

AP STATE COUNCIL OF HIGHER EDUCATION
CBCS STRUCTURE for BSc ZOOLOGY w.e.f. 2015-16
 (Revised in April 2016)

YEAR	SEMESTER	PAPER	TITLE	MARKS	CREDITS
I	I	I	Biology of Non-chordates	100	03
			Practical - I	50	02
	II	II	Biology of Chordates	100	03
			Practical - II	50	02
II	III	III	Cell biology, Genetics and Evolution	100	03
			Practical - III	50	02
	IV	IV	Embryology, Physiology and Ecology	100	03
			Practical - IV	50	02
III	V	V	Animal Biotechnology	100	03
			Practical - V	50	02
		VI	Animal Husbandry	100	03
			Practical - VI	50	02
	* Any one Paper from A, B and C	VII A*	Elective	100	03
			Practical - VII A	50	02
		VII B*	Elective	100	03
			Practical - VII B	50	02
	** Any one cluster from I, II and III	VII C*	Elective	100	03
			Practical - VII C	50	02
		VIII (I)**	Cluster Elective - I ::	100	03
				100	03
	100			03	
	50			02	
	50			02	
	VI	VIII (II)**	Cluster Elective - II ::	100	03
				100	03
				100	03
		VIII (III)**	Cluster Elective - III ::	50	02
				50	02
50				02	
50				02	

*Third year syllabi will be sent shortly

**Student Activities like Seminars, Assignments, Fieldwork, Study Projects, Models etc. are Part of Curriculum for all units in all papers.

AP STATE COUNCIL OF HIGHER EDUCATION
w.e.f. 2015-16 (Revised in April, 2016)

**BSc ZOOLOGY SYLLABUS FOR I SEMESTER
ZOOLOGY - PAPER - I**

ANIMAL DIVERSITY - NONCHORDATES

Periods: 60

Max. Marks: 100

1.1 Brief history, Significance of Diversity of Non Chordates

1.2 Protozoa

1.2.1 General characters

1.2.2 Classification of Protozoa up to classes with examples

1.2.3 *Elphidium* (type study)

1.3 Porifera

1.3.1 General characters

1.3.2 Classification of Porifera up to classes with examples

1.3.3 *Sycon* – External Characters, Types of cells,

1.3.4 Skelton in Sponges

1.3.5 Canal system in sponges

Unit - II

2.1 Coelenterata

2.1.1 General characters

2.1.2 Classification of Coelenterata up to classes with examples

2.1.3 *Obelia* - External Characters, Structure of Polyp and Medusa

2.1.4 Polymorphism in coelenterates

2.1.5 Corals and coral reef formation

2.2 Platyhelminthes

2.2.1 General characters

2.2.2 Classification of Platyhelminthes upto classes with examples

2.2.3 *Fasciola hepatica* - External Characters, Excretory system, Reproductive System,
Life History and pathogenicity

Unit - III

3.1 Nematelminthes

3.1.1 General characters

3.1.2 Classification of Nematelminthes up to classes with examples

3.2 Annelida

3.2.1 General characters

3.2.2 Classification of Annelida up to classes with examples

3.2.3 *Hirudinaria granulosa* - External Characters, Digestive System, Excretory System

3.2.4 Coelomoducts

3.2.5 Vermiculture - Scope, significance, earthworm species, processing, Vermicompost, economic importance of vermicompost

