

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE



Faculty of Science

B. Sc. (Honors)

DETAILED CURRICULUM

(W.E.F. 2024-25)

Credit Framework for Four Years Undergraduate Program (As per KCG SOP)

Faculty of Science, Sarvajani University

Semester	Major						Minor		Skill Enhancement		Ability Enhancement		Multidiscipl.		Value Added		Total Credits
	Major No. of Papers	Theory		Lab		Total Major Credits											
		Theory Hours	Theory Credits	Lab Hrs	Lab Credits		No. of Papers	Credits	No. of Papers	Credits	No. of Papers	Credits	No. of Papers	Credits			
1	2	3+3	3+3	2+2	1+1	8	1	4	1	2	1	2	1	4	1	2	22
2	2	3+3	3+3	2+2	1+1	8	1	4	1	2	1	2	1	4	1	2	22
3	3	3+3+3	3+3+3	2+2+2	1+1+1	12	0	0	1	2	1	2	1	4	1	2	22
4	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	1	2	1	2			1	2	22
5	3	3+3+3	3+3+3	2+2+2	1+1+1	12	2	8	1	2							22
6	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	Intrnsp	4	1	2					22
Total after 3y	16					64	6	24	5+I	10+4	5	10	3	12	4	8	132
7 (Honors)	4	3+3+3+3	3+3+3+3	2+2+2+2	1+1+1+1	16	1	4	1	2							22
8 (Honors)	4	3+3+3+3	3+3+3+3	2+2+2+2	1+1+1+1	16	1	4	1	2							22
7 (Research)	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	RP	6							22
8 (Research)	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	RP	6							22
Total after 4y	24/22					96/88	8	32	7+I	18/26	5	10	3	12	4	8	176

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE



Faculty of Science

B. Sc. (Honors)

Programmes

(Teaching and Evaluation Schemes)
(W.E.F. 2024-25)

Teaching Scheme for B.Sc. (Hons) Semester 1, 2, 3 and 4 (Applied Sciences)						
Semester	Course Category	Credits	Theory (Hrs/Week)	Theory (Total)	Laboratory (Hrs/Week)	Laboratory (Total)
1	Major	4	3	45	2	30
	Major	4	3	45	2	30
	Minor	4	3	45	2	30
	Skill Enhancement Courses	2	2	30	0	0
	Ability Enhancement Courses	2	2	30	0	0
	Value Added Courses	2	2	30	0	0
	Multidisciplinary	4	4	60	0	0
	Total	22	19	285	6	90
2	Major	4	3	45	2	30
	Major	4	3	45	2	30
	Minor	4	3	45	2	30
	Skill Enhancement Courses	2	2	30	0	0
	Ability Enhancement Courses	2	2	30	0	0
	Value Added Courses	2	2	30	0	0
	Multidisciplinary	4	4	60	0	0
	Total	22	19	285	6	90
3	Major	4	3	45	2	30
	Major	4	3	45	2	30
	Major	4	3	45	2	30
	Skill Enhancement Courses	2	2	30	0	0
	Ability Enhancement Courses	2	2	30	0	0
	Value Added Courses	2	2	30	0	0
	Multidisciplinary	4	4	60	0	0
	Total	22	19	285	6	90
4	Major	4	3	45	2	30
	Major	4	3	45	2	30
	Major	4	3	45	2	30
	Minor	4	3	45	2	30
	Skill Enhancement Courses	2	2	30	0	0
	Ability Enhancement Courses	2	2	30	0	0
	Value Added Courses	2	2	30	0	0
	Total	22	18	270	8	120

Evaluation Scheme for B.Sc. (Hons) Semester 1, 2, 3 and 4							
Semester	Course Category	Continuous and Comprehensive Evaluation (CCE)			Total CCE	Semester End Examination (SEE)	Grand Total
		CCE	Assignments	Attendance			
1	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Minor	30	10	10	50	50	100
	Skill Enhancement Courses	15	5	5	25	25	50
	Ability Enhancement Courses	15	5	5	25	25	50
	Value Added Courses	15	5	5	25	25	50
	Multidisciplinary	30	10	10	50	50	100
2	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Minor	30	10	10	50	50	100
	Skill Enhancement Courses	15	5	5	25	25	50
	Ability Enhancement Courses	15	5	5	25	25	50
	Value Added Courses	15	5	5	25	25	50
3	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Skill Enhancement Courses	15	5	5	25	25	50
	Ability Enhancement Courses	15	5	5	25	25	50
	Value Added Courses	15	5	5	25	25	50
	Multidisciplinary	30	10	10	50	50	100
4	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Minor	30	10	10	50	50	100
	Skill Enhancement Courses	15	5	5	25	25	50
	Ability Enhancement Courses	15	5	5	25	25	50
	Value Added Courses	15	5	5	25	25	50

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE



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

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Introduction:

These programmes are an exploration into the science that directly affects us all on a daily basis, and that will enhance its significance to the overall environment. Students will be introduced to the scientific study of our environment, as well as the technological, social, political and economic challenges required for the understanding and critical examination of related issues.

Some important features of the programmes are as below:

1. B. Sc. Honors Programmes will run on a Choice Based Credit System as per NEP 2020.
2. These programmes will run on the Semester system and each Semester will be of fifteen (15) weeks.
3. Whole programme will be of four years (Eight Semesters).
4. There will be two options for the students for the fourth year, (a) with Honors (b) with Honors (Research).
5. Overall credit structure for these programmes will be Annexure-I.
6. Proposed Teaching and Examination Scheme will be as per Annexure-II.
7. Syllabus of B. Sc. Honors program will be as per Annexure-III.
8. Examination system and passing standards will be as per Sarvajanik University and UGC-NEP norms (W.E.F. 2024-25).

Objectives of programmes:

1. To make students aware about how science and the scientific method address current issues.
2. To empower students through skill development and progressive learning for entrepreneurship development.
3. To provide knowledge and skills on sustainability, interactions between humans and Earth's natural systems i.e. energy generation and usage, resource consumption and economics, food production, agriculture, health and clinical sciences, industrial and pharmaceutical research and manufacturing.

