



# MAHISHADAL RAJ COLLEGE

(Govt. Sponsored)

NAAC Accredited 'A' Grade College

DST (FIST) Govt. Of India approved College, NSDC Training Partner

Estd. : 1946

Mahishadal : Purba Medinipur

Phone STD 03224 No. 240220

Ref. No.....

Date:

## Online ADD ON COURSE 2020-21

Organised by Department Zoology & Nutrition

Topic: Induced breeding and seed production of *Anabas* and *Heteropneustes*.

Add on course summary:

### REPORT:

Name of the course- Induced breeding and seed production of *Anabas* and *Heteropneustes*.

Course coordinator: Dr. Subhamoy Das, (Associate Professor, HOD, Department of Zoology , Mahishadal Raj College)

Date of commencement: 03.10.2020

Date of completion: - 17.10.2020

Number of participant enrolled: 30

Total duration day: 15

Total duration hour: 30

Evaluation method:- Paper pen MCQ and practical work (Online)

### RESULT DETAILS:-

Number of student participate in this program: 30

Number of student completes this program: 24

Number of student got certificate in this program: 24

Name of the course: Induced breeding and seed production of *Anabas* and *Heteropneustes*.

Course coordinator: Dr. Subhamoy Das, (Associate Professor, HOD, Department of Zoology , Mahishadal Raj College)



## Induced breeding and seed production of *Anabas* and *Heteropneustes*

### ✚ About the course:

Induced breeding and seed production are essential aspects of aquaculture that involve controlled reproduction of fish for commercial purposes. These practices help ensure a steady and reliable supply of fish for food and other purposes. Induced breeding is a technique that involves manipulating environmental conditions and employing hormonal treatments to stimulate fish to spawn under controlled conditions. These courses on these topics typically cover the theoretical aspects of fish reproductive biology, practical techniques for induced breeding, and the management of hatchery and nursery operations. They are valuable for individuals involved in aquaculture, fisheries management, and related fields. These courses of induced breeding and seed production in fish are indispensable components of modern aquaculture practices. Through the manipulation of environmental conditions and advanced reproductive techniques, fish farmers can ensure a consistent and reliable supply of fish for various purposes. Despite the challenges, ongoing research and innovations continue to enhance these courses, contributing to the sustainability and growth of the aquaculture industry.

### ✚ Learning outcomes:

This course of induced breeding and seed production in fish aquaculture not only contributes to meeting the global demand for fish but also opens a diverse array of career opportunities. From hands-on technical roles to managerial positions, entrepreneurial ventures, and research-focused careers, individuals with expertise in these specialized areas are well-positioned to make meaningful contributions to the sustainable development of the aquaculture industry. As the world looks towards innovative solutions for food security, the job opportunities in induced breeding and seed production are set to grow, offering a promising and fulfilling career path for those passionate about aquatic sciences and environmental sustainability. This course opens different job opportunities such as aquaculture technician, hatchery manager, research scientist, aquaculture consultant, Entrepreneurs in Aquaculture, Fisheries and Aquaculture Extension Officers, and Quality Control Specialists.

### ✚ Target audience:

Any branch of life sciences students (UG and PG), research scholars, and faculties who have interest in fishery and industrial fishery. Fish farmers who have very much interest may join the programme.

### ✚ Course content overview:

Induced breeding is a technique where by ripe fish breeders are stimulated by pituitary hormone or any other synthetic hormone introduction to breed in captive condition. Then the carps being excited lay eggs in the pond water and the process is called induced breeding. This process of breeding is also known as hypophysation. Major carps are most important species from the point of view of their high food and nutritive values. Hence they have kept attention of scientists and aqua farmers. They have peculiar habit of breeding in running waters of rivers and streams where they have large space for movement. The breeding technique in which the breeders use hormones to ripe the fish artificially is known as induced breeding. This leads to the release of eggs and sperms from the fish at a specific time interval. As induced breeding is an artificial technique it is also known as artificial breeding. The hormone used during induced breeding is gonadotrophin. Gonadotrophin comprises that follicle-stimulating hormone (FSH) which induces early gametogenesis in fish.