Unit - IV

4.1 Arthropoda

4.1.1 General characters

4.1.2 Classification of Arthropoda up to classes with examples

4.1.3 Prawn - External Characters, Appendages, Respiratory system and Circulatory System

4.1.4 *Peripatus* - Structure and affinities

4.2 Mollusca

4.2.1 General characters

4.2.2 Classification of Mollusca up to classes with examples

4.2.3 Pearl formation in Pelecypoda

4.2.4 Torsion in gastropods

Unit - V

5.1 Echinodermata

5.1.1 General characters

5.1.2 Classification of Echinodermata up to classes with examples

5.1.3 Water vascular system in star fish

5.2 Hemichordata

5.2.1 General characters

5.2.2 Classification of Hemichordata up to classes with examples

5.2.3 *Balanoglossus* - Structure and affinities

5.3 Non-Chordata larval forms

5.3.1 Amphiblastula

5.3.2 Ephyra

5.3.3 Trochophore

5.3.4 Nauplius

5.3.5 Glochidium

5.3.6 Bipinnaria

5.3.7 Tornaria

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ZOOLOGY MODEL PAPER FOR I SEMESTER

ZOOLOGY - PAPER - I

ANIMAL DIVERSITY - NONCHORDATES

Time : 3 hrs

Max. Marks : 75

I. Answer any FIVE of the following :

5x5=25

Draw labeled diagrams wherever necessary

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

II. Answer any FIVE of the following:

5x10=50

Draw labeled diagrams wherever necessary

9.

OR

10.

OR

11.

OR

12.

OR

13.

OR

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ZOOLOGY PRACTICAL SYLLABUS FOR I SEMESTER

ZOOLOGY - PAPER - I
ANIMAL DIVERSITY - NONCHORDATES

Periods: 24

Max. Marks: 50

Observation of the following slides / spotters / models

Protozoa	: <i>Elphidium, Paramecium</i> - Binary fission and conjugation
Porifera	: <i>Spoonbill, Euspongia, Sycon, Sycon</i> - T.S and L.S
Coelenterata	: <i>Obelia</i> - colony and medusa, <i>Physalia, Velella, Corallium, Gorgonia, Pennatula</i>
Platyhelminthes	: <i>Planaria, Fasciola hepatica, Fasciola</i> larval forms - Miracidium, Redia, Cercaria, <i>Echinococcus granulosus</i>
Nemathelminthes	: <i>Ascaris</i> - Male and female, <i>Ancylostoma duodenale</i>
Annelida	: <i>Neries, Heteroneries, Aphrodite, Hirudo</i> , Trochophore larva
Arthropoda	: Mouth parts of male and female <i>Anopheles</i> and <i>Culex</i> , Mouth parts of housefly, Mouth parts of Scorpion, Nauplius, Mysis, Zoea larvae, crab, prawn, <i>Scolopendra, Sacculina, Limulus, Peripatus</i>
Mollusca	: <i>Chiton, Murex, Sepia, Loligo, Octopus, Nautilus</i> , Glochidium larva
Echinodermata	: <i>Ophiothrix, Echinus, Clypeaster, Cucumaria, Antedon, Asterias</i> , Bipinnaria larva
Hemichordata	: <i>Balanoglossus</i> , Tornaria larva

Demonstration of dissection / dissected / virtual dissection :

1. Leech / Prawn / Scorpion / Crab - Digestive system
2. Prawn - Appendages
3. Prawn / Scorpion / Crab - Nervous system
4. *Pila / Unio* - Digestive system
5. Mounting of Statocyst
6. Mounting of Radula

b Laboratory record work shall be submitted at the time of practical examination

b Compulsory one species to be adopted for demonstration only by the faculty

b Computer aided techniques should be adopted as per UGC guide lines

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ZOOLOGY SYLLABUS FOR II SEMESTER

ZOOLOGY - PAPER - II

ANIMAL DIVERSITY - CHORDATES

Periods: 60

Max. Marks: 100

Unit - I

- 1.1 General characters of Chordata**
- 1.2 Prochordata**
 - 1.2.1 Salient features of Cephalochordata
 - 1.2.2 Structure of *Branchiostoma*
 - 1.2.3 Affinities of Cephalochordata
 - 1.2.4 Salient features of Urochordata
 - 1.2.5 Structure and life history of *Herdmania*
 - 1.2.6 Significance of Retrogressive metamorphosis

