



**Yogi Divine Society inspired,
Sarvodaya Kelavani Samaj managed,
Shree Manibhai Virani and Smt. Navalben Virani Science College,
Rajkot**

(Affiliated to Saurashtra University, Rajkot)

Re-Accredited at 'A' Level by NAAC

STAR college Scheme & Status by MST-DBT

UGC- College with Potential for Excellence (CPE)

UGC-DDU KAUSHAL Kendra

GAAA – Highest Grade A-1 by KCG, Government of Gujarat

GPCB-Government of Gujarat approved Environment Audit Center

UGC-Autonomous College

**DSE – Allied course for UG student
Admitted form A.Y, 2016-17 onward**

**DSE – Allied BOTANY
SEMESTER I**

SCHEME OF INSTRUCTION AND EXAMINATION

Subject Code	Subject	Hrs. of Instructi/week	Exam Duration (Hours)	Maximum Marks			Credit
				CIA	SEE	Total	
PART-2							
16UBCDA01	DSE - Allied Plant Science	4	3	30	70	100	4
16UBCDA02	DSE - Allied Practical Plant Science practical	2	3	20	30	50	1

OBJECTIVE

1. This course is survey of the botanical aspects of plant diversity, morphology, Reproduction, and Physiology.
2. Improve understanding of the structure functioning, life histories and diversity of plants.
3. Development of personal perception of plants and environment.

DSE – Allied BOTANY SEMESTER I

16UBCDA01	Plant Science Theory	4 Hrs/Week	4 Credit
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Unit I: Plant Kingdom [09 Hrs]

- Classification of kingdom (Five Kingdom System)
- Classification of Kingdom (Seven Kingdom System)
- General characters, Smith's Classification & economics importance of Algae
- General characters, Smith's Classification & economics importance of Fungi
- General account and outline classifications of Bryophytes
- General account and outline classifications of Pteridophytes
- General account and outline classifications of Gymnosperms

Unit II: Plant Morphology [10 Hrs]

- General study of Root
- General study of Stem
- General study of Leaf
- Types of Fruit
- Flower – Epigynous, Perigynous, Hypogynous
- General characteristics of herb, shrub, tree, climber and creeper

Unit III: Plant Diversity Of Angiosperms [10 Hrs]

- Binomial Nomenclature of angiosperms
- Systems of classification
- Classification System of Bentham & Hooker.
- Taxonomic studies of Dicot plants from each following Families with its medicinal value.
 - *Malvaceae*
 - *Solanaceae*
 - *Apocynaceae*
- Taxonomic studies of Monocot plants from each following families with its medicinal value
 - *Poaceae*
 - *Amarilidaceae*

Unit IV: Method of Plant Reproduction [6 hrs]

- Fission
- Fragmentation
- Vegetative reproduction

- Asexual reproduction
- Sexual reproduction

Unit V: Plant Physiology [13 Hrs]

- Opening and closing of stomata
- Plant-water relations
- Translocation in the phloem
- Photoperiodism
- Seed dormancy

Text Books

1. V.K. Jain (2000) Fundamental of Plant Physiology , S.Chand (G/L) & Company Ltd; 5th Revised edition .
- 2 .V. Singh D. K. Jain P. C. Pande (2010) A Text Book of Botany : Angiosperms, Rastogi Publications-Meerut.

Reference Books:

1. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, Delhi.
2. Campbell, N.A., Reece J.B., Urry L.A., Cain M.L., Wasserman S.A. Minorsky P.V., Jackson R.B. (2008). Biology, Pearson Benjamin Cummings, USA. 8th edition.
3. Taiz, L., Zeiger, E., Møller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.

16UBCDA02	Plant Science Practical	2 Hrs/week	1 Credit
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1. Observational study of herb, shrub, tree, climber and creeper through field visit.
2. To study morphology of root and stem.
3. To study morphology of leaf.
4. To study morphology of flower.

5. To study of various types of fruits.
6. To understand floral formula and floral diagram
7. Taxonomic studies of Malvaceae family with its economical and medicinal value.
8. Taxonomic studies of Solanaceae family with its economical and medicinal value.
9. Taxonomic studies of Apocynaceae family with its economical and medicinal value.
10. Taxonomic studies of Poaceae family with its economical and medicinal value.
11. Taxonomic studies of Amaryllidaceae family with its economical and medicinal value.
12. To study different methods of plant reproduction through chart/slides.
13. Calculation of stomatal index and stomatal frequency from the two surfaces of leaves of mesophyte and xerophyte.



