

## Diploma in Apiculture (One Year Diploma Course)

### SEMESTER-I

Course UGC DIP	Unit	Topic	Duration of Exam	External	Internal	Max Marks	Type	Hours per Semester	Credits
	I	Introduction to Apiculture –Scope, Importance	3 Hours	60	40	100	General	45	3
	II	Honey Bee Morphology, Anatomy and Life cycle	3 Hours	60	40	100	General	45	3
	III	Honey Bee health	3 Hours	60	40	100	General	45	3
	IV	Honey- Properties and Uses	3 Hours	60	40	100	General	45	3
	V	Practical Based on Topic I-IV	3 Hours	60	40	100	Skill	75	5
	VI	Compulsory Computer	3 Hours	100	-	100**	Skill	15	2
	VII	Compulsory Language	3 Hours	30	20	50	Skill	15	2
	VII	On site job training					Skill		10
<b>Total</b>						<b>650</b>			<b>31</b>

### SEMETSER -II

Course UGC DIP	Unit	Topic	Duration of Exam	External	Internal	Max Marks	Type	Hours per Semester	Credits
	I	Bee Keeping : Tools and Equipments	3 Hours	60	40	100	General	45	3
	II	Honey Bee : Plants and Floral calendar	3 Hours	60	40	100	General	45	3
	III	Honey Processing and Bee Hive Products	3 Hours	60	40	100	General	45	3
	IV	Economics of Bee keeping	3 Hours	60	40	100	General	45	3
	V	Practical Based on Topic I-IV	3 Hours	60	40	100	Skill	75	5
	VI	Compulsory Project	3 Hours	100	-	100**	Skill	15	2
	VII	EVS	3 Hours	30	20	50	Skill	15	3
	VII	On site job training					Skill		10
<b>Total</b>						<b>650</b>			<b>32</b>

1. Syllabus of Compulsory language is as that of B.A./B.Sc.-II.
2. Environmental Studies paper will be studied as a qualifying paper. Syllabus is same as that of B.A./B.Sc.-II
3. Theory exams will be held semester wise.
4. Practical exams will be annual.

## **SEMESTER I**

### **UNIT – I Introduction to Apiculture - scope, importance (45 L)**

History of bee keeping: Definition, Bee keeping in worldwide, In India.  
Traditional bee keeping, Modern beekeeping, Urban or backyard  
beekeeping.  
Apiculture development in India - institutions involved. Role of Central  
Honey Bee Research & Training Institute.

### **UNIT – II Honey Bee morphology, Anatomy and Life cycle (45 L)**

Basic concepts of morphology of Honey bees - indigenous, exotic  
Honey bee species and identification. Origin, systematic and distribution of  
honey bees. Types of honey bees, Species of honey bees. Bee identification.  
Social organization in honey bees: Colony life and social organization –  
Queen, drone, worker. Annual biological cycle of the bee colony.

### **UNIT – III Honeybee Enemies and Diseases (45 L)**

Bee enemies and diseases: An introduction, Bee enemies – Wax Moth,  
Ants, Wasps, Microorganisms, Pests. Diagnosis and Identification.  
Mites attacking honey bees: Varroa mites, Mite Biology, Controlling  
Varroa Mites, Mechanical control, Mite-tolerant stocks, Biopesticides,  
Chemical (synthetic pesticide) treatments.  
Bacterial, viral, fungal & protozoan diseases: Bacterial disease - American  
Foulbrood, European Foulbrood, Viral disease - Deformed Wing Virus,  
Sacbrood Virus, Black Queen Cell Virus, Kashmir Bee Virus, Acute Bee  
Paralysis Virus; Fungal disease - Chalkbrood, Stonebrood; Protozoan disease -  
Nosemosis, *Nosema cerana*.

### **UNIT – IV Honey - its properties and application in various fields (45 L)**

Honey - its medicinal properties - application in various fields - other valuable  
by products of honey bees  
Value added honey products. Properties of honey products, Nutrients  
and composition of honey, Acid content and flavor effects.  
Types of value added honey products.

## **SEMESTER-II**

- UNIT – I      Bee keeping: Tools and Equipment.      (45 L)**  
Basic requirements of Tools for starting bee keeping: Getting Started in Beekeeping  
- Land and Buildings, Equipment and supplies.  
Bee keeping equipment - introduction to types of bee boxes - BIS standard Tools used  
in apiculture.  
Bee breeding multiplication of colonies - Queen reaching technique.
- UNIT – II      Honeybee Plants and Floral Calendar.      (45 L)**  
Bee flora - importance propagation - congenial conditions for starting up of apiculture.  
Migratory Bee Keeping - designing floral Calendar  
Improved Agricultural practices - crop pollination - Pesticides impact on Honey bees.
- UNIT – III      Honey Processing and Bee Hive Products      (45 L)**  
Honey extraction & handling - Quality control standards - Honey testing kit  
Processing of honey. Other valuable by products of honey bees  
Bee venom & Royal jelly extraction.
- UNIT – IV      Economics of bee keeping      (45 L)**  
Economics in small scale and large scale bee keeping. Economic Value of  
Commercial Beekeeping.  
Preparing bankable bee keeping project: Steps involved in starting a beekeeping  
project, Funding sources for beekeeping projects.

## PRACTICAL

<b>Sr. No.</b>	<b>Particulars</b>	<b>Credit</b>	<b>P/Week</b>
	<b>Term I</b>	<b>5</b>	<b>3</b>
01	To study the morphology of Honeybees and Identification of different species and classes of Honey bees		
02	To Study different stages in life cycle of Honey bees.		
03	To study the behavior of Honeybees		
04	Bee keeping unit - Handling of frames with colonies		
05	Introduction of parts of Bee box - ISI 'A' type 'B' type & Tools used in Bee keeping		
06	Colony inspection, maintenance - writing up of inspection report		
07	Identification of Queen cells, Drone cells & Brood		
08	Sugar feeding of colonies in scarcity period		
09	Identification of swarming tendency in a colony - Removal of Drone cells		
10	Identification of kinds of Queen cells.		
11	Methods of Multiplication of Bee Colonies		
12	Steps for strengthening of colonies - Requeening technique.		
	<b>Term II</b>	<b>5</b>	<b>3</b>
1	Bee flora - Propagation of bee plants - Preparation of floral calendar.		
2	Migratory Bee Keeping - measures to be taken while transporting colonies-Mapping of areas for migration.		
3	Extraction of Honey using Honey extractor, moisture reduction, packing and storing of Honey.		
4	Methods of Extraction of Bees wax, Royal Jelly and Bee venom.		


5	Honey testing kit - Physical and chemical methods of analysis.		
6	Fermentation and Granulation of Honey.		
7	Disease management - Identification of symptoms of Nosema. Sac brood Virus, Thai sac brood virus, American foul brood and European foul brood diseases.		
8	Preventive and control measures of the diseases.		
9	Application of antibiotics to colonies - Destruction of diseased colonies and disinfection of frames.		
10	Management of colonies for different hive products.		
11	Natural enemies and predators of Honey Bees - management involved.		

### **ONSITE JOB TRAINING (Credit – 8)**

#### **Management of *Apis melifera***

***Every student has to undergo onsite job training considering following Aims:***

Equipment, Procurement of Colonies, location and management during scarcity, Building up of the colonies, importance of drawn out combs, multiplication of colonies, Honey Flow management.

  
Dr. P. S. Patil

  
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