BHAKTA KAVI NARSINH MEHTA UNIVERSITY, JUNAGADH

FACULTY OF SCIENCE

[Three Years (6 Semesters) Full Time Course]

ZOOLOGY SYLLABUS(UG)

2018 – 19

Bhakta Kavi Narsinh Mehta University
Junagadh – 362 001
Gujarat, India

EXAMINATION CODING SYSTEM

Sr. No.	Name Of Programme	B.Sc. ZOOLOGY	
1	Title Of Paper	Sem -I Non Chordates : Systematic, Forms & Functions, Cell biology & Histology, Ecology, Fisheries Biology, Wild life & Instrumental Biology	Sem -II Chordate: Systematic, Forms & Functions, Genetics, Evolution, Physiology, Embryology, Applied Zoology, Reproductive Biology and Functional Anatomy of chordates
2	Theory Credit	4	4
3	Practical Credit	3	3
4	Total Credit	7	7
5	External Marks Of Theory	70	70
6	Internal Marks Of Theory	30	30
7	Total Marks Of Theory	100	100
8	External Marks Of Practical	35	35
9	Internal Marks Of Practical	15	15
10	Total Marks Of Practical	50	50
11	Grand Total	150	150
12	External Exam Time Duration	2½ Hours	2½ Hours

BHAKTA KAVI NARSINH MEHTA UNIVERSITY, JUNAGADH

ZOOLOGY

SYLLABUS (UG)

[SYLLABUS FOR THE CHOICE BASED CREDIT SYSTEM (CBCS)]

(F.Y. B.Sc.)

SEMESTER I – PAPER – Z-01

&

SEMESTER II – PAPER – Z-02

New Syllabus

INFORCE FROM JUNE – 2018

BHAKTA KAVI NARSINH MEHTA UNIVERSITY, JUNAGADH

[UG SYLLABUS FOR CHOICE BASED CRADIT SYSTEM (CBCS)]

INFORCE FROM JUNE – 2018

SUBJECT: ZOOLOGY

SEMESTER – I

ZOOLOGY PAPER – Z –01

Non Chordates :Systematic, Forms & Functions, Cell biology & Histology, Ecology, Fisheries Biology, Wild life & Instrumental Biology

SEMESTER – II

ZOOLOGY PAPER – Z – 02

Chordate: Systematic, Forms & Functions, Genetics, Evolution, Physiology, Embryology, Applied Zoology, Reproductive Biology and Functional Anatomy of chordates

FORWARD

Forming the new Curriculum is the prime important criteria in the University education system.

Syllabus provides an educational guide line and demarks the horizon of a subject. Syllabus of different Theory and Practical papers should have subjective harmony and gradual relationship within periphery of a subject.

Formulation of Curriculum for a particular subject requires the following criteria.

(A) Background of previous Curriculum.
(B) Relationship with other related subjects.
(C) Resources of Educational needs at regional level as well as national level.
(D) Financial and Statuary provisions of the State government.

All the above criteria are taken into consideration in formulation of this Curriculum.

This Curriculum is the result of prolonged discussions among the experienced teacher in this subject because after all, the college teachers are the real catalysts for implementation of this Syllabus.

The proposed Syllabus after required formalities will be implemented in the first year B.Sc.

Valuable guidelines and all facilities in this curriculum are provided by the authorities of the Bhakta Kavi Narsinh Mehta University, Junagadh.

BHAKTA KAVI NARSINH MEHTA UNIVERSITY, JUNAGADH

(CBCS Syllabus)

SEMESTER – I

ZOOLOGY

PAPER – Z-01

Non Chordates :Systematic, Forms & Functions, Cell biology & Histology, Ecology, Fisheries Biology, Wild life & Instrumental Biology

UNIT – 1: SYSTEMATIC

Salient feature & classification up to classes in Non-chordates, structural organization in different phylum of Non-chordates with examples.
Phylum- Protozoa, Porifera, Coelenterata, Platyhelminthes, Aschelminthes, Annelida, Arthropoda, Mollusca, Echinodermata, Hemichordata.

