



**NATIONAL COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI - 620 001**

**Nationally Accredited at 'A' Level by NAAC**

**B. Sc. ZOOLOGY  
COURSE STRUCTURE UNDER C.B.C.S.**

(Applicable to the candidates admitted from the academic year 2013-14 Onwards)

Sem.	Part	Course	Course Title	Ins. hours/ week	Credit	Exam.Hrs.	Marks			Total
							CIA	External		
								W	O	
I	I	Language Course-I - (LC-I)	Language	6	3	3	25	75	-	100
	II	English Language Course-I (ELC-I)	English	6	3	3	25	75	-	100
	III	Core Course-I (CC-I)	Faunal Diversity- Invertebrata	5	5	3	25	75	-	100
		Core Course-II - (CC-II)	Practical I (Pertaining to ZY1& ZY3)	3	-	-	-	-	-	-
		First Allied Course-I - (1AC-I)	Allied Chemistry-I	5	3	3	25	75	-	100
		First Allied Course-II - (1AC-II)	Allied Chemistry Practical I	3	-	-	-	-	-	-
	IV	Skill Based Electives-I - (SBEC-I)	Office Automation	2	2	3	25	75	-	100
		<b>Total</b>		<b>30</b>	<b>16</b>					<b>500</b>
II	I	Language Course-II - (LC-II)	Language	6	3	3	25	75	-	100
	II	English Language Course-II(ELC-II)	English	4	2	3	25	75	-	100
		Communicative English	Communicative English -I (CEC-I)	2	1	3	25	70	5	100
	III	Core Course-II - (CC-II)	Practical I (Pertaining to ZY1 & ZY3)	3	5	3	25	70	5	100
		Core Course-III - (CC-III)	Faunal Diversity-Chordata	5	5	3	25	75	-	100
		First Allied Course-II - (1AC-II)	Allied Chemistry Practical I	3	3	3	25	70	5	100
		First Allied Course-III - (1AC-III)	Allied Chemistry -II	5	3	3	25	75	-	100
	IV	Environmental Studies Course (ESC)	Environmental Studies	2	2	3	25	75	-	100
	<b>Total</b>		<b>30</b>	<b>24</b>					<b>800</b>	
III	I	Language Course-III - (LC-III)	Language	6	3	3	25	75	-	100
	II	English Language Course-III (ELC-III)	English	4	2	3	25	75	-	100
		Communicative English-II - (CEC-II)	Communicative English -II (CEC-2)	2	1	3	25	70	5	100
	III	Core Course-IV - (CC-IV)	Cell and Molecular Biology	5	5	3	25	75	-	100
		Core Course-V - (CC-V)	Practical I (Pertaining to ZY4 & ZY6)	2	-	-	-	-	-	-
		Second Allied Course-I - (2AC-I)**	Allied Botany I	5	3	3	25	75	-	100
		Second Allied Course-II - (2AC-II)**	Allied Botany Practical I (Pertaining ABO1 & ABO3)	2	-	-	-	-	-	-
	IV	Skill Based Elective Course-II (SBEC-II)	Desktop Publishing	2	2	3	25	75	-	100
		Skill Based Electives-III - (SBEC-III)	Office Automation & Desktop Publishing Lab	2	2	3	25	70	5	100
	<b>Total</b>		<b>30</b>	<b>18</b>					<b>700</b>	

