

**B.S.C ZOOLOGY COURSE STRUCTURE UNDER CBCS PATTERN**  
(For the Candidates admitted from 2015 – 2016 Academic year onwards)

Sem	Part	Title of the Course(s)	Hrs/ week	credits	Ma rks		Total	
					Int.	Ext.		
I	I	15T101a	LC-I- செய்யுள் (இக்கால இலக்கியம்), சிறுகதை, பயன்முறைத் தமிழ், தமிழ் இலக்கிய வரலாறு	6	3	25	75	100
	II	15H101	ELC - I English for Communicative Competence	6	3	25	75	100
	III	15Z101	CC-I -Invertebrata-I	6	5	25	75	100
		15Z102L	CC-II - Practical - I (Invertebrata –I & II)*	3	-	-	-	-
		15Z103A	A C –I – Botany	4	4	25	75	100
		15Z104L	AC –II – Botany Practical	3	-	-	-	-
	IV	15VEDa	VE-Value Education	2	1	-	100	100
		Total	30	16	-	-	500	
II	I	15T202a	LC-II- செய்யுள் (பக்தி, இடைக்கால இலக்கியம்) தமிழ்ச் செம்மொழி வரலாறு, மொழிபெயர்ப்பியல், தமிழ் இலக்கிய வரலாறு	6	3	25	75	100
	II	15H202	ELC-II- English for Proficiency	6	3	25	75	100
	III	15Z102L	CC –II- Practical-I (Invertebrata-I & II )	3	4	25	75	100
		15Z205	CC-III- Invertebrata-II	4	4	25	75	100
		15Z104L	A C –II – Botany Practical	3	4	25	75	100
		15Z206A	A C –III -Botany	4	4	25	75	100
	IV	15EVS	EVS -Environmental Science	2	1	-	100	100
		15XZ21	SKBC-I -Apiculture, Sericulture and Fish culture	2	2	-	100	100
			Total	30	25	-	-	800
	III	I	15T303	LC-III - செய்யுள் (காப்பியங்கள்), புதினம், தமிழ் இலக்கிய வரலாறு	6	3	25	75
II		15H303	ELC-III- English for Employability	6	3	25	75	100
III		15Z307	CC – IV –Chordata	5	5	25	75	100
		15Z308L	CC– V Practical –II (Chordata, Cell and Molecular Biology)*	3	-	-	-	-
		15Z309A	AC – IV – Allied Chemistry –I	5	4	25	75	100
		15Z310L	AC– V- Allied Chemistry Practical	3	-	-	-	-

	IV	15XZ32	SKBC-II- Poultry and Dairy Farming	2	2	-	100	100	
		15GS	GS-Gender Studies (Self study)	0	1	-	100	100	
			Total	30	18	-	-	600	
IV	I	15T404	LC-IV- செய்யுள் (பழந்தமிழ் இலக்கியம்), நாடகம், தமிழ் இலக்கிய வரலாறு, கட்டுரை வரைவியல்	6	3	25	75	100	
	II	15H404	ELC-IV- English through Literary Texts	6	3	25	75	100	
	IV		15Z411	CC-VI -Cell and Molecular Biology	6	5	25	75	100
			15Z308L	C C-V - Practical –II (Chordata, Cell and Molecular Biology)	3	4	25	75	100
			15Z310L	AC – V – Allied Chemistry - Practical	3	4	25	75	100
			15Z412A	AC –VI - Allied Chemistry –II	6	4	25	75	100
			15SSC	SSC- Soft Skills Course	0	2	-	100	100
		Total	30	25	-	-	700		
V	III	15Z513	CC – VII -Biochemistry and Physiology	5	5	25	75	100	
		15Z514	CC – VIII - Genetics	5	5	25	75	100	
		15Z515	CC– IX -Developmental Biology	5	4	25	75	100	
		15Z516L	C C– X Practical –III (Biochemistry and Physiology, Genetics, Developmental Biology)	6	5	25	75	100	
		15Z517a	EC –I- Biostatistics and Bio-Instrumentation	5	5	25	75	100	
		15Z517b	EC –I – Pests and their Management						
	IV	15Z5Na	NMEC- Bio source Technology	4	4	-	100	100	
		15Z5Nb	NMEC – Medical Laboratory Technology						
		15Z5Nc	NMEC –Public Health and Hygiene						
			Total	30	28	-	-	600	
VI	III	15Z618	CC– XI - Ecology and Evolution	6	5	25	75	100	
		15Z619	CC – XII - Microbiology and Immunology	6	4	25	75	100	
		15Z620	CC – XIII - Biotechnology and Bioinformatics	6	4	25	75	100	
		15Z621L	CC – XIV -Practical –IV (Ecology & Evolution, Microbiology & Immunology, Biotechnology & Bioinformatics)	6	5	25	75	100	
		15Z622a	EC –II-Economic Entomology	6	5	25	75	100	
		15Z622b	EC –II- Wild life Biology						
	IV	15ZC	Comprehensive Course	0	4	-	100	100	
		15EA	EA-Extension Activities	-	1	-	-	-	
			Total	30	28	-	-	600	
			Over all Total	180	140	-	-	3800	

\* Examination will be conducted at the end of even semester

Elective Course-I

- a. Biostatistics and Bio-Instrumentation
- b. Pests and their Management

Non-Major Based Electives-I:

- a. Bioresource Technology
- b. Medical laboratory Technology
- c. Public Health and Hygiene

Elective Course -II

- a. Economic Entomology
  - b. Wildlife Biology
  - Skill Based Course I – Apiculture, Sericulture and Fish culture
  - Skill Based Course II – Poultry Farming and Dairy Farming
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<b>Code:15T101a</b>	<b>LC-I- செய்யுள் (இக்கால இலக்கியம்), சிறுகதை, பயன்முறைத் தமிழ், தமிழ் இலக்கிய வரலாறு</b>	<b>Sem:I</b>
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### அலகு – 1

மரபுக்கவிதைகள் பாரதியார் பாடல்கள் - பக்திப் பாடல்கள், தமிழ்த்தாய், கண்ணம்மா என் காதலி, பாரதிதாசன் பாடல்கள் - தமிழின் இனிமை, நீங்களே சொல்லுங்கள்?, சிறுத்தையே வெளியே வா, பொன்னடியான் - அறத்தால்..., மாணவனே!, சாமி.பழனியப்பன் - சமுதாயமும் நூலகங்களும் தமிழேந்தி - சுற்றுச் சூழல் கெடுவதுவோ?, சாதனை வேண்டும்.

### அலகு – 2

புதுக்கவிதைகள் அப்துல் ரகுமான் - மறுபக்கம், இன்குலாப் - கொள்ளைக்காரர்கள் எப்படி இருக்கிறார்கள்?, தணிகைச்செல்வன் - தாய், மு.மேத்தா - தேசப்பிதாவிற்கு ஒரு தெருப்பாடகனின் அஞ்சலி, தமிழன்பன் - நல்லாள் நகும், வாலி - பாரதிதாசன், - வைரமுத்து - திருத்தி எழுதிய தீர்ப்புகள், தாமரை - தொலைந்து போனேன், யுகபாரதி - சொல்வதெனில், நா.முத்துக்குமார் - அக்காவின் கடிதம், நாட்டுப் புறப் பாடல்கள் - பக்திப் பாடல்கள், தாலாட்டுப் பாடல்கள், காதல் பாடல்கள், தொழிற் பாடல்கள் - ஒப்பாரிப் பாடல்கள், தெம்மாங்குப் பாடல்கள்.

### அலகு – 3 சிறுகதை

பாடநூல் - வார்ப்பு - தொகுப்பாசிரியர்கள் - முனைவர் கா.வாசுதேவன், முனைவர் மு.அருணாசலம், என்.சி.பி.எச். வெளியீடு, சென்னை - 098. (2015-2016, 2016-2017 கல்வியாண்டுக்கு), சிறுகதை மலர் - பிரமி பதிப்பகம், திருச்சி-21. (2017-2018 கல்வியாண்டுக்கு).

### அலகு – 4 பயன்முறைத் தமிழ்

எழுத்தியல் - எழுத்துப் பிழைகளும், திருத்தங்களும் - இன எழுத்துக்கள் வேறுபாடுகள் - தமிழில் பிறமொழிச் சொற்கள் - வலிமிகுதல், வலி மிகாமை.

பாடநூல் - பயன்பாட்டுத் தமிழ் (இலக்கணக் கையேடு), தமிழ் நாதன் பதிப்பகம், சென்னை – 110.

### அலகு – 5 தமிழ் இலக்கிய வரலாறு

தற்காலம் - மரபுக் கவிதை-புதுக்கவிதை – தோற்றமும் வளர்ச்சியும், ஹைகூ கவிதை, நாட்டுப்புறப் பாடல்கள், மறுமலர்ச்சி காலக் கவிஞர்கள் - சிறுகதை – தோற்றமும் வளர்ச்சியும், தமிழ்உரைநடை வளர்ச்சி.

<b>Code:15H101</b>	<b>ELC-I - English For Communicative Competence</b>	<b>Sem:I</b>
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## **Objectives**

*To expose students to effective communication in the form of prose, biographies and short stories*

*To familiarize students with various forms and functions of the English language*

### **UNIT I**

- 1.The Gift of Language – *J.G.Bruton*
- 2.My Visions for India – *A.P.J.Abdul Kalam*
- 3.Unlock Your Own Creativity – *Roger Von Oech*

### **UNIT II**

- 1.Mahathma Gandhi – *Francis G.Hutchins*
- 2.Mother Teresa – *John Frazer*
- 3.Indira Nooyi – *An Article*

### **UNIT III**

- 1.Science and Religion – *S.Radhakrishnan*
- 2.Technology with a Human Face – *E.F.Schumacher*
- 3.And Now E-teachers – *Robin Abreu*

### **UNIT IV**

- 1.Vanishing Animals – *Gerald Durrell*
- 2.Climate Change and Human Strategy – *E.K.Federov*
- 3.The Old Folks at Home – *Alphonse Daude*

### **UNIT V**

- 1.The Tempest (Retold by Charles Lamb) – *William Shakespeare*
- 2.The Cop and the Anthem – *O.Henry*
- 3.Marriage is a Private Affair – *Chinua Achebe*

<b>Code:15Z101</b>	<b>CC – I- Invertebrata – I</b>	<b>Sem: I</b>
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### **Objectives**

*To enlighten the students about the diverse forms of invertebrate animals which belong to 5 major phyla present around us.*

*To help our students to distinguish various invertebrate animals.*

*To help our students to understand both beneficial and harmful forms of invertebrates; and to know the evolutionary sequence of invertebrate animals.*

### **UNIT - I**

**Protozoa:** Classification up to orders and their distinguishing characters with suitable examples of ecological/biological importance for each order. Detailed Study: Free-Living forms: *Euglena* and *Paramecium* - Parasitic forms: *Trypanosoma* and *Plasmodium*; General Topics: Nutrition in Protozoa - Locomotion in Protozoa - Reproduction in Protozoa –Parasites of protozoa- Economic importance of Protozoa.

### **UNIT - II**

**Porifera:** Classification up to orders and their characteristic features with suitable Examples of ecological/biological importance for each order. Detailed Study: *Sycon*; General Topics: Canal system in sponges - Reproduction in sponges – Skeleton in sponges - Economic importance of Sponges.

### **UNIT - III**

**Coelenterata:** Classification up to orders and their characteristic features with suitable examples of ecological/biological importance for each order. Detailed Study: *Hydra*; *Obelia* and *Aurelia*; General Topics: Corals and Coral reefs - Polymorphism in Coelenterata.

### **UNIT - IV**

**Platyhelminthes:** Classification up to orders and their characteristic features with suitable examples of ecological/biological importance for each order. Platyhelminthes: Detailed Study: *Planaria*, *Fasciola* and *Taenia*. General Topics: Parasitic adaptations in platyhelminthes.

## UNIT - V

**Aschelminthes:** Classification up to orders and their characteristic features with suitable examples of ecological/biological importance for each order. Detailed Study: *Ascaris*; General Topics: Parasitic adaptations of *Ascaris* or Nematodes. Economic importance of Aschelminthes.

### List of Text Books

- Ayyar, E.K. and T.N. Ananthakrishnan. 1995. *A manual of Zoology. Vol. I (Invertebrata) Part I & II.* Viswanathan Pvt. Ltd.,
- Kotpal, R.L. 1996. *Modern TextBook of Zoology Invertebrates.* Rastogi Publications, New Delhi.
- Nair, N.C., Leelavathy, L. Soundara Pandian, N., Murugan, T and Arumugam, N. 2009. *A Text book of Invertebrates.* Saras Publications. Nagerkoil.
- Rastogi, V.B. 1984. *Invertebrate Zoology.* Kedar Nath Ram Nath Publications, Meerut.

### List of Reference Books

- ✓ Agarwal, V.K. 2003. *Invertebrate Zoology.* S.Chand & Company Ltd., New Delhi.
- ✓ Barnes, R.D. 1982. *Invertebrate Zoology.* Saunders College, Philadelphia.
- ✓ Barrington, E.J.W. 1979. *Invertebrates. Structure and Function.* ELBS & Nelson.
- ✓ Jordan, E.L. and Verma, P.S. 2009 (*Multicolour Revised Edition*). *Invertebrate Zoology.* S. Chand & Company Ltd., New Delhi.

Code:15Z103A	AC-I- BOTANY	Sem: I
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### Objectives

*To know about morphological characters of plants.*

*To understand the basic structure of plant cell.*

## UNIT - I

**Morphology:** Phyllotaxy and its types (Alternate, opposite, ternate, whorled, radical, leaf mosaic); Inflorescence types – (Racemose, cymose, special types)

## UNIT - II

**Taxonomy:** Binomial nomenclature – Bentham & Hooker’s system of classification. Study of the following families and their economic importance. Annonaceae, Rutaceae, Papilionaceae, Caesalpinaceae, Mimosae, Rubiaceae, Apocyanaceae and Lamiaceae.

### **UNIT - III**

**Cytology:** Ultrastructure of cell and brief outline of the following cell organelles. Cell wall, Cell membrane, Endoplasmic reticulum, Mitochondria, Chloroplast, Nucleus, Cell division: Mitosis and Meiosis  
**Genetics:** Mendel’s law. Mono and dihybrid experiments. Incomplete dominance.

### **UNIT - IV**

**Anatomy:** Simple permanent tissues; Complex permanent tissues. Primary structure of stem and root in Dicot and Monocot plants. Secondary growth in normal stem. (Dicot alone).

**Embryology:** Structure and development of anther, male gametophyte structure and types of ovule, development of female gametophyte – Polygonum type of embryo sac. Endosperm – types.

