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VEER NARMAD SOUTH GUJARAT UNIVERSITY

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વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી

યુનિવર્સિટી કેમ્પસ, ઉદ્ધના-મગદલા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

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-: પરિપત્ર :-

વિજ્ઞાન વિદ્યાશાખા હેઠળની પ્રાણીશાસ્ત્ર વિષય ચલાવતી સંલગ્ન સ્નાતક આચાર્યશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ : ૨૦૨૧-૨૨ થી અમલમાં આવનાર F.Y.B.Sc. Sem-1 & 2 તથા S.Y.B.Sc. Sem-3 & 4 ના અભ્યાસક્રમ અંગે ચર્ચા કરતા ઝૂઓલોજી વિષયની અભ્યાસસમિતિની તા.૨૨/૦૩/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંક: ૩ અન્વયે નીચે મુજબ કરેલ ભલામણ વિજ્ઞાન વિદ્યાશાખાની તા.૧૭/૦૬/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંક:૪ અન્વયે મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલે તેની તા.૨૫-૨૬/૦૬/૨૦૨૧ ની સભાના ઠરાવ ક્રમાંક: ૨૧ અન્વયે સ્વીકારી મંજૂર કરેલ છે. તેની જાણ સંબંધકર્તા શિક્ષકો અને વિદ્યાર્થીઓને કરવી, તદ્દુપરાંત તેનો અમલ કરવો.

ઝૂઓલોજી વિષયની અભ્યાસસમિતિની તા.૨૨/૦૩/૨૦૨૧ની સભાનાં ભલામણ ક્રમાંક: ૩

- :: આથી સર્વાનુમતે ઠરાવવામાં આવે છે કે, F.Y.B.Sc. Sem-1 & 2 તથા S.Y.B.Sc. Sem-3 & 4 માં ચર્ચાને અંતે આંશિક સુધારા કરવામાં આવ્યા છે. જે શૈક્ષિક વર્ષ ૨૦૨૧-૨૨ થી અમલમાં આવે તે રીતે મંજૂર કરવા વિજ્ઞાન વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.

વિજ્ઞાન વિદ્યાશાખાની તા.૧૭/૦૬/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંક:૪

- :: આથી ઠરાવવામાં આવે છે કે, ઝૂઓલોજી વિષયની અભ્યાસસમિતિની તા.૨૨/૦૩/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંક: ૩ અન્વયે મંજૂર કરેલ F.Y.B.Sc.Sem-1 & 2 તથા S.Y.B.Sc. Sem-3 & 4 નો અભ્યાસક્રમ આંશિક સુધારા સહિત મંજૂર કરી શૈક્ષિક વર્ષ ૨૦૨૧-૨૨ થી અમલમાં આવે તે રીતે મંજૂર કરવા એકેડેમિક કાઉન્સિલને ભલામણ કરવામાં આવેલ છે.

એકેડેમિક કાઉન્સિલની તા.૨૫-૨૬/૦૬/૨૦૨૧ ની સભાનાં ઠરાવ ક્રમાંક: ૨૧

- :: આથી ઠરાવવામાં આવે છે કે, પ્રાણીશાસ્ત્ર વિષયની અભ્યાસસમિતિએ તેની તા.૨૨/૦૩/૨૦૨૧ ની સભાના ઠરાવ ક્રમાંક : ૩ અન્વયે ભલામણ કરેલ અને વિજ્ઞાન વિદ્યાશાખાએ તેની તા. ૧૭/૦૬/૨૦૨૧ ની સભાનાં ઠરાવ ક્રમાંક : ૪ અન્વયે સ્વીકારેલ F.Y.B.Sc.Sem-1 & 2 તથા S.Y.B.Sc.Sem-3 & 4 નો અભ્યાસક્રમ શૈક્ષણિક વર્ષ ૨૦૨૧-૨૨ થી અમલમાં આવે તે રીતે મંજૂર કરવામાં આવે છે.