Sem.	Part	Course	Course Title	Instru. hours/ week	Credit	Exam hr	Marks			Total	
							CIA	External			
								W	O		
IV	I	Language Course-IV (LC-IV)		6	3	3	25	75	-	100	
	II	English Language Course-IV (ELC-IV))		6	3	3	25	75	-	100	
	III	Core Course-V (CC-V)	Practical I (Pertaining to ZY4 & ZY6)	3	5	3	25	70	5	100	
		Core Course-VI (CC-VI)	Physiology & Biochemistry	5	5	3	25	75	-	100	
		Second Allied Course -II (2AC-II)**	Allied Botany Practical I (Pertaining ABO1 & ABO3)	3	3	3	25	70	5	100	
		Second Allied Course-III -(2AC-III)**	Allied Botany II	5	3	3	25	75	-	100	
	IV	Non-Major Elective Course-I (NMEC-I)	Horticulture	2	2	3	25	75	-	100	
		<b>Total</b>			<b>30</b>	<b>24</b>					<b>700</b>
V	III	Core Course-VII (CC-VII)	Genetics and Evolution	5	5	3	25	75	-	100	
		Core Course-VIII (CC-VIII)	Bio Physics and Bio Statistics	5	5	3	25	75	-	100	
		Core Course-IX (CC-IX)	Practical III (ZY7, ZY-8 & ZY14)*	2	-	-	-	-	-	-	
		Core Course-X (CC-X)	Practical IV (ZY14 & ZY15l)*	3	-	-	-	-	-	-	
	IV	Elective Course-I (EC-I)	Economic Entomology	5	4	3	25	75	-	100	
		Elective Course -II (EC-II)	Wild life Biology	4	4	3	25	75	-	100	
		Non-Major Elective Course-II (NMEC-II)	Biofertilizer, and Biopesticides	2	2	3	25	75	-	100	
		Value Education Course - VEC	Value Education	2	2	3	25	75	-	100	
		Soft skills		2	2	3	25	75	-	100	
		<b>Total</b>			<b>30</b>	<b>24</b>					<b>600</b>
VI	III	Core Course-IX	Practical III (ZY7, ZY-8 & ZY14)*	3	5	3	25	70	5	100	
		Core Course-X	Practical IV (ZY14 & ZY15l)*	3	5	3	25	70	5	100	
		Core Course-XI (CC-XI)	Environmental Biology and Management	6	6	3	25	75	-	100	
		Core Course-XII (CC-XII)	Developmental Biology and Immunology	6	6	3	25	75	-	100	
		Core Course-XIII (CC-XIII)	Microbiology and Bio technology	6	6	3	25	75	-	100	
		Elective Course -III (EC-III)	Aquaculture	5	4	3	25	75	-	100	
	V	Gender Studies Course (GSC)	Environmental Biology and Management	1	1	3	25	75	-	100	
		<b>Total</b>			<b>30</b>	<b>33</b>					<b>700</b>
	V	Extension Activities			-	1	-	-	-	-	-
		<b>Grand Total</b>				<b>140</b>					<b>4000</b>

Part-I	Language	4 Courses	12 Credits
Part-II	English	4 Courses	10 Credits
Part-II	Communicative English	2 Courses	02 Credits
Part-III	Core Course	13 Courses	70 Credits
	Elective Course	3 Courses	12 Credits
	Allied Course-I	3 Courses	09 Credits
	Allied Course-II	3 Courses	09 Credits
Part-IV	Environmental Studies	1 Course	02 Credits
	Value Education	1 Course	02 Credits
	Non-Major Elective	2 Courses	04 Credits
	Skill Based Elective	3 Courses	06 Credits
	Gender Studies	1 Course	01 Credit
Part-V	Extensive Activities		01 Credit
	<b>Total</b>		<b>140 Credits</b>

nraAs; (, f, fhy , yf, fak) > ci uei l > rWfi j > , yf, fa tuyhW > gadKi wj j kp; -

U13T1

gUtk; : I

fwgpfFk; fhyk; : 6

myF - 1:

ghuj pahu; ftpi j fs;	:	] u] ;tj p Nj tpaPd; Gfo; ghuj ehL
ghuj pi hrd; ftpi j fs;	:	j kpaPd; , dpi k , dgj j kpa>
gl LfNfhl ; l ahu; ftpi j fs;	:	c yfk; c d;Di l aJ> nfhl L KuNr
	:	ci ogGk; Nj i t
	:	, td; NrhW NghLfwhd> mtd; \$W NghLfwhd;
ehkffiy; ft,Qu; ghl yfs; :	:	, sej kpaDfF
fz z j hrd; ftpi j fs; :	:	ghLtJ ehdy

myF - 2:

mgJy; uFkhd;	:	kz ;
i tuKj J	:	ghuj p epi df;fggLfwhd;
Nkj j h	:	nrUgGl d; xU Ngl b
kBh	:	Nt fk;j kpaGgW>Ruz ;l ykhk?>
	:	rptgGehl h> fhj Nyh fhj y>
	:	gof;fk; nghyyhj J
, d;Fyhg;	:	xU Gddi fr; rkpf; fahy;
mKj ghuj p	:	i ` f;\$
ehl LgGwg; ghl yfs; :	:	xgghuG; ghl y; g,rahwg; Ngh,tj pyi y

myF - 3:

ci uei l:

ghuj pahu;	-	j pahdqfS k; kej muqfS k;
j pU.tpf.	-	kdj d;
c.Nt.rh	-	vJ j kpa?
uh.gp NrJggps;i s	-	FbAk; gi l Ak;
K.t.	-	nkhop , yyhj epi y
GJi kggj j d;	-	j kpa; ehfupfj j py;

fphkthof; f

fy;fp	-	Gi dfspd; Nti y eWj j k;
r,vcd; mz z hJi u	-	gwW
R[ hj h	-	fl Ts; , Uf;fpwhuh?