Unit - II

- 2.1 Cyclostomata**
 - 2.1.1 General characters of Cyclostomata
 - 2.1.2 Comparison of the *Petromyzon* and *Myxine*
- 2.2 Pisces**
 - 2.2.1 General characters of Fishes
 - 2.2.2 Classification of fishes up to sub - class level with examples
 - 2.2.3 *Scoliodon* - External features, Digestive system, Respiratory system, Heart, Brain
 - 2.2.4 Migration in Fishes
 - 2.2.5 Types of Scales
 - 2.2.6 Dipnoi

Unit - III

- 3.1 Amphibia**
 - 3.1.1 General characters of Amphibian
 - 3.1.2 Classification of Amphibia upto orders with examples.
 - 3.1.3 *Rana hexadactyla* - External features, Digestive system, Respiratory system, Heart, Brain
- 3.2 Reptilia**
 - 3.2.1 General characters of Reptilia
 - 3.2.2 Classification of Reptilia upto orders with examples

3.2.3 Calotes - External features, Digestive system, Respiratory system, Heart, Brain

3.2.4 **Identification of Poisonous snakes** and Skull in reptiles

Unit - IV

4.1 Aves

4.1.1 General characters of Aves

4.1.2 Classification of Aves upto subclasses with examples.

4.1.3 *Columba livia* - External features, Digestive system, Respiratory system,
Heart, Brain

4.1.4 Migration in Birds

4.1.5 Flight adaptation in birds

Unit - V

5.1 Mammalia

5.1.1 General characters of Mammalia

5.1.2 Classification of Mammalia upto sub - classes with examples

5.2 Comparison of Prototherians, Metatherians and Eutherians

5.3 Dentition in mammals



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ZOOLOGY MODEL PAPER FOR II SEMESTER

ZOOLOGY - PAPER - II

ANIMAL DIVERSITY - CHORDATES

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following:

5x5=25

Draw labeled diagrams wherever necessary

1. *Amphioxus*
2. Placoid scale
3. Quill feather
4. Prototheria
5. Anadromous migration
6. *Draco*
7. Emu
8. Apoda

II. Answer any FIVE of the following:

5x10=50

Draw labeled diagrams wherever necessary

9. Explain the life history of *Herdmania*

OR

Explain the origin and general characters of chordates

10. Compare the characters of *Petromyzon* and *Myxine*

OR

Describe the structure of heart of *Scoliodon*

11. Describe the brain of *Rana hexadactyla*

OR

Explain the external features of *Calotes*

12. Write an essay on flight adaptations in birds

OR

Explain the respiratory system of *Columba livia*

13. Compare the characters of Metatheria and Eutheria

OR

Write an essay on dentition in mammals

ZOOLOGY PRACTICAL SYLLABUS FOR II SEMESTER

ZOOLOGY - PAPER - II

ANIMAL DIVERSITY - CHORDATES

Periods: 24

Max. Marks: 50

Observation of the following slides / spotters / models

- Protochordata** : *Herdmania, Amphioxus, Amphioxus* T.S. through pharynx
- Cyclostomata** : *Petromyzon, Myxine*
- Pisces** : *Pristis, Torpedo, Channapleuronectes, Hippocampus, Exocoetus, Eheneis, Labeo, Catla, Clarius, Auguilla, Protopterus*
Placoid scale, Cycloid scale, Ctenoid scale
- Amphibia** : *Ichthyophis, Amblystoma, Siren, Hyla, Rachophous*
Axolotl larva
- Reptilia** : *Draco, Chamaeleon, Uromastix, Vipera russeli, Naja, Bungarus, Enhydrina, Testudo, Trionyx, Crocodilus*
- Aves** : *Passer, Psittacula, Bubo, Alcedo, Columba, Corvus, Pavo*, Study of different types of feathers : Quill, Contour, Filoplume down
- Mammalia** : *Ornithorhynchus, Tachyglossus, Pteropus, Funambulus, Manis, Loris*, Hedgehog
- Osteology** : Appendicular skeletons of Varanus, Pigeon
Rabbit - Skull, fore limbs, hind limbs and girdles