### **UNIT - V**

**Ecology:** Plant Habitat: Factors influencing plant growth (Climatic, edaphic and biotic factors). Xerophytes – Nerium; Mesophytes – Hibiscus; Hydrophytes – Hydrilla

<b>Code: 15Z104L</b>	<b>AC-II- Botany Practical</b>	<b>Sem: I &amp; II</b>
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### **Description of the following families:**

- Annonaceae,
- Rutaceae,
- Papilionaceae,
- Caesalpinaceae,
- Mimosae,
- Rubiaceae,
- Apocyanaceae and
- Lamiaceae

### **Reference:**



- ✓ *College Botany – Gunguly, Dass & Datta, 3<sup>rd</sup> Edition, New central book publishers, Culcutta.*
- ✓ *Outlines of Botany – R. V. Narayanaswami, K. N. Rao & A. Raman, Viswanathan Printers & Publisers, Chennai.*
- ✓ *Plant Anatomy – B. P. Pandey, 4<sup>th</sup> Edition, S. Chand Publisers – New Delhi.*
- ✓ *A Text book of Botany – Singh, Pande & Jain, 2<sup>nd</sup> Edition, Rastogi*

<b>Code:15VEDa</b>	<b>VE -Value Education (வாழ்வியல் கல்வியும் மனித உரிமைகளும்)</b>	<b>Sem:I</b>
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*Publications.*

- ✓ *A Text book of Botany – Angiosperm - Singh, Pande & Jain, 1<sup>st</sup> Edition, Rastogi and company.*

## அலகு 1

**வாழ்வியல் கல்வி – திறன் மேம்பாடும் உயர் பண்புகளும்**

கல்வி, வாழ்வியல் கல்வியின் நோக்கம் - வாழ்வியல் கல்வியின் பரிணாம வளர்ச்சி - வாழ்வியல் கல்வியின் கூறுகள் - சுய முன்னேற்றம் - திறன் மேம்பாடு - உயர்பண்புகள் - தன்மதிப்பீடும் சுயபரிசோதனையும் - பாலினச் சமத்துவத்தை உளமாரப் பின்பற்றுதல் - மாற்றுத் திறனாளிகள், மனவளம் குன்றியோர், வயதில் பெரியவர்கள், அனுபவசாலிகள், சான்றோர்கள், குடும்ப உறுப்பினர்கள், அருகில் வசிப்பவர்கள், சுற்றத்தார், உடன் பணியாற்றுவோர் இவர்களுக்கு மதிப்பளித்தல் - நற்பண்புகளும் நடத்தை உருவாக்கமும் - உண்மை - ஆக்கத்திறன் - தியாகம் - நேர்மை - கட்டுப்பாடு - உதவி செய்யும் மனப்பான்மை - சகிப்புத்தன்மை - அறிவியல் கண்ணோட்டம்

## அலகு 2

**தேசிய, உலக முன்னேற்றத்திற்கான வாழ்வியல் கல்வி**

தேசம், சர்வ தேசங்கள் குறித்த எண்ணங்கள் - நமது நாடு - அரசமைப்பு - மக்காளாட்சித் தத்துவம் - சமதர்மம் - மதச்சார்பின்மை - சமத்துவம் - சமூக நீதி, தனியுரிமை - சுதந்திரமும் சகோதரத்துவமும் சமூகப் பண்புகள் - இரக்கம் மற்றும் நேர்மை, சுயகட்டுப்பாடு, உலகளாவிய சகோதரத்துவம் - தொழில் சார் பண்புகள் - அறிவு வேட்கை - தொழிலில் நேர்மை - முறைமை - காலந்தவறாமையும் நம்பிக்கையும் - மதம் சார்ந்த பண்புகள் - சகிப்புத்தன்மை, மெய்யறிவு, நன்னடத்தை - அழகியல் பண்புகள் - இலக்கியம், நுண்கலைகள்

ஆகியவற்றைப் பயில்தல், சுவைத்தல், மனதார்ப் பாராட்டுதல் மதித்தல், பாதுகாத்தல், தேசிய ஒருமைப்பாடும் சர்வதேசப் புரிதலும்.

### அலகு 3

அறப்பண்புகள் மற்றும் வாழ்வியலில் உலகளாவிய பெருவளர்ச்சிகள் ஏற்படுத்தும் தாக்கங்கள்

பண்பண்பாட்டு முரண்பாடுகளின் தாக்கங்கள் - எல்லை தாண்டிய கல்வி - தொழில் சார்ந்த அறை கூவல்களும் சமரச இணக்கமும் - பொருளியல் சிந்தனைகள் - மக்கள் தொடர்புச் சாதனங்கள் - இளமை உணர்ச்சி வேக நடத்தையின் நவீன அறைகூவல்கள் - இல்லறமும் நல்லுணர்வும் - ஒப்பீடும் போட்டி இடுதலும் - நேர்மறை, எதிர்மறை எண்ணங்கள் - அகந்தை - சினம் - சுயநலம் - அறைகூவல்கள்

### அலகு 4

உடல், உள்ள நலமும் நோய் தீர்க்கும் செயல்பாடுகளும்

உணவுப் பழக்கமும் உணவு முறைகளும் - பொருந்தும் உணவுகள் - பொருந்தா உணவுகள் - மனக் கட்டுப்பாடு - மனத்திண்மை - எளிய உடற்பயிற்சி - தியானம் - மனம், ஆன்மா சார்ந்த விளைவுகள் - யோகா - நோக்கங்கள் - வகைகள் - முறைகள் - ஆசனங்கள் - ஆசைகளை ஒழுங்குபடுத்துதல் - கவலை நீக்குதல் - சினம் தணிதல் - நெடுநீர், மறதி, சோம்பல் தவிர்த்தல் - தூக்கம் முறைப்படுத்துதல் - துக்கம், இழப்புகளை எதிர்கொள்ளல் - புகை, மது முதலானவைகளின் தீங்கு உணர்தல்- வாழ்த்துகளின் பயன்கள்

குறிப்பு : இந்த அலகு உடற்பயிற்சி - தியானம் - யோகா செய்முறைப் பயற்சிகளுடன் கூடியது.

### அலகு 5 மனித உரிமை, மனித உரிமை கருத்துக்கள்

தேசிய மற்றும் பன்னாட்டுக் கண்ணோட்டங்கள் - மனித உரிமையின் பரிணாமம் - மனித உரிமையின் பரந்த வகைப்பாடுகள் வாழ்தற்கான உரிமை, சுதந்திரம், கண்ணியத்துடன் வாழ்வதற்கான உரிமைகள் - கலாச்சாரம் மற்றும் கல்விக்கான உரிமைகள் - பொருளாதார உரிமைகள் - அரசியல் உரிமைகள் - சமூக உரிமைகள் - பெண்கள் மற்றும் குழந்தைகளின் மனித உரிமை - சமூகப் பழக்கங்களும் அரசியலமைப்புப் பாதுகாப்புகளும்.

<b>Code:15T202</b>	<b>LC-II - செய்யுள் (பக்தி,இடைக்கால இலக்கியம்)தமிழ்ச் செம்மொழி வரலாறு, மொழிபெயர்ப்பியல், தமிழ் இலக்கிய வரலாறு</b>	<b>Sem:II</b>
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### அலகு - 1

**தேவாரம் - திருஞானசம்பந்தர்** திருவையாறு திருமுறைப் பதிகம் -3 “புலனைந்தும் பொறிகலங்கி” எனத் தொடங்கும் பதிகம், **திருமந்திரம்** - 10 பாடல்கள் ஒன்றவன்... (பாடல் எண் - 1), தீயினும்... (பாடல் எண் - 8), பிறப்பிலி... (பாடல் எண் - 25), வானின்று... (பாடல் எண் - 30), அப்பனை... (பாடல் எண் - 36), கல்லா அரசனும்... (பாடல் எண் - 238), வேட நெறி... (பாடல் எண் - 240), வேந்தன் உலகை... (பாடல் எண் - 245), அமுதாறும்...( பாடல் எண் - 248), தன்னையறியாது...( பாடல் எண் - 255). **நாலாயிரத் திவ்வியப் பிரபந்தம்** - குலசேகர ஆழ்வார் பெருமாள் திருமொழி - “ஊனேறு செல்வத் துடற்பிறவி” எனத்தொடங்கும் பாடல் முதல் 11 பாடல்கள் (677-687), **திருவிளையாடல் புராணம்** - திருநாட்டுச் சிறப்பு 20 பாடல்கள், **திருஅருட்பா** - பிள்ளைச் சிறு விண்ணப்பம் 3394 முதல் 3409 வரை 16 பாடல்கள்.

**அலகு - 2 கலிங்கத்துப் பரணி** - காடு பாடியது, **தமிழ் விடு தூது** - 179 ஆவது கண்ணி முதல் 198 ஆவது கண்ணி முடிய 20 கண்ணிகள், **குற்றாலக் குறவஞ்சி** - எங்கள் மலையே 5 பாடல்கள், **முக்கூடற்பள்ளு** 07 பாடல்கள் - **நாட்டுவளம்** -கோட்டு வளங்...(பாடல் எண் - 16)இ மேடையேறித்தன்... (பாடல் எண் - 17)இ கறைபட்டுள்ளது... (பாடல் எண் - 21), **மீதுயர்ந் திடுங்....** (பாடல் எண் - 25), **நகர்வளம்** - கொண்டல் கோபுரம்... (பாடல் எண் - 19) கோதி மாமணி...(பாடல் எண் - 23) கார் பூத்த வண்ணனார்... (பாடல் எண் - 28)

### அலகு - 3 தமிழ்ச் செம்மொழி வரலாறு

செம்மொழி விளக்கம் - செம்மொழி வரலாறு - உலகச் செம்மொழிகள் - இந்தியச் செம்மொழிகள் - செம்மொழிக்கான தகுதிகள் அல்லது செம்மொழிப் பண்புகள் - தமிழ்ச் செம்மொழி நூல்கள்.

**பாடநூல் - தமிழ்ச் செம்மொழி வரலாறு** - முனைவர் மு.சாதிக்கபாட்சா, இராஜா பப்ளிகேசன், திருச்சி-23.

### அலகு - 4 மொழிபெயர்ப்பியல்

ஒரு மடல்(கடிதம்) அல்லது ஒரு பத்தி ஆங்கிலத்திலிருந்து தமிழில் மொழிபெயர்த்தல்.

**பாடநூல் - மொழிபெயர்ப்பியலும் மொழிபெயர்ப்புகளும்** - மகிழினி பதிப்பகம், சென்னை- 106.

## அலகு - 5 தமிழ் இலக்கிய வரலாறு

சமயமும் தமிழும், சிற்றிலக்கியங்கள், பக்தி இலக்கியங்கள், முத்தொள்ளாயிரம்இ சித்தர்கள், உரையாசிரியர்கள், இலக்கண நூல்கள், நிகண்டுகள்.

**Code:15H202**

**ELC-II- - English for Proficiency**

**Sem:II**

### Objectives

*To expose students to the wisdom and experience written in the form of prose, biographies and short stories*

*To familiarize students with various forms and functions of the English language*

#### UNIT I

- 1.The Beauty Industry – *Aldous Huxley*
- 2.A Talk on Advertisement – *Herman Wouk*
- 3.On Seeing Films – *Anonymous*

#### UNIT II

- 1.Charlie Chaplin– *From his Biography*
- 2.Subash Chandra Bose – *M.L Ahuja*
- 3.Isaac Newton – *Colin Swatridge*

#### UNIT III

- 1.The Need for Excellence – *N.R.Narayana Murthy*
- 2.Travel by Train – *J.B.Priestly*
- 3.Tight Corners – *E.V.Lucas*

#### UNIT IV

- 1.Letter to Bapu from Generation Next – *Chetan Bhagat*
- 2.Human Rights and Legal Responsibilities – *Nani A.Palkhivala*
- 3.Cellphone Epidemic – *Claudia I.Haas*

#### UNIT V

- 1.Three Days to see – *Helen Keller*
- 2.The Four Brothers – *Walter De La Mare*
- 3.A Different Kind of Learning – *Jade Snow Wong*

<b>Code:15Z102L</b>	<b>CC –II – Practical –I(Invertebrata –I &amp;II)</b>	<b>Sem:I &amp;II</b>
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## **Objectives**

*To impart training on the technique of dissecting the invertebrate animals and to understand the various systems present in the body.*

*To demonstrate the technique of in silico dissection of invertebrate animals.*

*To train the students to discriminate the various external body parts of invertebrates.*

*To observe the preserved invertebrate animals (wet and dry) and to study their characteristic features.*

**Major Dissections:** Digestive and Nervous systems of Earthworm and Cockroach; Nervous system of Prawn. Dissection of any one Invertebrate animal's digestive and Nervous system by using Computers (Demonstration only).

**Minor Dissections:** Mounting of Body setae and Penial setae of Earthworm; Mounting of mouth parts of Honey bee, House fly, Cockroach and Mosquito; Appendages of Prawn.

**Spotters:** Study of invertebrate forms which belong to different phyla with special reference to the following aspects:

**A. Classify giving reasons:** *Paramecium, Euglena, Obelia* (Entire), Sea Anemone, *Aurelia*, *Ascaris*-male, *Ascaris*-Female, Earthworm, *Nereis*, Leech, *Arenicola*, Prawn, Centipede, House fly, *Lepas*, *Scolopendra*, Millipede, *Grylotalpa*, *Pila*, *Loligo*, *Sepia*, *Chiton*, *Murex*, *Xancus*, Star fish and Sea Cucumber.

**B. Biological Significance:** *Paramecium* – Conjugation and Binary fission; Sponge - Gemmule; *Fasciola*, Tape worm, *Ascaris*, Heteronereis, *Limulus*, Nauplius Larva, *Peripatus*, Cocoon of silk moth, Honey bees and *Bipinnaria* Larva.

**C. Ecological adaptations:** *Physalia*, *Porpita*, *Verella*, *Aphrodite*, *Ascaris*, Leech, Head Louse and *Teredo*,

**D. Relationship between structure and function:** Sponge- Spicules; *Taenia solium* – Scolex; *Nereis* – Parapodium; Prawn – *Petasma*; *Sepia* - Cuttle bone; *Pila* – *Radula*.

**E. Draw and Label the parts:** *Planaria* – T.S.; *Fasciola* – T.S.; Tape Worm – T.S.; *Ascaris* – Male –T.S.; *Ascaris* – Female T.S.; Leech – T.S.; and *Nereis* – T.S.

<b>Code:15Z205</b>	<b>CC-III - Invertebrata-II</b>	<b>Sem: II</b>
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### **Objectives**

*To enlighten the students about the diverse forms of invertebrate animals which belong to 4 major phyla present around us.*

*To help our students to distinguish various invertebrate animals.*

*To help our students to understand both beneficial and harmful forms of invertebrates; and to know the evolutionary sequence of invertebrate animals.*

### **UNIT - I**

**Annelida:** Classification up to orders and their distinguishing characters with suitable examples of biological/ecological importance for each order. **Detailed study:** Earthworm and Leech. **General Topics:** Modes of Life in Polychaetes; Excretion in Annelida; Economic importance of annelids.