**myF - 4: rƿfi j :**

tƿbay; fhƿk; - Ki dtu; , uh.ghyRgukz ƿad;

**myF - 5:**

**, yffƿa tuyhW** - , Ugj hk; E}wwhz l  
(Gj ƿdk> ehl fk; eb;fyhf)

**gadKi wj j kƿ;** - tƿkƿFk; tƿj ƿfsƿd; nj hFgG kƿfhi kf;Fuƿa  
tƿj ƿfs; (eyy j kƿ; vOj Ntz lkh  
gf;260 - 290.

**ghl E)y;**

- 1. nraAs> c i uei l - fy;Y}up ntsƿal
- 2. rƿfi j - tƿbay;fhƿk> Ki dtu; , uh. ghyRgukz ƿad;
- 3. , yffƿa tuyhW - nghJ
- 4. gadKi wj j kƿ; - eyyj kƿ; vOj Ntz lkh>  
m.fƿ guej hkdh> gf;260-290

\*\*\*\*\*

**nraAs; (, i l ffhy , yffƿak> Gj ƿdk> , yffƿa tuyhW**  
**nraAs; - U13T2**

**gUtk; : II**

**ghl k; : II**

**fwgƿFk; fhƿk; : 6**

**j ugGssƿ : 3**

**myF - 1**

- 1.1 j ƿUQhdrkgej u; Nj thuk; j ƿUfNfhbfffh j ƿUj j yk; (11 ghl yfs) , dW..
- 1.2. j ƿUehTffuru; Nj thuk; j ƿUgGfY}u; j ƿUj j yk; (10 ghl yfs) kUs th..
- 1.3. Rej uu; Nj thuk; j ƿUthi dffh j ƿUj j yk; (10 ghl yfs); ki wfs;..
- 1.4. khz ƿf;fthrfu; j ƿUthrfk; - j ƿUntkghi t (10 ghl yfs) Mj ƿAk;..

**myF - 2**

- 2.1. Mz l hs; j ƿUgghi t (10 ghRuqfs) Xqfƿ
- 2.2. nj hz l ubgnghbaho;thu; j ƿUkhi y (10 ghRuqfs) gri r
- 2.3. j ƿUgghz ho;thu;mk y dhj ƿƿuhd; (10 ghRuqfs)
- 2.4. FyNrfuho;thu;ngUkhs; j ƿUnkhop (11 ghRuqfs) CNdW

**myF - 3**

- 3.1. - Kj ;J fFkhurhkƿ gƿsi sj j kƿ; (2 ghl yfs)
- 3.2. - eej ƿf;fykgfk; - 5 ghl yfs;
- 3.3. - Kf;\$l wgs;S - 5 ghl yfs;

- 3.4. - xsi tahu; ghl y;fs; - 4 ghl y;fs;
- 3.5. - fhsNkfgGytu; ghl y;fs; - 3 ghl y;fs;
- 3.6. - rfj pKj j gGytu; ghl y; - 1 ghl y;
- 3.7. - fkgu; ghl y;fs; - 3 ghl y;fs;

**myF - 4**

Gj pdk;- rKj ha tJ p - eh. ghuj j rhuj p

**myF - 5**

**5.1. , yffja tuyhW**

- 5.1.1. - gfj p , yffjak; [i rtk> i tz tk]
- 5.1.2. - rpwpyffjak; [gpsi sj j kpo> fykgfk>gs;S
- 5.1.3 - Gj pd , yffjak;

\*\*\*\*\*

**fhgjak> ehl fk> , yffjatuyhW - U13T3**

**gUtk; : III**

**ghl k; : III**

**fwgpfFk; fhyk; : 6**

**j ugGssp : 3**

**myF - 1**

- 1. rpyggj pfhuk; (, sqNfhtbfs) - tofFi u fhi j
- 2. kz pNkfi y (rj j i yrrhj j dhu)- Mj pi u gpi rapl i fhi j