બિડાણ: ઉપર મુજબ

ક્રમાંક : એકે./પરિપત્ર/૯૨૬૮/૨૧

તા.૦૧-૦૭-૨૦૨૧

ઈ.ચા. કુલસચિવ

પ્રતિ,

- ૧) વિજ્ઞાન વિદ્યાશાખા હેઠળની પ્રાણીશાસ્ત્ર વિષય ચલાવતી સંલગ્ન કોલેજોના આચાર્યશ્રીઓ.
- ૨) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા
- ૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

.....તરફ જાણ તેમજ અમલ સારૂ.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
F.Y.B.Sc. SEMESTER- I
ZOOLOGY: Z – 101
(Effective from JUNE-2019)
(Systematics and Animal Diversity)

UNIT- I: Systematics

Scope and branches Zoology, Salient features of Non-chordates, structural organization in different phylum of Non-chordates with examples.

Kingdom – Animalia

Phylum – Protozoa- Locomotory Organelles and locomotion

Porifera-Canal System in Sycon

Cnidaria-Polymorphism in Hydrozoa

Platyhelminthes, Nematelminthes-Parasitic adaptations

Annelida-Metamerism

Arthropoda -Metamorphosis in Insects

Mollusca-Shell in Mollusca

Echinodermata-Water-vascular system in Asteroidea

Protochordata- General features and Phylogeny

UNIT- II: Non-Chordate Animal Diversity

Type study– *Fasciola hepatica* (Liver fluke)

- Systematic position, Habit and habitat
- External features, Body wall
- Digestive system, Respiratory System, Excretory system, Nervous system
- Reproductive system, Life cycle and development
- Pathogenesis, Parasitic Adaptations

UNIT-III: Systematics

Salient features of Chordate classes with examples.

Agnatha, Pisces, Amphibia, Reptiles, Aves, Mammals

UNIT- IV: Chordate Animal Diversity

Pisces-Difference between Osteichthyes and Chondrichthyes

Amphibia- Parental care

Reptiles- Poisonous and non-poisonous snakes

Aves-Types of beak and feet in birds

Mammals-Proboscidea

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
F.Y.B.Sc. SEMESTER-I
ZOOLOGY PRACTICALS (Based on Paper-Z – 101)
(Effective from JUNE-2019)
(Systematics and Animal Diversity)

The following practicals are to be taught/studied **only** with the help of charts, models, videos, photographs, permanent slides, working models etc.

1. Study of the following specimens:
Amoeba, Euglena, Paramecium, Sycon, Hyalonema, Physalia, Aurelia, Metridium, Taenia solium, Male and female *Ascaris lumbricoides*, Nereis, Pheretima, Hirudinaria
 2. Carcinus, Scolopendra, Limulus, Lepisma, Periplaneta, Butterfly Chiton, Dentalium, Pila, Ostrea, Octopus, Pentaceros, Ophioderma, Echinus, Cucumaria.
 3. Balanoglossus, Herdmania, Branchiostoma, Petromyzon, Sphyrna, Pristis, Torpedo, Labeo, Exocoetus, Ichthyophis, Salamandra, Bufo, Hyla,
 4. Chelone, Hemidactylus, Chamaeleon, Vipera, Naja, Crocodylus, Gavialis, Koel, Peacock, Sparrow, Ornithorhynchus, Macropus, Bat, Dolphin
 5. Study of the following permanent slides:
T.S. and L.S. of *Sycon*, **Liver fluke**: Larva stages. miracidium, sporocyst, redia, cercaria
 6. Key for Identification of poisonous and non-poisonous snakes
 7. An “**animal album**” containing photographs, cut outs, with appropriate write up about the above mentioned taxa. Different taxa/ topics may be given to different sets of students for this purpose.
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VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.

