

Shree Manibhai Virani and Smt. Navalben Virani Science College, Rajkot
AUTONOMOUS COLLEGE
(Affiliated to Saurashtra University, Rajkot)



DEPARTMENT OF BIOLOGY

Shree Manibhai Virani and Smt. Navalben Virani Science College, Rajkot
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BOARD OF STUDIES IN BIOLOGY MEETING

Date: 10.09.2016 Time: 12:00 noon Venue: AITS Library

MINUTES OF THE MEETINGS

Botany Study Board Members:

S.No.	Name	Membership	Present/Absent
1.	Dr. Reena P. Dave	Chairperson	Present
2.	Dr Neha T. Patel	Member	Present
3.	Dr Jignasa Joshi	Member	Present
4.	Dr. Manish N. Jani	Sub. Expert	Present
5.	Dr. B. A. Jadeja	Sub. Expert	Absent
6.	Dr. R S Patel	VC Nominated	Present
7.	Dr. K. D. Hapalia	Corp Sect.	Present

Zoology Study Board Memebers:

S.No.	Name	Membership	Present/Absent
1.	Dr. Rahul S Gohel	Chairman	Present
2.	Dr. B B Radadia	Member	Present
3.	Dr. Y M Kadiyani	Sub. Expert	Absent
4.	Dr. Nikesh Kotadiya	Sub. Expert	Present
5.	Dr. Manish Vishavadiya	VC Nominated	Absent
6.	Dr. Rajen Jadav	Corp Sect.	Absent

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AGENDA:

1. Framing of Syllabii Of DSE-Allied courses of 3rd & 4th semester for following UG programmes
 - 1.1 B.Sc. Allied Botany
 - 1.2 B.Sc. Allied Zoology
2. Framing of syllabi & evaluation norms & guidelines for following part III – Sec II Co-curricular course :-
 - 2.1 Sericulture
3. Framing of syllabi for following part III – Sec III Value added courses :-
 - 3.1 Aquarium Management
 - 3.2 Regional Medicinal Plants and Herbal Remedies.
4. Any other matter with permission of the chair.

The chairperson welcome to all the present members of BoS.

The BoS in Biology met as indicated above, and discussed on the above Agenda. All the members appreciated the material presented to them by the department with respect to the agenda. Sharing the expertise of all the members and the deliberated on the agenda with very proactive inputs, the members unanimously resolved the following as appended are to be recommended to Academic Council for approval for students admitted from **AY 2016-2017 & onwards:**

1. Syllabii of 3rd& 4th semester courses of **B. Sc. Allied programme** (Botany & Zoology) framed for the courses of the **3rd& 4th semesters** of the below stated programme for students admitted from **AY 2016-2017 & onwards**. We discussed and **approved**.
B. Sc. Allied programme (Botany & Zoology).....(**Enclosure-I**)
2. **Syllabi & evaluation norms for Part-III-SEC-II – Co-curricular courses** was framed for students admitted from **AY 2016-2017 & onwards:**
 - 2.1 Syllabi & evaluation norms for

Course	Duration	Credit	Semester
Sericulture	80 Hrs	01	Any Semester from II to V

.....(**Enclosure-II**)

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3. **Syllabi for Part-III - SEC-III – Value added courses** was framed for students admitted from **AY 2016-2017 & onwards:**

3.1 & 3.2 Syllabi & evaluation norms for

No.	Course	Duration	Credit	Semester
3.1	Aquarium Management	40 Hrs	01	Any Semester from II to V
3.2	Regional Medicinal Plants and Herbal Remedies	40 Hrs	01	Any Semester from II to V

.....(Enclosure-III)

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Enclosure - I

DSE – Allied BOTANY
SEMESTER III

(With Biotechnology)

16UBTDA05	Plant Science	4 Hrs/Week	4 Credit
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Objectives of Outcome :

After completion of this course, student will be able to :

- Define and describe morphology of plant sex organs, flower and process of development and fertilization of male and female gametophyte in plants, and Identify the internal anatomy of root stem of plants.
- Understand the process of evolution and origin of life
- Carry out preparation of sections and staining of plant organs for microscopic studies and also comprehend the basis of photobiology and plant movements.