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Evaluation Scheme for B.Sc. (Hons) Semester 1, 2, 3 and 4 (WEF 2024)							
Semester	Course Category	Continuous and Comprehensive Evaluation (CCE)			Total CCE	Semester End Examination (SEE)	Grand Total
		CCE	Assignments	Attendance			
1	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Minor	30	10	10	50	50	100
	Skill Enhancement Courses	15	5	5	25	25	50
	Ability Enhancement Courses	15	5	5	25	25	50
	Value Added Courses	15	5	5	25	25	50
	Multidisciplinary	30	10	10	50	50	100
2	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Minor	30	10	10	50	50	100
	Skill Enhancement Courses	15	5	5	25	25	50
	Ability Enhancement Courses	15	5	5	25	25	50
	Value Added Courses	15	5	5	25	25	50
3	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Skill Enhancement Courses	15	5	5	25	25	50
	Ability Enhancement Courses	15	5	5	25	25	50
	Value Added Courses	15	5	5	25	25	50
	Multidisciplinary	30	10	10	50	50	100
4	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Minor	30	10	10	50	50	100
	Skill Enhancement Courses	15	5	5	25	25	50
	Ability Enhancement Courses	15	5	5	25	25	50
	Value Added Courses	15	5	5	25	25	50

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Paper No	Semester	Titles of Major Courses			
		Biotechnology	Environmental Science	Microbiology	Chemistry
1	1	<i>Foundation Major in Applied Sciences 1</i>			
2		<i>Foundation Major in Applied Sciences 2</i>			
3	2	<i>Foundation Major in Applied Sciences 3</i>			
4		<i>Foundation Major in Applied Sciences 4</i>			
5	3	Prokaryotic and Eukaryotic Cell Structure	Prokaryotic and Eukaryotic Cell Structure	Prokaryotic and Eukaryotic Cell Structure	Organic Chemistry-1
6		Growth and Control of Microorganisms	Ecology and Ecosystem Services	Nutrition and Growth of Bacteria	Inorganic Chemistry-1
7		Biochemistry and Enzymology	Biochemistry and Enzymology	Biochemistry and Enzymology	Biochemistry and Enzymology
8	4	Taxonomy of Microbes, Plants and Animals	Taxonomy of Microbes, Plants and Animals	Control of Microorganisms	Physical Chemistry-1
9		Plant Anatomy and Physiology	Industrial Chemicals and Environment	Microbial Diversity	Industrial Chemicals and Environment
10		Applied Environmental Microbiology	Applied Environmental Microbiology	Applied Environmental Microbiology	Organic Chemistry-2
11	5	Animal Physiology and Immunology	Green Chemistry	Basics of Immunology	Green Chemistry
12		Environmental Biotechnology	Environmental Biotechnology	Industrial Microbiology	Inorganic chemistry-2
13		Molecular Biology	Atmosphere and Climate	Molecular Biology	Physical chemistry-2
14	6	Microbial Physiology and Metabolism	Ecoinformatics	Microbial Physiology and Metabolism	Organic chemistry-3
15		Animal and Plant Biotechnology	Pollution Chemistry and Management	Medical Microbiology	Pollution Chemistry and Management
16		rDNA Technology	Ecotourism and Entrepreneurship	rDNA Technology	Petrochemistry
17	7	Biotechnology Research: DNA Sequencing and Omics	Ecotoxicology	Microbial Technology	Chemistry of drugs & dyes
18		Biotechnology Business: Vaccine Manufacturing	Environmental Law	Advances In Virology	Inorganic chemistry-3
19		Biotechnology Business: IVF and ART	Disaster Management	Molecular Immunology	Polymer chemistry
20		Dairy Technology	Formulation and Synthesis of Chemicals	Enzyme Technology and Protein Engineering	Formulation and Synthesis of Chemicals

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

21	8	Biotechnology Business: CRO and CMDO	Environmental Statistics	Microbial Pathogenicity	Physical chemistry-3
22		Biotechnology Business: Aquaculture and Livestock Biotechnology	Sustainable Development	Pharmaceutical Microbiology	Organic chemistry-4
23		Biotechnology Business: Cancer Diagnosis and Therapy	Waste Management	Microbial Ecology & Agriculture Microbiology	Food & Dairy chemistry
24		Food Technology	Food Technology	Genomics & Proteomics	Agricultural chemistry

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Credit Framework for Four Years Undergraduate Program (As per KCG SOP) (W.E.F. 2024)																		
Faculty of Science, Sarvajani University																		
Semester	Major						Minor		Skill Enhancement		Ability Enhancement		Multidiscipli		Value Added		Total Credits	
	Major No. of Papers	Theory		Lab		Total Major Credits												
		Theory Hours	Theory Credits	Lab Hrs	Lab Credits		No. of Papers	Credits	No. of Papers	Credits	No. of Papers	Credits	No. of Papers		No. of Papers	Credits		
1	2	3+3	3+3	2+2	1+1	8	1	4	1	2	1	2	1	4	1	2	22	
2	2	3+3	3+3	2+2	1+1	8	1	4	1	2	1	2	1	4	1	2	22	
3	3	3+3+3	3+3+3	2+2+2	1+1+1	12	0	0	1	2	1	2	1	4	1	2	22	
4	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	1	2	1	2			1	2	22	
5	3	3+3+3	3+3+3	2+2+2	1+1+1	12	2	8	1	2							22	
6	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	Intrnsp	4	1	2					22	
Total after 3y	16					64	6	24	5+I	10+4	5	10	3	12	4	8	132	
7 (Honors)	4	3+3+3+3	3+3+3+3	2+2+2+2	1+1+1+1	16	1	4	1	2							22	
8 (Honors)	4	3+3+3+3	3+3+3+3	2+2+2+2	1+1+1+1	16	1	4	1	2							22	
7 (Research)	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	RP	6							22	
8 (Research)	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	RP	6							22	
Total after 4y	24/22					96/88	8	32	7+I	18/26	5	10	3	12	4	8	176	

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Faculty of Science
B. Sc. (Honors) Programmes
(PACK OF MINORS OFFERED WITH MAJOR COURSES)
(W.E.F. 2024-25)

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Introduction:

Minor courses are designed in such a way that students will get the opportunity to study in depth specialization along with their chosen Major Courses with an interdisciplinary approach that will enhance their vocational skills and will lead to the overall development of students. Minor packs are designed to reflect upon some of the needs of the society and satisfies the willingness of the students to learn new and advanced applications in addition to their Major course.

Some important features of the Minor packs are as below:

1. Minor courses are offered from the first year onwards to all 4 years (8 semesters).
2. First two semesters are introductory in nature and common paper for all students.
3. From the third semester onwards, students have to select one of the packs of the minor courses.
4. Overall credit structure and titles of minor packs will be as per Annexure-I and II.
5. Syllabus of minors pack will be as per Annexure-III.
6. Examination system and passing standards will be as per Sarvajanik University and UGC-NEP norms (W.E.F. 2024-25).

Objectives of Minor packs:

1. To make students aware about the interdisciplinary approaches in sciences.
2. To empower students with vocational skills related to new horizons for entrepreneurship development.
3. To nurture the culture of innovative ideas as per the needs of society and overall upliftment of a student's career.