UNIT – 2: FORMS AND FUNCTIONS IN ANIMALS

General structures and morphology with functional anatomy of following type Animals

2.1 PLATYHELMINTHES – Type study: *Taenia solium*
2.2 ANNELIDA – Type Study: Earth worm
2.3 ARTHROPODA – Type Study: Mosquito
(i) Life cycle of Culex & Anopheles Mosquito
(ii) Mouth parts of Culex & Anopheles mosquito

UNIT – 3: CELL BIOLOGY AND HISTOLOGY

3.1 CELL BIOLOGY: Only Structure and Function of following organelles

(i)Mitochondria
(ii) Nucleus
(iii) Endoplasmic Reticulum
(iv) Plasma membrane

3.2 HISTOLOGY: Histological structure and function of following organs of Mammals
(i) Stomach
(ii) Intestine
(iii) Liver
(iv) Pancreas

UNIT – 4: ECOLOGY& FISHERIES BIOLOGY

4.1 Introduction of Ecology
4.2 Marine Ecosystem
4.3 Fresh water – Pond Ecosystem
4.4 Ecological Adaptations:
(i) Fossorial Adaptation
(ii) Aquatic Adaptation
(iii) Arborial Adaptation
(iv) Volant Adaptation
(v) Desert Adaptation
4.5 Introduction of fish morphology
4.6 Difference between Chondrichthyes and Osteichthyes
4.7 Scales in fishes
4.8 Types of fishing Boats & Nets

UNIT – 5: WILD-LIFE & INSTRUMENTAL BIOLOGY

5.1 Introduction & Importance of Wild life
5.2 Difference between National Parks &Sanctuaries

5.3 Wild-life in Gujarat:
(I): NATIONAL PARKS: (i)Gir Forest National Park
(ii) Marine National Park in Gulf of Kutch

(II): SANCTUARIES:

(i) Kutch desert wild life sanctuary
(ii)Barda wild life sanctuary
(iii)Nalsarovar bird sanctuary
(iv)Khijadia bird sanctuary

5.4 Instrumental Biology:

Principle, structure & function of following instruments.
(i) Light microscope
(ii) Thermometer
(iii) pH Meter
(iv) Centrifuge

PRACTICALS RELATED TO PAPER – Z-01

Practical: 1 : Identification and classification of Invertebrate animals

(i) Phylum: Protozoa : - Arcella, Ceratium, Vorticella, Plasmodium
(ii) Phylum: Porifera : - Leucosolenia, Euplectella, Euspongia
(iii) Phylum: Coelenterata :-Hydra, Rhizoastoma, Metridium

Practical: 2 : Identification and Classification of Invertebrate animals.

(i) Phylum: Platyhelminthes : - Planaria, Liverfluke, Tape worm
(ii) Phylum; Aschelminthes : - Ascaris, Hookworm
(iii) Phylum: Annelida : - Aphrodite, Earthworm, Leech

Practical: 3 : Identification and Classification of Invertebrate animals

(i) Phylum : Arthropoda :- Peripetus, Lobester, Millipades, Dragon fly, Scorpion
(ii) Phylum: Mollusca : - Chiton,Pila, Unio, Octopus, Dentalium

Practical: 4 : Identification and Classification of Invertebrate animals

(i) Phylum: Echinodermata: - Star fish, Brittle Star, Sea Urchin, Sea-Cucumber, Feather Star
(ii) Phylum : Hemichordata : - Balanoglossus

Practical: 5 : Systems of Earth worm:

(i) External Characters
(ii) Digestive System
(iii) Nervous System
(iv) Reproductive System
- Through chart or Multimedia

Practical: 6 : Mounting of Earth worm:

(i) Septal Nephridia
(ii) Body Setae
(iii) Blood Gland
(iv) Ovary
- Through chart or Multimedia or Slide

Practical: 7 : Study of permanent slides *Taenia solium*:

(i) Scolex
(ii) Mature segment
(iii) Gravid segment
(iv) Bladder worm

Practical: 8 : Study of permanent slides Earth worm:

(i) T.S. Through Pharynx

(ii) T.S. Through Gizzard

(iii) T.S. Through Typhlosole

Practical: 9 : Study of permanent slides Mosquito:

(i) Life cycle of Culex Mosquito
(ii) Life cycle of Anopheles mosquito
(iii) Mouth Parts of Culex and Anopheles Mosquito

Practical: 10 : Study of following cell organelles:

(i) Mitochondria
(ii) Nucleus
(iii) Endoplasmic Reticulum
(iv) Cell Membrane

- By photograph, Chart, Model, or multimedia.