#### ✚ Schedule: Total 30 hours

DAY	SCHEDULE
Day 1	Introduction to fish breeding (T) (2 hours)
Day 2	Natural and induced breeding of fish (T) (2 hours)
Day 3	Brood fish collection and rearing(T+P) (2 hours)
Day 4	Different types of pond or concrete tank preparation (T+P) (2 hours)
Day 5	Soil quality management in <i>Anabas</i> and <i>Heteropneustes</i> . (T+P) (2 hours)
Day 6	Water quality management in <i>Anabas</i> and <i>Heteropneustes</i> . (T+P) (2 hours)
Day 7	Induced breeding of <i>Anabas</i> (P) (2 hours)
Day 8	Induced breeding of <i>Heteropneustes</i> . (P) (2 hours)
Day 9	Rearing of hatchlings of <i>Anabas</i> and <i>Heteropneustes</i> (T+P) (2 hours)
Day 10	Planning and designing of fish farm.(T) (2 hours)
Day 11	Entrepreneurship development through <i>Anabas</i> and <i>Heteropneustes</i> aquaculture and marketing.(T) (2 hours)
Day 12	Feeding and rearing of hatchlings (P) (2 hours)
Day 13	Plankton culture (2 hours)
Day 14	Common disease and its management. (2 hours)
Day 15	Discussions & Evaluation. (2 hours)

#### ✚ Detail Work Schedule

Date	Day	Contents	Time	Duration	Experts	Designation
03.10.20	1	Introduction to fish breeding (T)	12 to 2pm	2	Dr. Subhamoy Das	HOD DEP. of ZOOLOGY
04.10.20	2	Natural and induced breeding of fish (T)	1 to 3 pm	2	Dr. Subhamoy Das	HOD DEP. of ZOOLOGY
05.10.20	3	Brood fish collection and rearing(T+P)	3 to 5pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
06.10.20	4	Different types of pond or concrete tank preparation (T+P)	03 to 05pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
07.10.20	5	Soil quality management in <i>Anabas</i> and <i>Heteropneustes</i> .	02 to 04pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
08.10.20	6	Water quality management in <i>Anabas</i> and <i>Heteropneustes</i> .	01 to 03pm	2	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
09.10.20	7	Induced breeding of <i>Anabas</i> (P)	03 to 05pm	2	Dr Rajkumar Guchhait	SACT Mahishadal Raj College



10.10.20	8	Induced breeding of <i>Heteropneustes</i> . (P)	02 to 04pm	2	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
11.10.20	9	Rearing of hatchlings of <i>Anabas</i> and <i>Heteropneustes</i> (T+P)	02 to 04pm	2	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
12.10.20	10	Planning and designing of fish farm.(T)	01 to 03pm	2	Prof. Manik Das	SACT Mahishadal Raj College
13.10.20	11	Entrepreneurship development through <i>Anabas</i> & <i>Heteropneustes</i> aquaculture and marketing.	02 to 04pm	2	Prof. Moumita Jana	SACT Mahishadal Raj College
14.10.20	12	Feeding and rearing of hatchlings (P)	02 to 04pm	2	Dr Rajkumar Guchhait	SACT Mahishadal Raj College
15.10.20	13	Plankton culture	01 to 03pm	2	Prof. Sagnik Manadal	SACT Mahishadal Raj College
16.10.20	14	Common disease and its management.	01 to 03pm	2	Prof. Saheli Maiti	SACT Mahishadal Raj College
17.10.20	15	Discussions, Evaluation, valediction, feedback	12 to 2 pm	2	Dr. Subhamoy Day, Dr. Rajkumar Guchhait, Prof. Sagnik Manadal, Prof. Manik Das and Prof. Moumita Jana.	HOD & SACT., Zoology; Principal,
				30 hours		

**✚ Course structure and examination scheme:**

Course name	Theory classes (hr.)	Practical classes (hr.)	Continuous assessment		Total marks
			Theory	Practical	
Induced breeding and seed production in <i>Anabas</i> and <i>Heteropneustes</i> .	12	18	40	10	50



Participant's Details and attendance:

**Enrolment Details of Students**

Sl no.	Student ID	Roll No.	Name
1.	B.Sc/19/0452	2190452	DIPAYAN KHAN
2.	B.Sc/19/0453	2190453	SASWATA MANNA
3.	B.Sc/19/0454	2190454	GANGA JHULKI
4.	B.Sc/19/0485	2190485	NABA KUMAR MANNA
5.	B.Sc/19/0486	2190486	SAYAN KUILA
6.	B.Sc/19/0496	2190496	AMITA RANA
7.	B.Sc/19/0497	2190497	DIPIKA DAS
8.	B.Sc/19/0498	2190498	SITASREE CHAKRABORTY
9.	B.Sc/19/0499	2190499	SK MUSTAK AHAMED
10.	B.Sc/19/0536	2190536	ANJAN SEN
11.	B.Sc/19/0537	2190537	POULAMI HAZRA
12.	B.Sc/19/0544	2190544	PRITAM DAS
13.	B.Sc/19/0549	2190549	SHUVAJIT MAITY
14.	B.Sc/19/0036	2190036	SOURAV GIRI
15.	B.Sc/19/0078	2190078	SANTANU PRADHAN
16.	B.Sc/19/0080	2190080	SUDIP PANJA
17.	B.Sc/19/0081	2190081	SUVASH DOLAI
18.	B.Sc/19/0143	2190143	DEBALINA PAKHIRA
19.	B.Sc/19/0144	2190144	SUKHEN MIDYA
20.	B.Sc/19/0177	2190177	AHINA HAZRA
21.	B.Sc/19/0203	2190203	SAHELI KHATUN
22.	B.Sc/19/0204	2190204	SOUVICK PRAMANIK
23.	B.Sc/19/0206	2190206	ARUN KUMAR BAG
24.	B.Sc/19/0207	2190207	JUHITA KHATUA
25.	B.Sc/19/0261	2190261	SUBHRADIP DAS
26.	B.Sc/19/0320	2190320	SUMAN KALYAN SAMANTA
27.	B.Sc/19/0398	2190398	PAULAMI PAIK
28.	B.Sc/19/0513	2190513	SUPRAVAT DAS
29.	B.Sc/19/0514	2190514	APURBA SAMANTA
30.	B.Sc/19/0040	2190040	PRITIKANA DAS ADHIKARY