### **UNIT - II**

**Arthropoda:** Classification up to orders and their distinguishing characters with suitable examples of biological/ecological importance for each order. **Detailed study:** Cockroach and Prawn. **General Topics:** Salient features and affinities of Peripatus; Mouthparts and their modifications in insects; Respiration in Arthropods.

### **UNIT - III**

**Mollusca:** Classification up to orders and their distinguishing characters with suitable examples of biological/ecological importance for each order; **Detailed study:** Pila and Fresh water mussel. **General Topics:** Oyster culture - Pearl Culture - Foot in Molluscs - Torsion in Mollusca.

### **UNIT – IV**

**Echinodermata:** Classification up to orders and their distinguishing characters with suitable examples of biological/ecological importance for each order. **Detailed study:** Starfish and Sea cucumber. **General Topics:** Water vascular system in Echinoderms; Larval forms of Echinoderms.

## UNIT – V

**Minor Phyla:** Rhynchocoela - General organization, affinities with lower hemichordates, vertebrates and platyhelminths; Endoprecta general organization, affinities with Ectoprecta, Annelida and Rotifer; Chetognatha - General organization, affinities with Annelida, Brachiopoda and Aschelminthes.

### List of Text Books

- Ayyar, E.K. and T.N. Ananthakrishnan. 1995. *A manual of Zoology. Vol. I (Invertebrata) Part I & II. Viswanathan Pvt. Ltd.,*
- Kotpal, R.L. 1996. *Modern TextBook of Zoology Invertebrates. Rastogi Publications, New Delhi.*
- Nair, N.C., Leelavathy, L. Soundara Pandian, N., Murugan, T and Arumugam, N. 2009. *A Text book of Invertebrates. Saras Publications. Nagerkoil.*
- Rastogi, V.B. 1984. *Invertebrate Zoology. Kedar Nath Ram Nath Publications, Meerut.*

### List of Reference Books

- ✓ Agarwal, V.K. 2003. *Invertebrate Zoology. S.Chand & Company Ltd., New Delhi.*
- ✓ Barnes, R.D. 1982. *Invertebrate Zoology. Saunders College, Philadelphia.*
- ✓ Barrington, E.J.W. 1979. *Invertebrates. Structure and Function. ELBS & Nelson.*
- ✓ Jordan, E.L. and Verma, P.S.2009 (*Multicolour Revised Edition*). *Invertebrate Zoology. S. Chand & Company Ltd., New Delhi.*

<b>Code: 15Z206A</b>	<b>AC-III- Botany</b>	<b>Sem:II</b>
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### **Objectives**

*To know about general characters and life history of lower plants.*

*To understand some physiological activities of plants.*

### **UNIT -I Thallophytes:**

Algae: General characteristics of algae, study of the structure and life history of the following genera; Oscillatoria, Oedogonium, Chara, Polysiphonia.



## **UNIT - II**

Fungi: General characteristics of fungi, study of the structure and life history of the following genera; Penicillium, Yeast, Polyporus. Elementary knowledge of bacteria (Structure, nutrition, reproduction, and economic importance) and virus (TMV structure, transmission and life cycle).

## **UNIT - III**

Bryophytes, Pteridophytes and Gymnosperms:

Study of the structure and reproduction of Funaria,

Study of the structure and reproduction of Lycopodium,

Study of the structure and reproduction of Cycas.

## **UNIT - IV** Plant physiology:

Absorption of water and salts, Role of mineral elements (Macro and micro elements) in plant growth, Transpiration – Factors affecting transpiration, Growth hormones and its role in plant growth.

## **UNIT - V**

Photosynthesis: Path of Carbon (Light and Dark reactions), Respiration: Glycolysis and Krebs's cycle. Nitrogen cycle, Biological nitrogen fixation (Rhizobium alone), Mineral nutrition (Macro and micro nutrients)

<b>Code:15EVS</b>	<b>EVS -Environmental Science</b>	<b>Sem:II</b>
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## **Objectives**

*To create awareness among the students about our environment, its values, and the need for protecting it for the well being of mankind in the months and years to come.*

### **UNIT - I**

Multidisciplinary nature of Environmental Science – Definition – Scope and importance. Natural resources: Land resources: Lands as resources and their uses – land degradation, soil erosion. Forest resources: Importance of forest resources - Major and minor forest produces – Need for afforestation – Water resources: Availability of surface and ground water – Importance of water conservation – Food resources: World food problems and possible solutions. Effect of modern agriculture.

### **UNIT - II**

**Mineral resources**: Their availability and uses – environmental effects of extracting. Energy resources: Growing energy needs – renewable and non-renewable energy sources – Use of alternate energy sources – Case studies – Equitable use of resources for sustainable life styles.

### **UNIT-III:**

**Ecosystem**: Concept – Structure and function of Grass land, Pond and Forest ecosystem – Food chains, food webs and Ecological pyramids. Biodiversity: Definition – Genetic, Species and Ecosystem diversity – Biogeographical classification of India – Values of Biodiversity – Biodiversity at global, national and local levels – India as a mega-diversity nation – Hotspots of Diversity – Threats to Biodiversity – Endangered and Endemic species of India – *In situ* and *Ex situ* conservation of biodiversity.

### **UNIT-IV:**

**Environmental pollution**: Definition, Causes, effects and control measures of Air, Water, Soil, Marine, Noise, Thermal and Nuclear pollution – Solid Waste Management: Causes, effects and management of urban and industrial wastes

## UNIT-V:

**Social issues and environment:** Effects of deforestation, Construction of Dams, Mineral mining on environment – Natural disasters and their management: Floods, Earthquake, Cyclone and Landslides – Conflicts over water – Advantages of rainwater harvesting and watershed management – Climate change, global warming, acid rain, ozone depletion. Environmental ethics – Case studies – Population explosion – Effects of population explosion on environment – Various acts and legislations, environment and human health, human rights, HIV/AIDS, women and child welfare. Role of individual in preservation of environment.

### **List of Reference Books**

- ✓ Anon. 2000. *Environmental Studies (U.G.C Syllabus)*, Periyar E.V.R College, Tiruchirapalli.
- ✓ Asthana, D.K., Meera, A. 2006. *A Text Book of Environmental Studies for under graduate students*. S.Chand & Company Ltd., New Delhi.
- ✓ Benny Joseph. 2005. *Environmental Studies*. Tata McGraw-Hill Publishing Company Ltd., New Delhi.
- ✓ Kumaraswamy, K., Alagappa Moses, A. and Vasanthi, M. 2004. *Environmental Studies (A Text Book for all under graduate students)*. Bharathidasan University, Tiruchirapalli.

<b>Code:15XZ21</b>	<b>SKBC-I- Apiculture, Sericulture And Fish Culture</b>	<b>Sem:II</b>
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### **Objectives**

*To impart training to our students both on site and off site on the technique of Honey, Wax etc., production from Apiculture.*

*To impart training to our students both on site and off site on the technique of silkworm rearing, cocoon production and silk reeling from sericulture.*

*To impart training to our students both on site and off site on the technique of ornamental fish culture and fish farming.*

*To kindle the young minds to become self employers/entrepreneurs of these three culture practices of their choice in their native places after graduation.*

### **APICULTURE**

## **UNIT – I**

Apiculture: Wild Bees – Species of Honey Bees– Morphology, Colony Organization and Life Cycle - Bee Keeping Equipments: Newton’s Bee Hive – Other Bee Keeping Equipments – Equipments for Handling Bees. Social Behaviour of Bees: Division of Labour, Food Gathering, Feeding, Communication and working Habit of Field Bees.

## **UNIT – II**

Bee Hive Products: – Honey - Chemical composition of honey – Nutritional and Medicinal values of Honey - Wax – Bee Venom – Propolis – Royal Jelly; Pollination: Pollination and Fertilization–External Agents of pollen transfer – Advantages of Bee Pollination in Crops.

## **SERICULTURE**

### **UNIT-III:**

Sericulture: Non-Mulberry Silkworms: Tasar silk worm, Muga silk worm and Eri silkworm – Uses of silk - The Central Silk Board (CSB): Functions of CSB – Magnitude of Silk production in the world – Sericulture in India; Moriculture; Methods of propagation: Vegetative propagation; Irrigation, manuring, Pruning, Harvesting and Storage of mulberry leaves. The Mulberry Silk worm - *Bombyx mori*: Commercial races of India; Rearing Facilities: Rearing methods: - Storage of cocoons - Cocoon Marketing;

## **FISH CULTURE**

### **UNIT - IV**

Ornamental fish culture: Aquarium fishes:- Common Species of ornamental fishes suitable for Aquarium - Varieties of Gold Fishes - Introduction of fishes in an Aquarium tank; Feeding: Food items - Some Important live Food - Healthy fishes. Breeding: Breeding of ornamental fishes - Selection and Conditioning of Fishes for Breeding - Water quality for breeding tanks - Egg scatterers. Diseases and ailments: Protozoan disease – White spot disease; Bacterial disease – Erythroderma; Viral disease – Erythrocytic necrosis; Deficiency diseases. Quarantine tanks – Marketing of ornamental fishes.

### **UNIT - V**

The fish farm: Fish farm, design and construction; Maintenance of fish farm: Fertilizers of pond, Improvement of pond bottom, control of

aquatic weeds, control of Aquatic insects and control of predatory and weed fishes; Culture of some important species: Culture of Indian major carps - Culture of common carps. Harvesting - precautions observed during harvesting -Fish spoilage, fish preservation. Nutritive value of fishes.

Visit to a nearby apiculture Unit, sericulture Unit, Ornamental fish and edible Fish Farm Unit for imparting training on various aspects of apiculture, sericulture and fish farming techniques. Preparation and submission of a report on the visit.

### **Apiculture**

#### **List of Text Books:**

- *Ahsan, J. and Sinha, S.P. 2003. A Hand book on Economic Zoology. S. Chand & Company Ltd., New Delhi.*
- *Arumugam, N., Murugan, T., Johnson Rajeshwar, J. and Ram Prabhu, R. 2009. Applied Zoology. Saras Publication, Nagercoil.*

#### **List of Reference Books:**

- ✓ *Abrol, D. P. 1997. Bees and Beekeeping in India. Kalyani Publishers, Ludhiana.*
- ✓ *Fenemore, P.G. and A. Prakash. 2006. Applied Entomology. New Age International Publishers, Chennai.*
- ✓ *Mishra, R.C. 1995. Honey Bees and Their Management in India. Indian Council of Agricultural Research, New Delhi.*
- ✓ *Shukla, G.S. and Upadhyay, V.B. 1997. Economic Zoology. Rastogi Publications, Meerut.*

### **Sericulture**

#### **List of text Books**

- *Taxima, Y. 1972. Hand Book of Silkworm Rearing. Fuji Publication, Tokyo.*
- *Tomar, B.S and N.Singh. A Text Book of Applied Zoology. 2007. Emkay publications. Delhi.*
- *Ullal, S.R. and Narasimhanna, M.N. 1979. Hand book of Practical Sericulture. Central Silk Board, Bombay.*

#### **List of Reference Books:**

- *Ganga, G. and Sulochana Chetty, J. 2003. An Introduction to Sericulture (2<sup>nd</sup> Edition). Oxford and IBH Publishing co. Pvt-Ltd., New Delhi.*
- *Shukla, G.S. and Upadhyay, V.B. 1997. Economic Zoology. Rastogi Publications, Meerut.*

### **Fish culture**

#### **List of Text Books:**

- ✓ *Arumugam, N. 2008. Aquaculture. Saras Publication, Nagercoil.*
- ✓ *Santhanam, R., N. Sugumaran and P. Natarajan. 1987. A manual of Fresh water aquaculture. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.*

#### **List of Reference Books:**

- ✓ *Gupta, S.K and Gupta, P.C. 2006. General and Applied Ichthyology. S.Chand and company Ltd. New Delhi.*
- ✓ *Shanmugam, K. 1992. Fishery Biology and Aquaculture. Leo Pathipagam, Madras.*

<b>Code:15T303</b>	<b>LC-III - செய்யுள் (காப்பியங்கள்), புதினம், தமிழ் இலக்கிய வரலாறு</b>	<b>Sem:III</b>
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**அலகு - 1**

1. சிலப்பதிகாரம் - கனாத்திறன் உரைத்த காதை (80 வரிகள்)
2. மணிமேகலை - ஆபுத்திரன் திறன் அறிவித்த காதை (115 வரிகள்)

**அலகு - 2**

1. கம்பராமாயணம் - இரணியன் வதைப் படலம் (56 பாடல்கள்)
2. பெரியபுராணம் - இளையான் குடி மாறனார் புராணம் (27 பாடல்கள்)
3. சீறாப் புராணம் - பாந்தள் வசனித்தப் படலம் - (18 பாடல்கள்)

**அலகு - 3**

1. இராவண காவியம் - தமிழகக் காண்டம் - (தலைமக்கள் படலம்-28
2. பாடல்கள்)
3. இயேசு காவியம் - (உவமை வழிச் செய்தி முழுவதும்)

**அலகு - 4 புதினம்**

**பாடநூல்**

சக்கை, கலைச் செல்வி, என்.சி.பி.எச். வெளியீடு, சென்னை - 600 098.

**அலகு - 5 தமிழ் இலக்கிய வரலாறு**

காப்பியங்கள் - ஐம்பெருங்காப்பியங்கள், ஐஞ்சிறு காப்பியங்கள், பிறகாப்பியங்கள் நாவல் - தோற்றம், வளர்ச்சி,-அயல் நாடுகளில் தமிழ்.

<b>CODE:15H303</b>	<b>ELC-III-English for Employability</b>	<b>SEM:III</b>
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**Objectives**

*To expose students to the language items tested in the competitive examinations*

*To familiarize students with different forms of multiple choice and descriptive type questions*

**UNIT I**

Spellings

Vocabulary – Synonyms and Antonyms

**UNIT II**

Spotting Errors

## Errors and How to Avoid Them

### UNIT III

Reading Comprehension  
Jumbled Sentences

### UNIT IV

Words often confused  
Idioms and Phrases & Phrasal Verbs  
Dialogue Writing

### UNIT V

Public Speaking  
Interview skills and Group Discussion  
Letter Writing & CV Writing  
Report Writing

<b>Code:15Z307</b>	<b>CC – IV- Chordata</b>	<b>Sem:III</b>
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General Paragraph and Essay Writing

The text book is compiled by the Members of the Dept of English.

### Objectives

*To enlighten the students about the diverse forms of chordate animals around us.*

*To help our students to distinguish various chordate animals.*

*To help our students to discriminate both harmful and beneficial chordate animals.*

### UNIT - I

Prochordata and Agnatha: General characters and an outline classification of Prochordata and Agnatha up to orders with suitable examples of biological interest; Origin of Chordates - Prochordata and Agnatha: Detailed Study: Amphioxus and *Petromyzon*; Affinities of Prochordates with Echinoderms.