Practical: 11 : Study of Histological structures of following Mammalian Organs

(i) Stomach
(ii) Intestine
(iii) Liver
(iv) Pancreas

Practical: 12 : Study of different animals for Ecological Adaptations

(i) Fossorial : Earthworm, Gryllotalpa, Snake, Rat
(ii) Aquatic : Labeo, Crocodile, Turtle, Loligo
(iii) Arboreal : Wall lizard, Chamelion, Squirrel, Monkey
(iv) Volant : Exocoetus, Draco, Flying frog

(v) Desert : Uromastix, Phyrynosoma

Practical: 13 : Fisheries Biology:

(i) Difference between Chondrichthyes and Osteichthyes
(ii) Scales in fishes
(iii) Types of fishing Boats & Nets

Practical: 14 : Study of Wild animals

(i) Study of National parks and Sancturies of Gujarat state
(ii) Study of following wild animals on the basis of zoo-geographical region as per theory
   (a). Asiatic Lion
   (b). Leopard
   (c). Corals
   (d). Jelly fish
   (e). Chinkara
   (f). Spotted deer
   (g). Greater flamingo
   (h). Painted stork
   - by photograph, Chart, stuffed animals or multimedia

Practical: 15 : Instrumental Biology

Principle, structure & function of following instruments
(i) Light microscope
(ii) Thermometer
(iii) pH Meter
(iv) Centrifuge

Practical: 16 : Visit to any one National Park or Sanctuary OR Fish processing plant OR Fishing area OR Reserve forest area

DISTRIBUTION OF UNITS

SEMESTER – I

PAPER – Z-01			
Unit No.	**Unit Title**	**Theory Period**	**Marks.**
Unit : 1	Systematic	10	14
Unit : 2	Forms and Functions	18	14
Unit : 3	Cell Biology and Histology	14	14
Unit : 4	Ecology& Fisheries Biology	13	14
Unit : 5	Wild-life & Instrumental Biology	10	14
	TOTAL :	**65**	**70**

- Above statement concerned to only Theory portion of the paper.
- Above mentioned third column 'Theory Period' indicates total number of theory lectures per unit.
- Total syllabus should be completed within 65 theory lectures.
- Each and every units are carries equal 14 marks.
- Total marks for theory examination are 70 marks.
- **PAPER SETTER MUST FOLLOW THE UNIT WISE MARK SETUPS.**

BHAKTA KAVI NARSINH MEHTA UNIVERSITY-JUNAGADH

THEORY EXAMINATION

SEMESTER – I

ZOOLOGY

(Based on Paper – Z-01)

Time: **2½** Hours Total Marks: **70**

Instructions:

1. Illustrate your answer with neat and labeled diagrams.
2. Figure to the right side indicates full marks of questions.

QUESTION-1 (THIS QUESTION IS TAKEN FROM UNIT-1)

QUESTION-2 (THIS QUESTION IS TAKEN FROM UNIT-2)

QUESTION-3 (THIS QUESTION IS TAKEN FROM UNIT-3)

QUESTION-4 (THIS QUESTION IS TAKEN FROM UNIT-4)

QUESTION-5 (THIS QUESTION IS TAKEN FROM UNIT-5)

- ANY TYPE OF MCQ IS NOT INCLUDED IN THIS PAPER STYLE.

- EACH QUESTION CARRIES EQUAL MARKS – 14.

- THERE ARE 5 QUESTIONS CONTAINING SUB-QUESTIONS (A), (B), (C).

QUESTION-1: (From UNIT-1)[14]

(A) Give the answer of following questions. [04]

Only short questions (Objective Questions Like Definitions and Fill in the blanks etc.. NOTE: MCQs ARE NOT INCLUDED)

Each Question carries1 Marks.

(1)

(2)

(3)

(4)

(B) Write any one out of Two. [03]

Each Question carries 3 Marks.

(1)

(2)

(C) Write any one out of Two. [07]

Each Question carries 7 Marks.

(1)

(2)

QUESTION-2: (As Above) (From UNIT-2) [14]

QUESTION-3: (As Above) (From UNIT-3) [14]

QUESTION-4: (As Above) (From UNIT-4) [14]

QUESTION-5: (As Above) (From UNIT-5) [14]

BHAKTA KAVI NARSINH MEHTA UNIVERSITY - JUNAGADH

PRACTICAL EXAMINATION

SEMESTER – I

ZOOLOGY

(Based on Paper – Z-01)

Time: **3** Hours Total Marks: **35**

Que -1: Sketch and label _____ system of Earth worm. [06]

Que – 2: Sketch and label /Mountings of earth worm_____.