**myF - 2**

- 3. fkguhkhaz k; (fkgu) - , uhkhtj huk; - fhl rpggl yk;
- 4. ngupaGuhz k; (Nrf;fphu)- Gryhu; ehadh; Guhz k;

**myF - 3**

- 5. , NaRfhtpak; (fz z j hrd) - ki ygnghoT
- 6. rWhgGuhz k; (c kWgGytu) - khDf;Fg; gpi z epdw gl yk;

**myF - 4 :**

- 7. j z z B; j z z B; (Nfhky; Rthkpeh j d)- ehl fk;

**myF - 5**

- 8. , yffjatuyhW - fhggjak> Guhz k> ehl fk;

\*\*\*\*\*

**gz i l , yf,fiak> , yf,fiæ tuyhW> nkhoggaþwrp - U13T4**

**gUtk; : IV**

**ghl k; : IV**

**fwgpfFk; fhyk; : 6**

**j ugGSSp : 3**

**myF - 1**

- 1. FWenj hi f - 10 ghl y,fs; (8>18>25>40>58>99>131>135>167>196)
- 2. ewwpi z - 5 ghl y,fs; (1> 3> 16> 30> 355)
- 3. l qFEjW - 10 ghl y,fs; (nryT mOqFtþj j ggj j)

**myF - 2**

- 4. fyþj nj hi f - 2 ghl y,fs; (FwþQrþf,fiyþ15>Ky i yf,fiyþ11)
- 5. mfehDjW - 2 ghl y,fs; (129> 140)
- 6. GwehDjW - 10 ghl y,fs; (95>165>182>183>184>188>194>195>204)

**myF - 3**

- 7. j þUfFws; - mwj jGgghy; 5 mj þfhuq,fs; (11> 13> 14> 43> 47)

**myF - 4**

- 8. gj jGgghl L - Ky i ygghl L KOtJk; (egGj dhu)

**myF - 5**

, yf,fiæ tuyhW-vl Lj nj hi f> gj jGgghl L> gj þndz ; fb,fi,z f,F> nkhoggaþwrp - nghJ f,fi l i u (nghJ mwþT> ehl lEl gG> rKj ha NehfF gwwþad)

\*\*\*\*\*

**ENGLISH FOR COMMUNICATION – U13E1**

**Semester: I**

**English Language Course: I**

**Instruction Hours/Week: 6**

**Credit: 3**

**Unit I :**

- 1. Civilization and History – C.E.M. Joad
- 2. The Fun They Had – Issac Asimov

**Unit II :**

- 3. Big Numbers and Infinities – George Gamow
- 4. Oil – G.C. Thornley

**Unit III:**

- 5. An Observation and An Explanation – Desmond Morris

6. A Robot about the House – M.W.Thring

**Unit IV:** 7.A Wrong Man in Worker’s Paradise – Rabindranath Tagore  
8. Making Surgery Safe – Horace Shipp

**Unit V:** 9. Using Land Wisely – L.Dudley Stam  
10. The Karuburator – Karel Capek

**Text Book:** English through Reading, by W.W.S.Baskar and N.S.Prabu, Published by Macmillan Publishers India Ltd.,

\*\*\*\*\*

**ENGLISH THROUGH EXTENSIVE READING - U13E2**

**Semester : II**  
**Instruction Hours/Week:4**

**English Language Course : II**  
**Credit: 2**

**Unit I**

R.K.Narayan	An Astrologer’s Day
Boman Desai	Between the Mosque and the Temple

**Unit II**

O.Henry	The Gift Of the Magi
Premchand	The Child

**Unit III**

R.P. Sisodia	The Last Salvation
Kasturi Sreenivasan	I Prepare to go to Coimbatore

**Unit IV**

F.E.B. Gray	A Slip of the Tongue
Ruskin Bond	The Eyes are not Here

**Unit V**

Rabindranath Tagore	The Cabuliwallah
Guy de Maupassant	The Diamond Necklace

**Text book**

Glimpses of Life ; An Anthology of Short Stories ; Board of Editors [Orient Longman]

\*\*\*\*\*



**COMMUNICATIVE ENGLISH I – U13CE1**

**Semester : II**

**Communicative English Course: I**

**Instruction Hours/Week:2**

**Credit: 1**

**OBJECTIVES**

- 01. To Facilitate communication
- 02. To expose the students to various levels/types of communication.
- 03. To help the students achieve communicative competency

**UNIT I**

- 01. At the College
- 02. on the Campus
- 03. Outside the class

**UNIT II**

- 04. At the Post office
- 05. For Business and Pleasure
- 06. Review

**UNIT III**

- 07. Are you Smart?
- 08. Are you creative?
- 09. Is it too hard to improve?
- 10. How to win?

