

**A.G&S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS &  
SCIENCE VUYYURU, KRISHNA Dt. A.P.(Autonomous)**  
**Accredited by NAAC with “A” Grade**



**DEPARTMENT OF ZOOLOGY**  
**MINUTES OF BOARD OF STUDIES**

**B.Sc. AQUACULTURE(industrial Fisheries)**

**16-10-2019**

**EVEN SEMESTER**



2

Minutes of the meeting of Board of studies in Zoology for the Autonomous courses of AG & SG Siddhartha Degree College of Arts & Science, Vuyyuru, held at 10.30 AM on 16-10-2019 in the Department of Zoology.

Smt.D.A. Kiranmayee. ...

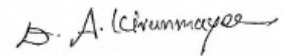
Presiding

**Members Present:**

- 1) S. Aruna Kiranmayee Chair person  
(Smt. D.A.Kiranmayee.) 16/10/19 Head, Department of Zoology,  
A.G&S.G.S Degree College of  
Vuyyuru-521165.
- 2) J. Navaneetha Latha University Nominee  
(Dr.J.N.Lavanya Latha.) 16/10/19 Dr. J.N.Lavanya Latha,  
Krishna University,  
Machilipatnam.
- 3) K. Daniel Academic Council  
(Dr. K.Daniel.) 16/10/19 Nominee Head, Department of Zoology,  
JKC College,  
Guntur,
- 4) B. Elia Academic Council  
(B. Elia.) 16/10/19 Nominee Head, Department of Zoology,  
Gov. Degree College,  
Pitapuram.
- 5) M. Lakshmi Priyanka Member  
(kum.M.Lakshmi Priyanka.) 16/10/19 Lecturer in Zoology,  
A.G&S.G.S Degree College  
Vuyyuru-521165.
- 6) B. Appala Naidu Industrialist  
(B. Appala Naidu.) 16/10/19 Asst. Project Manager,  
RGCA  
Manikonda.
- 7) Ch. Chiranjeevi Student Represent  
(Ch.Chiranjeevi.) 16/10/19 P.hd –Research Scholar,  
Dept.of Botany & Microbiology,  
Acharya Nagarjuna University,  
Guntur.

**Agenda for B.O.S Meeting.**

1. To recommend the new course aquaculture for the academic year 2019-2020.
2. To recommend the syllabi (Theory & Practical), Model question paper for II Semester of I B.Sc (A.B.C) for the academic year 2019-2020.
3. To recommend the syllabi (Theory & Practical), Model question paper and Blue print of II semester of I, B.Sc (A.B.C.) for the academic year 2019-2020.
4. To recommend the teaching and evolution methods to be followed under Autonomous statues.
5. Any other matter.



Chairman.

## **RESOLUTIONS**

1. It is resolved to implement the new course B.Sc Aquaculture

2. It is resolved to implement the framed syllabi (Theory & Practical), model question paper of II Semester of I B.Sc. (A.B.C) under Choice Based Credit System (CBCS) for the academic Year 2019 – 2020.

3. It is resolved to follow the Model question paper and Blue print of II semester of I B.Sc.(A.B.C.) for the academic year 2019-2020.

4. It is resolved to continue the following teaching & evolution methods for the Academic year 2019-20.

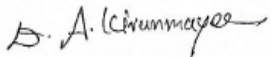
5 Any other matter.

### **Teaching methods:**

Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

### **Evaluation of a student is done by the following procedure:**

- **Internal Assessment Examination:**
- Out of maximum 100 marks in each paper for I, B.Sc (A.B.C) 30 marks shall be allocated for internal assessment.
- Out of these 30 marks, 20 marks are allocated for announced tests (i.e. IA-1& IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance and remaining 5 marks are allocated for the assignment for I, B.Sc (A.B.C).
- **Semester – End Examination:**
- The maximum mark for I (A.B.C) semester – End examination shall be 70 marks and duration of the examination shall be 3 hours. Even though the candidate is absent for two IA exams/ obtain Zero marks the external marks are considered (if the candidate gets 40/70) and the result shall be declared as "PASS".
- Semester – End examination shall be conducted in theory papers at the end of every semester, while in practical papers, these examinations are conducted at the end of II semester for I B.Sc. (A.B.C).

  
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**Adusumilli Gopalakrishnaiah & Sugar Cane Growers Siddhartha Degree  
College of Arts & Science, Vuyyuru-521165, Krishna Dt. ,A.P.  
(Autonomous).**

**Aquaculture**

**Class: I B.Sc .( ABC)**

**Credits : 3**

**Title of the paper: Biology of fin fish & shell fish**

**60 hrs.(4hrs/week)**

**Semester – II**

**PAPER-II**

**w.e.f. 2019-2020**

**(Code: Aqu-201C)**

**Max.Marks : 70**

**Objective of the course:** To introduce the Biology of fin fish & shell fish. General characters, Classification, growth and Development crustacean shellfish

**Course outcomes:**

1. Understand the characters and classification of cultivable Fin and Shell fish and commercial importance of crustaceans and Fish .
2. Gain Knowledge of feeding habits, gut content analysis and growth factors in fishes.
3. Understand and learn breeding in fishes, method of induced breeding in fishes.
4. To create awareness on parental care of Fishes and embryonic and larval development and environmental factors affecting development of major aquaculture organisms.
5. Acquire knowledge about Endocrine system in fishes.

