Autoecology of Species and Ecological Amplitude

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B.Sc. (Hons)

Unit-6 Major Groups of Microorganisms

(7 hrs)

6.1 Origin and Evolution of Microorganisms

6.2 Universal Tree of Life

6.3 Classification of Microorganisms

6.4 Major groups of Microorganisms

List of Practicals:

1. Introduction of Common Instruments: Autoclave, Incubator, pH Meter, Hot Air Oven, Weight Balance, Water Bath, Refrigerator, Spectrophotometer and/or Colorimeter, Microscope, Shaker, Stirrer, Centrifuge, Hemocytometer, Vortex. Laminar air flow
2. Estimation of carbonate and hydroxide present together in mixture.
3. Study of topographical features using different topographic maps.
4. Observation of motile organisms by Hanging drop preparation.

Sarvajanik University

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B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Major
Subject: Foundation Major in Applied Sciences-4	Credits: 4
Semester: 2	
Course Description: The objectives of this course are able to apply the skills of basic Biotechnological, Chemistry, Environmental Science and Microbiology concepts. It will help students in creating a strong foundation necessary for science based careers.	
Student Learning Outcome: 1. Obtained ideas on application of various branches Biotechnology, Chemistry, Environmental Science and Microbiology. 2. Identify ways in which science is applied and used to solve local and global problems. 3. Apply the knowledge to explore how science and technology are interdependent. 4. To uncover the fundamental principles, developments and potential applications.	

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Biotechnology:

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3. Singh, B. D. (2010). Biotechnology (4th ed), Kalyani Publicers, ISBN: 8127256390, 9788127256395.
4. India Bioeconomy Report-2022, BIRAC
5. Verma, Das and Singh (2014) Laboratory Manual for Biotechnology, S.Chand ISBN-978-93-83746-22-4

Chemistry:

1. Organic Chemistry, Volume-1,2, I.L.Finar, 6 th Edn., 2002, , Pearson
2. Organic Chemistry, Seventh Edition, By R.T.Morrison, R.N.Boyd, S.K. Bhattacharjee 2010, Pearson
3. Advance Organic Chemistry, Arun Bahl and B S Bahl, 2012, S.Chand
4. Organic Chemistry, W.H. Perkin and F. S. Kipping, 2012, Nabu Press

Environmental Science:

1. Keller E.A (2012): Introduction to Environmental Geology, Pearson Publication, USA.
2. Basudeb Bhatta, (Oxford Publications, New Delhi). Remote Sensing and GIS. ISBN: 9780195692396

Microbiology:

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B.Sc. (Hons)

1. Brock, T. D., Madigan, M. T., Martinko, J. M., & Parker, J. (2014). Brock biology of microorganisms. 14th edi., Upper Saddle River (NJ): Prentice-Hall.

Science:

1. Mendham J., Denney R C., (2008). Vogel's Textbook of Quantitative Chemical Analysis, 6th Edition, Person Education.

Unit-1 Statistics and metrics -1

(8 hrs)

- 1.1 Classification of Error and reduce systematic errors
- 1.2 Accuracy
- 1.3 Precision
- 1.4 Significance of digit (Figures)

Unit-2 Statistics and metrics -2

(8 hrs)

- 2.1 Mean and standard deviation
- 2.2 Distribution of random errors
- 2.3 Reality of results
- 2.4 Confidence intervals
- 2.5 Comparison of result

Unit-3 Scope of Biotechnology

(7 hrs)

- 3.1 Biofertilizers
- 3.2 Biopesticides
- 3.3 Biofuels
- 3.4 Biotechnology Products: Insulin, BT Cotton, Golden Rice
- 3.5 Status of biotechnology industry in India

Unit-4 Stereochemistry of organic compounds

(8 hrs)