(Practical-6,7,&8) [03]

Que – 3: Do as per instruction and show it to examiner [03]

(Practical – 13)

Que – 4: Do as per instruction and show it to examiner [03]

(Practical – 10)

Que – 5: Write as per instruction. [14]

(A) Identify and classify giving reasons. (Lower invertebrate)
(B) Identify and classify giving reasons. (Higher invertebrate)
(C) Identify and describe. (Practical- 9)
(D) Identify and describe. (Practical-11)
(E) Identify and describe (Practical-12)
(F) Identify and describe (Practical-14)
(G) Identify and describe (Practical-15)

Que. – 5: Report and Viva-voice. [03]

Que – 6: Certified Journal. [03]

BHAKTA KAVI NARSINH MEHTA UNIVERSITY – JUNAGADH

List of Slides, Specimens, Charts, Models & Photographs

SEMESTER – I ZOOLOGY

(Based on Paper – Z-01)

LIST OF SLIDES:

(1) All animals from Protozoa. [Practical-1, (i)]

(2) Mountings of Earthworms. [Practical-6]

(3) Permanent slides of Taenia Solium. [Practical-7]

(4) Permanent slides of Earth worm. [Practical-8]

(5) Permanent slides of Mosquitoes. [Practical-9]

(6) Histological structure of Mammalian organs. [Practical-11]

(7) Scales in Fishes. [Practical-13, (ii)]

LIST OF SPECIMENS:

(1) All animal specimens from Phylum- Porifera to Phylum-Hemichordata. [Practical-1,(ii),(iii) to Practical-4]

(2) All animal specimens for Ecological Adaptations. [Practical-12]

(3) One animal of Chondrichthyes-Scoliodon & One specimen of Osteichthyes-Labeo/Catla/Pomfret. [Pratical-13, (i)]

LIST OF CHARTS/MODELS/PHOTOGRAPHS:

(1) National Parks & Sanctuaries of Gujarat State & Wild-animals on the basis of Zoo-geographical region. [Practical-14,(i),(ii)]

LIST OF INSTRUMENTS:

(1) Light Microscope

(2) Thermometer

(3) pH Meter

(4) Centrifuge

REFERENCE BOOKS

SEMESTER – I

List of books For Unit-1 & 2

1 : Invertebrate Zoology……E.L.Jordan & Dr.P.S.Verma

2 : Invertebrate Zoology……..……..P.S.Dhami&J.K.Dhami.

3 : A modern textbook of Zoology Invertebrate Zoology……..…..……R.L.Kotpal.

4 : A textbook of Practical Zoology-Invertebrates…….S.S.Lal

5 : Kotpal Series – Platyhelminthus……..…….R.L.Kotpal

6 : Kotpal Series – Annelida……R.L.Kotpal

7 : Kotpal Series – Arthropoda…….R.L.Kotpal

8 : A Manual of Practical Zoology, Invertebrates……..P.S.Verma

List of books For Unit-3

9 : Cell Biology…….…….…….....Dr. Satyeshchandra Roy.

10 : Cell Biology……..…C.B.Power

11 : Cytology & Genetics…….……P.K.Gupta

12 : Cell & Molecular Biology……..……..……..De Robertis.

13 : Biotechnological Cell Biology..……..……..…V.B.Rastogi.

14 : Molecular Biology……V.B.Rastogi

15 : Histology……..……Atlas.

16 : Cell Biology, Genetics, Molecular Biology, Evolution and Ecology…….…P.S.Varma&V.K.Agrawal.

17 : Cytology……...……..P.S.Verma & V.K.Aggarwal

18 : Cytology, Genetics & Evolution……..…P.K.Gupta

List of books for Unit-4

19 : Ecology & Environmental biology…….…….P.D.Sharma.

20 : Cell Biology, Genetics, Molecular Biology, Evolution and Ecology…….…P.S.Varma& V.K.Agrawal.

21 : Fundamentals of Ecology……..…..Odum E.P. & Barrett G.W.

22 : Basic Concepts of Ecology…….……A. Arumugam

23 : Elements of Ecology……....Robert & Thomas.

24 : Environmental Biology……...P.S.Verma & V.K.Aggrwal

25 : Fish and Fisheries of India……...……V.B.Jhingran.

List of books for Unit-5

26 : Wild Life of Gujarat…….……H.S.Singh.

27 : Indian National Parks and Sanctuaries……..…Khati&Annand S.

28 : Modern textbook of Zoology Vertebrates……R.L.Kotpal

29 : Vertebrate Zoology…….….E.L.Jordan & Dr.P.S.Verma

30 : Practical Zoology Vertebrate…….S.S.Lal

List of Books for Viva-Voices

31 : Practical Zoology Invertebrate……..S.S.Lal

32 : Practical Zoology Vertebrate…….S.S.Lal