Demonstration of dissection / dissected / virtual dissection:

1. V, VII, IX, X cranial nerves of shark / locally available fishes
2. Arterial system, venous system of Shark / Calotes / Fowl / Rat
3. Digestive system of fish

b Laboratory record work shall be submitted at the time of practical examination

b Compulsory one species to be adopted for demonstration only be the faculty

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ZOOLOGY SYLLABUS FOR III SEMESTER

ZOOLOGY - PAPER - III

CYTOLOGY, GENETICS AND EVOLUTION

Periods: 60

Max. Marks: 100

Unit - I

1. Cytology - I

- 1.1 Definition, history, prokaryotic and eukaryotic cells, virus, viroids, mycoplasma
- 1.2 Electron microscopic structure of eukaryotic cell.
- 1.3 Plasma membrane – Different models of plasma membrane.

Unit – II

2. Cell organelles

- 2.1 Structure and functions of Endoplasmic Reticulum
- 2.2 Structure and functions of Golgi apparatus
- 2.3 Structure and functions of Lysosomes
- 2.4 Structure and functions of Ribosomes
- 2.5 Structure and functions of Mitochondria
- 2.6 Nucleus
- 2.7. **Chromatin - Structure and significance**, Chromosomes - Structure, types, functions

Unit - III

3.1 Genetics - I

- 3.1.1 Mendel's work on transmission on traits
- 3.1.2 Principles of inheritance
- 3.1.3 Incomplete dominance and codominance
- 3.1.4 Lethal alleles, Epistasis, Pleiotropy

Unit - IV

4.1 Genetics - II

- 4.1.1 Sex determination
- 4.1.2 Sex linked inheritance
- 4.1.3 Linkage and crossing over
- 4.1.4 Extra chromosomal inheritance
- 4.1.5 Human karyotyping

Unit - V

5.1 Evolution

5.1.1 Origin of life

5.1.2 Lamarckism, Darwinism, Neo – Darwinism, Hardy-Weinberg Equilibrium.

5.1.3 Variations, isolating mechanisms, natural selection

5.1.4 Types of natural selection (directional, stabilizing, disruptive)

5.1.5 Artificial selection and forces of evolution

5.1.6 Speciation (Allopatric and Sympatric)

5.1.7 Macro evolutionary principles (Example: Darwin's finches)



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ZOOLOGY MODEL PAPER FOR III SEMESTER

ZOOLOGY - PAPER - III

CYTOLOGY, GENETICS AND EVOLUTION

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following:

5x5=25

Draw labeled diagrams wherever necessary

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

II. Answer any FIVE of the following:

5x10=50

Draw labeled diagrams wherever necessary

9.

OR

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ZOOLOGY PRACTICAL SYLLABUS FOR III SEMESTER

ZOOLOGY - PAPER - III

CYTOLOGY, GENETICS AND EVOLUTION

Periods: 24

Max. Marks: 50

I. Cytology

1. Preparation of temporary slides of Mitotic divisions with onion root tips
2. Observation of various stages of Mitosis and Meiosis with prepared slides
3. Mounting of salivary gland chromosomes of *Chironomus*

II. Genetics

1. Study of Mendelian inheritance using suitable examples
2. Study of linkage recombination, gene mapping using the data
3. Study of human karyotypes

III. Evolution

1. Study of fossil evidences
2. Study of homology and analogy from suitable specimens and pictures
3. Phylogeny of horse with pictures
4. Darwin's finches (pictures)
5. Visit to natural history museum and submission of report

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ZOOLOGY SYLLABUS FOR IV SEMESTER

ZOOLOGY - PAPER - IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Periods: 60