- 4.1 Isomerism: Definition and classification
- 4.2 Introduction to Geometrical isomerism: cis-trans , syn-anti and E/Z notations with C.I.P rules
- 4.3 Optical Isomerism: Optical Activity, Specific Rotation, Chirality, Enantiomers,
- 4.4 Molecules with two or more chiral-centres
- 4.5 Di-stereoisomers, meso structures, Racemic mixture and their resolution. Relative and absolute configuration: D/L and R/S designations

Unit- 5 Geospatial Technologies in Environment

(8 hrs)

- 5.1 Basics of Remote Sensing
- 5.2 Satellite launch vehicles
- 5.3 Introduction to Geographical Information System (GIS)
- 5.4 Application of Geoinformatics in environmental science & management

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B.Sc. (Hons)

Unit-6 Principles of Microscopy

(8 hrs)

- 6.1 Light Microscopy
- 6.2 Improving Contrast in Light Microscopy
- 6.3 Imaging Cells in Three Dimensions
- 6.4 Electron Microscopy

List of Practicals:

1. Field / Virtual Visit: Local Biotechnology Unit / Laboratory
2. Estimation of carbonate and bicarbonate present together in a mixture.
3. Determination trophic status index of given water body.
4. Simple staining by using acidic and basic dyes
5. Observation of specimens by Dark field and Phase contrast microscopy.

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Minor
Subject: Foundation Minor in Applied Sciences-2	Credits: 4
Semester: 2	
Course description: The objectives of this course are to provide students with fundamental scientific knowledge of basics of Agriculture & Forestry, Analytical chemistry & Instrumentation, Forensic science, Industrial Fermentation, Medical Lab Technology & Occupational Health concepts. It will help students in creating a strong foundation necessary for science based careers.	
Student Learning Outcome: 1. Develop understanding in various subjects viz. Agriculture & Forestry, Analytical chemistry & Instrumentation, Forensic science, Industrial Fermentation, Medical Lab Technology & Occupational Health concepts. 2. Students will be acquainted with the traditional and applied aspects of the subjects. 3. Able to learn general concepts and industrial application of Agriculture & Forestry, Analytical chemistry & Instrumentation, Forensic science, Industrial Fermentation, Medical Lab Technology & Occupational Health.	

References and Textbooks:

Agriculture & Forestry:

1. Alikhan I & Khanum A. 2008. *Role of Biotechnology in Medicinal and Aromatic Plants*. UKAZ Publ.
2. Chadha KL & Gupta R.. 2006. *Advances in Horticulture*. Vol. XI. *Medicinal and Aromatic Plants*. Malhotra Publ. House.
3. Gupta AK & Sharma M. 2008. *Reviews on Indian Medicinal Plants*. ICMR. Gupta AK, Tandon N & Sharma M. 2008. *Quality Standards of Indian Medicinal Plants*. ICMR.
4. Johnson CB & Franz C. 2005. *Breeding Research on Aromatic and Medicinal Plants*. International Book Distr.
5. Sharma R. 2004. *Agrotechniques of Medicinal Plants*. Daya Publ.

Analytical Chemistry:

1. Daniel C Harris: Exploring Chemical Analysis.
2. Daniel C Harris: Quantitative Chemical Analysis.
3. Quantitative Analysis, R.A Day, A.L Underwood, 6th Edition, 1991, Prentice-Hall
4. Basic Concepts of Analytical Chemistry, S.M. Khopkar, 3rd Edition, 2008, New Age International Publishers

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Forensic Science:

1. Criminalistics: An Introduction to Forensic Science, 9th edn.: Richard Saferstein
2. Computer Crime and Computer Forensic: Dr. R.K. Tiwari
7. Criminal Profiling: An Introduction to a Behavioral Evidence Analysis, 3rd edn. : Brent E. Turvey
3. Forensic Science in Criminal Investigation and Trial, 4th edn.: B.R. Sharma
4. Handbook of Forensic Psychology: Dr. Veerraghavan

Industrial Fermentation Technology:

1. Crueger, W., Crueger, A., (2017). Crueger's Biotechnology: A textbook of Industrial Microbiology, 3rd Ed., Medtech publisher.