Unit I: Evolution

10

- Origin of species
- Catastrophism
- Origin and evolution of land plants
- Process of fossilization
- Adaptations, natural selection and patterns of evolution

UNIT II: Basics of plant anatomy

10

- Plant anatomy : Introduction and organization of meristems
- Simple plant tissue (parenchyma, collenchyma and sclerenchyma)
- Complex plant tissue (xylem, phloem, secretary structure and periderm)

UNIT III: Secondary growth in plants

10

- Primary structure of monocot root and stem
- Primary structure of dicot root and stem
- Secondary anomalous growth in stem with special reference to *Aristolochia* and *Salvadora*
- Secondary anomalous growth in root with special reference to carrot, radish and beet root
- Biological importance and function of secondary and anomalous structure in growth

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UNIT IV: Basic of plant embryology **10**

- Structure and development and male and female gametophytes
- Fertilization
- Development and types of embryo
- Polyembryony and apomixis

Unit V: Sensory photobiology of plant **10**

- Structure, function and action of phytochromes, cryptochrome and phototropins
- Stomatal movement
- Photoperiodism
- Biological clocks
- Plant movement

16UBTDA07	Plant Science Practicals	3 Hrs/Week	1 Credit
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Exe:-1. Study of anatomical details of monocot root and stem through permanent slides/temporary stain mounts/macerations/museum specimens with the help of suitable examples.

Exe:-2. Study of anatomical details of dicot root and stem through permanent slides/temporary stain mounts/macerations/museum specimens with the help of suitable examples.

Exe:-3. Mounting of embryo - monocot and dicot

Exe:-4. Study of different types of ovules through slide preparation/permanent slide/photographs

Exe:-5. Study of T.S. of anther and mounting of pollen grains

Exe:-6. Study of anomalous structure of stem through slide preparation (*Aristolochia* and *Salvadora*)

Exe:-7. Study of anomalous structure of root through slide preparation (carrot, radish and beet root)

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Suggested Reading:

Text books

- Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms, Vikas Publishing House. Delhi. 5th edition
- Sharma, P.D. (2010). Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
- Rastogi, V. B. (1994). Organic evolution. Kedernath Ramnath, India, 190.

Reference books

- Dickison, W.C. (2000). Integrative Plant Anatomy. Harcourt Academic Press, USA.
- Odum, E.P. (2005). Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
- Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U. S.A. 4th edition.
- Raghavan, V. (2000). Developmental Biology of Flowering plants, Springer, Netherlands

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DSE – Allied ZOOLOGY
SEMESTER IV

(With Biotechnology)

16UBTDA07	Animal Science	4 Hrs/Week	4 Credit
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Course Outcome :

After completion of this course, student will be able to :

- Know about the basic principle and overview of animal classification.
- Understand the internal structure of organ and working principle of body.
- Define and describe process of fertilization and development of embryo in human.
- Understand the process of evolution and origin of life,

UNIT 1: Animal Classification

10

- 1.1 Principle of Animal classification
- 1.2 General overview of Animal classification.
- 1.3 Non Chordates: General classification & Salient features of important nonchordate
i.e. Protozoa, Porifera, Cnidaria, Platyhelminthes, Aschelminthes, Nematoda;
Annelida, Arthropoda, Mollusca, Echinodermata
- 1.4 Chordates: Salient Features of Pisces, Amphibia, Reptilia, Aves and Mammalia.

UNIT 2: Animal tissues

8

- 2.1 Epithelial tissue, connective tissue, muscular tissue, nervous tissue and types of
Integumentary glands
- 2.2 Bones: structure and types, ossification, bone growth.
- 2.3 Nervous tissue: general organization, Myelinated and non myelinated nerve.
- 2.4 Muscle: histology of different types of muscle, ultra structure of skeletal muscle and
cardiac muscle.
- 2.5 Molecular and chemical basis of muscle contraction

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Unit 3: Human physiology

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- 3.1 Endocrine system: basic concept of hormone, Structure and function of various endocrine gland (Pituitary, Parathyroid, Adrenal, Ovary, Testis).
- 3.2 Digestive system: structure and functions of organs and glands involved in the digestive system, mechanism of digestion.
- 3.3 Respiratory and Circulatory System: Heart and its functioning, Circulatory pathway of blood and lymph, Bohr and Haldane effect, Chloride shift, cardiac cycle, cardiac output, Structure of lungs, mechanism of gaseous exchange.
- 3.4 Excretory system: Structure of mammalian nephron and kidney, physiology of urine formation, osmoregulations.
- 3.5 Nervous system: Type of nervous system, Structure and function of Brain, Propagation of nerve impulse through nerve fibers.

Unit 4: Basic of developmental biology

10

- 4.1 Structure and functions of Testis and ovary in Human.
- 4.2 Gametogenesis: Spermatogenesis and structure of sperm, Oogenesis and structure of ovum, types of ova
- 4.3 Fertilization: Events of fertilization, mechanism of sperm transfer, polyspermy.
- 4.4 Cleavage, blastulation and gastrulation and organogenesis of Amphioxus.
- 4.5 Extra embryonic membranes, Placentation.