**UNIT IV**

- 11. View points
- 12. Snakes and ladders
- 13. Your Self

**UNIT V**

**Write**

- 14. Circulars, notes-reminders, warnings, farewells, apology;
- 15. Draft invitations – marriage, annual day, inaugural functions of associations, valediction, seminar, workshop.
- 16. Draft Short messages- compliments, birthday wishes, notifications, etc., Draft Posters- Slogans, announcements etc.,
- 17. Dialogue writing

Text Book: Creative English for Communication (2<sup>nd</sup> edition) by Krishnasamy and Sriraman.

Reference: Websites           www.english club.com  
[www.usingenglish.com](http://www.usingenglish.com)  
Owl-online writing lab  
MIT-open course ware  
www.eslcaf .com

\*\*\*\*\*

**ENGLISH FOR COMPETITIVE EXAMINATIONS – U13E3**

**Semester : III**  
**Instruction Hours/Week:4**

**English Language Course : III**  
**Credit: 2**

**Unit-I:**

Basics of English

- (a) Parts of speech
- (b) Tenses
- (c) Active and passive voice
- (d) Tag questions

**Unit –II:**

- (a) Errors and how to avoid them
- (b) Spotting errors
- (c) Reconstructing passages
- (d) Précis writing

**Unit –III**

Reading comprehension

**Unit –IV:**

Vocabulary – synonyms, antonyms, prefix & suffix, Homonyms, sentence completion, spelling  
Phrasal verbs & Idiomatic Expressions.

**Unit –V:**

Writing letters and drafting a resume /cv  
Types of essays and how to write them  
Guidance to a group discussion and  
Guidance to attending an interview

**Text book :**

**English for Competitive Examinations** by R.P.Bhatnagar & Rajul Bhargava macmillan India  
Ltd. Delhi.

\*\*\*\*\*

## COMMUNICATIVE ENGLISH II – U13CE2

Semester : III  
Instruction Hours/Week:2

Communicative English Course : II  
Credit: 1

### Unit-I:

Enriching Vocabulary – Register Development; who is who; Synonyms, antonyms,  
Active and Passive vocabulary, proverbs

### Unit –II:

Tense Forms with emphasis on differences between Present and Present Continuous; Past  
and Present Perfect – Framing questions, Auxiliaries, if clauses; conjunctions, and linkers;  
Prepositions

### Unit –III

Pronunciation, Good Pronunciation habits, R.P., Greetings, Farewells commands etc.,

### Unit –IV:

Conversational Skills – Affirmative or Negative Language – idiomatic expressions,  
Phrases, Dialogue Writing,

### Unit –V:

Writing Skills – Note- taking, note- making, e-mail- Describing an object- narrating a story

### Reference Books

- i) A Practical English Grammar by A.J Thomson and A.V. Martinet.
- ii) Remedial English Grammar, by F.T. Wood.
- iii) English for competitive Examinations by R.P Bhatnagar & Rajul Bhargava.

\*\*\*\*\*

## READING POETRY AND DRAMA– U13E4

Semester : IV  
Instruction Hours/Week:6

English Language Course: IV  
Credit: 3

### POETRY:

Unit: I	John Milton	:	On His Blindness
	Oliver Goldsmith	:	The village Schoolmaster
	William Wordsworth	:	The Solitary Reaper



#### **UNIT - IV : ANNELIDA AND ARTHROPODA**

General characters and classification up to class level with examples.

Detailed study : *Penaeus*

General topics : Adaptive Radiation in Annelida, Larval forms of crustacean and their significance, Beneficial and harmful insects.

#### **UNIT - V : MOLLUSCA AND ECHINODERMATA**

General characters and classification up to class level with examples.

Detailed study : *Pila*

General topics: Economic importance of molluscs, Larval forms of Echinoderms, Water-vascular system in Echinoderms.