Medical Laboratory Technology:

1. P.B. Godkar, (2014), Textbook of Medical Laboratory Technology, Vol I, 3rd ed., Bhalani Publishing House, Mumbai, India. (ISBN: 9789381496190)
2. Bhalani Publishing House, Mumbai, India. (ISBN: 9789381496190)
3. Mukharjee K.L. (1999), Medical Laboratory Technology, Vol I, 2nd ed., Tata MacGraw Hill. (ISBN: 9789352606818)

Occupational Health:

1. Mistry K.U (2012): Fundamentals of Industrial Safety & Health-I, Siddharth Prakashan, Ahmedabad.
2. Mistry K.U (2012): Fundamentals of Industrial Safety & Health-II, Siddharth Prakashan, Ahmedabad.
3. Benjamin O. Alli (2008): Fundamental principles of occupational health and safety, International Labour Office; 2nd edition, 978-9221204541.

Unit-1: Application of traditional knowledge of forestry:

(10 hrs)

- 1.1 Identification of important herbs used in traditional medicine
- 1.2 formulation, validation and process of allopathic drugs based on traditional drugs
- 1.3 national and international institutions involved in scientific validation of traditional \ knowledge (CDRI, CIMAP, PRL'S, WHO etc.)
- 1.4 Composition of major herbal formulations and their sources
- 1.5 Role of local forest traditions in primary health care and socio-economic development.

Unit-2: Basic principles and general concepts of analytical chemistry

(10 hrs)

- 2.1 General steps in chemical analysis
- 2.2 Classification of analytical methods according to property
- 2.3 Types of analysis – Complete analysis, partial analysis and assay of ingredients, the analytical chemist and analyst
- 2.4 Introduction to methods of detecting analytes: Physical, electromagnetic radiations, electric charge

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Unit-3 Crime and Crime Scene (10 hrs)

- 3.1 Crime: definition and types of crime
- 3.2 Reasons of crime and criminal behaviour
- 3.3 Prevention of crime
- 3.4 Difference in blue and white collar crime
- 3.5 Introduction of cyber crime
- 3.6 Introduction and significance
- 3.7 Role of investigator
- 3.8 Evaluation, Protection & Photography of crime scene

Unit-4 Screening for new metabolites & Important microbial Products (10 hrs)

- 4.1 Primary and secondary metabolites
- 4.2 Strains used in screening
- 4.3 Test system
- 4.4 Important Primary & Secondary metabolites
- 4.5 Microbial biomass production
- 4.6 Recombinant products
- 4.7 Microbial enzymes (Bulk, Analytical, Therapeutic and Diagnostic, Immobilized)
- 4.8 Application of microbes in health care products, food & beverage fermentation
- 4.9 Microbes classified as GRAS category.

Unit-5 Clinical specimen collections & Quality Control (10 hrs)

- 5.1 Methods of Blood collection
 - 5.1.1 By venipuncture
 - 5.1.2 By capillary puncture
- 5.2 Role of Anticoagulants
- 5.3 Other clinical specimen (Urine, Sputum, Throat swab, Stool, CSF)
- 5.4 Quality control in different sections of clinical laboratory
- 5.5 Laboratory regulations
- 5.6 Medico-legal problems

Unit-6 Applications of ISOH (10 hrs)

- 6.1. Confined Space Virtual Reality training.
- 6.2. Hazard-specific preventive measures.
- 6.3. Personal Protection and protective devices.
- 6.4. Workplace-specific preventive measures.
- 6.5. Human error analysis and safety

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Practicals:

1. Production of Drakshasav and detection of sugar from it by Cole's method.
2. Estimation of protein from forest based products.
3. Preparation of buffers
4. Use of pH meter: determination of pH of given dilute solutions of shampoos/ soaps
5. Titration of acid-base using pH meter
6. To compare and calculate diameter of given bangle piece
7. Packaging and forwarding of physical evidences.
8. Screening of antimicrobial compounds producing microorganisms by crowded plate & wilkin's method.
9. Blood collection by venipuncture method (Demonstration).
10. Submission of report based on industrial visit.