Unit 5: Evolution

8

Evidences of organic evolution

- 5.1 Geological time scale
- 5.2 Species concept: isolating mechanisms and modes of speciation
- 5.3 Adaptation: definition, kinds of adaptations, adaptive radiation, convergence and divergence
- 5.4 Evolution of man

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16UBTDA08	Animal Science Practical	4 Hrs/Week	1 Credit
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- Exe:-1. Study of whole mount of eggs, early cleavage stage, T.S. of blastula and gastrula of frog.
- Exe:-2. Study and isolation of chick embryo: 18 hours, 24 hours, 36 hours, 48 hours and 72 hours.
- Exe:-3. Study of T.S. of ovary, testis and placentation through permanent slide
- Exe:-4. Preparation of temporary mounts: Squamous epithelium, Ciliated epithelium, Striated muscle fibres and nerve cells.
- Exe:-5. Examination of permanent sections of mammalian skin, Cartilage, Bone, Pancreas, Testis, Ovary
- Exe:-6. Study of all the biotic and abiotic components of any simple ecosystem- natural pond or terrestrial ecosystem or human modified ecosystem.
- Exe:-7. Study of the life table and fecundity table, plotting of the three types of survivorship curves from the hypothetical data.

Suggested Reading:

Text books

- Gyton C. and Hall J.E.(2011)Textbook of Medical Physiology,11th edition,Elsevier,USA.
- Gilbert S.F. (2010) Developmental Biology (Sinauer) 10th edition.
- Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
- Mathur R (2010) Animal Behaviour, Rastogi Publications, Merrut
- Rastogi, V. B. (1994) Organic evolution. Kedernath Ramnath, India, 190.

Reference books

- Tortora, G.J. and Grabowski, S. (2006). Principles of Anatomy & Physiology. XI Edition. John wiley & sons, Inc.
- Victor P. Eroschenko. (2008). diFiore's Atlas of Histology with Functional Correlations. XII Edition. Lippincott W. & Wilkins

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Enclosure - II

Department of Biology
Part III – SEC II Co-curricular Course
(For students admitted from 2016 – 2017 & onward)

16UBLCO1	Sericulture	80 hrs Duration	1 Credit
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Course Profile :

Sericulture, in recent times, has begun to offer a wide variety of employment and entrepreneurship options. Most importantly, every state in India has a sericulture department to focus on rearing of silk worms, production of fibre and marketing. There are many laboratories that conduct experimentation on this natural fibre and these serve as excellent avenues for those inclined towards technology and scientific experimentation. There is demand for Indian silk items from America, Japan, Spain, Germany, Italy and Europe. Demand for Kashmiri silk carpets has been on the rise constantly. All this has created additional avenues for Seri culturists. Sericulture is quite popular in Southern India and is now available as a career option in Western India and Gujarat too. With research institutions devising new technological processes, Sericulture is now being recognised as a mainstream profession.

Sericulture offers career opportunity in Govt. research centers, silk boards, academic fields, sericulture units, agriculture sector banks etc. One can get jobs in Central Government agencies like Central Silk Board/Silk Export Promotion Council/Fao/Nabard, Krishi Vigyan Kendra etc. Seri culturists can find employment as officers, managers in the agricultural loan sector of nationalised as well as private banks.

Unit : 1 : Sericulture Introduction and Importance 05

- Introduction
- Importance
- Sericulture in India.

Unit : 2 : Moriculture 14

- Types of Propagation methods.
- Vegetative propagation
- Seedling propagation
- Micropropagation.

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Unit : 3 : Silk worm and its life-cycle. 16

- Classification of silk-worm
- Life cycle of silk- worm

Unit : 4 : Rearing Of Silk-worm. 14

- Rearing House
- Rearing appliances

Unit : 5 : Silk Reeling 16

- Steps of silk reeling.

Practicals : 15

1. Study of Silk worm life cycle
2. To study the vegetative propagation.
3. Study of Rearing appliances.
4. Study to arrangement of Rearing house.
5. Study of silk reeling steps.

Text Books :

1. Text Book on Mulberry Cultivation, BIE, Hyderabad by Jaya Rao and Ramaswamy, 1994.
- 2 Text Book on Silkworm Rearing, BIE, Hyderabad by Dr. P. Srinivas and Y. Ramaswamy, 1994.
3. Text Book on Silkworm Diseases, Pests and Silk Reeling, BIE, Hyderabad by Dr. P. Srinivas, Y. Ramaswamy, 1994.

References :

1. Silkworm Rearing and Disease of Silkworm, 1956, Ptd. By Director of Ptg., Stn. & Pub.Govt.Press Bangalore.
2. Silkworm Disease (Vol IV) Written By: LU Yun – Lian, Translated By: LiuFu- an, Published by: Oxford and IBH publishing Co. Pvt. Ltd. New Delhi, Bombay, Calcutta.