## Sample Question of Examination

- Which among the following is used for induced breeding of carps ?  
(A) Ovaprim (B) MS222 (C) Carbonic acid (D) Acetone
- Give an example for Air breathing fish :  
(A) Tilapia (B) Trout (C) Murrel (D) Common carp
- The pond in which the fry are grown to fingerling size is :  
(A) Nursery pond (B) Production pond  
(C) Breeding pond (D) Rearing pond
- Gas bubble disease is due to :  
(A) Protein deficiency (B) Dissolved oxygen deficiency  
(C) Excess dissolved oxygen (D) Pollution
- Give an example for live feed used In shrimp hatchery :  
(A) Lab - lab (B) *Skeletonema* (C) *Fragillaria* (D) *Microcystis*
- The traditional shrimp farming in Kerala is known as :  
(A) Prawn filtration (B) Intensive farming  
(C) Valli culture (D) Semi intensive farming
- In Kerala famous centre for Milk fish fry collection is :  
(A) Kumarakom (B) Poyya (C) Puduvaipu (D) Njarakkal
- Sea bass is a :  
(A) Herbivore (B) Detritivore (C) Omnivore (D) Carnivore
- State fish of Kerala is :  
(A) Oil sardine (B) Indian mackerel (C) Pearl spot (D) Seer fish
- Select the true statement from  
(A) Dissolved Oxygen is m  
(B) Dissolved Oxygen leve  
(C) Dissolved Oxygen is m  
(D) Dissolved Oxygen leve
- Duck cum fish culture is an  
(A) Composite fish culture  
(C) Intensive culture
- Eye stalk ablation technique  
(A) Induced breeding of c  
(C) Induced breeding of r
- Catla* is a \_\_\_\_\_ feeder  
(A) Surface (B)
- Which among the following  
(A) *Fenneropenaeus indicus*  
(C) *Penaeus vannamei*
- In fish culture pond aerator  
(A) To increase dissolved  
(C) To decrease acidity
- The fish which can be used  
(A) *Catla* (B)
- Give an example for cold w  
(A) Guppy (B)
- Scientific name of Green Mussel is :  
(A) *Pinctada fucata* (B) *Perna indica*  
(C) *Pampus argentius* (D) *Perna viridis*
- Which among the following is not a product extracted from sea weed ?  
(A) Agar - agar (B) Carrageenan (C) Alginic acid (D) Chitin
- Fish is a good source of :  
(A) Vitamin (B) Mineral (C) Protein (D) Carbohydr
- The greenish colour of a pond water is an indication of :  
(A) Plankton turbidity (B) Clay turbidity  
(C) High acidity (D) Oxygen depletion
- Raft culture is commonly used for :  
(A) Shrimp (B) Mussel (C) Crab (D) Murrel
- Name an elasmobranch fish :  
(A) Sardine (B) Platy (C) *Anabas* (D) Shark
- Indian pearl oyster is :  
(A) *Perna indica* (B) *Pinctada fucata*  
(C) *Loligo duvauceli* (D) *Crassostrea madrasensis*
- Name a shrimp that completes its life cycle in sea itself :  
(A) Karikadi shrimp (B) Giant tiger prawn  
(C) Indian white prawn (D) Giant freshwater prawn
- The protozoa stage of shrimp feeds mainly on :  
(A) Rotifer (B) *Artemia nauplii* (C) Diatom (D) Detritus
- Mono sex culture is popular in :  
(A) Mullet (B) White shrimp (C) Milk fish (D) *Tilapia*
- Give an example for live bearing fish :  
(A) Molly (B) Gold fish (C) Koi carp (D) Angel fish
- Name a plant toxicant used in Aquaculture :  
(A) Dieldrin (B) Groundnut oil cake  
(C) Tea seed cake (D)  $\text{CuSO}_4$
- Select the correct order of larval development in Penaeid shrimp :  
(A) Egg - mysis - nauplius - protozoa - post larvae  
(B) Egg - protozoa - nauplius - mysis - post larvae  
(C) Nauplius - egg - protozoa - mysis - post larvae  
(D) Egg - nauplius - protozoa - mysis - post larvae
- Which among the following is popularly known as "Scampi" ?  
(A) *Penaeus monodon* (B) *Macrobrachium rosenbergii*  
(C) *Metapenaeus dobsonii* (D) *Metapenaeus monoceros*
- White spot disease in shrimp is caused by :  
(A) Bacteria (B) Fungus (C) Virus (D) Protozoa
- The instrument Secchi disc is related with :  
(A) Salinity (B) Temperature (C) pH (D) Turbidity
- Pick out the odd one :  
(A) Copepod (B) *Navicula* (C) *Anabaena* (D) *Chlorella*
- Which among the following is not a coastal district in Kerala ?  
(A) Kozhikode (B) Kollam (C) Malappuram (D) Palakkad
- used in mosquito larvae control :  
(B) *Gambusia* (C) Silver carp (D) Gold fish
- ure from below :  
(B) Urea  
(D) Tea seed cake
- grow better in cages :  
(B) Pearl spot (C) Mrigal (D) *Anabas*
- eriod of Indian Tiger shrimp is :  
(B) One year (C) 6 - 8 Months (D) 8 - 10 Mo
- trench in an earthen bund is :  
ble space  
e bund  
contact with bund and water  
ing operation
- st in world fish production ?  
(B) USA (C) China (D) Japan
- (B) *Penaeus monodon*  
(D) *Fenneropenaeus indicus*
- outor of cultured shrimp in India is :  
(B) Andhra Pradesh  
(D) West Bengal
- n Mahua oil cake is :  
(B) Rotenone (C) Eldrin (D) Simazine



45. The Cannibalism behaviour is shown by :  
(A) Mrigal (B) Milk fish  
(C) Giant freshwater prawn (D) None of the above
46. Quick lime is :  
(A) CaO (B) Ca(OH)<sub>2</sub> (C) CaCO<sub>3</sub> (D) Mg(OH)<sub>2</sub>
47. Winkler's test is used for the determination of :  
(A) Alkalinity (B) Dissolved Oxygen (C) Hardness (D) Ammonia
48. A device used in spat collection of mussel is :  
(A) Rack (B) Ren (C) Reef (D) Raft
49. 'Brine shrimp' is :  
(A) *Metapenaeus monoceros* (B) Rotifer  
(C) Moina (D) Artemia
50. Viral disease in shrimp can be detected by :  
(A) Widal Test (B) ELISA Test  
(C) PCR Test (D) None of the above

✚ **SAMPLE CERTIFICATE OF COURSE COMPLETION**





# CERTIFICATE OF COURSE COMPLETION

THIS IS TO CERTIFY THAT

**AHINA HAZRA**

has successfully completed the **Add-on Course** on **Induced breeding and seed production**  
held during **2020-2021** academic year at Mahishadal Raj College.

Course Co-ordinator

IQAC Co-ordinator

Principal