Max. Marks: 100

Unit - I

- 1.1 Developmental Biology and Embryology**
- 1.1.1 Gametogenesis
 - 1.1.2 Fertilization
 - 1.1.3 Types of eggs
 - 1.1.4 Types of cleavages
- 1.2 Development of Frog upto formation of primary germ layers
- 1.3 Formation and functions of Foetal membrane in chick embryo
- 1.4 Development, types and functions of Placenta in mammals

Unit - II

- 2.1 Physiology - I**
- 2.1.1 Elementary study of process of digestion
 - 2.1.2 Absorption of digested food
 - 2.1.3 Respiration - Pulmonary ventilation, transport of oxygen and carbondioxide
 - 2.1.4 Circulation - Structure and functioning of heart, Cardiac cycle
 - 2.1.5 Excretion - Structure of nephron, urine formation, counter current mechanism

Unit - III

- 3.1 Physiology - II**
- 3.1.1 Nerve impulse transmission - Resting membrane potential, origin and propagation of action potentials along myelinated and non-myelinated nerve fibers
 - 3.1.2 Muscle contraction - Ultra structure of muscle fibre, molecular and chemical basis of muscle contraction
 - 3.1.3 Endocrine glands - Structure, secretions and the functions (of hormones) of pituitary, thyroid, parathyroid, adrenal glands and pancreas
 - 3.1.4 Hormonal control of reproduction in a mammal

Unit - IV

- 4.1 Ecology - I**
- 4.1.1 Meaning and scope of Ecology
 - 4.1.2 Important abiotic factors of Ecosystem - Temperature, light, water, oxygen and CO₂
 - 4.1.3 Nutrient cycles - Nitrogen, carbon and phosphorus

- 4.1.4 Components of Ecosystem (Example: lake), food chains and food web, energy flow in ecosystem

Unit - V

5.1 Ecology - II

5.1.1 Habitat and ecological niche

5.1.2 Community interactions - Mutualism, commensalism, parasitism, competition, predation

5.1.3 Ecological succession

5.1.4 Population studies

5.2 Zoogeography

5.2.1 Zoogeographical regions

5.2.2 Study of physical and faunal peculiarities of Oriental, Australian and Ethiopian regions



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ZOOLOGY MODEL PAPER FOR IV SEMESTER

ZOOLOGY - PAPER - IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Time: 3 hrs

Max. Marks: 75

I. Answer any FIVE of the following:

5x5=25

Draw labeled diagrams wherever necessary

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

II. Answer any FIVE of the following:

5x10=50

Draw labeled diagrams wherever necessary

- 9.
- 10.
- 11.
- 12.
- 13.

OR

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OR

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ZOOLOGY PRACTICAL SYLLABUS FOR IV SEMESTER

ZOOLOGY - PAPER - IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Periods: 24

Max. Marks: 50

I. Embryology

1. Study of T.S. of testis, ovary of a mammal
2. Study of different stages of cleavages (2, 4, 8 cell stages)
3. Study of chick embryos of 18 hours, 24 hours, 33 hours and 48 hours of incubation

II. Physiology

1. Qualitative tests for identification of carbohydrates, proteins and fats
2. Qualitative tests for identification of ammonia, urea and uric acid
3. Study of activity of salivary amylase under optimum conditions
4. Study of prepared slides of T.S. of duodenum, liver, lung, kidney, spinal cord, bone and cartilage

III. Ecology

1. Determination of pH of given sample
2. Estimation of dissolved oxygen of given sample
3. Estimation of total alkalinity of given sample
4. Estimation of salinity of given sample

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A.P. State Council of Higher Education
Revised Common Framework of CBCS for Colleges in Andhra Pradesh
w.e.f. 2015-16, Revised in April, 2016