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Enclosure - III

Department of Biology
Part III – SEC III Value Added Course
(For students admitted from 2016 – 2017 & onward)

16UBLVA01	Aquarium Management Theory	40 hrs Duration	1 Credit
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Course Profile :

This course introduces the freshwater hobbyist to various aspects of successful aquaria management. Rather than being an entertainment guide, which extols the virtues of one or other approach to aquaria management, this course presents the basic principles, themes and steps needed to set-up and maintain a freshwater aquarium. The course provides the key skills needed to set up and operate the aquarium business. This course also fulfill the requirements in order to maintain fish health, quality water chemistry and nutritional requirements, aquarium plants and ornamental plants. The practical section of the course, taught to built new aquarium house, on how to keep fish and aquatic animals as pets. which fish can live together and those that just don't get along. You will also learn how to look after them including health care and managing water quality.

Unit 1 : Aquarium Tank and setting **04**

- Types of tank
- Tank selection
- Tank setting and position
- Aquascaping

Unit 2 : Aquarium Fishes and plants. **06**

- Characters of Aquarium fishes
- Community Aquarium fishes

Unit 3 : Aquarium Plants **06**

- Introduction to Aquarium plants
- Importance of Aquarium plants
- Types of Aquarium plants
- Arrangement of Aquarium plants.

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Unit 4 : Aquarium Equipments and fish food. 06

- Common Aquarium equipments
- Fish feed and nutrition.

Unit 5 : Aquarium Fish Diseases. 06

- Common aquarium diseases.
- Types of aquarium diseases.
- Cause, symptoms and cure of aquarium diseases.

Practicals : 16

1. Study of different types of aquarium tanks.
2. Study to aquarium tank arrangement.
3. Aquarium tank setting.
4. Characteristics of Fish.
5. Study of common aquarium fishes.
6. Study of common aquarium plants.
7. Demonstration to fish feed.
8. Study of some aquarium diseases.

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Department of Biology
Part III – SEC III Value Added Course
(For students admitted from 2016 – 2017 & onward)

16UBLVA01	Regional Medicinal plants and Herbal Remedies	40 hrs Duration	1 Credit
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Course Profile

The botanical wisdom accumulated by indigenous people has provided humankind with herbal drugs used in human healthcare for thousands of years. Although ancient texts and ceremonies indicate plants were used as medicine from the dawn of history, antibiotics and vaccinations developed in first half of the 20th century led conventional medicine to shun plant material for chemically synthesized replacements. Concerns about modern medicine and changes in life style and research during the past 20 years, however, have led to increased interest in using plants and plant extracts as medicine. In this course, we will focus on a series of plants used in remedial medicines to treat diseases and improve health. Medicinal plants as remedy will be explored through class presentation and discussions, looking to the future of medicines form plants.

Unit I Ethnomedicine **03**

- Introduction of medicinal plants,
- history of traditional medicine.
- scope and feature of Ethnomedicinal plants

Unit II Traditional knowledge and utility **03**

- Traditional knowledge and utility of some medicinal plants in Gujarat
- Tribal medicinal plants of Gujarat.
- Methods of disease diagnosis and treatment.

Unit III Medicinal plants and remedies – I **06**

- Cardiovascular diseases and its remedy from medicinal plants.
- Respiratory diseases and its remedy form medicinal plants.
- Kidney stone - remedy form medicinal plants.

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Unit IV Medicinal plants and remedies – II **06**

- Skin diseases and its remedy from medicinal plants.
- Asthma and Bronchitis and its remedy from medicinal plants.
- Urinogenital diseases and its remedy from medicinal plants.

Unit V Common Medicinal plants and remedies **04**

- Plants in day to day life.
- Nutritive and medicinal values of fruits and seeds.
- Nutritive and medicinal values of Vegetables.

Practicals : **18**

1. Field study for identification of Medicinal plants.
2. Identification and medicinal values of locally available medicinal plants for Cardiovascular diseases.
3. Identification and medicinal values of locally available medicinal plants for Respiratory diseases.
4. Identification and medicinal values of locally available medicinal plants for Kidney stone..
5. Identification and medicinal values of locally available medicinal plants for Skin diseases and Asthma.
6. Identification and medicinal values of locally available medicinal plants for Urinogenital diseases.
7. Nutritive and medicinal values of fruits and seeds.
8. Nutritive and medicinal values of Vegetables.
9. To prepares powder drug of locally available medicinal plants.

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References:

1. Ethnobiology – R.K.Sinha & Shweta Sinha – 2001. Surabhe Publications – Jaipur.
2. Tribal medicine – D.C. Pal & S.K. Jain 1998, Naya Prakash, 206, Bidhan Sarani, Calcutta – 700 006.

Text Books:

1. Kumar, N.C. (1993). An Introduction to Medical botany and Pharmacognosy. Emkay Publications, New Delhi.
2. Rao, A.P. (1999). Herbs that heal. Diamond Pocket Books (P) Ltd., New Delhi.