

ST. JOSEPH'S UNIVERSITY

BENGALURU-27



BSc BIOLOGY SYLLABUS

SYLLABUS FOR UNDERGRADUATE PROGRAMME

Semester	III
Paper Code	BY323
Paper Title	Biology Paper III
Number of teaching hours per week	04
Total number of teaching hours of theory per semester	56
Number of theory credits	04
Total number of teaching hours of practicals per semester	56
Number of practicals credits	02

Course Title: BIOLOGY PAPER III	Course Credits: 4
Course Code: BY323	L-T-P per week: 0-0-4
Total Contact Hours: 56 hrs	Duration of ESA: 2 Hours
Formative Assessment Marks:50	Summative Assessment Marks:50

Unit I	Pteridophytes	14 hrs
	General characteristics of Pteridophytes. Systematic position, sporophytic structure, reproduction and life cycle of <i>Psilotum</i> , <i>Lycopodium</i> , <i>Equisetum</i> , and <i>Marsilea</i> [<u>Morphology of <i>Equisetum</i> and <i>Marsilea</i> – self study</u>]. Study of fossil Pteridophyte - <i>Rhynia</i> .	10 + 1 hrs
	A brief account of heterospory and seed habit. Stellar evolution in Pteridophytes.	2 hrs
	<u>Economic importance of Pteridophytes (Self study).</u>	1 hr
Unit II	Gymnosperms	14 hrs
	General characters of Gymnosperms <u>Salient features of Cycadales, Coniferales and Gnetales (Self study).</u>	2 + 1 hr
	Study of the habitat, distribution, habit, anatomy, reproduction and life-cycles in <i>Pinus</i> and <i>Gnetum</i> (Developmental details not required) Study of fossil Pteridophytes – <i>Glossopteris</i> , <i>Pentoxylon</i>	11 hrs
	<u>Economic importance of Gymnosperms (Self study)</u>	1 hr
Unit III	Protochordata	9 hrs
	Salient features of Chordates and classification Origin of Chordates – A brief account of Echinoderm theory, Ascidian theory and Lophophorate theory.	3 hrs
	Hemichordata- Salient features of Hemichordates Balanoglossus - external, structure of Tornaria larva and its significance	2 hrs
	Cephalochordata - Salient features of Cephalochordates Amphioxus - external and modes of feeding	2 hrs
	Urochordata - Salient features of Urochordates Ascidian-external, Ascidian tadpole and retrogressive metamorphosis	2 hrs
Unit IV	Agnatha	5 hrs
	Theories regarding the origin of vertebrates - Branchiostome ancestry, Balanoglossus ancestry.	1 hr
	External features of Petromyzon	1 hr
	Ammocoetes larva- structure and its phylogenetic significance	1 hr
	Salient features of Agnatha Classification up to classes, with suitable examples (Self study)	2 hrs

Unit V	Pisces	8 hrs
	General characters – with emphasis on the primary aquatic adaptations, classification up to orders, with suitable examples. Differences between cartilaginous & bony fishes.	3 hrs
	Pisciculture – rearing, breeding and preservation of fishes	2 hrs
	Migration of fishes, Potamodromous, Oceanodromous, Catadromous and Anadromous with suitable examples.	2 hr
	Interesting features of dipnoi	1 hr
Unit VI	Amphibia	7 hrs
	General characters and classification up to living orders with examples, a brief account of the origin of amphibia	2 hrs
	Frog endoskeleton.	3 hrs
	Neuro-endocrine control of metamorphosis in Amphibia	1 hr
	Parental care in Amphibia– <i>Pipa</i> , <i>Gastrothecus</i> , <i>Alytes</i> and <i>Ichthyophis</i> (Self study)	1 hr
Practicals	<ol style="list-style-type: none"> 1. Study of morphology, anatomy and reproductive parts of <i>Psilotum</i>, <i>Lycopodium</i>, <i>Selaginella</i>. 2. Study of morphology, anatomy and reproductive parts of <i>Equisetum</i>, <i>Marsilea</i> 3. Study of morphology, anatomy and reproductive parts of <i>Pinus</i> 4. Study of morphology, anatomy and reproductive parts of <i>Gnetum</i> 5. Study of <i>Rhynia</i>, <i>Glossopteris</i> and <i>Pentoxylon</i> 6. Protochordates <ul style="list-style-type: none"> • Amphioxus – w.m, T.S. through pharynx and T.S. through intestine • Balanoglossus – w.m, T.S. passing through proboscis • Ascidia, Ascidian tadpole 7. Agnatha <ul style="list-style-type: none"> • Petromyzon, Myxine and Ammocoetes larva 8. Fishes <ul style="list-style-type: none"> • Electric Ray, Saw fish, Sucker fish, Globe fish, Eel- Muraena, Hippocampus, Flat fish. • Accessory respiratory organs in Anabas, Clarias and Saccobranthus. 	