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B. Sc. (Hons)	Type: Skill Enhancement Course
Subject: Dairy Farmer	Credits: 2
Semester: 2	

Unit 1: Introduction to Dairy Farming (07 hours)

Unit 2: Establishing Livestock Accommodation (07 hours)

Unit 3: Provide Feed and Water for Livestock (08 hours)

Unit 4: Maintain Healthy Performance of Livestock (08 hours)

Training:

45 Hours training at a dairy farm.

Reference:

Participant's Handbook by Agriculture Skill Council of India

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B. Sc. (Hons)	Type: Skill Enhancement Course
Subject: Florist	Credits: 2
Semester: 2	

Unit 1: Procurement and storage of cut flowers and foliage (07 hours)

Unit 2: Preparation of cut flowers for arrangements (07 hours)

Unit 3: Designing and Creating Floral Designs (08 hours)

Unit 4: Packing and Shipping Floral Arrangements (08 hours)

Training:

45 Hours training at a florist.

Reference:

Participant's Handbook by Agriculture Skill Council of India

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Value Added Course (VAC)
Subject: Indian Knowledge System (Chemistry)	Credits: 2
Semester: 2	

Reference:

1. Ray PC. History of Hindu Chemistry, Vol. I, 1902, Vol. II, 1908. P. Ray: History of Chemistry in Ancient & Medieval India, Calcutta. 1956.

Unit 1: (08 hours)

- About the author of 'History of Hindu Chemistry'
- Vedic Period
- Atomic Theory
- Chemistry in Kautilya
- Chemistry in Charaka and Susruta
- Chemistry in Bower Manuscript
- Chemistry in Vagbhata
- Chemistry in Vrinda and Chakrapani

Unit 2: (07 hours)

- A general survey of Tantrik Period
- A general survey of Iatrochemical Period

Unit 3: (08 hours)

- Metallurgy and Working with Metals

Unit 4: (07 hours)

- Gunpowder, Saltpetre and Mineral acids, etc.
- Paper, Ink, Soap, Cosmetics, etc.
- Weights and Measures

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Value Added Course (VAC)
Subject: Indian Knowledge System (Health Sciences)	Credits: 2
Semester: 2	

Reference:

1. Subbarayappa BV. Science in India: A historical perspective. Rupa Publisher; 2013.

Unit 1: Ayurveda-1

(08 hours)

- Ayurveda: Philosophical Foundation
- Structure of Ayurveda
- Diseases and Their Characterization
- Ayurvedic Approach to Treatment

Unit 2: Ayurveda-2

(08 hours)

- Surgery
- Rasayana and Vajikarana
- Transmission of Ayurveda
- Present Status of Ayurveda

Unit 3: Siddha Medicine

(07 hours)

- Introduction and Alchemical Origin
- Diagnostic methods
- Therapeutic principles
- Siddha Drugs, muppu and its classification
- Kaya-kalpa
- Present status

Unit 4: Yoga

(07 hours)

- Textual resources for ancient indian yoga
- Ashtanga yoga

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- Shatkarmas
- Health benefits of Asanas
- Health benefits of Pranayama
- Health benefits of Meditation
- Yoga as therapy in modern world

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Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Value Added Course (VAC)
Subject: Indian Knowledge System (Antiquity of Bharat)	Credits: 2
Semester: 2	

References:

1. Oak NN. When Did the Mahabharata War Happen?: The Mystery of Arundhati. Subbu; 2018.
2. Oak NN. 12209 BCE: Rama - Ravana Yuddha. Subbu; 2019.
3. Sastry S. Tearing Down Aryan Invasion Myth. Subbu; 2021.
4. Danino M. Aryans and the Indus civilization: Archaeological, skeletal, and molecular evidence. A companion to South Asia in the past. 2016 Jun 8:205-24.
5. Bansal JG. Aryan Invasion Theory: Why it Must be Purged from School Textbooks. From: <https://hindudvesha.org/thearyaninvasion-myth-textbooks/>