F.Y.B.Sc. SEMESTER- I

ZOOLOGY: Z – 102

(Effective from JUNE-2019)

(Cytogenetic, Ecology and Ethology)

UNIT-I: Cytology

- Structural organization of cells- Prokaryotes and Eukaryotes
- Introduction to cell organelles (Golgi body, E.R., Mitochondria, Nucleus, Lysosome, Ribosome, Nucleolus, Cell wall) and cell inclusions.

UNIT-II : Genetics

Types, structures and functions of chromosomes

- Principles of inheritance, Mendel's law, deviation from Mendelian inheritance, incomplete dominance and co-dominance, Complementary genes, Supplementary genes. multiple alleles (ABO blood groups)

UNIT-III : Ecology

- Introduction to Ecology
- Marine Ecosystem
- Fresh water – Pond Ecosystem
- Desert ecosystem

Ecological Adaptations

- Aquatic, Arboreal, Volant, Desert

UNIT- IV :Ethology

- Introduction, Scope and patterns of behavior.
- Nesting behavior (Weaver bird, Horn bill) and social behavior (honeybee)
- Behavioral disorders- Alzheimer's and Dementia

VEER NARMADSOUTH GUJARAT UNIVERSITY, SURAT.
F.Y.B.Sc. SEMESTER- I
ZOOLOGY-PRACTICALS (Based on Z-102)
(Effective from JUNE-2019)
(Cytogenetic, Ecology and Ethology)

The following practicals are to be taught/studied **only** with the help of charts, models, videos, photographs, permanent slides, working models etc.

1. Ecological adaptations

- (a) Aquatic: Catla, Dolphin
- (b) Arboreal: Chameleon, Squirrel
- (c) Volant: Flying fish, Bat
- (d) Desert: Camel, Phrynosoma

2. To study structure of typical animal cell and cell organelles: Golgi body, E.R., Mitochondria, Nucleus, Lysosome, Ribosome, Nucleolus, Cell wall.

3. To study nesting behaviour (Weaver bird, Horn bill) and social behaviour (Honey bees).

4. To prepare blood smear to observe R.B.C.s and W.B.C.s from human blood.

5. To study Blood groups and Rh factor in human blood.

6. Complementary genes, Supplementary genes.

Reference Books:

- (1) Ruppert and Barnes, R.D. (2006). *Invertebrate Zoology*, VIII Edition. Holt Saunders International Edition.
 - (2) 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
 - (3) Kardong, K.V. (2005) *Vertebrates' Comparative Anatomy, Function and Evolution*. IV Edition. McGraw-Hill Higher Education.
 - (4) Kent, G.C. and Carr R.K. (2000). *Comparative Anatomy of the Vertebrates*. IX Edition. The McGraw-Hill Companies.
 - (5) Young, J. Z. (2004). *The Life of Vertebrates*. III Edition. Oxford University press.
 - (6) Modern Text Book of Zoology (vertebrate) R.L.Kotpal, Rastogi Publication, Meerut, India.
 - (7) Modern Text Book of Zoology (invertebrate) R.L.Kotpal, Rastogi Publication, Meerut, India.
 - (8) Invertebrate Zoology- E.L.Jordan & P.S.Verma
 - (9) Invertebrate Zoology- T.C. Majupuria, Pradeep Publication, Jalandhar, India.
 - (10) Introduction to Chordates- T.C. Majupuria, Pradeep Publication, Jalandhar, India.
 - (9) A manual of Practical Zoology Invertebrates- P.S.Verma, S. Chand & Co. Ltd. New Delhi, India.
 - (10) A manual of Practical Zoology Chordates- P.S.Verma, S. Chand & Co. Ltd. New Delhi, India.
 - (11) Cell biology, Genetics and Molecular Biology- V.B. Rastogi, Rastogi Publi. Meerut- India
 - (12) Modern zoology –Dr. Ramesh Gupta, Prakash Publication, 12th Edition, Muzaffarnagar (UP)
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VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
F.Y.B.Sc. SEMESTER- II
ZOOLOGY: Z – 201
(Effective from JUNE-2019)
(COMPARATIVE ANATOMY, APPLIED ZOOLOGY, WILDLIFE BIOLOGY)

Unit-1: Integumentary System

Derivatives of integument w.r.t. glands and digital tips

Digestive System

Brief comparative account of alimentary canal and digestive glands of vertebrates (Pisces to mammals).