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Sem.	Paper No	Minor Pack 1	Minor Pack 2	Minor Pack 3	Difficulty Level
		Agriculture and Forestry	Analytical Chemistry and Instrumentation	Forensic Science	
1	1	Foundation Minor in Applied Sciences 1			Foundation
2	2	Foundation Minor in Applied Sciences 2			Foundation
4	3	Fundamentals of Agroforestry	Analytical chemistry-I	Criminalistics-1	Intermediate
5	4	Fundamentals of Horticulture	Analytical chemistry-II	Criminalistics-2	Intermediate
	5	Ethnobotany	Applied Analytical Techniques	Forensic Chemistry	Higher
6	6	Forest and Agriculture Pathology	Instrumentation Techniques of Analysis	Forensic Biology and Environmental Forensics	Higher
7	7	Agriculture Management	Advanced Analytical Chemistry	DNA Typing	Advanced
8	8	Forest and Wildlife Management	Modern Instrumentation for Analysis	Forensic Toxicology	Advanced

Sem.	Paper No	Minor Pack 4	Minor Pack 5	Minor Pack 6	Difficulty Level
		Industrial Fermentation Technology	Industrial Safety and Occupational Health	Medical Laboratory Technology	
1	1	Foundation Minor in Applied Sciences 1			Foundation
2	2	Foundation Minor in Applied Sciences 2			Foundation
4	3	Introduction to Industrial Fermentation Processes	Fundamentals of Industrial Safety	Introduction to Clinical Laboratories and GLP	Intermediate
5	4	Concept of Fermentation Technology	Safety in Industries	Introduction to Clinical Pathology and Histopathology	Intermediate
	5	Screening and Improvement of Microorganisms	Environment and Safety	Basics of Clinical Biochemistry	Higher
6	6	Fermenter Design and Downstream Processing	Occupational Health and safety	Diagnostic Microbiology and Serology	Higher
7	7	Bioprocess Engineering-I	Fire Safety and Audit	Molecular Diagnosis and Cytogenetics	Advanced
8	8	Bioprocess Engineering-II	Industrial Disaster and Safety Measures	Clinical Laboratory Management	Advanced

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Faculty of Science

B. Sc. (Honors)

Programmes

(SKILL ENHANCEMENT COURSES)
(W.E.F. 2024-25)

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Sarvajanik University	
Faculty of Science	
AY 2024-25: List of Skill Enhancement Courses (Applied Sciences)	
Semester	Title
1	Arogya Mitra
1	Soap and Detergent Making
2	Dairy Farmer
2	Florist
3	Mushroom Cultivation Technology
3	Economical Arthropods
4	Forest Mensuration

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE



Faculty of Science

B. Sc. (Honors)

Programmes

(VALUE ADDED COURSES)
(W.E.F. 2024-25)

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Sarvajanik University	
Faculty of Science	
AY 2024-25: List of Value Added Courses	
Semester	Titles
1	Indian Knowledge Systems (Foundation)
2	Indian Knowledge Systems (Chemistry)
	Indian Knowledge Systems (Health Science)
	Indian Knowledge Systems (Antiquity of Bharat)
3	Indian Knowledge Systems (Temple Architecture and Design)
	Indian Knowledge Systems (Gananshastra)
4	Indian Knowledge Systems (Parampara : Sustainable Practices of Bharat)
	Indian Knowledge Systems (Vedic Microbiology)
	Indian Knowledge Systems (Tark evam Krutrim Buddhimata)

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE



Faculty of Science

B. Sc. (Honors)

Programmes

(ABILITY ENHANCEMENT COURSES)
(W.E.F. 2024-25)

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Sarvajanik University	
Faculty of Science	
AY 2024-25: List of Ability Enhancement Courses	
Semester	Title
1	Time Management
1	IPDC-1
1	MIL Gujarati-1
2	IPDC-2
2	MIL Gujarati-2
3	Communication Skills
3	Mastering Google Drive
4	Environmental Studies

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE



Faculty of Science

B. Sc. (Honors)

Programmes

(MULTIDISCIPLINARY COURSES)
(W.E.F. 2024-25)

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Sarvajanik University	
Faculty of Science	
AY 2024-25: List of Multidisciplinary Courses	
Semester	Title
1	Ornamental Fish Breeding and Culture
1	First Aid
1	Human Health and Nutritional Disorders
1	Exploring the Spectrum of Art
1	Social and Economic Geography
2	Energy Management and Audit in Green Schools
2	Mastering Your Money: An Entry-Level course to Financial Planning and Smart Investments
2	Nutrition & Fitness
2	Aapnu Gujarat/State of Gujarat
3	Entrepreneurship and Innovation- Indian Context
3	Green Schools
3	Personal Finance and Investment Planning
3	Pharmaceutical Product

SARVAJANIK UNIVERSITY
FACULTY OF SCIENCE

Semester 1

B.Sc. (Hons)**Semester 1**

Sr. No.	Category	Course Title	Course Type
1	Major	Foundation Major in Applied Sciences 1	Compulsory
2		Foundation Major in Applied Sciences 2	Compulsory
3	Minor	Foundation Minor in Applied Sciences 1	Compulsory
4	SEC	Arogya Mitra	Elective
		Soap and Detergent Making	
5	VAC	Indian Knowledge Systems (Foundation)	Compulsory
6	AEC	Time Management	Elective
		IPDC-1	
		MIL Gujarati-1	
7	Multidisciplinary	Ornamental Fish Breeding and Culture	Elective
		First Aid	
		Human Health and Nutritional Disorders	
		Exploring the Spectrum of Art	
		Social and Economic Geography	

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Major
Subject: Foundation Major in Applied Sciences-1	Credits: 4
Semester: 1	
Course description: The objectives of this course are to provide students with fundamental scientific knowledge 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 various branches Biotechnology, Chemistry, Environmental Science and Microbiology. 2. Students will be acquainted with the historical account and development. 3. Able to learn scientific principles and scope of Biotechnology, Chemistry, Environmental Science and Microbiology. 4. Will be aware of general characteristics and able to gather knowledge about Biotechnology, Chemistry, Environmental Science and Microbiology.	

References and Textbooks:

Biotechnology:

1. John Smith., (2009). Biotechnology, Cambridge Press. ISBN 9780521711937
2. Ratledge, C., & Kristiansen, B., (2006). *Basic Biotechnology*, Cambridge University Press. ISBN 9780521549585
3. R.C. Dubey (2014) Advanced Biotechnology S.Chand ISBN 81-219-4290-X
4. Sobti and Pachauri (2009) Essential of Biotechnology, Ane Books Pvt. Ltd. ISBN-81-8052-160-5

Chemistry:

1. Foundations of Chemistry: An Introductory Course for Science Students B.y Philippa B. Cranwell ,Elizabeth M. Page

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:

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.