Unit 1: Bharatiya System of Recording Dates (07 hours)

- Indian Calendar System
- Origin of Weekday Names

Unit 2: Study of Indian Antiquity and Ramayana (08 hours)

- World Civilizations, River Sarswati and Dating of Veda
- Out of India Migrations
- Domestication of Horses
- Overview of Existing Proposals of Dating Ramayana
- Contributions, Theory and Timeline Proposed by Nilesh Oak

Unit 3: Study of Indian Antiquity: Mahabharata (08 hours)

- When did the Mahabharata War Happen?
- Brief Review of Mahabharata Research
- Summary of the Theory Proposed by P. V. Vartak
- Contributions, Theory and Timeline Proposed by Nilesh Oak

Unit 4: Aryan Migration Controversy (07 hours)

- Aryan Invasion Theory: How and Why?
- Aryan Migration Controversy: Unmasking
- Evidences Against the Aryan Invasion Theory

Sarvajanik University
Faculty of Science
B.Sc. (Hons)

Faculty: Science	Department: All
Program: B. Sc. (Hons)	Type: Ability Enhancement Course
Subject: MIL Gujarati-2	Credits: 2
Semester: 2	

Unit 1: વર્ણનાત્મક-1

- કાવ્યપંક્તિઓ કે ગદ્યસૂક્તિનો વિચારિવસ્તાર
- નિબંધ (વર્ણનાત્મક / વિષ્લેષણાત્મક / ચિંતનાત્મક / સાંપ્રત સમસ્યા પર આધારિત)

Unit 2: વર્ણનાત્મક-2

- પ્રચાર માધ્યમો માટે નિવેદનો તૈયાર કરવા
- પત્રલેખન (અભિનંદન/શુભેચ્છા/વિનંતી/ફરિયાદ વગેરે)

Unit 3: વર્ણનાત્મક-3

- ચર્યાપત્ર (વતર્માનપત્રમાં પ્રજાના પ્રશ્નો/સાંપ્રત સમસ્યાઓ/વ્યક્તિગત અભિપ્રાય રજૂ કરતું ચર્યાપત્ર)
- ભાષાંતર : અંગ્રીજીમાંથી ગુજરાતીમાં અનુવાદ

Unit 4: વર્ણનાત્મક-4

- અહેવાલલેખન
- પુસ્તક સમીક્ષા (સૂચીમાં દર્શાવેલ પુસ્તકોમાંથી એક ઉપર)

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Faculty: Science	Department: Environmental Science
Program: B. Sc. (Hons)	Type of Subject: Multidisciplinary
Subject: Energy Management and Audit in Green Schools	Semester: 2
Credits: 4	

Student Learning Outcomes (SLOs):

After completing the course, students will be able to:

1. Students' awareness about energy management and its conservation.
2. Aware of various governmental programs and energy audit practices.
3. Teaching methodology for General practices for energy audit for school children.

References and Textbooks: (With Author, Edition, Publishers, ISBN)

1. A manual to assess the energy performance of your school by Centre for Science and Environment (CSE).
2. Manual of Energy Audit, BEE India.

Unit 1: Introduction To Energy Management

1. definition and objectives of energy management
2. Need for energy audit

Unit 2: Energy Audit: Types and Methodology

1. Type of Energy Audit
2. Ten steps methodology for energy audit
3. Phase wise audit activity

Unit 3: Detailed Energy Audit

1. Checklist of information to be collected during audit
2. Preparation of detail energy audit: Case study Penicillin-G Fermentation
3. Understanding Energy Costs
4. Benchmarking energy performance and Calculation

Unit 4: System Efficiency

1. Introduction
2. Fuel and Energy Substitution
3. Energy Audit Instruments

Unit 5: Introduction to GSP

1. What is the Green School Programme?
2. Audit Champs: Case studies of GSP schools

Unit 6: The process of audit

1. Profiling and Auditing the schools
2. Tasks of Energy Audit

Unit 7: Important Information

1. Important Information on Energy
2. Sources of Energy
3. Unequal distribution of energy
4. Tips to save energy
5. India's energy scenario
6. Rooftop solar panels in schools and its advantages