#### **Reference Books:**

1. Ayyar, C.K. and T.N. Ananthakrishnan, 1992. A Manual of Zoology, Vol-I (Invertebrata) Parts I & II, Viswanathan Pvt. Ltd.,
2. Barrington, E.J.W. 1979, Invertebrates Structure and Function. Ed ELBS and Nelson.
3. Hyman, L.H., 1940-1955, The Invertebrates, Vol – I to VII McGraw Hill Book Co.
4. Jordon, E.L. and P.S. Verma 1995, Invertebrate Zoolgy, 12<sup>th</sup> Edn. S.Chand & Co.
5. Kotpal, R.L., S.K. Agarwal, R.P.R.Khetarpal. 1989. Modern Text Book of Zoology, Rostogi Publications.

\*\*\*\*\*

#### **MAJOR PRACTICAL – I U13ZY2P (Pertaining to ZY1 & ZY3)**

**Semester : I&II**

**Core Course : II**

**Instruction Hours/Week : 3+3**

**Credit : 5**

#### **Invertebrata**

##### **Dissection**

Earthworm : Nervous system

Prawn : Nervous system

##### **Mounting**

Earthworm : Body setae, Penial setae

Prawn : Appendages

##### **Spotters and slides**

Protozoa : Paramecium, Paramecium conjugation.

Porifera : Sycon, Gemmule, Spicules.

Coelenterata : Obelia (entire), Physalia, Obelia medusa, Porpita, Sea anemone, Aurelia.

Platyhelminthes : Liver fluke, Planaria, Tapeworm, and Scolex, Redia larva

Nemathelminthes: Ascaris (Male and Female).

Annelida : Nereis, Parapodium, Heteronereis, Trochophore larva, Arenicola, Leech.

- Arthropoda : Penaeus, Nauplius, Sacculina on crab, Peripatus, Limulus,  
Alima larva. Artemia, Cyclops.  
Molluscs : Pila, Chiton, Sepia, Nautilus.  
Echinodermata : Starfish, Bipinnaria larva, Sea urchin.

### **Chordata**

#### Mounting

Shark : Placoid scales.

#### Spotters and Slides:

- Prochordata : Amphioxus, Balanoglossus.  
Fishes : Shark, Echeneis, Hippocampus, Exocoetus.  
Amphibia : Alytes, Bufo, Hyla, Ichthyophis.  
Reptilia : Naja naja, Viper, Chelone,  
Aves : Pigeon, Feathers.  
Mammalia : Rabbit, Bat.  
Dentition : Rabbit, Man.  
Skeleton : Pigeon – Synsacrum  
Rabbit : Pectoral and pelvic girdles.

A record of lab work should be maintained and submitted at the time of practical exam

#### References Books:

1. P.S. Verma and P.C.Srivastava 2007. Advanced Practical in Zoology (S. Chand & Co.)
2. S.S. Lal 2004. Practical Zoology : Chordates (Rastogi Publications)

\*\*\*\*\*

### **FAUNAL DIVERSITY (CHORDATA)-U13ZY3**

**Semester : II**

**Core Course: III**

**Instruction Hours/Week : 5**

**Credit : 5**

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

General characters and classification of chordates up to order level with examples.

Detailed study : Amphioxus.

General topics : Retrogressive metamorphosis in Ascidia, Affinities of Balanoglossus.

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

General characters and classification up to sub class with examples.

Detailed study : Shark (Excluding endoskeleton)

General topics: Migration in fishes, Accessory respiratory organs in fishes.

#### **UNIT - III : AMPHIBIA AND REPTILIA**

General characters and classification up to order with examples.

Detailed study : Frog (Excluding endoskeleton)

General topics : Parental care in Amphibia, Identification of poisonous and non-poisonous snakes of South India, biting mechanism and first aid for snake bite.

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

General characters and classification up to sub class with examples.

Detailed study : Pigeon (Excluding endoskeleton)  
General topics : Migration in birds, Flight adaptations in birds.

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

General characters and classification up to sub class with examples.  
Detailed study : Rabbit (Excluding endoskeleton)  
General topics : Aquatic mammals, Prototheria and its affinities.

#### **Reference Books :**

1. Ekambaranathan Ayyar, I , 1993 – Outlines of Zoology – Vol – I Viswanathan Pvt. Ltd.

\*\*\*\*\*

### **CELL BIOLOGY -U13ZY4**

**Semester : III**

**Core Course : IV**

**Instruction Hours/Week : 5**

**Credit : 5**

#### **UNIT – I**

Microtome techniques: Preservation, fixation, sectioning and staining. Prokaryotes and Eukaryotes.  
Physical and chemical properties of cytoplasm. Plasma membrane : Structure and functions.