Sarvajani University

Faculty of Science

B.Sc. (Hons)

2. M. K. Cowan and H. Smith. (2018). Microbiology: Systems Approach, 5th edi., McGraw-Hill Publishing Company

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 Measurement and Units

(7 hrs)

- 1.1 Metric system and prefixes
- 1.2 SI units
- 1.3 Significant digits
- 1.4 Exponents and scientific notations

Unit-2 Types of Solutions

(8 hrs)

- 2.1 Solutions: Basic concepts
- 2.2 Part and Percentage solutions
- 2.3 Molarity, Molality and Normality
- 2.4 Osmolarity and Osmolality
- 2.5 Density

Unit-3 Basic Biotechnology:

(8 hrs)

- 3.1 History and introduction to Biotechnology
- 3.2 Definition of Biotechnology, Traditional and New
- 3.3 The World of Biotechnology- Red, Green, White and Blue Biotechnology
- 3.4 Biotechnology-an Interdisciplinary Pursuit
- 3.5 Biotechnology- a three-component central core

Unit-4: Foundation of chemistry

(7 hrs)

- 4.1 Qualitative observation Vs quantitative observation
- 4.2 Theory vs law
- 4.3 Mass vs weight, Density: Solid, liquid, gas
- 4.4 Physical changes and chemical changes
- 4.5 Chemical bonds (Types, bond length, bond energy)

Unit-5 Natural Resources and Management

(8 hrs)

- 5.1 Classification of natural resources; renewable and non-renewable resources
- 5.2 Resource degradation & resource conservation; resource availability and factors influencing its availability

Sarvajani University

Faculty of Science

B.Sc. (Hons)

5.3 Types of resources: Land resources; Water resources; Fisheries and other marine resources; Energy resources; Mineral resources

5.4 Impact on natural resources: Human impact; ecological, social and economic dimension of resource management

Unit-6 Introduction and major themes of Microbiology

(7 hrs)

6.1 Microbiology & its importance

6.2 Structure and Activities of Microbial cell

6.3 Evolution and Diversity of Microbial Cell

6.4 Microorganisms and Their Environment

6.5 The Impact of Microorganisms on Humans

List of Practicals:

1. Introduction to three Biotechnology laboratories and Instrumentation Room.
2. Qualitative analysis of unknown organic compounds containing monofunctional groups (carbohydrates, aryl halides, aromatic hydrocarbons, nitro compounds, amines and amides) and simple bifunctional groups, for e.g. salicylic acid, cinnamic acid, nitrophenols etc. (Minimum Seven)
3. Determination of minimum quadrat size by species-area curve method.
4. Study of bright field microscope.

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Major
Subject: Foundation Major in Applied Sciences-2	Credits: 4
Semester: 1	
Course description: The objectives of this course are to provide students with fundamental scientific knowledge 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 various branches Biotechnology, Chemistry, Environmental Science and Microbiology. 2. Students will be acquainted with the historical account and development. 3. Able to learn scientific principles and scope of Biotechnology, Chemistry, Environmental Science and Microbiology. 4. Will be aware of general characteristics and able to gather knowledge about Biotechnology, Chemistry, Environmental Science and Microbiology.	

References and Textbooks:

Biotechnology:

1. John Smith., (2009). Biotechnology, Cambridge Press. ISBN 9780521711937
2. Ratledge, C., & Kristiansen, B., (2006). *Basic Biotechnology*, Cambridge University Press. ISBN 9780521549585
3. R.C. Dubey (2014) Advanced Biotechnology S.Chand ISBN 81-219-4290-X
4. Sobti and Pachauri (2009) Essential of Biotechnology, Ane Books Pvt. Ltd. ISBN-81-8052-160-5

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. P. D. Sharma (Rastogi Publications, New Delhi), Ecology and Environment. ISBN: 8171338143.
2. Keller E.A (2012): Introduction to Environmental Geology, Pearson Publication, USA.
3. Sagar Rajendra (2014): Geochemistry and Environmental Geology, Anmol Publications Pvt. Ltd., New Delhi.

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

4. Francois Ramade 1984. Ecology of Natural Resources. John Wiley & Sons Ltd ISBN-13: 978-0471906254.

Microbiology:

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.
2. M. K. Cowan and H. Smith. (2018). Microbiology: Systems Approach, 5th edi., McGraw-Hill Publishing Company

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 Solution preparation and Dilution

(7 hrs)

- 1.1 Ration and Proportion
- 1.2 Calculations for the dilution of solutions
- 1.3 Preparation and Dilution of solution with Factor X
- 1.4 Preparation and dilution of Percent Solution
- 1.5 Stock solution and working solution

Unit-2 pH and Buffers, Calculation related to enzyme activity

(7 hrs)

- 2.1 Concept of pH and pH scale
- 2.2 Buffer
- 2.3 Mathematical calculations to find pH
- 2.4 Calculation of Enzyme activity

Unit-3 Biotechnology in India

(7 hrs)

- 3.1 Role of GSBTM, STBI and GBRC
- 3.2 Gujarat Biotechnology Policy 2022-27
- 3.3 Introduction to DBT, Its Mandate and Strategy
- 3.4 Autonomous and Public sector undertakings of DBT
- 3.5 BIRAC and ABLE

Unit-4 Recapitulation of basics of organic chemistry

(8 hrs)

- 4.1 Introduction to natural and synthetic organic compounds
- 4.2 Hybridisation: Shapes of molecules, effect on resonance structure
- 4.3 Electronic displacements and their applications: Inductive, electromeric, resonance and mesomeric effects and hyperconjugation
- 4.4 Homolytic and Heterolytic fission with suitable examples
- 4.5 Electrophiles and Nucleophiles, Curly arrow rule

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

4.6 Types, shape and relative stability of Carbocations, Carbanions, Free radicals and Carbenes

4.7 Introduction to types of organic reactions: Addition, Elimination and Substitution reactions.

Unit- 5 Environment, Climate and Sustainability

(8 hrs)

5.1 Classification, characteristics of Rocks and Mineral

5.2 Basics in Climatology, various impact of climate change

5.3 Principles of Environmental Sustainability

5.4 Sustainable Environmental Technologies and its application

Unit-6 Microbiology in historical context

(8 hrs)

6.1 The Discovery of Microorganisms

6.2 Pasteur & Spontaneous Generation

6.3 Koch, Infectious Disease and Pure Cultures

6.4 The Rise of Microbial Diversity

List of Practicals:

1. Introduction to Biosafety and Biohazards.
2. Determination of porosity, bulk density, water holding capacity and field capacity of soil.
3. Examination of Hay infusion by wet mount technique

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Minor
Subject: Foundation Minor in Applied Sciences-1	Credits: 4
Semester: 1	
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. Obtained ideas on various branches Agriculture & Forestry, Analytical chemistry & Instrumentation, Forensic science, Industrial Fermentation, Medical Lab Technology & Occupational Health concepts. 2. Students will be acquainted with the historical account and development. 3. Able to learn scientific principles and scope of Agriculture & Forestry, Analytical chemistry & Instrumentation, Forensic science, Industrial Fermentation, Medical Lab Technology & Occupational Health. 4. Will be aware of general characteristics and able to gather knowledge about Agriculture & Forestry, Analytical chemistry & Instrumentation, Forensic science, Industrial Fermentation, Medical Lab Technology & Occupational Health.	