### UNIT – II

Gnathostomata: General characters and an outline classification of Pisces up to orders with suitable examples of biological interest. Pisces: Detailed study - *Scoliodon* (Shark). General Topics - Accessory



respiratory organs in fishes - Dipnoi and their affinities - Migration of fishes – Economic importance of fishes.

### **UNIT – III**

Amphibia and Reptilia: General characters and an outline classification of Amphibia and Reptilia up to orders with suitable examples of biological interest. Amphibia and Reptilia: Detailed Study: *Rana hexadactyla* (Frog); and *Calotes versicolor* (Garden Lizard); General Topics: Parental Care in Amphibia – Neoteny - Identification and distribution of poisonous and non-poisonous snakes of India – Dinosaurs.

### **UNIT – IV**

Aves: General characters and an outline classification of Aves up to orders with suitable examples of biological interest; Aves: Detailed Study: *Columba livia* (Pigeon); General Topics: Flightless birds –Evolutionary significance of Archeopteryx - Flight adaptations in birds, Types of Nests.

### **UNIT – V**

Mammalia: General characters and an outline classification of Mammalia up to orders with suitable examples of biological interest. Mammalia: Detailed study: *Oryctolagus* (Rabbit); Prototheria – Special features with examples - Distribution and adaptive radiation in Marsupials - Dentition in Mammals – Adaptations in aquatic mammals.

### **List of Text Books:**

- Ayyar. E.M., Anantha Krishnan T.N. 1995. *Manual of Zoology Vol.II, Part I & II. (Chordata), S. Viswanathan Pvt. Ltd., Chennai.*
- Kotpal, R.L.1998. *Modern Text Book of Zoology - Vertebrata, Rastogi and Company, Meerut, India.*
- Thangamani, T. and Arumugam, N. 2009. *A text book of Chordates. Saras Publications.*

### **List of Recommended Books:**

- ✓ Dhami, P.S and Dhami, J.K. 1982. *Chordate Zoology. R.Chand & co Publishers, New Delhi.*
- ✓ Goodrich, 1958. *Structure and development of vertebrates, Vol.I & II. Reprinted by Dower Pub. Inc. New York.*
- ✓ Jordan, E. 1983. *Chordate Zoology. S. Chand & Company Ltd., New Delhi*
- ✓ Jordon E and Verma P.S. 1995. *Chordate Zoology elements of animal physiology. S.Chand & Co. New Delhi.*

<b>Code:15Z308L</b>	<b>CC – V-Practical –II(Chordata, Cell and Molecular Biology)</b>	<b>Sem:III &amp; IV</b>
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✓ *Waterman, A.J. 1971. Chordate structure and function. Macmillan Company- New York.*

## **Objectives**

*To impart training on the technique of dissecting the vertebrate animals (both animals in silico models) and allow our students to comprehend the various systems.*

*To observe the preserved chordate animals (wet and dry) and to study their characteristic features.*

*To impart training on the cytological and molecular biology techniques.*

## **CHORDATA:**

**Major Dissections:** Digestive and reproductive systems of a bony fish; Dissection of any one vertebrate animal's digestive and reproductive system by using Computers (Demonstration only).

**Minor Dissections:** Mounting of scales of fishes (Cycloid, Ctenoid and Placoid)

## **Spotters:**

**Prochordates:** *Balanoglossus, Amphioxus, Ascidian and Tornaria larva.*

**Pisces:** *Scoliodon, Narcine, Arius, Gambusia, Hippocampus, Exocoetus, Anabus, Synapteura, Periophthalmus, Echeneis and Ophiocephalus.*

**Amphibia:** *Bufo, Hyla, Salamandra, Alytes and Axolotl larva.*

**Reptillia:** *Hemidactylus, Draco, Varanus, Naja naja, Hydrophis and Chelone.*

**Aves:** Kingfisher, Owl, Quill feather and Synsacrum, Pigeon.

**Mammalia:** Rat, Kangaroo and Bat.

**Skeletal System:** Frog-Skull; Pectoral and pelvic girdles; fore and hind limbs.

**Mammalian Vertebrae** – Atlas, Axis, Cervical, Thoracic, Lumbar, Sacral and Caudal.

## **CELL AND MOLECULAR BIOLOGY**

Squash preparation of onion root tip to study the different stages of mitosis.

Squash preparation of grasshopper testis to study the different stages of meiosis.

Cell as an osmometer.

Isolation of Genomic DNA

**Spotters:**

To study a typical Prokaryotic and Eukaryotic cells with the help of a Microscope.

Study of different types of tissues (Epithelial tissues and connective

<b>Code:15Z309A</b>	<b>AC-IV-Allied Chemistry –I</b>	<b>Sem:III</b>
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tissues).

**Objectives:**

*To learn about volumetric analysis and some bio organic compounds*

*To learn some separation techniques in organic chemistry.*

**Unit - I: Principles of volumetric analysis and quantum numbers.**

1.1 Volumetric Principles –basic requirements of titration-concentration Units –normality. Quantum numbers-principal, azimuthal, magnetic and spin quantum numbers and their significance.

1.2 principles governing the occupancy of electrons in various quantum levels-Pauli's exclusion principle. Aufbau principle, Hund's rule-stability of half-filled and fully-filled orbitals.

**Unit - II: Isomerism and heterocyclic compounds.**

2.1 Classification of organic compounds-classification of functional groups-IUPAC-names of simple organic compounds. Isomerism-structural, chain, and position isomerism of alcohols only.

2.2 Metamerism. Stereoisomerism- cis-trans isomerism- optical isomerism. Heterocyclic compounds-furan and pyridine-preparation and properties.

**Unit - III: Carbohydrates and vitamins.**

3.1 Carbohydrates- Glucose-preparation and properties. Sucrose-manufacture and properties.

3.2 Vitamins-Thiamine and riboflavin-occurrence and biological importance (no structural elucidation)

#### **Unit - IV: Amino acids and proteins.**

4.1 Amino acids-classification, preparation and properties. Peptides (elementary treatment). Proteins.

4.2 Biological functions of proteins-primary and structure of proteins. Purines-synthesis-classification-structure (no structural elucidation) and uses.

#### **Unit - V: Separation technique**

5.1 Solvent extraction-soxhlet steam distillation apparatus.

5.2 Chromatography-column, paper, and thin layer chromatography.

#### **References:**

- *B.R.Puri, L.R.Sharma, principles of inorganic chemistry, S.Naginchand & Co., Jalandhar, 1982.*
- *B,S.Bahl, Arunbhal, A text book Organic Chemistry, S.Chand & Company Ltd. New Delhi, 16<sup>th</sup> edition, 2001.*
- *I.L.Finar, Organic Chemistry, ELBS and Longman Group Ltd, London, 6<sup>th</sup> edition, 1973.*

#### **Text Book**

- ✓ *B.R.Puri & L.R. Sharma, Principles of physical chemistry (16<sup>th</sup> edition), Shoban Lal Naginchand & Co., New Delhi (2000).*
- ✓ *B.R.Puri, L.R.Sharma, principles of inorganic chemistry, S.Naginchand & Co., Jalandhar, 1982.*
- ✓ *B,S.Bahl, Arunbhal, A text book Organic Chemistry, S.Chand & Company Ltd. New Delhi, 16<sup>th</sup> edition, 2001.*
- ✓ *I.L.Finar, Organic Chemistry, ELBS and Longman Group Ltd, London, 6<sup>th</sup> Edition, 1973.*

<b>Code:15Z310L</b>	<b>AC-IV-Allied Chemistry –I</b>	<b>Sem:III</b>
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## **Objective**

*To learn different titrimetric methods.*

*To study the basics of organic analysis*

### **I. VOLUMETRIC ANALYSIS:**

Acidimetry- Alkalimetry

- a) Strong acid Vs strong base
- b) Weak acid Vs strong base
- c) Determination of Hardness of water

### **2. Permanganimetry**

- A) Estimation of Ferrous sulphate using  $\text{KMnO}_4$ .
- B) Estimation of Oxalic acid using  $\text{KMnO}_4$ .

### **3. Iodometry**

- A) Estimation of Copper using thiosulphate.
- B) Estimation of  $\text{K}_2\text{Cr}_2\text{O}_7$  using thiosulphate.
- C) Estimation of  $\text{KMnO}_4$  using thiosulphate.

### **II. ORGANIC ANALYSIS:**

A study of reactions of the following organic compounds:

1. Acid
2. Phenol
3. Aldehyde
4. Ketone
5. Carbohydrate
6. Amine
7. Amide.

The students may be trained to perform the specific reactions like test for element (Nitrogen only) Aliphatic or Aromatic, saturated or Unsaturated and Functional group present and record their observations.

### **References**

- V.Venkateswaran, R.Veerawamy and A.R.Kulandaivelu, *Basic principles of practical chemistry sultan chand & sons, New Delhi, 2nd edition, 1977.*
- ARTHUR I. VOGEL, *Elementary practical chemistry, Quantitative analysis, CB publishers and distributors, 6<sup>th</sup> edition, 2000.*

<b>Code:15XZ32</b>	<b>SKBC –II- Poultry and Dairy Farming</b>	<b>Sem:III</b>
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### **Objectives**

*To impart training to our students, both on site and off site on the techniques of poultry and dairy farming.*

*To create interest in the young minds to become self employers/entrepreneurs of these two farming practices of their choice in his/her native places after graduation.*

### **POULTRY FARMING**

#### **UNIT - I**

**Poultry Industry in India:** Breeds of fowls – Indigenous breeds and Exotic breeds: American, Asiatic and Mediterranean Classes; Breeding and rearing – Selection of Breed – Breeding – Housing of Birds - Semi-Intensive - Intensive Methods – Deep Litter system – Individual Cage System.

#### **UNIT - II**

**Poultry Feeds and feeding:** Feeding utensils – Feed additives - Incubation of Eggs: Artificial Incubation – Brooding and Rearing of Chicks – Poultry diseases and their management: Ranikhet (New Castle) disease, Fowl pox, Avian Leucosis, Tick fever, Tuberculosis, Fowl Cholera, Infectious coryza - Culling.

#### **UNIT - III**

**Nutritive values of eggs and meat:** Quality, Preservation and Marketing of poultry products – By-products of Poultry — Economics of Poultry farming - **Visit to a nearby Poultry Unit for imparting training on various aspects of Poultry farming to the students. Preparation and submission of a report on the visit.**

### **DAIRY FARMING**

#### **UNIT - IV**

**Breeds of cattles:** Draught breeds, Dairy breeds, Dual purpose breeds; Indigenous and Exotic breeds; Feeding stuff – Maintenance of rations – Feeding of young stock – Important Pests and Diseases of Cattles.

#### **UNIT - V**

**Breeding:** Important traits for breeding - Cross breeds – Breeding and Cattle Improvement Programmes in India - Reproduction in cattles: Artificial Insemination - Nutritive values, Quality, Preservation and Marketing of dairy products – By-products of dairy farming. Visit to a nearby Dairy farming Unit for imparting training on various aspects of Dairy farming to the students. Preparation and submission of a report on the visit.

**List of Text Books:**

- *Arumugam, N., Murugan, T., Johnson Rajeshwar, J. and Ram Prabhu, R. 2009. Applied Zoology. Saras Publication, Nagercoil.*
- *Babu, M. and Lurthu Reetha, T. 2011. A Handbook on Poultry farming. Tamilnadu Veterinary and Animal Sciences University and Nehru Memorial College, Tiruchy.*
- *Tomar, B.S. and Singh, N. 2007. A Text Book of Applied Zoology. Emkay Publications, Delhi.*

**Reference Book:**

*Shukla, G.S. and Upadhyay, V.B. 1997. Economic Zoology. Rastogi Publications, Meerut*

<b>Code:15GS</b>	<b>GS –Gender Studies( Self Study)</b>	<b>Sem:III</b>
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## ***FOUNDATION COURSE IN GENDER STUDIES***

### **Objectives**

*To make boys and girls aware of each others strengths and weakness.*

*To develop sensitivity towards both genders in order to lead an ethically enriched life.*

*To promote attitudinal change towards a gender balanced ambience and women empowerment.*

### **Unit - I : Concepts of Gender**

Sex – Gender- Biological Determination – Patriarchy -Feminism- Gender Discrimination- Gender Division of Labour – Gender Stereotyping- Gender Sensitivity – Gender Equity – Gender Equality- Gender Mainstreaming – Empowerment.

### **Unit – II: Women’s Studies vs Gender Studies**

UGC’s Guidelines –VII to XI Plans – Gender Studies: Beijing Conference and Convention on the Elimination of All forms of Discrimination against Women (CEDAW) - Exclusiveness and Inclusiveness

### **Unit – III: Areas of Gender Discrimination:**

Family – Sex ratio – Literacy - Health – Governance- Religion- Work Vs Employment –Market-Media –Politics –Law – Domestic Violence-Sexual Harassment – State Policies and Planning.

### **Unit – IV: Women Development and Gender Development**

Initiatives- International Women’s Decade – International Women’s Year –National Policy for Empowerment Year 2001 – Mainstreaming Global Policies.

### **Unit – V: Women’s Movement and Safeguarding Mechanism in India**

National Commission for Women (NCW) – All Women Police Station- Family Court- Domestic Violence Act – Prevention of Sexual Harassment at Work Place- Supreme Court Guidelines – Maternity



Benefit Act –Pre-natal Diagnostic Act - Hindu Succession Act 2005- Eve Teasing Prevention Act – Self Help Group -73<sup>rd</sup> and74 th Amendment Act for PRIS.