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DEPARTMENT OF BIOLOGY

BOTANY

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DSE – Allied BOTANY SEMESTER II

SCHEME OF INSTRUCTION AND EXAMINATION

Subject Code	Subject	Hrs. of Instruc ti/week	Exam Duration (Hours)	Maximum Marks			Credit
				CIA	SEE	Total	
PART-2							

16UMBDA03	DSE - Allied Medicinal Botany	4	3	30	70	100	4
16UMBDA04	DSE - Allied Practical Medicinal Botany practical	2	3	20	30	50	1

OBJECTIVE

1. This course is survey of the botanical aspects of plant diversity, morphology, physiology Anatomy.
2. Improve understanding of the structure functioning of medical botany and plant pathology.
3. Development of personal perception of plants and environment.

DSE – Allied BOTANY SEMESTER II

SCHEME OF INSTRUCTION AND EXAMINATION

16UMBDA03	Medicinal Botany Theory	4 Hrs/Week	4 Credit
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UNIT I: PLANT KINGDOM (09 Hrs)

- Classification of Five Kingdom System according to Whitaker
- General characters and classification of Algae

- General characters and classification of Fungi
- General account and outline of classifications of Bryophytes
- General account and outline of classifications of Pteridophytes
- General account and outline of classifications of Gymnosperms
- General account and outline of classifications of Angiosperms

UNIT-II PLANT PHYSIOLOGY AND PLANT ANATOMY (10 Hrs)

- Plant-water relations
- Photobiology
- Types of simple tissue
- Types of complex tissue
- Microtomy

UNIT- III PLANTS PRODUCTS (10 Hrs)

- Alkaloids yielding plants – Sarpagandha, Tobacco
- Dye yielding plants – Heena, Kesudo
- Oil yielding plants – Ground nut, Nilgiri
- Resin yielding plants – *Pinus*, Gugal
- Gum yielding plants – Neem, Baval

UNIT- IV MEDICINAL PLANTS (09 Hrs)

- Usage of plants for wellness of respiratory disease – Arduasi, Tulsi
- Usage of plants for wellness of gastrointestinal disease – Kariyatu, Kadu
- Usage of plants for wellness of dermatological disease –, Turmaric, Chandan
- Usage of plants for wellness of cancer disease – Kuvarpathu, Barmasi
- Scope and future of medicinal plants

UNIT-V PLANT PATHOLOGY (10 Hrs)

- Introduction and classification of plant diseases
- General symptoms of disease
- Tikka disease of ground nut
- Red rot of sugar cane
- Different methods of plant disease control
- Citrus canker

16UMBDA04	Medicinal Botany Practical	3 Hrs/Week	1 Credit
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1. Observational study of Algae through specimens and slides.
2. Observational study of Fungi through specimens and slides.

3. Observational study of Bryophytes through specimens and slides.
4. Observational study of Pteridophytes through specimens and slides.
5. Observational study of Gymnosperms through specimens and slides.
6. To understand floral formula and floral diagram.
7. Demonstrate water potential of given tissue (potato tuber) by weight method.
8. To study evaluation of oxygen during photosynthesis.
9. To study anatomy of simple tissues.
10. To study anatomy of complex tissues.
11. To prepare permanent slides through microtomy.
12. Observational study of plant products according to theory.
13. Observational study of different medicinal plants.
14. Study of different plant disease through specimens and slides.

Text Books:

Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, Delhi.

Sharma, P.D. (2011). Plant Pathology, Rastogi Publication, Meerut, India.

References:

Agnes Arber (1999). Herbal plants and Drugs. Mangal Deep Publications.

Taiz, L., Zeiger, E., Møller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.



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DEPARTMENT OF BIOLOGY

ZOOLOGY

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**DSE – Allied ZOOLOGY
SEMESTER I
SCHEME OF INSTRUCTION AND EXAMINATION**

Subject Code	Subject	Hrs. of Instruction/week	Exam Duration (Hours)	Maximum Marks			Credit
				CIA	SEE	Total	
PART-2							
16UMBDA01	DSE - Allied Modern	4	3	30	70	100	4

	Zoology						
16UMBDA02	DSE - Allied Practical Modern Zoology Practical	2	3	20	30	50	1

OBJECTIVE

- The students pursuing this course would have to develop in depth understanding various aspects of the Zoology.

- The working principles, design guidelines and experimental skills associated with different fields of Zoology.

DSE – Allied ZOOLOGY SEMESTER I

16UMBDA01	Modern Zoology	4 Hrs/Week	4 Credit
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Unit -I: Animal Taxonomy

[24 Lectures]

- Systematic of Non-chordate Animals.
- Systematic of Chordate Animals.

Unit-II: Forms & Functions in Animals

[09 lectures]

Type Study: Earth worm.

- External Characters

- Digestive system
- Reproductive system
- Nervous system
- Types of Nephridia
- Structure of Septal Nephridia
- Blood gland.

Unit-III: Developmental Biology

[06 Lectures]

- Structure of Frog Sperm.
- Structure of Frog Ovum.
- Fertilization in Frog.
- Cleavage in Frog.
- Blastula in Frog.
- Gastrula. in Frog.