References and Textbooks:

Agriculture & Forestry:

1. Dwivedi AP. 1992. *Agroforestry: Principles and Practices*. Oxford and IBH.
2. Dwivedi AP. 1993. *A Text Book of Silviculture*. International Book Distributors, Dehradun.
3. Khanna LS. 1996. *Principle and Practice of Silviculture*. International Book Distributors.
4. Smith DM, Larson BC, Ketty MJ & Ashton PMS. 1997. *The Practices of Silviculture-Applied Forest Ecology*. John Wiley & Sons.

Analytical Chemistry:

1. Douglas A. Skoog and Donald M. West: *Fundamentals of Analytical Chemistry*.
2. Adion A. Gordus: *Schaum's Outline of Analytical Chemistry*, Tata McGraw-Hill.
3. Gary D. Christian : *Analytical Chemistry* .
4. Freifelder and Kealy: *Analytical Chemistry*

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Forensic Science:

1. Henry Lee's Crime Scene Handbook: Henry C Lee
2. Forensic Biology: Shrikant H. Lade
3. Crime Scene Processing and Laboratory Work Book : Patric Jones
4. Forensic Science: An Introduction to Scientific and Investigative Techniques 3rd ed. : Stuart H. James

Industrial Fermentation Technology:

1. Patel, A. H. (2016). Industrial Microbiology, 2nd Ed., Trinity press; An imprint of Laxmi publications PVT. Ltd.
2. Stanbury, P., Whitaker, A. and Hall, S. J. (2016). Principles of fermentation technology, 3rd Ed., Butterworth-Heinemann.

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. 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: Introduction forestry:

(10 hrs)

- 1.1 Concept of forest ecosystem and dynamics of forest succession
- 1.2 Classification of world's forest vegetation
- 1.3 Productivity and vegetation forms of India and forest composition and classification
- 1.4 Natural regeneration of species and types of uneven-aged silviculture
- 1.5 Principles of silviculture and physical-ecological factors affecting it.

Unit-2: Scope and importance of analytical chemistry

(10 hrs)

- 2.1 Introduction and role of analytical chemistry in sciences
- 2.2 Quantitative analysis; major, minor and trace constituents
- 2.3 SI Units: Basic units, Derived units, Conversion between units
- 2.4 Concept of concentration: Mole, Molar mass, Solutions and their concentrations

Unit-3 Forensic science and Forensic laboratories

(10 hrs)

- 3.1 Introduction, definition and principles

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

- 3.2 Laws of forensic science
- 3.3 Historical aspects of forensic science in India
- 3.4 Need of forensic science in present scenario
- 3.5 Types and divisions
- 3.6 Forensic examination
- 3.7 Organizational set up of forensic science laboratories at central and state level.
- 3.8 Introduction of BPR& D, NICFS, CDFD, CCMB, IITR, CDTS, NCRB

Unit-4 History and Basic of Industrial Fermentation Processes (10 hrs)

- 4.1 Historical development of industrial processes
- 4.2 The range of fermentation processes
- 4.3 The component parts of fermentation process
- 4.4 Stages of fermentation process
- 4.5 Types of fermentation Process – Batch, Continuous & Fed batch

Unit-5 Organization of the Clinical laboratory and Laboratory Safety (10 hrs)

- 5.1 Clinical pathology laboratory definition & Laboratory Premises
- 5.2 Functional components of clinical laboratories
- 5.3 Various types of laboratories
- 5.4 Responsibilities of the laboratory worker
- 5.5 Precautions for prevention of transmission of pathogens
- 5.6 Precautions regarding fire and explosions
- 5.7 Important instructions to reduce infections in laboratory workers

Unit-6 Introduction of Occupational Health (10 hrs)

- 6.1 Basic concepts of Occupational Health and Safety (OHS).
- 6.2 Hazard identification and prevention techniques at the workplace.
- 6.3 Occupational Health and Safety Standards.
- 6.4 Workplace environment monitoring and measurements.
- 6.5 Occupational health hazards and preventive measures.

Practicals:

- 1. Study of Raunkiaer's normal frequency distribution of vegetation.
- 2. Study of anatomical adaptations of hydrophytes (Roots and petiole), Xerophytes (Stem and Root), Mesophytes (monocot and dicot leaf, stem and root).
- 3. Use and calibration of volumetric equipment (volumetric flasks, pipette's and burette's)
- 4. Preparation of standard solutions of acids and bases
- 5. Preparation of standard solution of EDTA and estimation of magnesium using EDTA
- 6. Determination of specific gravity of petroleum products
- 7. To compare physical evidence (Cloth, Thread)
- 8. Introduction to laboratory batch fermenter.
- 9. Study of safety symbols and waste disposal in clinical laboratories.
- 10. Measurement of Illumination by Lux meter.

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B. Sc. (Hons)	Type: Skill Enhancement Course
Subject: Arogya Mitra	Credits: 2
Semester: 1	

Unit 1: Overview of ABPMJAY (08 hours)

Unit 2: Daily Operation Process (08 hours)

Unit 3: Software and Systems: BIS, TMS, Support (07 hours)

Unit 4: Hardware (07 hours)

Training:

45 Hours training as Arogya Mitra

Reference:

Participant's Handbook by Healthcare Sector Skill Council

Skill Enhancement Course: Soap and Detergent Making

Faculty: Science	Title: Soap and Detergent Making
Program: B.Sc. (Hons)	Total Credit: 2
Semester: 1	Type: Skill Enhancement Course

1. Student Learning Outcomes (SLOs):

- Skill development for detergent cake and liquid soap, shampoo, handwash making.
- Knowledge of basic concepts and techniques of soap and detergent industry.
- Understanding of oil, fat and their sources in India.

2. References and Textbooks:

- Ajay Kr. Gupta, Handbook on Soaps, Detergents & Acid Slurry , 3rd revised edition; NIIR Board publication. ISBN: 9789381039472
- P. K. Chattopadhyay, Modern Technology of Soaps, Detergents & Toiletries (with Formulae & Project Profiles) 4th Revised Edition, NIIR Board publication; ISBN: 9789381039700
- H. Panda, Herbal Soaps & Detergents Handbook, NIIR Board publication; ISBN: 9789381039007

Unit-1: Introduction to oil and fats:

(6 hours)

- 1.1 Classification, structure and sources of oil and fats
- 1.2 Natural sources of oils and fats in India

Unit-2: Soaps:

(7 hours)

- 2.1 introduction to soaps, synthetic detergents, raw materials and its selection
- 2.2 principles of soap making and chemistry of soap
- 2.3 Boiling, saponification process

Unit-3: Detergents:

(7 hours)

- 3.1 Types of detergents, classification of detergents (anionic, cationic, nonionic, amphoteric), biodegradability.
- 3.2 Inorganic compounds of detergents (builder & other additives, phosphates, silicates, zeolites, etc)

Unit-4: Synthetic detergents:**(10 hours)**

- 4.1 Organic raw materials for manufacturing of fatty acids, olefins, alkylbenzene, methyl esters, fatty amines, ethylene oxide, propylene oxide sources and manufacture.
- 4.2 Inorganic raw material for sulphonation viz; sulphuric acid, sulphonic acid, oleum, sulphur trioxide, chlorosulphonic acid.
- 4.3 Sulphonation of organic raw materials like fatty acids, fatty acids ethoxylates plants and processes.
- 4.4 Sulphonation of alkylbenzene, olefins & vegetable oils, plants and processes.