**Book for Study:**

- *N.Manimekalai and S.Suba –Gender Studies- Bharathidasan University- Trichirappalli-620024.*

**Reference Books:**

- *V.S. Gurusamy- Empowerment of Women in India – New Century Publications-New Delhi-First Edition-2008.*

<b>Code:15T404</b>	<b>LC-IV- செய்யுள் (பழந்தமிழ் இலக்கியம்), நாடகம், தமிழ் இலக்கிய வரலாறு, கட்டுரை வரைவியல்</b>	<b>Sem:IV</b>
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**அலகு – 1**

**குறுந்தொகை – 05 பாடல்கள்**

1. “நள்ளென் றன்றே ....” (பாடல் எண்- 6)
2. “கழனி மாஅத்து விளைந்துகு ....” (பாடல் எண் -8)
3. “கான மஞ்சை .....“ (பாடல் எண் - 38)
4. “யாயும் யாயும் .....“ (பாடல் எண் - 40)
5. “கடும்புனல் தொடுத்த .....” (பாடல் எண் - 103)

**ஐங்குறுநூறு – மருதம் - வேழப் பத்து -10 பாடல்கள்**

**அகநானூறு - 05 பாடல்கள்**

1. “அன்னாய வாழிவேண் டன்னை ....” (பாடல் எண் - 68)
2. “சிலம்பிற் போகிய ...” (பாடல் எண் - 302)
3. “பெரும் பெயர் மகிழ்ந பேணா ...” (பாடல் எண் - 306)
4. “நீலத் தன்ன நீர்பொதி ...” (பாடல் எண் - 314)
5. “சாரல் யாஅத்து உயர்சினை ...” (பாடல் எண் - 337)

**புறநானூறு - 05 பாடல்கள்**

1. “நளியிரு முந்நீர் ஏணியாக ...” (பாடல் எண் 35)
2. “பாணன் சூடிய...” (பாடல் எண் 141)
3. “உற்றுழி உதவியும்...” (பாடல் எண் 183)
4. “கேட்டன் மாத்திரை யல்லதி யாவதும்...” (பாடல் எண் 216)
5. “யாதும் ஊரே...” (பாடல் எண் 192)

**அலகு – 2**

**திருக்குறள் 2 அதிகாரங்கள் -- ஊக்கமுடைமை , அவையடக்கம்**

### இனியவை நாற்பது – 10 பாடல்கள்

1. கற்றல் சான்றோரைச் சார்தல் - (பாடல் எண் 1)
2. அன்பும் நிலவும் - (பாடல் எண் -9)
3. குழந்தை அவையஞ்சாமை-(பாடல் எண்-12)
4. கற்றது உரைத்தல் பழகுதல் (பாடல் எண் -16)
5. துறவிகளின் இயல்பு - (பாடல் எண்-18)
6. புறங்கூறாமை (பாடல் எண் - 19)
7. வழங்கல் நல்லோராய் வாழ்தல் (பாடல் எண் -22)
8. செய்ந்நன்றி அடைக்கலம் வெளவாமை (பாடல் எண் -30)
9. இரவுப்பயணம், நற்பேச்சு வேண்டா நட்பு (பாடல் எண் -34)
10. கல்விக்கு நிகரான இனியது இல்லை (பாடல் எண் - 40)

### நல்வழி – 10 பாடல்கள் (பாடல்

1. காலம் அறிந்து செய்க (பாடல் எண் -4)
2. பேராசை கூடாது - (பாடல் எண் - 6)
3. குடிபிறந்தார் வறுமையிலும் உதவுவார் (பாடல் எண் -9)
4. சிவாய நமவென்று - (பாடல் எண் - 15)
5. உயர் நோக்கம் இன்மை - (பாடல் எண் -19)
6. வஞ்சனை யில்லார்க்கு வாழ்வு சிறக்கும் - (பாடல் எண்- 21)
7. மன அமைதி வேண்டும் - (பாடல் எண் -28)
8. பொருள் இருக்கும் போதே அறம் செய்க (பாடல் எண்-32)
9. வன்சொல்லும் இன்சொல்லும் - (பாடல் எண்-33)
10. உண்மை நிலை - (பாடல் எண் 38)

### திரிகடுகம்- 10 பாடல்கள்

1. “கல்லார்க்கு இன்னாய...”(பாடல் எண் - 3)
2. “தொல்லவையுள் தோன்றுங் ...”(பாடல் எண் - 8)
3. “பெருமை யுடையா...” (பாடல் எண் - 9)
4. “கணக்காயர் இல்லாத...”(பாடல் எண் - 10)
5. “விளியாதான் கூத்தாட்டுக்...”(பாடல் எண் - 11)
6. “ஆசை பிறன்கட்...”(பாடல் எண் - 20)
7. “சிலசொற் பெருந்தோள்....”(பாடல் எண் - 47)
8. “காவோ டறக்குளந்...”(பாடல் எண் - 70)
9. “கயவரைக் கையிகந்து ...” (பாடல் எண் - 77)
10. “பத்திமை சான்ற...”(பாடல் எண் - 100)

### அலகு – 3 நாடகம்

பாடநூல் - பிசிராந்தையார் - பாரதிதாசன், தமிழ் நாதன்  
பதிப்பகம், சென்னை - 110

### அலகு – 4 தமிழ் இலக்கிய வரலாறு

சங்க காலம் - சங்க இலக்கியங்கள், சங்க காலம் பொற்காலம், சங்க மருவிய காலம் - கீழ்க்கணக்கு நூல்கள் தொல்காப்பியம், அகத்தியம், பிற்காலப் புலவர்கள், நாடகம் தோற்றம் வளர்ச்சி.

அலகு – 5 கட்டுரை வரைவியல் - பொதுக்கட்டுரை

பாடநூல் - பொதுக்கட்டுரைகள், மகிழ்வினி பதிப்பகம், சென்னை- 106.

**பாடநூல்கள்**

செய்யுள் திரட்டு (நான்கு பருவங்கள்), தமிழ்த்துறை வெளியீடு.

தமிழ் இலக்கிய வரலாறு, மு.அருணாசலம், இராஜா வரதராஜா, அருண் பதிப்பகம், திருச்சி-1. (2017-2018 கல்வியாண்டுக்கு).

<b>Code:15H404</b>	<b>ELC-IV- English Through Literary Texts</b>	<b>Sem:IV</b>
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### **Objectives**

*To expose students to the creative use of the English language and make them appreciate it*

*To familiarize students with various forms and styles of writing in English*

### **Unit - I --- British Poetry**

1. Incident of the French Camp – Robert Browning 2. Ozymandias – P.B.Shelley 3. Lotus Eaters – Alfred Tennyson

### **Unit - II --- Indian Poetry in English**

1. Where the Mind is Without Fear – Rabindranath Tagore 2. Very Indian Poem in Indian English – Nissim Ezekiel 3. On Killing a Tree – Gieve Patel (Or) Caring for Animals – Jon Silkin

### **Unit - III --- American Poetry**

1. Brahma – Ralph Waldo Emerson  
2. Stopping by Woods on a Snowy Evening – Robert Frost  
3. Strange Meeting – Wilfred Owen

### **Unit - IV --- Poetry from the Third World and Indian Fiction**

Australia – A.D.Hope  
Telephone Conversation – Wole Soyinka (Or) Africa Speaks – Michael Dei Anang  
Great Expectations – Charles Dickens (Or) Five Point Someone – Chetan Bhagat

### **Unit - V --- One Act Plays**

The Rising of the Moon by Lady Gregory (One-act play) Little Man by John Galsworthy (One-act play) - Seven Slaves – A.Ball (One-act play) (Or) The Hour of Truth – Percival Wilde

<b>Code: 15Z411</b>	<b>CC –VI - Cell and Molecular Biology</b>	<b>Sem:IV</b>
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### **Objective**

*This course covers the biological principles relating to cellular and sub-cellular levels of structure and function. Topics include molecular biology and the fundamentals of cell structure and physiology. It facilitates to understand the structure at molecular level and function of prokaryote and Eukaryote cell.*

### **Unit - I**

**Cell and types:** Definition – Prokaryotic cell - Structure; Eukaryotic cell - Structure; Cell theory; Cytoplasmic matrix: Physical and Chemical nature of cytosol (or Cytoplasmic matrix). Ultrastructure of plasma membrane and functions of plasma membrane.

### **Unit - II**

**Cell organelles:** Endoplasmic Reticulum (ER): Occurrence, ultrastructure, types and functions of endoplasmic reticulum; Golgi apparatus: Occurrence, distribution, morphology, and functions; Lysosomes: Occurrence, ultrastructure and functions.

### **Unit - III**

**Mitochondria:** Morphology, chemical composition - mitochondria as transducing systems and functions; Nucleus: Nucleo-cytoplasmic relationship, ultrastructure, nuclear envelope, nucleoplasm. Chromosomes: Types, Structure and functions; Histones and Heterochromatins; Cell cycle: Growth and Division: Mitosis and Meiosis – An overview of Cancer - its causes and effects.

### **Unit - IV**

**Genetic material:** DNA and RNA as a genetic material. DNA - Watson and Crick's model of DNA – Polymorphism of DNA; Replication of DNA: DNA replication in eukaryotes; RNA: Structure, Types and Functions.

### **Unit - V**

**Genetic code:** Characteristics of genetic code – Protein Synthesis: Central dogma – Transcription of mRNA, Translation and Protein synthesis, Regulation of gene action.

**List of Text Books**

- Arumugam, N.2001. *Cell Biology*. Saras Publications, Nagercoil.
- David, F. 2003. *Molecular Biology*. Second Edition. Narosa Publishing House, New Delhi.
- Kumar, H.D. 2003. *Molecular Biology*. Second revised Edition. Vikas Publishing House Pvt. Ltd., New Delhi.
- Powar, C.B. 1997. *Cell Biology*. Himalaya Publishing House, Bombay.

**List of Reference Books**

- ✓ De Robertis, E.D.P. and De Robertis E.M.F. 1995. *Cell and Molecular Biology*. 8th Edition, B.I. Waverly Pvt., Ltd., New Delhi.
- ✓ Freidfelder, D. 2003. *Molecular Biology*. Narosa Publishing House, New Delhi.
- ✓ Turner, P.C., Mc Lennan, A.G., Bates, A.D and White, M.R.H. 2001. *Molecular Biology*. Second Edition. Viva Books Pvt. Ltd., New Delhi.
- ✓ Verma, P.S. and V.K. Agarwal. 1998. *Cell Biology*. S.Chand Company Ltd., New Delhi.
- ✓ Verma, P.S. and V.K. Agarwal. 2003. *Cytology (Cell Biology and Molecular Biology)*. S.Chand Company Ltd, New Delhi.

<b>Code: 15Z412A</b>	<b>AC- VI – Allied Chemistry -II</b>	<b>Sem:IV</b>
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**Objectives:**

*To learn interhalogen compounds and Co-Ordination compounds  
To study some biological molecules.*

**Unit - I: Chemical bonding and interhalogen compounds.**

Molecular orbital theory –bonding, antibonding and nonbonding orbitals. Molecular orbital's- Molecular orbital configuration of H<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>, F<sub>2</sub>, bond order, diamagnetism and paramagnetism. ICl, BrF<sub>3</sub>, IF<sub>7</sub>-preparation, hybridization, structure and shape.

**Unit - II: Coordination and industrial chemistry.**

2.1 Nomenclature of mononuclear complexes-Werner and sidgwick theories, Chelation examples.

2.2 Biological role of hemoglobin. Fuel gases-natural, water gas, carburatted water gas, producer gas and LPG.

### **Unit - III: Chemotheraphy and Water chemistry.**

3.1 Chemotherapy:-sulpha drugs-sulpha pyridine, sulphathiazole and sulphadiazine-structural formula and use only. Antibiotics'-Pencillin-G and Chloromycetin-structural formula and use only.

3.2 Water chemistry: Hard water and soft water-Temporary and permanent hardness-purification methods-Desalination.

### **Unit - IV: colloids and catalysis.**

4.1 Colloids-Types-properties-Tyndall effect-Brownian movement-Electrophoresis-Electro osmosis.

4.2 Catalysis-Homogeneous and Heterogeneous catalysis – types of catalysis, promoters and poisons – enzyme catalysis. Definition of  $P^H$  – Determination of  $P^H$  by calorimetric methods.

### **Unit - V Polymer Chemistry**

5.1 An introduction to polymers and macromolecules. Natural and synthetic polymers.

5.2 Classification of polymers-addition and condensation polymers. General methods of preparation of polymerization through function groups (step growth), multiple bonds (chain growth) and ring opening.

5.3 Coordination polymerization. Mechanisms of free radical, cationic and anionic polymerization reactions.

### **Text Books**

- *J. D. Lee, Concise Inorganic Chemistry, 5<sup>th</sup> edition, Blackwell science, London 1996.*
- *Puri and Sharma. Principles of physical chemistry. 40<sup>th</sup> edition.2003*
- *L. Finar, Organic chemistry, 6<sup>th</sup> edition, ELBS, 1990*
- *Polymer Science, V. R. Gowariker, N. V. Viswanathan and J. Sreedhar, Wiley Eastern*

### **References:**

- ✓ *B.R.Puri, L.R.Sharma, principles of inorganic chemistry, S.Naginchand & Co., Jalandhar, 1982.*

- ✓ *B,S.Bahl, Arunbhal, A text book Organic Chemistry, S.Chand&CCompany Ltd. New Delhi, 16<sup>th</sup> edition,2001.*
- ✓ *I.L.Finar, Organic Chemistry, ELBS and Longman Group Ltd, London, 6<sup>th</sup> edition, 1973.*
- ✓ *Gurdeep Raj, Advanced Physical chemistry, Goel publishing House, Meerut,2002.*

<b>Code: 15SSC</b>	<b>Soft skills course</b>	<b>Sem-IV</b>
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### **Objectives**

*“Soft skills” or behavioral skills are those that are crucial to an employee’s ability to work “smarter”. A survey of employers has revealed a list of specific “soft skills” that they believe as essential for employees. The skills most frequently mentioned for fresh entrant engineers are English communication, knowing how to learn; competence in reading, writing, effective listening and oral communication skills; grammar and vocabulary; and initiative; interpersonal skills; the ability to work in teams, Knowledge of industry.*

### **Unit I**

Importance of Spoken English: Indian and Global Context; Native and NonNative Accents of English and Issue of Intelligibility

- Aspects of English Pronunciation: Individual sounds: Vowels and Consonants

### **Unit II**

- Features of Connected Speech: Word Stress, Rhythm and Intonation
  - Fluency in Spoken English: Rate of Speaking, Volume of Voice, Pitch, Articulation, Clarity of Expression, Lack of Hesitation, Confidence
  - Speaking Politely in English: Use of Can, Could, May, Might, Will, Would,
- Expressing Requests, Gratitude, Compliments, Agreement, Disagreement

### **Unit III**

Definition and Functions of Communication, Types of Communication:

Interpersonal (Dyadic), Group Communication, Mass Communication

- Maxims of Good Conversation

### **Unit IV**

- Characteristics of Competent Speaker
- Styles of Speaking
- Interview and Group Discussion

### **Unit V**

- Speaking with Confidence: Speech Anxiety, Ways to Overcome Speech Anxiety, Building Credibility as a Speaker: Competence, Character, Charisma

Situational Conversations: Meeting People, Greetings, Introducing Yourself,

Introducing People, Saying Thanks

<b>Code:15Z513</b>	<b>CC-VII- Biochemistry and Physiology</b>	<b>Sem:V</b>
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### **Objectives:**

*The objective of the Biochemistry course is to provide a basic approach to biochemistry. It provides the structure and function of bio molecules.*

*The study Physiology helps in understanding how the body functions adapts with respect to its external and internal environment, related to nervous integration, sensation, metabolism and reproduction.*

## **BIOCHEMISTRY**

### **UNIT-I**

**Major nutrients:** Carbohydrates - Structure and classification; Amino acids – Classification and structure; Proteins - Classification of Protein – Protein Structure and function; Lipids – structure and classification of Lipids.



## UNIT-II

**Minor nutrients:** Vitamins - Fat soluble vitamins – Water soluble vitamins; Vitamins deficiency syndrome. Minerals - classification and their importance. Enzymes: Nomenclature and classification – Isoenzymes; Mechanism of Enzyme Action - Factors Influencing enzyme Activity.