Unit 8: Case studies

1. Case studies of two GSP schools
2. How to make a school 'Energy Literate'
3. Case studies of 6 types of activities
4. Other Formulae

Name of Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Multidisciplinary
Subject: Mastering Your Money: An Entry-Level course to Financial Planning and Smart Investments	Semester: 2
Credit: 04	Total learning hours: 60
Course description: This course provides students with a comprehensive introduction to financial and personal planning, empowering them to shape their current and future financial trajectories. Through theoretical exploration and practical application, students will gain a deep understanding of various investment avenues offered by governmental and private sectors, as well as other benevolent societies. Additionally, students will develop the skills necessary to navigate the complexities of the stock market, including equities and commodity derivatives, while effectively managing financial risks and adapting to the dynamic nature of the global market.	
Student learning outcome: By the end of this course, students will be able to: 1. Understand Financial Concepts: Demonstrate a solid comprehension of fundamental financial concepts, including budgeting, saving, investing, and debt management. 2. Analyze Investment Opportunities: Evaluate various investment options provided by governmental, private sector organizations, and benevolent societies to make informed decisions aligned with financial goals. 3. Navigate Stock Market Dynamics: Explain the components of the stock market, including equities and commodity derivatives, and analyze market trends to anticipate fluctuations and make strategic investment choices. 4. Manage Financial Risks: Identify and assess financial risks associated with different investment vehicles, and employ risk management strategies to mitigate potential losses. 5. Adapt to Global Market Changes: Recognize the dynamic nature of the global market and its impact on personal financial planning, and adapt strategies accordingly to optimize financial outcomes.	

References

1. Arthur J. Keown: Personal Finance, Pearson India.
2. Eric Tyson: Personal Finance, 6th Edition Wiley publishing
3. Faith Glasgow: Personal Finance and investing, John Wiley and sons
4. Halan, Monika, Lets Talk Money: You've Worked Hard for It, Now Make It Work for You, July 2018, Harper Business.
5. Jack R. Kapoor, Les R. Dlabay, Robert J. Hughes, Melissa Hart: Personal Finance, Tata McGraw Hill India.
6. Lewis Altfest: Personal Financial Planning, Tata McGraw Hill.
7. Madura Jeff: Personal Finance, Pearson India.
8. Sinha. Madhu, Financial Planning: A Ready Reckoner July 2017 McGraw Hill.

Unit 1- Introduction to Financial Literacy

- 1.1 Meaning, Importance and Scope of Financial Literacy
- 1.2 Setting Financial Goals and Objectives
- 1.3 Various Financial Institutions: Banks, Insurance Companies, Post Offices
- 1.4 Time Value of Money: Compounding and Discounting

Unit 2- Banking Services

- 2.1 Types of Banks
- 2.2 Banking Products and Services
- 2.3 Types of Bank Deposit Accounts: Savings Bank Account, Term Deposit, Current Account, Recurring Deposit, PPF, NSC etc.
- 2.4 Prerequisite for Opening Various Types of Bank Accounts

Unit 3- Financial Services from Post Office

- 3.1 Post Office Savings Schemes: Savings Bank, Recurring Deposit, Term Deposit
- 3.2 Monthly Income Scheme, Kishan Vikas Patra, NSC, PPF, Senior Citizen Savings Scheme (SCSS), Sukanya Samriddhi Yojana (SSY)
- 3.3 India Post Payments Bank (IPPB), Indian Postal Order (IPO)
- 3.4 International Money Transfer Service, Electronic Clearance Services (ECS)

Unit 4- Investing in Mutual Funds

- 4.1 Basics of Investment, Introduction to Asset Management Companies
- 4.2 Strategies for Identifying Suitable Mutual Fund
- 4.3 Mutual Fund Investing Platforms