Practicals:

- 1. Determination of physico-chemical characteristics of oil and fats
 - 1. Moisture content
 - 2. Acid value
 - 3. Iodine value
 - 4. Saponification reaction and Saponification value
- 2. Manufacture of liquid soap (shampoo) and laundry soap.
- 3. Project Work: Industrial training for one month duration.

Name of Faculty: Science	Department: Biotechnology
Program: B.Sc. (Hons)	
Subject: Time Management	Semester: 01
Credit: 02	Total learning hours: 30
Type: Ability Enhancement Course	
Course description: This syllabus aims to provide students with a comprehensive understanding of time management principles and equip them with practical skills for effective time management. Through a combination of lectures, workshops, exercises, and reflection activities, students will develop the knowledge and habits necessary to optimize their use of time and achieve greater productivity and work-life balance.	
Student learning outcome: 1. Students will be able to learn concept of time management and its importance in personal and professional life 2. Students will be able to explore key principles and strategies for effective time management. 3. Students will be able to learn various tools and techniques to enhance time management skills. 4. Students will be able to develop action plans and strategies for implementing time management principles in daily life.	

Reference book:

1. Getting Things Done: The Art of Stress-Free Productivity by David Allen (2001) Penguin Books

Unit-1 Understanding Time Management (8 hrs)

- 1.1 Definition and significance of time management
- 1.2 Benefits of effective time management
- 1.3 Common time management challenges and obstacles

Unit-2 Time Management Principles (8 hrs)

- 2.1 Setting SMART goals and priorities
- 2.2 Prioritization techniques
 - 2.2.1 Eisenhower Matrix
 - 2.2.2 ABC method
- 2.3 Time blocking and scheduling techniques

Unit-3 Tools and techniques for Time Management (8 hrs)

- 3.1 Time management apps and software
- 3.2 Task delegation and outsourcing
- 3.3 Stress management and relaxation techniques

Unit-4 Implementing Time Management Strategies (6 hrs)

- 4.1 Creating personalized time management system
- 4.2 Overcoming procrastination and time-wasting habits
- 4.3 Continuous improvement and self-reflection

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

Faculty: Science	Department: All
Program: B. Sc. (Hons)	Type: Ability Enhancement Course
Subject: MIL Gujarati-1	Credits: 2
Semester: 1	

Unit 1: ગુજરાતી સાહિત્ય

- ગુજરાતી સાહિત્યનો ઇતિહાસ
- ગુજરાતી સાહિત્યના નોંધપાત્ર લેખકો અને કવિઓનો પરિચય

Unit 2: ગુજરાતી વ્યાકરણ

- રૂઢીપ્રયોગોના અર્થ અને તેનો વાક્યપ્રયોગ
- કહેવતોનો અર્થ
- સમાસનો વિગ્રહ કરી તેની ઓળખ
- છંદ ઓળખાવો
- અલંકાર ઓળખાવો

Unit 3: ગુજરાતી વ્યાકરણ

- શબ્દસમૂહ માટે એક શબ્દ
- જોડણી શુદ્ધિ
- લેખન શુદ્ધિ / ભાષા શુદ્ધિ
- સંધિ જોડો કે છોડો
- વાક્યરચનાના અંગો / વાક્યના પ્રકાર / વાક્ય પરિવર્તન

Unit 4: સંક્ષેપીકરણ અને સમીક્ષા

- ગદ્યખંડમાંથી આશરે ૧/૩ ભાગમાં સંક્ષેપ
- ગદ્યખંડના આધારે પૂછેલા પ્રશ્નોના જવાબ

Faculty: Science	Department: Env. Sc.
Program: B.Sc. (Hons)	Type: Multidisciplinary
Subject: Ornamental Fish Breeding and Culture	
Credit: 04	Total learning hours: 60
Semester: 1	
Course Objective: This course is designed to provide knowledge on advanced ornamental fish production technologies and aquatic ornamental plant propagation. Ornamental fish breeding is one of the most promising frontier of entrepreneurship in Gujarat.	
Student learning outcomes: 1. Students will have primary knowledge of ornamental fish breeding business. 2. Students will learn about major varieties of fish used for this purpose. 3. They will have an understanding of techniques used for fish breeding and tools needed for it. 4. Students will have the understanding of aquarium design, components, working and techniques used for the same.	

References:

1. National Fisheries Development Board, Package of Practices for Breeding and Culture of Commercially Important Freshwater Fish Species
2. Venugopal, K. M. "Aquarium Making and Maintenance." (2015).

Unit 1 Introduction to the business of fish breeding (07 hrs)

- 1.1 Global status of ornamental fish trade
- 1.2 Present status and of ornamental fish farming and trade in India
- 1.3 Types of fishes commonly been farmed in India

Unit 2 Diversity of Commercial Fish Varieties (07 hrs)

- 2.1 Indian ornamental fish diversity and its status
- 2.2 Prospects of production of new strains / varieties
- 2.3 Ornamental fish breeding techniques towards strain development

- 3.1 Self-maintained aquarium
- 3.2 Species compatibility and High value species
- 3.3 Aquarium maintenance and care
- 3.4 Common aquarium plants and their identification

- 4.1 Common gadgets and tools used in freshwater and marine aquarium
- 4.2 Aerators
- 4.3 Filters (UV, trickling and biofiltration)
- 4.4 Protein skimmers
- 4.5 Ozonizer
- 4.6 Thermostatic heater and chiller
- 4.7 Lighting
- 4.8 Water conditioners

- 5.1 Mass production of commercially important freshwater and marine ornamental fishes
- 5.2 Nursery and grow out culture of commercially important ornamental fish species in Raceways, RAS etc.
- 5.3 Hybrids development

- 6.1 Feed and feeding
- 6.2 Color enhancement through pigmented feed
- 6.3 Novel feeds
- 6.4 Common diseases and control
- 6.5 Water quality management.