## PHYSIOLOGY

### UNIT-III

**Feeding and Digestion:** Feeding Mechanisms - Digestion and Absorption of Carbohydrates, Lipids and Proteins; Metabolism: Glycogenesis, Glycogenolysis and Glycolysis, citric acid cycle, oxidative phosphorylation. Respiration: Respiratory organ - mechanism of respiration- Respiratory pigments- Structure and functions of Haemoglobin - Transport of gases in blood.

### UNIT-IV

**Circulatory system:** Haemopoiesis – Blood Coagulation – Cardiac circle and ECG. Lymph Circulation. **Excretion:** Nitrogenous waste products - ammonia, urea and uric acid - biosynthesis of urea in man. **Mammalian Reproduction:** Male and female reproductive System. Endocrine glands and Hormones.

### UNIT-V

**Nervous System:** Structure and types of nerve cells – Conduction of nerve impulse – Synaptic Transmission - The special senses: Optic and Auditory.- Reflexes; Muscular System: Structure and Types of Muscles – Chemical composition of Muscles – Mechanism of Muscle Contraction.

## **Biochemistry:**

### List of Text Books:

- Nagini, S. 2007. *Text Book of Biochemistry. SCITECH Publications (India) Pvt Ltd, Hyderabad.*
- Rastogi, S.C. 1998. *Biochemistry. Tata McGraw Hill Publishing Company Ltd, New Delhi.*
- Singh, S.P. 2004. *A Text Book of Biochemistry. Third Edition. CBS Publishers, New Delhi.*

### **List of Reference Books:**

- ✓ *Asokan, P. 2006. Analytical Biochemistry. Chinna Publications, Melvisharam.*
- ✓ *Jain, J.L. 2004. Fundamentals of Biochemistry. S.Chand and Company Ltd. New Delhi.*
- ✓ *Lehinger, L.1990. Biochemisrty. W.H. Free Man and Co.,*
- ✓ *Satyanarayana, U. 2005. Biochemistry. Arunabha Sen, books and Allied (P) Ltd., Kolkatta.*

### **Physiology:**

#### **List of Text Books:**

- ✓ *Berry A.K. 1998. A text book of animal physiology. Embay publications, Delhi.*
- ✓ *Mariakuttikan and N.Arumugam, 2002. Animal Physiology. Saras Publication, Nagarcoil.*

#### **List of Reference Books:**

- ✓ *Rastogi, S.L., 1997. Essential of Animal Physiology. New Age International Publisher, New Delhi.*
- ✓ *Verma, P.S. and V.K. Agarwal.1992. Animal Physiology. S. Chand and Co. New Delhi.*

<b>Code: 15Z514</b>	<b>CC - VIII - Genetics</b>	<b>Sem:V</b>
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### **Objectives**

*Giving a basic overview of genes, mutations, sex determination and patterns of inheritance.*

*An understanding of the inheritance and expression of human blood groups and inheritance of genetic disorders.*

### **UNIT-I**

**Inheritance:** Mendelian Inheritance: Patterns and Laws of Heredity; Linkage: Definition: Mechanism with *Drosophila* as an example – Linkage maps and Linkage groups; Crossing over – Kinds, Theories, Mechanism with *Drosophila* as an example; Multiple Alleles – ABO blood group in Man – Human Rh Blood Group system.

## **UNIT-II:**

**Structural Chromosome Aberrations:** Deletion, Duplication, Inversion and Translocation; Numerical Chromosome aberrations: Aneuploidy, Euploidy, Autopolyploidy and Allopolyploidy; Environmental Effects on the Development of Characters: Genotype and Phenotype. Mutation: Characteristics of Mutations - Classification of Mutations: Spontaneous and Induced Mutation; Mutagens; Applications of Mutations.

## **UNIT-III:**

**Sex Determination:** Sex Characters – Primary and Secondary sex Characters – Sex Chromatin. Sex Determination in animals – Chromosomal theory of sex determination – gynandromorphs – Environmental determination of sex – hormonal theory of sex determination. Population Genetics: Gene Frequency – Gene Pool – Hardy-Weinberg Law – Hardy-Weinberg Equilibrium.

## **UNIT-IV:**

**Human Genetics:** Human Chromosomes and Amniocentesis. Syndrome: Klinefelter's syndrome; Down syndrome; Turner's syndrome. Twins: Heredity of Twins - Identical or Monozygotic Twins – Fraternal or Dizygotic Twins. Inborn Errors of Metabolism: Phenylketonuria (PKU), Alkaptonuria, Albinism, Sickle-cell Anaemia. Sex linked inheritance: Colour blindness and Haemophilia. Euphenics – Eugenics – Positive Eugenics – Negative Eugenics – Genetic Counseling.

## **UNIT-V:**

**Microbial Genetics:** Recombination in Bacteria – Transformation – conjugation – Sex duction; Recombination in Bacteriophage – Transduction – Lytic and Lysogenic cycle. Genetic applications of bacteria and viruses.

### **List of Text Books:**

- *Meyyan, R.P. 2009. Genetics. Saras Publications, KanyaKumari.*
- *Rastogi, V.B. 1990. A Text Book of Genetics. Kedar Nath Ram Nath, Meerut.*

### **List of Reference Books:**

- ✓ *Gupta, P.K. 2003. Genetics. Rastogi Publication, Meerut.*
- ✓ *Sarin, C. 2006. Genetics. Tata McGraw-Hill Publishing Company Ltd., New Delhi.*

- ✓ Singh, B.D. 2006. *Fundamentals of Genetics*. Kalyani Publishers. Lucknow.
- ✓ Verma, P.S and Agarwal, V.K. 2002. *Genetics*. S.Chand & Company Ltd., New Delhi.

<b>Code: 15Z515</b>	<b>CC– IX-Developmental Biology</b>	<b>Sem:V</b>
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### **Objectives**

*Developmental Biology is an experimental science, which provides understanding of the processes of early embryonic development, to analyze the mechanisms of development by experimental manipulation of developing embryos and to review current developments in the field of embryology.*

### **UNIT-I**

**Definition:** Male Gonads and Spermatogenesis – Female Gonads and Oogenesis - Structure of a Mammalian sperm and ovum – Ovulation in Mammals – Hormonal control of Ovulation – Mechanism of Fertilization – Physico - Chemical changes – Natural and Artificial Parthenogenesis in animals – Significance of Parthenogenesis.

### **UNIT-II**

**Cleavage:** Types of Cleavage – Plans and Patterns of Cleavage; Blastulation and Morulation – Gastrulation in Frog and Chick – Fate Maps of frog and Chick – Cell lineage; Cyto-differentiation.

### **UNIT-III**

**Organogenesis in frog and chick:** Eye and heart; Metamorphosis – Definition – Role of hormones in Metamorphosis. Foetal membranes in chick – Placentation in mammals: Types and their functions. Sexual cycles – oestrous cycle – puberty – spermiation – ovulation – menstrual cycle – menopause – pregnancy – parturition.

### **UNIT-IV**

**Regeneration in animals:** Types of Regeneration – Factors influencing regeneration; Teratogenesis: and its types. Asexual reproduction: Fragmentation – fission – budding – Gemmule formation – Cells involved in asexual reproduction.

## UNIT-V

**Birth control:** Necessity – contraceptive devices - Impotency: Causes of Impotency and sterility in human male and female – Artificial Insemination in humans - In Vitro Fertilization (IVF) and Gamete-Intra-Fallopian Transfer (GIFT) – Advantages and Disadvantages – Embryonic Stem Cells and Their Applications.

### List of Text Books

- Arumugam, N. 2005. *A text book of Embryology*. Saras Publication.
- Berry, A.K. 2003. *An Introduction to Embryology*. Emkay Publications, Delhi.

### List of Reference Books

- ✓ Rastogi, V.B and Jayaraj, M.S. 2002. *Developmental Biology (Embryology)*. Kedar Nath Ram Nath, Meerut.
- ✓ Twymann, R.M. 2003. *Developmental Biology*. Viva Books Private Ltd., New Delhi.
- ✓ Verma, P.S., and Agarwal, V.K. 2007. *Chordate Embryology*. S.Chand & Company Ltd., New Delhi.

<b>Code: 15Z516L</b>	<b>CC– X - Practical –III (Biochemistry and Physiology, Genetics and Developmental Biology)</b>	<b>Sem:V</b>
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### **Objectives:**

*To impart training on the physiological, biochemical, genetical and embryological techniques.*

### **BIOCHEMISTRY AND PHYSIOLOGY**

Qualitative tests for Ammonia, Urea and Uric Acid.

Qualitative tests for Carbohydrate, Protein and Lipids.

Blood cell counting – Total (RBC and WBC) and differential count (WBC)

Effects of pH and temperature on the human salivary amylase activity.

Quantitative estimation of Protein – Colorimetric method

Analysis of Blood samples by using Biochemistry Analyser (Demonstration only)

Estimation of Haemoglobin by Haemoglobinometer

**Spotters:**

Sphygmomanometer, Models of amino acids, Haemoglobin, ATP, Electrophoresis apparatus.

**GENETICS**

Pedigree analysis – Human; Observations on *Drosophila* - Sexes, Wild and Mutant.

Survey of Mendelian traits in Man; Variations in finger prints. ABO blood grouping and Rh typing.

**DEVELOPMENTAL BIOLOGY**

**Temporary mounting of chick blastodisc.**

**Spotters:**

Examination of prepared micro slides to study the following stages: Frog – egg, cleavage, blastula, yolk plug stage; Chick – developmental stages – 24 hrs, 48 hrs, 72 hrs.

<b>Code: 15Z517a</b>	<b>EC - I Biostatistics And Bio-Instrumentation</b>	<b>Sem:V</b>
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**Objectives**

*The objective of Biostatistics is to emphasis basic idea about the Biostatistics and its application.*

*The Bioinstrumentation course is to emphasis the principle and biological applications of Microscope, chromatograph, electroporesis and spectroscope.*

**BIOSTATISTICS**

**(50% of questions for Section B and Section C should be asked with problems)**

**UNIT-I:**

**Collection of Data:** Methods of primary data collection-Census Methods and Sampling Methods. Types: Random and Non-random Sampling; Classification of Data and Frequency Distribution: Data Types of based on source. Differences between Classification and Tabulation, Necessity of Classification of Data, Objectives of Classification, Class Intervals– Frequency Distribution.

## **UNIT-II:**

**Graphical Representation of Data:** Bar Diagram, Pie Chart and Pictogram; Graphs Histogram, Frequency polygon and Frequency curve. Measures of Central Tendencies: Mean Median and Mode.

## **UNIT-III:**

**Measures of Dispersion:** Range, Variance, Standard Deviation and Standard Error; Coefficient of variation; **Correlation:** Karl Pearson's Correlation coefficient – Spearman's Rank Correlation; Student's t Test; Hypothesis Test; Chi-Square Test.

## **BIO-INSTRUMENTATION**

### **UNIT-IV:**

**Microscopy:** Components of a microscope – Types of Microscope: Simple Microscope, Phase contrast microscope and Electron microscopy.

**Balances:** Analytical balances; **Centrifuge:** Basic Principles of Sedimentation – Types of Rotors – Types of Centrifuges. **pH meter:** Principle, Components and applications.

### **UNIT-V:**

**Colorimetry:** Principle - Beer and Lambert's Law – Colorimeter and its applications; **Chromatography:** Principle and applications of chromatography - Paper chromatography. **Electrophoresis:** Principle and applications of electrophoresis.

### **Biostatistics:**

#### **List of Text Books:**

- Arumugam, N., Gopi, A., Sundaralingam, R., Meena, A. and Kumaresan, V. 2009. *Biostatistics, Computer Application, Bioinformatics and Instrumentation*. Saras Publication, Nagercoil.
- Ramakrishnan, P. 1995. *Biostatistics*. Saras Publications, KanyaKumari.

#### **List of Reference Books:**

- ✓ Gurumani, N. 2004. *An Introduction to Biostatistics*. MJP Publishers, Chennai.
- ✓ Prasad, S. 2001. *Elements of Biostatistics*. Rastogi Publications, Meerut.
- ✓ Veer Bala Rastogi. 2007. *Fundamentals of Biostatistics*. Ane Books India. Chennai.

### **Bioinstrumentation:**

**List of text Books:**

- Palanichamy, S. and Shunmugavelu, M. 1993. Principles of Biochemistry and Biotechniques. Palani Paramount Publications, Palani.
- Veerakumari, L. 2006. Bioinstrumentation, MJP Publishers, Chennai.

**Reference Book:**

- ✓ Bajpai, P.K. 2010 (Revised Edition). Biological Instrumentation and Methodology. S.Chand & Company Ltd., New Delhi.

<b>Code:15Z517b</b>	<b>EC- I -Pests And Their Management</b>	<b>Sem:V</b>
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**Objectives**

*To enlighten the students on harmful insects, their biology, their nature of damage and their management measures.*

*To teach our students about various vertebrate pests which attack our crops and belongings and their management measures.*

**UNIT-I:**

Insect pests – Types of depredation inflicted by insects to plants – Factors for insects assuming pest status – Minor and Major pests – Pest surveillance - Forecasting of pest out break – Estimation of insect pest population and their depredation to crops.

**UNIT-II:**

Insect pests of crops – Pests of rice, sugarcane, coconut, cotton and vegetables and their current management practices including Integrated Pest Management protocols (At least four pest for each crop / Category) - Insect pests of stored products and their management methods.

**UNIT-III:**

Methods and principles of pest management – Natural and Artificial control – cultural, mechanical, physical, legal, biological (Insect Predators, Parasites and Pathogens) and chemical (with special emphasis on Botanical Pesticides) methods. Recent trends in pest management – Ionizing radiation, Chemosterilants, Antibiotics, Hormones (IGRs), Attractants, Pheromones, Repellents, Antifeedants and Integrated Pest Management (IPM).

**UNIT-IV:**



Rodentology – Economic importance of rodents and their distribution in India – Magnitude of pre-harvest (Paddy, Sugarcane, Cotton, Pulses and Coconut) and post harvest losses caused by rodent pests – Burrows of rodent pests - Rodent pests management methods – cultural, physical, mechanical (traps), chemical (Acute and chronic rodenticides) and Biological methods – Trap Barrier system – Integrated Rodent Pest Management.

#### **UNIT-V:**

Agricultural Ornithology – Birds as pests of crops: Grainivorous Birds – Types and intensity of damage by bird pests – Eco-friendly management methods of Bird Pests – Birds as friends of farmers – Insectivorous birds and Birds of prey and their utilization in invertebrate and vertebrate pests' management.