Unit 5- Investing in Stock Markets and Real Estate

- 5.1 Identifying Stocks, Holding, Day Trading, Hedging
- 5.2 Investing in Real Estate: Identifying Properties, Likely Legal Issues in Purchase of Property
- 5.3 Documents in Purchase of Property

Unit 6- Investing in Bonds

- 6.1 Investing in Gold Bonds, Sovereign Bonds, other Government Issued Bonds
- 6.2 Tax Saving Instruments: PF, PPF, POMIS, SSY, etc.
- 6.3 Housing Loans: Institutions Providing Housing Loans, Loans under Pradhan Mantri Awas Yojana - Rural and Urban

Unit 7- Financial Fraud and Its Preventive Framework

- 7.1 Financial Fraud: Definition and Types
- 7.2 Causes of Cheating and Fraud in Investment
- 7.3 Basics of Regulatory Framework for Investing: SEBI, IRDA, RERA, AMFI, Bank ombudsman

Unit 8- Insurance Services

8.1 Life Insurance, Term Life, Endowment Policies, Pension Policies, ULIP, Health Insurance and its Plans

8.2 Considerations in Purchase of Insurance

8.3 Comparison of Policies Offered by Various Life Insurance Companies

8.4 Retirement Planning: Pension Plans and NPS

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: Microbiology
Program: B. Sc. (Hons)	Type: Multidisciplinary Course
Subject: Nutrition and Fitness	Credits: 4
Semester: 2	
Course Description: The Fit India initiative, launched by the Indian government, seeks to embed fitness into the daily routines of all Indian citizens, recognizing the manifold health benefits of physical activity. This course delves into the synergistic relationship between nutrition and fitness, highlighting the importance of balanced dietary choices and physical exercise in achieving optimal health and well-being.	
Learning Outcome: By the end of the course, students will gain an understanding of how dietary choices and physical activity intersect to influence overall health. They will adeptly identify essential nutrients crucial for supporting optimal performance in various fitness endeavors. Students will assess the physiological effects of exercise on the body, enabling them to design effective fitness regimes that align with nutritional requirements. Ultimately, students will be equipped with the knowledge and skills to promote lifelong habits of health and wellness through education.	

Reference:

1. Dietary guidelines for Indians (2011). National Institute of Nutrition, ICMR, India.
2. Fitness Protocols and Guidelines, by Fit India Mission, Ministry of Youth Affairs and Sports, Government of India, India.

Unit 1: Fundamentals of Nutrition

(7 hours)

- 1.1 Basics of health, nutrient requirements, and dietary standards
- 1.2 Definition and concept of: RDA and balanced diet
- 1.3 Understanding food groups, functions of food, and food in relation to health

Unit 2: Dietary Guidelines and Planning

(8 hours)

- 2.1 Dietary guidelines for Indians
- 2.2 Balanced diet: Principles and components
- 2.3 Strategies for achieving a balanced diet: Food pyramid, MyPlate and healthy eating patterns

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Unit 3: Nutritional Requirements (8 hours)

- 3.1 Nutritional needs of adults
- 3.2 Poor eating habits of current generation
- 3.3 Functional foods: Definition, benefits and uses
- 3.4 Nutrition and weight management: Over nutrition and Under nutrition

Unit 4: Healthy and Positive Food Concepts (8 hours)

- 4.1 Use of safe and clean foods
- 4.2 Restrict salt intake to minimum
- 4.3 Moderate use of edible oils
- 4.4 Eat plenty of vegetables and fruits

Unit 5: Participation in Physical Activity for Fitness (7 hours)

- 5.1 Fitness: Types and components
- 5.2 Benefits of fitness for physical wellbeing
- 5.3 Yoga for fitness
- 5.4 Role of exercise, dance, games, and sleep in fitness

Unit 6: Physical Fitness Assessment (8 hours)

- 6.1 Concept of physical fitness
- 6.2 Assessment tests: Flexibility, Muscular strength, Abdominal strength, Body Composition-BMI, Cardiovascular fitness, and Static balance test.