Table-7: B.Sc., SEMESTER – I

Sno	Course	Total Marks	Mid Sem Exam*	Sem End Exam	Teaching Hours	Credits
1	First Language (Tel/Hin/Urdu/Sans...)	100	25	75	4	3
2	Second Language English	100	25	75	4	3
3	<i>Foundation Course - 1</i> Human Values & Professional Ethics	50	0	50	2	2
4	<i>Foundation course -2</i> Environmental Studies	50	0	50	2	2
5	DSC-1 Paper-1 (Core)	100	25	75	4	3
6	DSC 1 Lab Practical	50	0	50	2	2
7	DSC 2 Paper-1 (Core)	100	25	75	4	3
8	DSC 2 Lab Practical	50	0	50	2	2
9	DSC 3 Paper-1 (Core)	100	25	75	4	3
10	DSC 3 A Lab Practical	50	0	50	2	2
	Total	750	-	-	30	25

#DSC: Domain (Subject) Specific Course (Paper)

Foundation Course: value or skill based

Note: For Science Domain Subjects which had no lab practical component earlier (eg. Mathematics) the following format is applicable. They, however, will have co-curricular activities (eg. Problem solving sessions etc.). The total marks will change accordingly for such combinations. For example for Maths, Physics and Chemistry the total marks will be 700.

	DSC (without Lab Practical)	100	25	75	6	5
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*Mid sem exam at the college (The marks split between Formal Test and Co-curricular activities may be decided by the University concerned). End Sem Exam by the Univ.

*Practical component will not be applicable to those science subjects which had no such component earlier (ex. Mathematics)

**Syllabus size shall be in accordance with the number of teaching hours

Table-8: B.Sc., SEMESTER – II

Sno	Course	Total Marks	Mid Sem Exam	Sem End Exam	Teaching Hours	Credits
1	First Language (Tel/Hin/Urdu/Sans...)	100	25	75	4	3
2	Second Language English	100	25	75	4	3
3	<i>Foundation course – 3</i> ICT – I	50	0	50	2	2
4	<i>Foundation course – 4</i> CSS – I	50	0	50	2	2
5	DSC 1 Paper-2 (Core)	100	25	75	4	3
6	DSC 1 Lab Practical	50	0	50	2	2
7	DSC 2 Paper-2 (Core)	100	25	75	4	3
8	DSC 2 Lab Practical	50	0	50	2	2
9	DSC 3 Paper-2 (Core)	100	25	75	4	3
10	DSC 3 Lab Practical	50	0	50	2	2
	Total	750	-	-	30	25

B.Sc. Table-9: B.Sc., SEMESTER – III

SEMESTER – III

Sno	Course	Total Marks	Mid Sem Exam	Sem End Exam	Teaching Hours	Credits
1	First Language (Tel/Hin/Urdu/Sans...)	100	25	75	4	3
2	Second Language English	100	25	75	4	3
3	<i>Foundation Course - 5</i> ICT – II	50	0	50	2	2
4	<i>Foundation course – 6</i> CSS – II	50	0	50	2	2
5	DSC 1 Paper-3 (Core)	100	25	75	4	3
6	DSC 1 Practical	50	0	50	2	2
7	DSC 2 Paper-3 (Core)	100	25	75	4	3
8	DSC 2 Practical	50	0	50	2	2
9	DSC 3 Paper-3 (Core)	100	25	75	4	3
10	DSC 3 Practical	50	0	50	2	2
	Total	750	-	-	30	25

Table-10: B.Sc., SEMESTER – IV

SEMESTER – IV

Sno	Course	Total Marks	Mid Sem Exam*	Sem End Exam	Teaching Hours**	Credits
1	<i>Foundation Course – 7</i> CSS – 2	50	0	50	2	2
2	<i>Foundation Course – 8</i> Analytical Skills	50	0	50	2	2
3	<i>Foundation Course - 9</i> Entrepreneurship	50	0	50	2	2
4	<i>Foundation course – 10</i> Leadership Education	50	0	50	2	2
5	DSC 1 Paper-4 (Core)	100	25	75	4	3
6	DSC 1 Lab Practical	50	0	50	2	2
7	DSC 2 Paper-4 (Core)	100	25	75	4	3
8	DSC 2 Lab Practical	50	0	50	2	2
9	DSC 3 Paper-4 (Core)	100	25	75	4	3
10	DSC 3 Lab Practical	50	0	50	2	2
	Total	750	-	-	30	23