Unit-IV: Evolution and Animal Behaviour

[09 Lectures]

- [A] Evolution
 - Isolation
 - Speciation
 - Genetic Drift.
- [B] Animal Behaviour
 - Introduction & Types
 - Social Behaviour in Animals
(1) Termite (2) Honey-bee
 - Parental Care in Animals
(1) Pices (2) Amphibia.

Unite-V: Applied Zoology

[09 Lectures]

A study of general structure and characters of following pathogenic animals.

- Entamoeba.
- Trypenosoma.
- Filarial worm.
- Guinea worm.
- Round worm.
- Pin worm.

16UMBDA02	Modern Zoology Practical	2 Hrs/Week	2 Credit
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[1]. Identification and Classification of Non-chordate Animals – part I (Protozoa to Annelid).

[2]. Identificatio and Classification of Non-chordate Animals – part II (Arthropod to Echinoderm).

- [3]. Identification and Classification of Chordate Animals – part I (Prochordate to Pisces).
- [4]. Identification and Classification of Chordate Animals – part II (Amphibia to Mammal).
- [5]. Systems of Earthworm.
- [6]. Developmental Biology of Frog.
- [7]. Study of Animal Behaviour.
- [8]. Study of Pathogenic Animals.

Text Books:

- Jordan E. L & Varma P.S.(2010) Non-chordate Zoology, S.Chand & Co. Ltd. New Delhi, 4th edition.
- Gilbert S.F. (2010) Developmental Biology (Sinauer) 10th edition.
- Mathur R (2010) Animal Behaviour, Rastogi Publications, Merrut
- Rastogi, V. B. (1994) Organic evolution. Kedernath Ramnath, India.

References:

- Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). *The Invertebrates: A New Synthesis*, III Edition, Blackwell Science .
- Walter, H.E. and Sayles, L.P; *Biology of Vertebrates*, Khosla Publishing House



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SCHEME OF INSTRUCTION AND EXAMINATION

Subject Code	Subject	Hrs. of Instruc ti/week	Exam Duration (Hours)	Maximum Marks			Credit
				CIA	SEE	Total	
PART-2							
16UBCDA03	DSE - Allied Life sustainable systems in Human	4	3	30	70	100	4

16UBCDA04	DSE - Allied Practical Life sustainable systems in Human practical	2	3	20	30	50	1
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OBJECTIVE

- The students pursuing this course would have to develop in depth understanding various aspects of the Zoology.

- The working principles, design guidelines and experimental skills associated with different fields of Zoology.

DSE – Allied ZOOLOGY SEMESTER I

16UBCDA03	Life sustainable systems in Human	2 Hrs/Week	1 Credit
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Unit -I: Digestive system

[12 Lectures]

- Structure and Organization.
- Mechanical digestion.
- Chemical digestion.

Unit-II: Circulatory system

[09 lectures]

- Structure and function of Blood vessels.
- Morphological and internal structure of Human Heart.
- Blood Components.
- Blood Coagulation.

- A,B ,O Blood Group and Rh-factor.

Unit-III: Respiratory system

[07 Lectures]

- Organization of Respiratory tract.
- Histological structure of Trachea.
- Histology of Lung.
- Transportation of Oxygen.
- Transportation of Carbon dioxide.

Unit-IV: Excretory System

[09 Lectures]

- Morphological and Internal structure of Kidney.
- Histology of Kidney.
- Structure of Nephron.
- Urine formation.

Unit-V: Co-ordinator system

[11 Lectures]

- Morphological structure of Human Brain.
- Structure and types of Nerve cell.
- Physiology nerve impulses
- Endocrine secretion and its function .

16UBCDA04	Life sustainable systems in Human Practical	2 Hrs/Week	1 Credit
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- [1]. Study of human digestive system through chart of multimedia.
- [2]. Digestion of Starch through Enzyme Amylase.
- [3]. Structure of Blood Vessels and Human-Heart through chart or multimedia.
- [4]. Preparation of Blood smear and study of Blood component.
- [5]. To determine blood group and Rh factor..
- [6]. Histological study of Respiratory track by permanent slides.
- [7]. Test for Normal and Abnormal Urin.
- [8]. To study life history of pathogenic animals.

Textbook:

- Jain A. K., Textbook of Physiology, Avichal Publishing Company, 6th edition.

- Vander A, Sherman J. and Luciano D. (2014). Vander's Human Physiology: The Mechanism of Body Function. XIII Edition, Mcgraw Hills .

Reference books

- Tortora, G.J. & Grabowski, S. (2006). Principles of Anatomy & Physiology. XI Edition John Wiley & sons.
- Victor P. Eroschenko. (2008). diFiore's Atlas of Histology with Functional correlations. XII Edition. Lippincott W. & Wilkins.