Unit 7 Transportation of Ornamental Fishes (08 hrs)

- 7.1 Medicines and chemicals used in the ornamental fish industry
- 7.2 Anaesthetics
- 7.3 Packing
- 7.4 Transportation
- 7.5 Marketing strategies

Unit 8 Entrepreneurship (08 hrs)

- 8.1 Culture unit for entrepreneurship development
- 8.2 Socio-economic upliftment through backyard ornamental fish farming
- 8.3 Micro-traders in ornamental fish marketing

Practicals:

1. Identification of common ornamental fishes
2. Introduction to plants and gadgets used in aquariums
3. Visit to ornamental fish units
4. Introduction to aquarium fabrication

Faculty: Science	Department: Microbiology
Program: B.Sc. (Hons)	Type: Multidisciplinary
Subject: First Aid	
Credit: 04	Total learning hours: 60
Course description: This course will incline the student how to respond to an emergency and to help the victim. It trains the student to make appropriate decisions about first aid care in different situations and cases until professional medical help arrives. Students will understand the significance of first aid training as a low cost, but highly effective strategy to reduce morbidity and mortality.	
Student learning outcome: 1. Students will be benefited by understanding the basic concepts of First Aid 2. Students will be conceptualized how to prevent medical emergencies from 3. Students will learn how to assess a victim during a medical emergency to determine what care is needed. 4. Students will acquire the understanding about how to provide the right and effective help before a trained health worker is available or the victim reaches a health facility,	

Reference Book:

- ☐ Indian First Aid Manual 2016 (7th Edition) Authorized Manual – English Version

Further Reading:

- ☐ Emergency Safety and First Aid Handbook, Department of Disaster Management, Ministry of Home & Cultural Affairs

Unit-1: Introduction to First Aid

(Duration: 6 Hrs)

- 1.1 What Is First Aid?
- 1.2 Aims Of First Aid
- 1.3 The First Aider
- 1.4 Dealing With An Emergency
 - 1.4.1 How To Make The Area Safe
 - 1.4.2 Evaluate The Condition Of The Sick Or Injured Person And Seek Help
- 1,4,3 Provide First Aid

Unit-2: Heart, Blood Circulation, Shock

(Duration: 7 Hrs)

- 2.1 The Heart And The Blood Circulation
- 2.2 Chest Discomfort
- 2.3 Bleeding
- 2.4 First Aid For Bleeding (In General)

Unit-3: Nervous System And Unconsciousness (Duration: 9 Hrs)

- 3.1 The Nervous System
- 3.2 Unconsciousness
- 3.3 Head Injuries
- 3.4 Stroke
- 3.5 Fits – Convulsions - Seizures

Unit-4: Skin, Burns, Heat Exhaustion, Fever And Hypothermia (Duration: 10 Hrs)

- 4.1 The skin & its function
- 4.2 Burn wounds
- 4.3 Heat exhaustion
- 4.4 Heatstroke
- 4.5 Frostbites
- 4.6 Fever & Hypothermia

Unit-5: Resuscitation CPR: Chest Compressions (Duration: 10 Hrs)

- 5.1 Basic CPR (Cardio Pulmonary Resuscitation)
 - 5.1.1 How To Observe Responsiveness And Consciousness - AVPU Scale
 - 5.1.2 How To Observe The Breathing?
- 5.2 How To Observe The Pulse?
- 5.3 Resuscitation Of A Person Who Is Not Breathing Or Not Breathing Normally

Unit-6: Poisoning (Duration: 6 Hrs)

- 6.1 Types of Poisoning
- 6.2 First aid procedures in Poisoning

Unit-7: Bites And Stings (Duration: 8 Hrs)

- 7.1 Animal Bites
- 7.2 Snake Bite
- 7. Insect Stings And Bites

Unit-8: First Aid Techniques

(Duration: 4 Hrs)

8.1 Dressings

8.2 Bandages

8.3 Fast evacuation techniques (single rescuer)

8.4 Transport techniques.

Experiments:

1. First Aid techniques for Dressings and Bandages
2. Demonstration of CPR by Experts
3. Identification of venomous snakes and first aid procedure in cases of snake bites



Faculty: Science	Department: Microbiology
Subject: Human Health and Nutritional Disorders	Type: Multidisciplinary
Credits: 04	
Course description: The following course is designed to... • To understand the functions and role of nutrients, their requirements and the effect of deficiency and excess (in brief) • To understand the concept of an adequate diet and the importance of nutrients in recommended Dietary Allowances. • Determine physiological changes at different stages of lifecycle.	
Student learning outcome: 1. The student will be able to apply basic nutrition knowledge in making food choices and obtaining an adequate diet. 2. The student will gain knowledge about energy requirements and the Recommended Dietary Allowances. 3. The student learns the impact of various functional foods on our health 4. The students will understand the role and importance of food and nutrition for the welfare of the community and acquire the skills in planning diet. 5. The students will be able to relate nutrient needs to developmental stages and plan diets which will adequately meet nutritional needs during growth stage.	

Reference Books:

1. Wiseman, G. (2002). *Nutrition and health*. Taylor & Francis.
2. Wadhwa, A., & Sharma, S. (2003). *Nutrition in The Community, A Text Book*.
3. Antia, F. P. (1973). *Clinical dietetics and nutrition*. Oxford University Press, Ely House, 37 Dover Street, London W1.

Unit-1: Human Health and Nutrition

(Duration: 06 Hrs)

- 1.1 Introduction to Health
- 1.2 Types of Health
- 1.3 Personal Health evaluation
- 1.4 Health and Nutrition

Unit-2: Concept of Community Health & Nutrition

(Duration: 06 Hrs)

- 2.1 Concept of Community, types of community
- 2.2 Factors affecting health of the community
- 2.3 Health Care Levels: Primary Health Care
- 2.4 National immunization schedule.

Unit-3: Macronutrients**(Duration: 08 Hrs)**

- 3.1 Classification, functions, Digestion& absorption (in brief), and their food sources
- 3.2 Protein,
- 3.3 Carbohydrate
- 3.4 Fat

Unit-4: Micronutrients**(Duration: 08 Hrs)**

function, absorption, food sources for

- 4.1 Iron,
- 4.2 Zinc
- 4.3 Fluorine
- 4.4 Iodine
- 4.5 Vitamins:Fat-soluble and Water soluble vitamins

Unit-5: Nutrition In The Life Cycle**(Duration: 08 Hrs)**

- 5.1 Nutrition during Infancy
- 5.2 Nutrition in Adolescence
- 5.3 Nutrition in adults

Unit-6: Social health problems**(Duration: 06 Hrs)**

- 6.1 Smoking
- 6.2 Alcoholism
- 6.3 Drug addiction
- 6.3 AIDS including AIDS Control Programme

UNIT-7: Nutritional Disorders-I**(Duration: 08 Hrs)**

- 7.1 Causes, symptoms, treatment, prevention of the following
- 7.2 Protein Energy Malnutrition (PEM)
- 7.3 Vitamin A Deficiency (VAD)
- 7.4 Iron Deficiency Anaemia (IDA)

UNIT-8: Nutritional Disorders-II**(Duration: 08 Hrs)**

- 8.1 Causes, symptoms, treatment, prevention of the following
- 8.2 Iodine Deficiency Disorders (IDD)
- 8.3 Zinc Deficiency
- 8.4 Fluorosis