#### **UNIT – II**

Endoplasmic reticulum: Structure, Types and Functions.  
Golgi complex: Origin, Ultra structure and functions.  
Lysosomes: Origin, Ultra structure, Chemistry and functions

#### **UNIT – III**

Mitochondria : Origin, Ultra structure and functions.  
Ribosomes : Structure and functions.

#### **UNIT – IV**

Nucleus : Ultra structure and functions.  
Chromosomes : Ultra structure, Classification and functions, Polytene chromosomes.  
DNA : Molecular structure, types, functions and replication.  
RNA : Types and structure.

#### **UNIT – V**

Cell cycle, Differences between mitosis and meiosis.  
Genetic code and Protein synthesis.  
Properties of cancer cells, Stem cell.

#### **Reference Books:**

1. De Roberties, E.P.P. and E.M.F. De Roberties 1987. Cell and Molecular Biology
2. Power, C.B., 1989. Essentials of Cytology. Himalaya Publishing House.

3. Verma, P.S. and V.K. Agarwal.2009. Cell biology, genetics, molecular biology , evolution and ecology. S. Chand & Co.
4. Tomar & Singh, 1999. Cell Biology. Rastogi Publication, Meerut.
5. Meyyan R.P. 2005. Cell Biology, Saras Publications.
6. Darner, Lodish and Baltimore 1990. Molecular Cell Biology, II Ed.
7. Watson *et al.*, 1987. Molecular Biology of the Gene.
8. Shukla 2005. Histological Techniques

\*\*\*\*\*

**Core Course V - U13ZY5P  
(Pertaining to ZY4 & ZY6)**

**Semester : III & IV  
Instruction Hours/Week :2+3**

**Core Course : V  
Credit : 5**

**Cell Biology**

1. Onion root tip – squash preparation and study of mitosis.
2. Spotters : Columnar, Ciliated, Squamous epithelium, Cardiac, Striated, Non-striated Muscle, Nerve cell, Blood of Man and Frog, Compound microscope, Centrifuge, Micrometer, Camera Lucida.

**Physiology**

1. Enumeration of RBC and WBC.
2. Qualitative tests for ammonia, urea and uric acid.
3. Spotters: Haemoglobinometer, Kymograph, Sphygmomanometer.

**Biochemistry**

1. Qualitative tests for proteins, carbohydrates and lipids
2. pH measurement of various samples.
3. Estimation of glucose in blood.

A record of lab work should be maintained and submitted at the time of the practical examinations.

\*\*\*\*\*

**PHYSIOLOGY AND BIOCHEMISTRY -U13ZY6**

**Semester : IV  
Instruction Hours/Week :5**

**Core Course : VI  
Credit : 5**

**UNIT – I**

Nutrition : Types, Digestion in Man.

Respiration : Transport of O<sub>2</sub> and CO<sub>2</sub> in man

Circulation : Blood composition, Types of heart, Origin and Conduction of heart beat in man, Blood pressure.

**UNIT – II**

Excretion : Types of nitrogenous wastes, Structure of mammalian kidney and Urine formation.

Osmo-ionic regulation in fresh water and marine fishes.



Muscle physiology : Types of muscles, Ultra structure of muscle fibre, Physiology of muscle contraction.

### **UNIT – III**

Nerve physiology: Neuron, Types, Neurotransmitters, Impulse transmission, Synapse, Synaptic transmission, Reflex action.

Phono and Photoreception in man.

Endocrine physiology : Endocrine glands in man, Secretion and Disorders.

### **UNIT – IV**

Carbohydrates, Proteins and Lipids. Classification.

Metabolism: Carbohydrates, Proteins and Lipids. Calorific values, Balanced diet.

### **UNIT – V**

Enzymes: Classification, Characteristics, Mode of action, Theories, Factors affecting enzyme action.

Vitamins : Types, Source, Function and Deficiency diseases.

### **References:**

1. Berry A.K. 1998. A text book of Animal Physiology. Emkay Publications, New Delhi – 51.
2. Hoar, W.S. 1983. General and Comparative Physiology. Printice Hall of India.
3. Nagabushanam R. 1991. Animal Physiology. S. Chand & Co.
4. Agarwal, R.A.A.K. Srivastava and Kaushal Kumar, 2005. Animal Physiology and Biochemistry. S. Chand & Co New Delhi.
5. Harper, H.A. 1993. Review of Physiological Chemistry. Muruzen Ascian Ed.
6. Lehninger L., 1990. Biochemistry. W. H. Freeman & Co.
7. Veerakumari. L. 2008. Biochemistry, MPJ Publications.