*Analytical Skills: To be taught by Maths/Stat Teachers (may be partly by English Teachers)

Entrepreneurship: To be taught by Commerce Teachers

Leadership Education: To be taught by Telugu Teachers

Table-11: B.Sc., SEMESTER – V

Sno	Course	Total Marks	Mid Sem Exam	Sem End Exam	Teaching Hours	Credits
1	DSC 1 Paper-5 (Core)	100	25	75	3	3
2	DSC 1 Lab Practical	50	0	50	2	2
3	DSC 2 Paper-5 (Core)	100	25	75	3	3
4	DSC 2 Lab Practical	50	0	50	2	2
5	DSC 3 Paper-5 (Core)	100	25	75	3	3
6	DSC 3 Lab Practical	50	0	50	2	2
7	DSC 1 Paper-6 (Core)	100	25	75	3	3
8	DSC 1 Lab Practical	50	0	50	2	2
9	DSC 2 Paper -6 (Core)	100	25	75	3	3
10	DSC 2 Lab Practical	50	0	50	2	2
11	DSC 3 Paper-6 (Core)	100	25	75	3	3
12	DSC 3 Lab Practical	50	0	50	2	2
	Total	900	-	-	30	30

Table-12: B.Sc., SEMESTER – VI

Sno	Course	Total Marks	Mid Sem Exam	Sem End Exam	Teaching Hours	Credits
1	Elective 1: DSC 1, Paper -7 (applied/adv)	100	25	75	3	3
2	Elective-1 Lab Practical	50	0	50	2	2
3	Elective-1: DSC 2, Paper -7 (applied/adv)	100	25	75	3	3
4	Elective-2 Lab Practical	50	0	50	2	2
5	Elective-1: DSC 3, Paper -7 (applied/adv)	100	25	75	3	3
6	Elective-3 Lab Practical	50	0	50	2	2
7	Elective -2: DSC 1, Paper -8 App/Inter-domain/Gen EI	100	25	75	3	3
8	Elective-2 Lab Practical	50	0	50	2	2
9	Elective -2: DSC 2, Paper -8 App/Inter-domain/Gen EI	100	25	75	3	3
10	Elective-2 Lab Practical	50	0	50	2	2
11	Elective -2: DSC 3, Paper -8 App/Inter-domain/Gen EI	100	25	75	3	3
12	Elective-2 Lab Practical	50	0	50	2	2
	Total	900	-	-	30	30

*7th paper of each of the domain specific subjects (1st paper of semester VI) will be a domain related Elective. More than one Elective may be offered giving choice to students. The Electives may be of Domain specific applied or advanced (specialization) in nature. The number of Electives may be decided (along with the syllabus) by the University concerned keeping the feasibility of conduct of University examinations in view.

** Applied Elective: It is desirable that around 25% of syllabus is taught by field experts. The college has to make such an arrangement.

*8th paper of each of the domain specific subjects (2nd paper of semester VI) will also be an Elective. The Electives may be of Inter-domain Clusters** - each Cluster having three papers with or without project work. or General in nature. The number of Clusters may be decided (along with the syllabus) by the University concerned keeping the feasibility of conduct of University examinations in view. It is desirable that around 25% of syllabus is taught by field experts.

**Cluster: In the last semester, for paper-8, each domain subject has one elective totaling three papers for each student. Electives may be given as Clusters of three papers each for each subject. A student can opt for all the three papers of the same subject (cluster or stream) including or

excluding project work for a wider learning experience. The student will not study the other two domain subjects for paper-8.

Total Credits for a B.Sc. Course: 158