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B. Sc. (Hons)	Type: Multidisciplinary Course
Subject: Exploring the Spectrum of Art	Credits: 4
Semester: 1	Duration: 60 hours
Course Description: It is a foundational course designed to introduce students to the world of arts through a multidisciplinary approach. This course offers an exploration of historical and modern sculptures and painting art forms. Through a combination of theoretical discussions and project exercises, students will develop a deeper understanding of artistic concepts, techniques, and historical contexts. Emphasis will be placed on fostering creativity, and encouraging students to engage with art as both creators and informed observers. The course helps to develop among students, a sense of ethical behavior, nationalism, appreciating Indian culture and art. This course serves as a gateway for students to embark on a journey of artistic discovery and appreciation.	
Learning Outcomes: By the end of the course, students will be able to: 1. Gain an understanding and appreciation of the historical and cultural context of different painting styles, sculptures, movements, and artists. 2. Demonstrate basic proficiency in fundamental artistic techniques of painting. 3. Engage in collaborative and reflective practices. 4. Explore connections between art and other disciplines, such as history, literature, and technology, fostering interdisciplinary thinking.	

References:

1. Mohan Singh Mawdi. Fundamentals of Painting (3rd ed), Takshila Prakashan, New Delhi. ISBN 9788179653029.
2. Living Traditions Tribal and Folk Paintings of India. Centre for Cultural Resources and Training Ministry of Culture, Government of India, New Delhi.
3. The complete book of drawing techniques. A professional guide for the artist. Arcturus Publishing Ltd. ISBN 0-572-02916-0.
4. The Art of Acrylic Painting. Walter Foster Publishing, Inc. ISBN 978-1-61059-816-3.

Unit 1: Fundamentals of Art

- 1.1 What is Art?
- 1.2 Origin and Definition of Art
- 1.3 Classification of Art
- 1.4 Need of Art in the Present Scenario

Unit 2: Sculpture Art of India

- 2.1 History of Ancient Indian Sculptures
- 2.2 Famous Sculptures in India
- 2.3 Sculpture Artists of India

Unit 3: Painting Art of India

- 3.1 Six Limbs of Indian Painting
- 3.2 Essentials of Painting: Line, Form and Color
- 3.3 Medium and Technique of Painting: Dry and Wet

Unit 4: Indian Folk Art

- 4.1 Introduction to Tribal & Folk Paintings of India
- 4.2 Origin of Various Heritage Arts
- 4.3 Theme and Techniques of Folk Arts

Unit 5: Ancient Warli Art

- 5.1 Origin and History
- 5.2 Motifs and Patterns
- 5.3 Technique and Process (For Paintings)
- 5.4 Technique and Process (For Artifacts)
- 5.5 Painting Projects: Glass bottles/Canvas/Stone

Unit 6: Charcoal in Art

- 6.1 History of Charcoal Art
- 6.2 Basics of Working with Charcoal
- 6.3 Tools and Materials Used
- 6.4 Modern Charcoal Techniques
- 6.5 Charcoal Projects: Still life/Landscape/Portrait Sketch

Unit 7: Contemporary Art of Acrylic & Oil Painting

- 7.1 Introduction and History
- 7.2 Tools and Materials Used

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

7.3 Drawing and Painting Techniques

7.4 Painting Projects: Canvas/Fabric

Unit 8: Art Entrepreneurship

8.1 Developing Artistic Skills

8.2 Crafting Unique Style and Brand

8.3 Understanding the Art Market

8.4 Marketing and Selling Art

8.5 Managing Business

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FACULTY OF SCIENCE

Faculty: Science	Department: Environmental Science
Program: B. Sc. (Hons)	Type of Subject: Multidisciplinary
Subject: Social and Economic Geography	
Semester: 1	

Student Learning Outcomes (SLOs):

After completing the course, students will be able to:

1. Understand and analyze geographical terrain of India.
2. Understand population type, migration and growth.
3. Learn various socio-geographical policies of India
4. Address importance of demographics and census in Indian Economy.

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

1. Jayakrishna Sanapa (2017): World Geography, Wiley Publications. ISBN: 978-9357465885
2. Majid Hussain (2022): Geography of India, McGraw Hill Publishers. ISBN: 978-9355322128
3. D. R. Khullar (2020): Geography Textbook. New Saraswati House India Pvt Ltd, India. ISBN: 9789350412435.
4. Anoop Kumar Singh (2021): Applied Geography, K. K. Publications, India. ISBN: 9789388399012

Unit 1: Geography of India 07 hours

- 1.1 Location, latitude, longitude, time zone, etc.
- 1.2 Neighbouring Countries, India's 'Neighbourhood First policy'
- 1.3 States and their position, States with international boundaries, Boundary conflicts
- 1.4 Rights of state according to Article 12 of Indian Constitution
- 1.5 Union territories

**Unit 2: Physical features of India
07 hours**

- 2.1 The Himalayas – geological formation, climate and major passes
- 2.2 The Great North Indian Plains - geological formation, climate and vegetation
- 2.3 Peninsular Plateau - geological formation, climate and vegetation
- 2.4 Indian desert, coastal plains and islands

**Unit 3: River system of India
08 hours**

- 3.1 Himalayan and Peninsular rivers, Ganga river system, peninsular river system
- 3.2 Mains Rivers and their tributaries
- 3.3 Inter linking of rivers
- 3.4 Inter-state river water sharing disputes and mechanism of resolution, The Inter-state river water disputes (Amendment) Bill, 2017

Unit 4: Physical Geography **08 hours**
4.1 Origin and structure of earth, rock types

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- 4.2 Folding and Faulting, tectonic plates and movements
- 4.3 Structure and composition of atmosphere
- 4.4 Origin and types of soil

Unit 5: World Geography

- 5.1 Continents, Countries and Cities
- 5.2 Economic Classification of Countries of the World
- 5.3 Population problems of developing and developed countries
- 5.4 Climatic zones of the world, Koppen's Classification Climatic Zones

Unit 6: Human Geography

- 6.1 Concept of Population and Community, Principles of population dynamics
- 6.2 Man & environment; relationship, growth and development of human geography;
- 6.3 Man and the Biosphere Programme (MAB)
- 6.4 Population, tribes and migration in India, India's refugee policy

Unit 7: Census and human demographics

- 7.1 India's Population Distribution by Density, Population Growth
- 7.2 National Population Policy
- 7.3 Census-History and procedure, Cohort analysis
- 7.4 Census in India, Socio-Economic and Caste Census (SECC)

Unit 8: Agricultural Geography

- 8.1 Agricultural Revolution in India
- 8.2 Subsistence Agriculture and types
- 8.3 Cropping pattern, agricultural productivity and Agroecological regions
- 8.4 Agriculture census 2011-12