Unit-2: Respiratory System

Brief account of Gills, Lungs, Air sacs and Swim bladder

Receptor Organs : Cutaneous receptors, Chemo receptors and Internal receptors

Unit-3: Applied Zoology:

- **Poultry Farming**-Importance of Poultry Farming, Breeds of poultry, Cage system and deep litter system of bird keeping, Egg as food, Care of egg laying hen, poultry appliances and excreta as manure.
- **Fisheries**-Prawn fishery, Pearl Oyster fishery and Bombay duck fishery

Unit-4: Wildlife Biology

- Introduction, causes of depletion of wild life, Importance of conservation of wild life
- Difference between National Parks and Sanctuaries
- **Wildlife in Gujarat:**
National Parks
(1) Gir National Park (2) Marine National Park

Sanctuaries

- (1) Wild ass sanctuary (2) Thol wildlife sanctuary (3) Velavadar black buck sanctuary

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
F.Y.B.Sc. SEMESTER- II
ZOOLOGY PRACTICALS (Based on Z- 201)
(Effective from JUNE-2019)

(COMPARATIVE ANATOMY, APPLIED ZOOLOGY, WILDLIFE BIOLOGY)

The following practicals are to be taught/studied **only** with the help of charts, models, videos, photographs, permanent slides, working models etc.

- 1. Integumentary System:** Derivatives of integument w.r.t. glands and Digital tips
 - 2. Digestive System:** Brief account of alimentary canal and digestive glands
 - 3. Respiratory System:** Brief account of Gills, lungs, air sacs and swim bladder
 - 4. Receptor Organs :** Cutaneous receptors: Free nerve endings, Tactile corpuscles
Chemo receptors: Taste buds, Organ of Jacobson
 - 5. Study of national parks and Sanctuaries**
Gir N.P., Marine N.P., Wild ass W.L.S.,
Thol W.L.S. and Velavadar W.L.S
 - 6. To study Prawn fishery, Pearl Oyster fishery and Bombay duck fishery**
 - 7. To study poultry appliances- hover canopy type brooder, modern hanging feeder (plastic), modern hanging water appliance (plastic) and box type candling appliance.**
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VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

F.Y.B.Sc SEMESTER- II

ZOOLOGY : Z- 202

(Effective from JUNE-2019)

(LIFE PROCESSES, BIOCHEMISTRY, IMMUNOLOGY AND TISSUE SYSTEM)

UNIT-I Life Processes

Nutrition/ Digestion in Human

- Buccal digestion: Salivary secretion and digestion.
- Gastric digestion: Gastric secretion and digestion
- Intestinal digestion: Pancreatic secretion, bile secretion, digestion in small intestine, digestion and absorption in large intestine

Reproduction and its types

UNIT-II Biological Chemistry

- pH and Buffers in Biological Systems
- Introduction to constituents of balanced diet-Sources, functions and deficiency status
- Diseases due to vitamin deficiency: Xerophthalmia, Nyctalopia (Night blindness),Rickets, Scurvy, Beriberi, Pellagra

UNIT-III Immunology

- Introduction and basic concepts of immunology
- Cells and organs of immune system
- Humoral and cellular immune response
- Innate and acquired immunity

UNIT-IV Tissue systems

To Study various types, their structure and functions.
Epithelial,Connective,Nervous and Muscular tissue

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
F.Y.B.Sc. SEMESTER- II
ZOOLOGY PRACTICALS (Based on Z-202)
(Effective from JUNE-2019)
(LIFE PROCESSES, BIOCHEMISTRY, IMMUNOLOGY AND TISSUE SYSTEM)

The following practicals are to be taught/studied **only** with the help of charts, models, videos, photographs, permanent slides, working models etc.