**UNIT- I: General character & Classification of Cultivable finShellfish**

- 1.1 General Characters and classification of fishes & crustaceans up to the level of Class
- 1.2 Fish and Crustaceans of commercial importance
- 1-3 Sense organs of fishes and crustaceans .
- 1.4 Specialized organs in fishes – electric organ, venom and toxins
- 1.5 Buoyancy in fishes- swim bladder and mechanism of gas secretion

**UNIT- II: Food, Feeding and Growth**

- 2.1 Natural fish food, feeding habits, feeding intensity, stimuli for feeding, utilization of food, gut content analysis, forageratio
- 2.2 Principles of Age and growth determination; growth regulation, Growth rate measurement – scale method, otolith method, skeletal parts as age indicators
- 2.3 Length-frequency method, age composition, age-length keys, absolute and specific growth, back calculation of length and growth, annual survival rate,
- 2.4 Length-weight relationship.

**UNIT- III: Reproductive Biology**

- 3.1 Breeding in fishes, breeding places, breeding habits & places, breeding in natural environment and in artificial ponds, courtship and reproductive cycles
- 3.2. Induced breeding in fishes
- 3-3 Breeding in shrimp, oysters, mussels, clams, pearl oyster, pila, and cephalopods.

**UNIT- IV: Development**

- 4.1. Parental care in fishes, ovo-viviparity, oviparity, viviparity, nest building and brooding
- 4.2 Embryonic and larval development of fishes
- 4.3 Embryonic and larval development of shrimp, crabs and molluscs of commercial importance
- 4.4 Environmental factors affecting reproduction and development of cultivable aquatic fin & shell fish

**UNIT- V: Hormones & Growth.**

- 1.1 Endocrine system in fishes.
- 1.2 Neurosecretory cells, androgenic gland, ovary, chromatophores,
- 1.3 Molting, molting stages, metamorphosis in crustacean shellfish

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Semester –II  
Model Question Paper

w.e.f. 2019-2020

Title of the paper: Biology of fin fish & shell fish

Time: 3hrs.

Code – AQU-201C

Max.marks: 70

Section – A

4 x 5 = 20.

Answer any **four** questions. Each question carries **five** marks. Draw neat labeled diagrams wherever necessary.

1. Writethegeneralcharactersofthefishes?
2. Explaintheelectricorganinfishes?
3. writethedefinitionanddifferenttypesofnaturalfishfeeding?
4. Definethegrowthratemeasurementinfish?
5. Whatisthebreeding?writethebreedinginnaturalenvironment?
6. What is nestbuilding?
7. Explain the structure of fish ovary?
8. pearl oyster

Section – B

5 x 10 =50.

Answer any **five** questions. Each question carries **Ten** marks. Draw neat labeled diagrams wherever necessary.

9. Definethe“fishgutcontentanalysis”?
10. Explaintheinducedbreedinginfishesanddrawthediagram?
11. Explain about the Breeding in shrimps
12. Explain about parental care of fishes?
13. Explain the environmental factors affecting reproduction of fin fishes?
- 14 Explain the fish endocrinesystem?
- 15 Explain about Molting stages of crustaceans

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Semester - II

Guide lines to the Paper Setter.

W.e.f. 2019-2020

Title of the paper: Biology of fin fish & shell fish.

Code – AQU-201C

Time: 3hrs.

Max. Marks: 70.

1. Answer any **four** questions out of eight in Section – A. Each question carries **five** marks.  
4x5 = 20M.

2. Answer any **five** questions out of eight in Section – B. Each question carries **Ten** marks.  
5x10= 50M.

	Section	UNIT-I	UNIT-II	UNIT-III	UNIT-IV	UNIT-V
5 Marks Questions	A	2	2	1	2	1
10 Marks Questions	B	1	1	2	2	2
Weightage		20	20	25	30	25

- Note:**
1. please provide the scheme of valuation for the paper.
  2. Question paper should be in English medium.

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521165, KRISHNA Dt.,A.P. (AUTONOMOUS)

**AQUACULTURE**  
**PRACTICAL - II**

w.e.f. 2019-2020

.Code :AQU- 201P

**MAX.MARKS : 50.**

**(2hrs/week)**

**SYLLABUS]**

1. Study of mouth parts in herbivorous and carnivorousfishes
- 2.Comparative study of digestive system of herbivorous and carnivorousfishes
3. Length-weight relationship offishes
4. Gut content analysis in fishes andshrimp
5. Mouth parts and appendages of cultivable prawns, shrimps and othercrustaceans
6. Study of eggs of fishes, shrimps, prawns and othercrustaceans
7. Study of oyster eggs
8. Embryonic and larval development offish
9. Study of gonadal maturity and fecundity in fishes and shellfish
- 10.Observation of crustaceanlarvae
- 11.Study of nest building and brooding offishes

**PRESCRIBED BOOK(S)**

Bone Q et al., 1995. Biology of fishes, Blackie academic & professional, LONDON  
1.14SaxenaAB1996.LifeofCrustaceans.AnmolPublicationsPvt.Ltd.,NewDelh

**REFERENCES:**

Tandon KK & Johal MS 1996. Age and Growth in Indian Fresh Water Fishes.  
Narendra Publishing House, New Delhi.  
Raymond T et al., 1990. Crustacean Sexual Biology, Columbia University Press, New York

Guiland J.A (ed) 1984. Penaeid shrimps- Their Biology and Management. 1.18Barrington  
FJW 1971. Invertebrates: Structure andFunction.ELBS

1.19Parker F & Haswell 1992. The text book of Zoology, Voll. Invertebrates (eds. Marshal  
AJ & Williams). ELBS & Mc Millan &Co.