#### **List of Text Books:**

- *Barnett, S.A. and Prakash, I. 1975. Rodents of Economic importance in India, Arnold – Henemann, New Delhi & London.*
- *David, B.V.2001. Elements of Economic Entomology. Popular Book Depot, Chennai.*
- *Fenemore, P.G. and Prakash, A. 2006. Applied Entomology. New Age International (P) Limited Publishers, New Delhi.*
- *Fitzwater, W.D. and Prakash, I. 1989. Handbook of vertebrate pest control. Indian Council of Agricultural Research, New Delhi.*
- *Kumar, A. and Nigam, P.M. 2003. Economic and Applied Entomology. Emkay Publications, Delhi.*

#### **List of Reference Books:**

- ✓ *Pedigo, L.P.2003. Entomology and pest management. Pearson Education (Singapore) Pvt. Ltd., Delhi.*
- ✓ *Prakash, I and Mathur, R.P.1987. Management of Rodent Pests. Indian Council of Agricultural Research, New Delhi.*
- ✓ *Singh, R. and Sachan, G.C. 2004. Elements of Entomology. Rastogi Publications, Meerut.*

<b>Code:15Z5Nc</b>	<b>NMEC - Public Health And Hygiene</b>	<b>Sem:V</b>
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### **UNIT-I:**

The Home as Health Centre – Community Health Services – Guarding your Family’s Health – Germs from various sources – Health factors in the home – Comfort and protection – Proper Light – Mental Health – Cleanliness and orderliness – Personal hygiene.

### **UNIT-II:**

Nutrition and Health: Macro and micronutrients – Nutrient contents of principal foods – Balanced diet – Controlling body weight.

### **UNIT-III:**

Food toxicants and food additives – Malnutrition and its effects – Community nutrition programmes.

### **UNIT-IV:**

Maternal and child Health: Expectant motherhood – signs of pregnancy – maternal hygiene.

### **UNIT-V:**

Congenital malformations – Antenatal and Postnatal care – Feeding infants – Factors responsible for infant mortality – Keeping baby well – Family Planning methods.

### **Text Book:**

- *Park, K. 2005. Park’s Textbook of Preventive and Social Medicine (18<sup>th</sup> Edition). M/s. Banarsidas Bhanot Publishers, Jabalpur, India.*

### **List of Reference Books:**

- ✓ *Anderson, R.C. 1976. Your Guide to Health (Fifth Edition). Oriental Longman Publishing House, Poona, India.*
- ✓ *Bauer, W.W. (Editor) 1965. Today’s Health Guide. American Medical Association. USA.*
- ✓ *Shryock, H. 1979. Modern Medical Guide. Pacifica Press publishing Association, California, USA.*
- ✓ *Anonymous. 1996. Know your Body. A Reader’s Digest Guide. RDI Print and Publishing Pvt., Ltd., Mumbai..*
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<b>Code: 15Z5Na</b>	<b>NMEC - Bio Resource Technology</b>	<b>Sem:V</b>
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## **Objectives**

*To impart training on various farming techniques and revenue generation potentials.*

*To encourage the trained students to become self-employers/entrepreneurs in the farming technique of his/her choice after graduation.*

## **UNIT-I**

**Aquaculture:** Construction of fish farm - Techniques of culture - cultivable fishes - Nursery ponds – Stocking ponds - Induced Spawning methods - Rearing ponds – Composite fish farming - Harvesting and post-harvesting: Harvesting, precautions observed during harvesting, sorting and grading the catch, Fish spoilage, fish preservation; Nutritive value of fishes - Fish products and by – products. Prawn culture: Species of prawn - Types of prawn farms in India - Commercial culture of prawn: Extensive culture, Paddy-cum prawn culture, prawn farms; Harvesting of prawns - Preservation and processing of prawns - Revenue generation potentials of Fish farming and Prawn farming.

## **UNIT-II**

**Poultry Farming:** An overview of Poultry production in India; Breeds of fowls – Exotic breeds – Indigenous breeds. Rearing techniques: Incubation of eggs - Brooding – Housing of poultry – Semi-intensive, Intensive, Deep litter and Individual Cage system – Housing Requirements - Poultry feeding – Rate of eggs laying – Nutritive values of egg and meat – Economics of Poultry farming.

## **UNIT-III**

**Dairy Farming:** Breeds of cattle – Draught breeds, dairy breeds, dual purpose breeds – Exotic and Indigenous breeds - Cross breeds - Reproduction in Cattles: Artificial Insemination - Nutritive values of milk - Value added milk products – Pasteurization - Revenue generation potentials of Dairy farming.

## **UNIT-IV**

**Sericulture:** Mulberry Silkworm: Commercial races of India; Rearing Facilities: Rearing house - Rearing appliances - Appliances used for feeding - Bed cleaning - disinfection and maintaining optimum culture

conditions; Rearing methods: Chawki rearing of young age worms in India - paraffin paper rearing - box rearing - new net method - co-operative rearing - Storage of cocoons - Cocoon Marketing – Reeling techniques - Revenue generation potentials of Sericulture.

#### **UNIT-V:**

**Apiculture:** Wild Bees – Species of Honey Bees– Morphology, Colony Organization and Life Cycle - Bee Keeping Equipments: Newton’s Bee Hive – Other Bee Keeping Equipments – Equipments for Handling Bees. Social Behaviour of Bees: Division of Labour, Food Gathering, Feeding, Communication and working Habit of Field Bees. Bee Hive Products: Honey - Chemical composition of honey – Nutritional and Medicinal values of Honey - Wax – Bee Venom – Propolis – Royal Jelly; Pollination: Pollination and Fertilization–External Agents of pollen transfer – Advantages of Bee Pollination in Crops.

#### **List of Text Books:**

- *Shanmugam, K. 1992. Fishery Biology and Aquaculture. Leo Pathipagam, Madras.*
- *Srivastava, C.B.L. 1992. A text book of Fishery Science and Indian Fisheries. Kitab Mahal, Allahabad.*
- *Santhanam, R., N. Sugumaran and P. Natarajan. 1987. A manual of Fresh water aquaculture. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.*
- *Tomar, B.S. and Singh, N. 2007. A Text Book of Applied Zoology. Emkay Publications, Delhi.*
- *Shukla, G.S. and Upadhyay, V.B. 1997. Economic Zoology. Rastogi Publications, Meerut.*
- *Ahsan, J. and Sinha, S.P. 2003. A Hand book on Economic Zoology. S.Chand & Company Ltd., New Delhi.*
- *Babu, M. and Lurthu Reetha, T. 2011. A Handbook on Poultry farming. Tamilnadu Veterinary and Animal Sciences University and Nehru Memorial College, Tiruchy.*
- *Ganga, G. and Sulochana Chetty, J. 2003. An Introduction to Sericulture (2<sup>nd</sup> Edition). Oxford and IBH Publishing co. Pvt-Ltd., New Delhi.*
- *Taxima, Y. 1972. Hand Book of Silkworm Rearing. Fuji Publication, Tokyo.*

➤ *Ullal, S.R. and Narasimhanna, M.N. 1979. Hand book of Practical Sericulture. Central Silk Board, Bombay.*

<b>Code: 15Z5Nb</b>	<b>NMEC - Medical Lab Techniques</b>	<b>Sem:V</b>
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#### **UNIT-I:**

**Essential Pre-Requisites of a Clinical Laboratory:** Introduction – Scope of the subject CLT – Collection of specimens and preservation – Records and report preparation and maintenance – Cleaning, maintenance and care of glassware – Sterilizations – Physical and Chemical methods – Disposal of specimen and infected materials – Safety precautions in the laboratory – First aid treatments.

#### **UNIT-II:**

**Microbiology:** Bacteria – Structure and types – Staining procedures – Culture media and antibiotic sensitivity test. Sexually transmitted diseases: Syphilis, Gonorrhoea, Chancroid or soft sore, Donovanosis, Genital candidiasis, Non-gonococcal urethritis, *Corynebacterium vaginale* and herpes genitalis, Lymphogranuloma venereum, Trichomoniasis.

#### **UNIT-III:**

**Clinical analyses:** Blood: Collection of blood (Venous and Capillary) – Plasma and serum for analysis – Total RBC count – Total leucocytes count – Differential count – Haemoglobin estimation (Shalis methods), ESR (Wintrobe and Westgren methods) – Bleeding and clotting time – Estimation of packed cell volume – Blood grouping and cross matching (Slide and Tube methods) – Anti-D (Rho) test (slide, rapid tube and Du test).

#### **UNIT-IV:**

**Clinical analyses:** Urine: Collection, preservation, routine examinations – protein – glucose – acetone – bile salts – bile pigments – urobilin – urobilinogen – microscopical examination of urine. Faeces: Microscopical examination – intestinal parasites – helminthes, nematodes, cestodes, trematodes, protozoa.

## UNIT-V:

**Sputum analysis:** Collection – microscopical and naked eye inspection – clinical examination. Cerebrospinal Fluid: Composition – CSF cells total and differential count – estimation of protein – sugar chloride. Spermatological studies: Collection of semen – microscopic examination – smear and count. Pregnancy Tests – Male frog test – Gravindex test

### Text Book:

- *Samuel, K. M. 1992. Notes on Clinical Lab Techniques (IV Edition). Publishers: M.K.G Iyyer & Sons, Madras.*

<b>Code:15Z618</b>	<b>CC - XI - Ecology and Evolution</b>	<b>Sem:VI</b>
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### **Objectives**

*Ecology course is designed to provide fundamental ecological principles that provide a in-depth understanding of our natural world, the scientific basis for understanding how environmental systems work, the environmental issues, environmental problems, effects and solutions. To understand the evolution of life.*

## ECOLOGY

### **UNIT-I:**

Definition – Branches of ecology; Environment: Atmosphere (air), Hydrosphere (Water), Lithosphere (Soil); Abiotic factors: Temperature and light – Effects of light and temperature on animals. Ecosystem: Concept, Components, Producers, Consumers, Decomposers, Transformers, Trophic level, Energy flow, Ecological pyramids and Productivity, Food chain and Food Web.

### **UNIT-II:**

**Biotic factors:** Animal association – symbiosis, Commensalism, Mutualism, Antagonism, Antibiosis, Parasitism, Predators and Competition. Population ecology: Population Size and Density, Natality, Mortality, Age Structure, Biotic Potential, Population Dynamics, Emigration and Immigration; Regulation of Population Size

### **UNIT-III:**

**Community Ecology:** Types of Communities; Characteristics of Community – Stratification - Community interdependence - Ecotone - Edge effect; Ecological Niche – Ecological succession. Habitat ecology - Characteristics features of Rocky, Sandy, Muddy shore fauna and adaptations.

### **EVOLUTION**

### **UNIT-IV:**

**Significance of Evolutionary Biology:** - Direct Evidences of Evolution: Embryological evidences; Theories of origin of life, Abiogenesis, Biogenesis, Cosmozoic, Special creation theory, Organic evolution theory. Theories of Organic Evolution: Theory of inheritance of acquired characters (Lamarckism): Examples of Lamarckism, Neo-Lamarckism; Theory of natural selection (Darwinism) – Neo-Darwinism.

### **UNIT-V:**

**Mutation:** Mutation theory - characteristics of mutation theory – Types of mutation – advantages of mutation theory – objections to mutation theory; Adaptive Radiation: Examples of adaptive radiation - Isolation: Types of isolation and isolating mechanisms. Speciation: Definition and Types. Mimicry colouration. Evolution of man.

### **Ecology:**

#### **List of Text Books:**

- Arumugam, N.1992. *Concepts of ecology*. Saras publications, Nagarkoil.
- Verma P.S. and V.K. Agarwal, 2007. *Environmental Biology*. S. Chand and Co., New Delhi.
- Verma, P.S and V.K. Agarwal. 2007. *Cell biology, Genetics, Molecular Biology, Evolution and Ecology*. S. Chand and Company Ltd. New Delhi.

#### **List of reference Books:**

- Claude, F., Christiane, F., Paul, M. and Jean, D. 1998. *Ecology Science and Practice*. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Odum E.P.1971. *Fundamentals of ecology*. W.B. Saunders Co., Philadelphia.

- *Rastogi, V.B. and M.S. Jayaraj. 1997. Animal ecology and distribution of animals. Kedarnath, Ramnath.*

**Evolution:**

**List of Text Books:**

- ✓ *Arumugam, N.1998. Essentials of evolution. Saras publications, Nagarkoil.*
- ✓ *Verma, P.S and V.K. Agarwal. 2007. Cell biology, Genetics, Molecular Biology, Evolution and Ecology. S.Chand and Company Ltd. New Delhi.*

**Reference Book:**

- ✓ *Jha, A.P. 1997. Genes and Evolution. Macmillan India Limited, New Delhi.*

<b>Code: 15Z619</b>	<b>CC - XII -Microbiology and Immunology</b>	<b>Sem:VI</b>
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**Objectives**

*Microbiology emphasis the infectious diseases that are of great actual or potential importance to humans. To provide students with the latest information in scientific microbiological methods. Immunology course emphasis the function of immune system, structure and function of immunoglobulin and immunological techniques.*

**MICROBIOLOGY**

**UNIT – I:**

**History and scope of microbiology:** – Classification - Prokaryotic cell; Microorganisms and Viruses: Prions – Viroids – Rickettsias – Mycoplasmas – Bacteria – Cyanobacteria – Protozoa – Algae – Fungi and Slime Moulds. Viruses: Symmetry – Transmission – Composition – Serology and Replication of viruses – Laboratory Study of Viruses – Plant Viruses – Human Viruses.

**UNIT-II:**

**Bacteria:** Morphological Features - Colony Characters - Physiological and Genetic Characters – Numerical Taxonomy – Major Groups of bacteria; Nutrition and growth of Bacteria: Sources of nutrients – Entry of Nutrient into the cell – Factors Affecting Microbial Growth – Growth of Bacteria; Metabolism of bacteria; Bacterial Respiration – Bacterial Fermentation – Products of industrial Fermented products.



### **UNIT-III:**

**Microorganisms and Environment:** Soil Microorganisms – Microorganisms in Aquatic Habitats – Microorganisms and pollution – Microorganisms in sewage – Methane production. Microorganisms and Microbial Diseases: General Account of Pathogenic Bacteria - Diseases caused by viruses (Yellow fever, Dengue Fever, Polio), Bacteria (Pneumonia, Diphtheria, Tuberculosis) Fungi (Madura foot, Athlete's foot, Candidiasis) and Protozoa (Malaria, Amoebic dysentery, Trypanosomiasis).

### **IMMUNOLOGY**

#### **UNIT-IV:**

**Types of immunity:** Innate and Acquired Immunity; Central and Peripheral lymphoid organs; Cells of lymphoid and myeloid lineage. Immunobiology – Antigens and Immunogenicity – Immunoglobulins: Structure and Function, antigen-antibody reaction. Detection and Application of antigen-antibody reactions. Complement System and Monoclonal Antibodies.

#### **UNIT-V:**

**Hypersensitivity:** Immunologic Tolerance and Autoimmunity – Immunopotential and Immunosuppression; Immunodeficiency Diseases; Immunological Techniques: Double Immuno-diffusion, Immunoelectrophoresis, Radio Immuno Assay (RIA), ELISA and Immuno-blotting.