1. To study the control of food ingestion in animals and T.S. of intestine of mammals to show villi for absorption.
 2. To study different salivary glands and their functions in human.
 3. Diseases due to vitamin deficiency: Xerophthalmia, nyctalopia (Night blindness),rickets, scurvy, beriberi, pellagra
 4. To study Different types of reproduction.
 5. Tissue System: Study of various types of tissues with the help of permanent slides- areolar tissue, adipose tissue, Hyaline Cartilage, Mammalian bone, Medulated and non Medulated nerve fiber.
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Reference Books :

- (1) Shukla, G.S. & Upadhyay, V.B. Economic Zoology. Rastogi Publi. 2005, 487 pages.(For Poultry)
- (2) JawaidAhsan, Sinha, S. P. 2008. A Handbook of Economic Zoology. S. Chand and Co. Publ. 272 pages.(For Poultry)
- (3) Ruppert and Barnes, R.D. (2006). *Invertebrate Zoology*, VIII Edition. Holt Saunders International Edition.
- (4)Kardong, K.V. (2005) *Vertebrates' Comparative Anatomy, Function and Evolution*.IVthEdition.McGraw-Hill Higher Education.
- (5) Kent, G.C. and Carr R.K. (2000). *Comparative Anatomy of the Vertebrates*. IX Edition.The McGraw-Hill Companies
- (6) 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
- (7) Young, J. Z. (2004). *The Life of Vertebrates*.III Edition.Oxford University press.
- (8) Modern Text Book of Zoology (vertebrate) R.L. Kotpal, Rastogi Publication, Meerut, India.
- (9) Modern Text Book of Zoology (invertebrate) R.L. Kotpal, Rastogi Publication, Meerut, India.
- (10) Invertebrate Zoology- E.L. Jordan & P.S.Verma
- (11) Invertebrate Zoology- T.C. Majupuria, Pradeep Publication, Jalandhar, India.
- (12) A Text Book of Histology – Leslie P. Gartner-4thedi.-Amazone
- (13) Intruduction to Chordates- T.C. Majupuria, Pradeep Publication, Jalandhar, India.
- (14) A manual of Practical Zoology Invertebrates- P.S.Verma, S. Chand & Co. Ltd. New Delhi, India.
- (15) A manual of Practical Zoology Chordates- P.S.Verma, S. Chand & Co. Ltd. New Delhi, India.
- (16)Prani Auotiki (Gujarati)- Desai and Akhunji – University Granth nirman Board- Ahmedabad- India.
- (17) Poultry vigyan- Mehta and Ghasura- University Granth nirman Board- Ahmedabad- India.
- (18) Vanyajiv Vidya ane Vanyajiv Vyavasthapan- Prof, V.C.Soni - University Granth nirman Board- Ahmedabad- India.
- (19) Ecology, Cell biology, Genetics, Animal diversity, Animal Physiology, Immunology, Chordates and Invertebrates- Titles by N.Arumugam, Saras Publi., Kanyakumari, India.

Web references:

(1) [Comparative Anatomy - Digestive System](https://www.slideshare.net/emscipriano/comparative-anatomy-digestive-system)

<https://www.slideshare.net/emscipriano/comparative-anatomy-digestive-system>

(2) [Comparative Anatomy - Respiratory System](https://www.slideshare.net/emscipriano/comparative-anatomy-respiratory-system)

<https://www.slideshare.net/emscipriano/comparative-anatomy-respiratory-system>

(3) [Urogenital system chap](https://www.slideshare.net/CharmHernandez/urogenital-system-chap)

<https://www.slideshare.net/CharmHernandez/urogenital-system-chap>