Unit 7: Psychological Aspects of Physical Fitness (7 hours)

- 7.1 Stress and anxiety management
- 7.2 Reduce depression
- 7.3 Improve self-esteem
- 7.4 Character development

Unit 8: Guidelines and Safety Considerations (7 hours)

- 8.1 Yoga guidelines: Before, During, and After the Practice
- 8.2 Environmental Considerations
- 8.3 Warm up, Hydration, Cool down and other considerations

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Name of Faculty: Science	Department: Biotechnology
Program: B.Sc. (Hons)	Type: Multidisciplinary
Subject: Aapnu Gujarat	Credits: 04
Semester: 2	
Course Description: The main objective of the course is to provide information about the historical perspective of Gujarat along with the geographic location, the Culture and Tourism observed in Gujarat that will help students in preparation of state level Public Services examinations.	
Student Learning Outcome: After completion of this course the students will be able to: 1. Understand the influence of historical events in the present status of Gujarat's Heritage. 2. Be informed about the Tourism and Culture of Gujarat. 3. Geographic location that puts Gujarat as a hub for vast business avenues.	

REFERENCES:

GPSC Exam Preparation Books

Unit 1: :Brief history of gujarat-1

- 1.1 Ānartta the first Purāṇic king of Gujarāt, and the Yādavas in Dwārīka
- 1.2 Mauryan and Greek Rule (B.C. 319–100)
- 1.3 The Kshatrapas (B.C. 70–A.D. 398):
- 1.4 The Traikūṭakas (A.D. 250–450):
- 1.5 The Guptas (G. 90–149; A.D. 410–470):
- 1.6 The Valabhis (A.D. 509–766)
- 1.7 The Chālukyas (A.D. 634–740)

Unit 2: :Brief history of gujarat-2

- 2.1 The Gurjaras (A.D. 580–808)
- 2.2 The Rāshtrakūṭas (A.D. 743–974)
- 2.3 The Mihiras or Mers (A.D. 470–900)
- 2.4 THE KINGDOM OF AṆAHILAVĀḌA (A.D. 720–1300), The Chāvāḍās (A.D. 720–956), The Chaulukyas or Solankis (A.D. 961–1242), The Vāghelās (A.D. 1219–1304)
- 2.5 MARĀṬHA PERIOD (A.D. 1760–1819)
- 2.6 GUJARĀT DISTURBANCES (A.D. 1857–1859)
- 2.7 Post Independence era

Unit 3: Geography of Gujarat

- 3.1 Geographic location of Gujarat
- 3.2 Climatic conditions
- 3.3 Water resources of Gujarat
- 3.4 Sanctuaries
- 3.5 Districts of Gujarat
- 3.6 Flora and fauna of Gujarat
- 3.7 Mineral resources

Unit 4: Cultural Heritage of Gujarat

- 4.1 The people diversity of Gujarat
- 4.2 Folk Fairs
- 4.3 Culture of Coastal Gujarat
- 4.4 Tribal Culture of Gujarat (Festivals, dance, rituals tradition)

Unit 5 Satyagrahas of Gujarat

- 5.1 Kheda satyagraha
- 5.2 Bardoli Satyagraha
- 5.3 Ahmedabad Satyagraha
- 5.4 Dandi Kuch

Unit 6 Tourism in Gujarat

- 6.1 Tourism policy of Gujarat
- 6.2 Pilgrimage places
- 6.3 Historical monuments
- 6.4 Tourism places

Unit 7 Gujarati Theatre

- 7.1 Pre-independence and Post-independence
- 7.2 Prominent Actors and their contribution,
- 7.3 Prominent playwrights and their contribution,
- 7.4 The new Gujarati Theatre

Unit 8 Folk culture and oral tradition of Gujarat

- 8.1 Painting
- 8.2 Handicrafts
- 8.3 Languages and literature
- 8.4 Folk songs and music
- 8.5 Folk Dance (Garba, Bhavai, Dandiya, Padhar, Tippani)