	<p>9. Amphibians (part 1)</p> <ul style="list-style-type: none"> • Bufo, Hyla, Ambystoma, Axolotl, Ichthyophis, Necturus, Salamander <p>10. Amphibians (part 2)</p> <ul style="list-style-type: none"> • Frog endoskeleton (Skull, Vertebrae, Girdles and limb bones) 	
<p>References</p>	<ol style="list-style-type: none"> 1. The morphology of Pteridophytes by K.R.Sporne, Hutchinsion Co., London (1970). 2. Pteridophytes by Rasheed, Vikas Publication, New Delhi. 3. Cryptogamic Botany Vol. II McGraw – Hill, New York. 4. The morphology of Pteridophytes by N.S.Parihar. Central Book Depot, Allahabad. 5. Morphology of vascular plants (lower groups) by Eames, A.J.1936. McGraw Hill, New York. 6. Studies in Paleobotany, Andrews, H.N. 1961. John Wiley, New York. 7. Andrews H.N. 1961 Studies in Paleobotany. John Wiley & Sons New York. 8. Chamberlain C.J. 1935. Gymnosperms. Structure and evolution. Univ, Chicago Press, Chikcago. 9. Coulter, J.M. & Chamberlain C.J. 1917 Morphology of Gymnosperms. Univ Chicago Press, Chicago. 10. Bhatnagar S.P. and AlokMitra 1966 Gymnosperms. New age International (P) Ltd. Publishers. 11. Sporne K.R. 1974 The Morphology of Gymnosperms. Hutchinson Univ. Lib. London. 12. Shripad N. Agashe 1995 – Paleobotany. Oxford and I.B.H. New Delhi. 13. Dutta S.C. 1966 An Introduction to Gymnosperms. Asia Publications House, Mumbai. 14. A MANUAL OF PRACTICAL ZOOLOGY: CHORDATES. P. S. Verma, S. Chand Publishing, 2000. ISBN 8121908302, 9788121908306. 	

15. A MANUAL OF PRACTICAL ZOOLOGY-
CHORDATES. **Verma, P.S.** (2002). S. Chand and
Co. Ltd.
16. A MANUAL OF ZOOLOGY.
Ekambaranatha Ayyar. (2000). Vol. II
S. Viswanathan and Co. .
17. A TEXTBOOK OF ZOOLOGY **Parker, T.J and
Haswell, W.A.** 1962., Vol.2, Vertebrates, 7th
edition Mac Millan Press, London.
18. A TEXTBOOK OF CHORDATES. **R.
McNeill Alexander** 2002 H.S.
Bhamrah (Author), Kavita
19. A TEXTBOOK OF VERTEBRATE ZOOLOGY.
S. N. Prasad, Vasantika Kashyap. New
Age International, 1989. ISBN
0852269285, 9780852269282
20. BIOLOGY OF CYCLOSTOMES. **Hardisty M W.**
21. CHORDATE ORIGINS AND EVOLUTION: THE
MOLECULAR EVOLUTIONARY ROAD TO
VERTEBRATES. **Noriyuki Satoh.** Academic Press,
2016. ISBN 0128030062, 9780128030066.
22. CHORDATE ZOOLOGY. **Bhaskaran, K. K.
and Biju Kumar, A.** (2003). Manjusha
Publications. Calicut. .
23. CHORDATE ZOOLOGY. **Jordan E. L. and P. S.
Verma.** (2002). S. Chand and Co. New Delhi .
24. CHORDATE ZOOLOGY. **P. S. Verma.** S.
Chand Publishing, 1965. ISBN
8121916399, 9788121916394.
25. CHORDATE ZOOLOGY: A Textbook for B. Sc. Students of Indian
Universities.

Dhami P. S.. R Chand, 1977.
26. COLOUR CHANGES IN ANGUILLA. **Neil RM**
27. EPIGENETICS OF BIRDS. **Waddigton CH**
28. GENERAL ZOOLOGY. **Storer and Usinger**
29. LIFE: AN INTRODUCTION TO BIOLOGY.
William S. Beck, Karel, F., Liem and George

Gaylord Simpson. (2000). Harper Collins Publishers, New York. 9 ·

30. MANUAL OF ZOOLOGY **Ekambaranatha Ayyar, T. N. Ananthkrishnan**. Volume II
Part I – Chordata
31. MODERN TEXTBOOK OF ZOOLOGY: VERTEBRATES. **Kotpal, R.L.** (2000).
Rastogi Publications, Meerut.
32. THE CHORDATES. **R. McNeill Alexander**. CUP Archive, 1981
ISBN 0521236584,
9780521236584.
33. THE FISHES OF INDIA BEING A
NATURAL HISTORY OF FISHES KNOWN
TO INHABIT THE WATERS OF BURMA
AND CEYLON. **Day F.**
34. THE LIFE OF VERTEBRATES. **Young J.Z.** (2006). Oxford
University Press
35. THE VERTEBRATE BODY, W.B.S. Saunders, Philadelphia
36. VERTEBRATE PALEANTOLOGY. **Romer AS. Chicago**
37. VERTEBRATE ZOOLOGY; AN
INTRODUCTION TO THE COMPARATIVE
ANATOMY, EMBRYOLOGY, AND
EVOLUTION OF CHORDATE ANIMALS **De
Beer, Gavin.**
38. VERTEBRATES. F. **Harvey Pough, John B.
Heiser, Christine M. Janis Benjamin
Cummings**, 2008 - Hyman's Comparative
Vertebrate Anatomy Edited By Marvaley H.
Wake
39. VERTEBRATES. **Kardong**. Tata McGraw-Hill
Education, 2005. ISBN 0070607508,
9780070607507.
40. VERTEBRATES. **Norman K. Wessels,
Elizabeth M. Center**. Jones & Bartlett
Learning, 1992. ISBN 0867208538,
9780867208535

BLUE PRINT

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Title of the paper: **BIOLOGY PAPER 3**

Total marks for which the questions are to be asked (including bonus questions)	Number of hrs	Chapter/ Unit number
19	14	I
18	14	II
12	9	III
7	5	IV
11	8	V
9	6	VI
76	56	TOTAL
Maximum marks for the paper (Excluding bonus question): 76		