### **Microbiology**

#### **List of Text Books:**

- *Rao, A.S. 2001. Introduction to Microbiology. Prentice Hall of India Private Limited, New Delhi.*
- *Dubey, R.C. and Maheswari, D.K.1999. Text Book of Microbiology. S. Chand and Company New Delhi.*
- *Mani, A., Narayanan, L.M., Fatima, D., Selvaraj, A.M and Arumugam, N. 2005. Immunology and Microbiology. Saras Publications, KanyaKumari.*
- *Narayanan, L.M., Selvaraj, A.M and N.Arumugam. 1999. Microbiology (General and applied). Saras Publication, Nagercoil*
- *Ananthanarayanan, R. and Jayaraman Paniker, C.K. 1990. Text Book of Microbiology. Orient Longman.*

### **List of Reference Books:**

- *Pelczar, M.J., Chan, E.S., Kreig, N.R. 1993. Microbiology (Fifth edition). Tata McGraw-Hill Publishing Company Ltd., New Delhi.*
- *Purohit, S.S. 2005. Microbiology Fundamentals and applications (Sixth Edition). Student edition, Jodhpur.*
- *Raman Rao, P.V. 2005. Essentials of Microbiology. CBS Publishers and Distributors, New Delhi.*
- *Malacinski, M.G. 2006. Essentials of Microbiology (Fourth edition). Narosa Publishing House, New Delhi.*

### **Immunology:**

#### **List of Text Books:**

- ✓ *Shetty, N. 2006. Immunology. New Age International (P) Limited, Publishers. New Delhi.*
- ✓ *Shastri, N.V. 2005. Principles of Immunology. Himalaya Publishing House, Delhi.*
- ✓ *Fatima, D. and Arumugam, N. 2001. Immunology. Saras Publications, KanyaKumari.*
- ✓ *Annadurai, B. 2009. A Textbook of Immunology and Immunotechnology. S.Chand & Company Ltd., New Delhi.*

#### **List of Reference Books:**

- ✓ *Rao, C.V. 2006. Immunology. Narosa Publishing House, New Delhi.*
- ✓ *Kannan, I. 2007. Immunology. MJP Publishers, Chennai.*

<b>Code: 15Z620</b>	<b>CC– XIII - Biotechnology and Bioinformatics</b>	<b>Sem:VI</b>
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### **Objectives**

*To enlighten our students on various aspects of biotechnology and its beneficial products.*

*To encourage the students to take biotechnology as their career as it provide ample scope for bright future.*

### **UNIT-I:**

**Biotechnology:** – Definition, Scope and Importance - History of Biotechnology. **Genetic Engineering:** Enzymes and Gene cloning vectors for Bacteria, Plants and Animals (pBR 322 Plasmid, Ti plasmid, pSV plasmid and simian virus 40); Preparation of desired DNA; *In vitro* construction of rDNA – Transfer of rDNA into bacterial cells: Transformation and Transfection; **Selection (Screening) of Recombinants:** Immunochemical Method and Colony Hybridization - Gene cloning in prokaryotes - Gene library/cDNA library.

### **UNIT-II:**

**Genetic Engineering for Human Welfare:** Insulin, Somatotropin (HGH), Human Interferons, Vaccine for Hepatitis B Virus and their applications; **Transgenic animals and their uses:** Cattle, Poultry and Fishes; Ethical implications of transgenic animals; **Animal Biotechnology:** Requirements for Animal Cell, Tissues and Organ Culture – Types, Maintenance and Storage of Cell Lines - Methods for Cryopreservation - Storage in Liquid Nitrogen – Cell Bank – Animal Bioreactors and their uses.

### **UNIT-III:**

**Molecular markers and their applications:** Restriction Fragment Length Polymorphism (RFLP) – Random Amplified Polymorphic DNA (RAPD) – Minisatellites or Variable Number of Tandem Repeats (VNTRs) – Microsatellites (SSRs); The PCR (Amplification of DNA) – Applications of PCR Technology; **DNA sequencing methods:** Sanger’s method and Automatic DNA sequencing; DNA Finger printing – Applications of DNA finger printing.

## **BIOINFORMATICS**

### **UNIT-IV:**

**Bioinformatics:** Definition – Components of Bioinformatics – Bioinformatics as a tool - Importance and Applications of Bioinformatics.

**Biological Databases: Sequence databases:** Primary and Secondary databases – **Nucleic acid sequence databases:** NCBI, DDBJ and EMBL; Structure of Nucleotide sequence databases: GenBank format – RNA databases; **Protein sequence databases:** SWISS-PROT, TrEMBL, PIR, UniProt; Structure of Protein Sequence Databases: SWISS-PROT format. **Protein structural databases:** PDB, SCOP and CATH.

### **UNIT-V:**

**Bioinformatics Tools:** BLAST, FASTA, Clustal W, PFAM, SCANPS, RasMol and PHYLIP; **Sequence Alignment:** Optimal, Global and Local alignments; **Substitution matrices:** PAM and BLOSUM Matrices; **Pair wise Sequence Alignment:** Dot Matrix, Dynamic Programming; **Multiple Sequence Alignment:** Definition, Uses of Multiple sequence Alignment;

## **Biotechnology:**

### **List of Text Books:**

- *Dubey, R.C. 2007. A Text book of Biotechnology. S.Chand and Company Ltd, New Delhi.*
- *Ignacimuthu, S.J.2002. Basic Biotechnology. Tata Mc Graw – Hill Publishing Company, Ltd., New Delhi.*
- *Kumerasan, V. 2009. Biotechnology (Revised Edition), Saras Publications, Kanyakumari.*
- *Arora, P.M.2003. Biotechnology. I Edition. Himalaya Publishing House, Mumbai.*

### **List of Reference Books:**

- *Gupta, P.K.2001. Elements of Biotechnology and Genomics (I Edition) Rastogi Publications, Meerut.*
- *Gupta, P.K.2004. Biotechnology and Genomics (Ist Edition) Rastogi Publications, Meerut.*
- *Das, H.K. 2005. Text book of Biotechnology (Second edition). Wiley Dreamtech India (P) Ltd., New Delhi.*

- Lohar, P.S. 2005. *Biotechnology*. MJP Publishers, Chennai.

## **Bioinformatics**

### **List of Text Books:**

- Murthy, C.S.V. 2004. *Bioinformatics*. Himalaya Publishing House, Delhi.
- Sundaralingam, R. and V.Kumaresan. 2008. *Bioinformatics*. Saras Publication. Nagercoil.
- Smith H, J, Smith & William. 1988. *Introduction to the Principles of Drug Design*, 2nd ed, Wright London.
- Lesk, A.M. 2007. *Introduction to Bioinformatics (Second edition)*. Oxford University press, New Delhi.
- Sundararajan, S and Balaji, R. 2003. *Introduction to Bioinformatics*. Himalaya Publishing House, Delhi.

### **List of Reference Books:**

- ✓ Campbell, A.M and Heyer, L.J. 2004. *Discovering Genomics, Proteomics and Bioinformatics*. Pearson Education, Delhi.
- ✓ Attwood, T.K and Parry-Smith, D.J. 2001. *Introduction to Bioinformatics*. Pearson Education, Delhi.
- ✓ Bal, H.P. 2007. *Bioinformatics Principle and applications*. Tata McGraw-Hill Publishing Company Ltd., New Delhi.
- ✓ Krane, D.E and Raymer, M.L. 2006. *Fundamental Concepts of Bioinformatics*. Pearson Education, USA.
- ✓ Gladis HelenHepsyba, S. and Hemalatha, C.R. 2009. *Basic Bioinformatics*, MJP Publishers, Chennai.
- ✓ Lohar, P.S. 2009. *Bioinformatics*, MJP Publishers, Chennai.
- ✓ Westhead, D.R., Parish, J.H and Twyman, R.M. 2003. *Bioinformatics*. Viva Books Private Ltd., New Delhi.

<b>Code: 15Z621L</b>	<b>CC-XIV –Practical –IV ( Ecology And Evolution, Microbiology &amp; Immunology, Biotechnology and Bioinformatics)</b>	<b>Sem:VI</b>
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## **ECOLOGY**

- ❖ Estimation of Dissolved oxygen content in water samples.
- ❖ Estimation of Salinity in water samples.
- ❖ Estimation of dissolved Carbon dioxide in water samples.
- ❖ Estimation of Carbonate and bicarbonate in water samples
- ❖ Plankton mounting and identification from water samples.

### **Spotters**

- ❖ Intertidal fauna: Rocky, Sandy, Muddy shores – any 4 examples in each type
- ❖ Animal association: Commensalisms, mutualism and Parasitism.

## **EVOLUTION**

### **Spotters**

- ❖ Animals of evolutionary significance: Peripatus and Archaeopteryx.
- ❖ Homologous organs: Fore limb modification in vertebrates.
- ❖ Analogous organs: Wing modifications.
- ❖ Colouration: Chameleon, Lycodon and Krait
- ❖ Mimicry: Monarch and Viceroy Butterfly
- ❖ Fossils: Nautilus and Ammonite.

## **MICROBIOLOGY**

Fixing and staining of bacteria.

MBRT (Methylene Blue Reduction Test) for analysis of Milk quality

### **Demonstrations**

Sterilization procedures; Motility of Bacterial cell; Serial dilution technique; Pour plate method;

Mother Culture; Air microflora - Open plate method.

**Spotters:** Autoclave, Petri plate, Inoculation loop, Inoculation hood.

## **IMMUNOLOGY**

- ❖ Lymphoid organs of the rat (Demonstration only).
- ❖ Double Immuno-diffusion (Demonstration only).

## **BIOTECHNOLOGY**

## **Demonstrations**

- ❖ Capturing of high resolution digital images of Gel bands by using Gel Documentation system
- ❖ Animal and Plant Tissue culture facilities including Inverted Microscope and CO<sub>2</sub> Incubator
- ❖ Ethanol production by using Fermentor

## **Spotters**

Plasmids; Electrophoresis; Pasteurised milk

## **BIOINFORMATICS**

- ❖ Sequence retrieval from NCBI, EMBL, and DDBJ.
- ❖ Sequence similarity analysis - BLAST,
- ❖ Multiple sequence alignment - Clustal W
- ❖ Phylogenetic analysis.

<b>Code: 15Z622b</b>	<b>EC – II -Wildlife Biology</b>	<b>Sem:VI</b>
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### **Objectives**

*To make the pupil aware about importance of natural resources and wildlife.*

#### **UNIT-I:**

Wildlife: Definition, importance, causes for depletion, methods of conservation. Rare, threatened, vulnerable, Endangered and Extinct animals: Salient features of Indian wildlife protection act (1972). Role of NGOs in wildlife conservation: IUCN, WWF, BNHS.

#### **UNIT-II:**

Wildlife management: Concepts, principles and Planning. Wildlife management plans. Evaluation of wildlife habitat: Reconnaissance type technique – vegetative analyses techniques.

#### **UNIT-III:**

Sanctuaries, National parks and Zoos: Aim and management of Sanctuaries, National parks and Zoos. Brief account of Mudumalai sanctuary, Point Calimere, and Gir sanctuary - Kealodo National Parks, Kaziranga National parks and, Gulf of Mannar Marine National parks. Project Tiger - Tiger reserves.

#### **UNIT-IV:**

Study of Tracks and Signs of Wildlife. Determination of age and Sex in birds (Gallinaceous and water birds) and mammals (Small and Large mammals).

#### **UNIT-V:**

Population Estimation: Direct count (Total counts, Drive counts, Transect methods): Indirect counts (call count, track count, pellet count, pugmark, camera trap) – Mark-recapture method.

#### **List of Text Books:**

- *Dasmann, R.F. 1964. Wildlife Biology, John Wiley and Sons Newyork. pp 231.*
- *Giles, R.H.Jr. (Ed.). 1984. Wildlife Management Techniques 3<sup>rd</sup> edition. The Wildlife Society, Washington. D.C. Nataraj Publishers, Dehra Dun. India. P547.*



- *Saharia, V.B. 1982. Wildlife of India, Nataraj Publishers, Dehra Dun, pp 206.*

**List of Reference Books:**

- ✓ *Robinson, W.L. and Eric, G. Bolen, 1984. Wildlife Ecology and Management. Max Millan Publishing Co, Ny. pp 478.*
- ✓ *Rodgers, W.A. 1991. Techniques for Wildlife census in India – A field Manual: Technical Manual – TM – 2. WII.*
- ✓ *Teague, R.D. (Ed.). 1987. A manual of wildlife conservation. The wildlife Society, Washington. D.D.Nataraj Publisheers, Dehra Dun, pp 206.*

<b>Code: 15Z622a</b>	<b>EC –II- Economic Entomology</b>	<b>Sem:VI</b>
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**UNIT-I:**

**Insect Pest:** Classification - biology, damage caused and control methods of pest of paddy, groundnut, sugarcane, cotton and wheat. Pests of stored products. Primary and Secondary and Minor pests, Secondary pest outbreak. Pest resurgence.

**UNIT-II:**

**Beneficial insect:** Pollinators, predators, soil builders, parasitoids and scavengers. Sericulture - biology and culture of silkworm. Apiculture - biology and culture of honey bee. Lac culture – Biology and culture of Lac insect.

**UNIT-III:**

**Principles of insect control:** Prophylactic measures – cultural, mechanical, physical and chemical methods. Pesticides – classification, types of formulation, mode of action, toxicity. Insecticide resistance and Environmental safety. Biological control – Parasites, Predators, Microbial agents and Botanicals. Non conventional methods – IGR, Repellents, Antifeedents, Pheromones, Chemosterilants, Irradiation, Genetic and Quarantine.

**UNIT-IV:**

**Integrated Pest Management (IPM):** Definition and Integration of methods. Potential components need for IPM and its application. Insect plant interactions. Pest – Predator Complex an ecological balance. Pest resistant crops – Transgenic crops.

## **UNIT-V:**

**Insects and Diseases:** Biology of insect vectors and control of Housefly, Mosquito, Flea and Sandfly. Mode of transmission and epidemiology of Relapsing fever, Plague, Malaria, Dengue, Encephalitis and Filariasis. Pest of domestic animals.

### **List of Text Books:**

- *Ambrose, D. P. 2004. General Entomology. Kalyan Publishers, West Bengal.*
- *Metcalf, C. V and Flint, W. P. 1979. Destructive and Useful Insects: Their Habitats and Control. Tata Mc Graw Hill Publications, New Delhi, India.*
- *Vasantharaj David, B. 2001. Elements of Economic Entomology. Popular Book Depot, Chennai, India.*
- *Vasantharaj David, B. and T. Kumaraswamy. 2002. Elements of Economic Entomology. Popular Book Depot, Chennai, India.*

### **List of Reference Books:**

- ✓ *Ananthakrishnan T. N. 2002. Insect Plant Interactions. Oxford and IBH, New Delhi.*
- ✓ *Chapman, R. F. 1988. The Insects Structure and function. Cambridge University Press, U.K*
- ✓ *Rathinasamy, T. K. 1986. Medical Entomology. S Viswanathan and Co., Madras, India.*