\*\*\*\*\*

## **GENETICS AND EVOLUTION -U13ZY7**

**Semester : V**

**Core Course : VI**

**Instruction Hours/Week : 5**

**Credit : 5**

### **UNIT – I**

Human Chromosome: Karyotype, Barr Bodies, Chromosomal aberration and syndromes. Linkage, Crossing over: Definition and Mechanism, Cytological evidence of Crossing over, Drosophila as an example. Chromosomal map.

### **UNIT – II**

Microbial genetics: DNA as the genetic material, Recombination in bacteria: Transformation, Conjugation, Sexduction, Transduction, Recombination in bacteriophage, Mechanism of recombination, Lytic and Lysogenic cycles.

### UNIT – III

Molecular genetics : Fine structure of gene, Cistron, Recon and Muton, Gene expression and regulation in Prokaryotes, Operon model, Lac and Trp Operon, Gene regulation in Eukaryotes. Britton and Davidson model. Gene amplification. Genetic basis of Cancer.

### UNIT – IV

Theories: Lamarckism, Darwinism, de Vries theory of mutation; Modern synthetic theory of evolution.

### UNIT – V

Mimicry and animal colouration, Speciation, Isolating mechanisms, Evolution of man.

#### Text Books:

1. Verma, P.S. and Agarwal, V.K. 1997. Genetics . S.Chand & Co., New Delhi

#### References:

1. Lewin, B. 2009. Gene X. Wiley Eastern Ltd., New Delhi.
2. Strickberger, M.W. 2002. Genetics. Printice Hall of Inda, New Delhi.
3. Rothwell, N.V. 1979. Human Genetics. Printice Hall of Inda, New Delhi.
4. Arumugam, N. 1989. Organic Evolution. Saras Publication. Nagarcoil
5. Strickberger, M.W. 2000. Evolution. Jones and Barlett Publishers.

\*\*\*\*\*

### BIOPHYSICS AND BIostatISTICS -U13ZY8

Semester : V

Core Course : VIII

Instruction Hours/Week : 5

Credit : 5

### UNIT – I

Colloids: Description, Types, Properties. Donnan Equilibrium, Tyndall effect, Surface tension, Brownian movement, Filtration, Osmosis, Dialysis, Adsorption.

### UNIT – II

Components of Light: Beer and Lambert's law of light absorption. Spectrophotometer, Laws of thermodynamics.

### UNIT – III

Biostatistics: Scope, Primary and Secondary data. Tabulation of data, Histogram, Polygon, Pie diagram. Types of variables: Continuous and discontinuous variables, Qualitative and quantitative variables.

#### **UNIT – IV**

Definition, illustration and significance: Mean, Median, Mode, Standard deviation, Standard Error, Variance and Co Variance.

#### **UNIT – V**

Definition, illustration and significance: Chi square, t-test, Simple Correlation and regression.

#### **References:**

1. Daniel, M. 1992 – Basic Biophysics and Biologists. Wiley International, New Delhi.
2. Das, D. 1996. Biophysics and Biological Chemistry. Academic Publishers, Calcutta.
3. Snedecor, G.W. and W.G. Cochran 1967. Statistical methods, Oxford & IBH Publishing. New Delhi.
4. Zar, J.H. 1974. Bio statistical analysis. Prentice Hall Inc., New Jersey, USA.

\*\*\*\*\*

### **Elective course I - U13ZY9E ECONOMIC ENTOMOLOGY**

**Semester : V**

**Elective Course : I**

**Instruction Hours/Week : 5**

**Credit : 4**

#### **UNIT – I**

Characteristic features of class Insecta, Classification with suitable examples.

#### **UNIT – II**

Destructive insects: Bionomics and life cycle of the common pests of Paddy and Coconut. Common pest of Brinjal and pests of Stored products.

#### **UNIT – III**

Beneficial Insects:

Economic importance of honey bee, silk worm and lac insect.

Insects as pollinators, predators, parasites, weed killers, soil builders and scavengers.

#### **UNIT – IV**

House hold insect pests: Mosquito, cockroach, housefly, termites, damages caused and their control measures.

#### **UNIT – V**

Insect Pest Management: Insect pest control- Natural, applied, mechanical, cultural, chemical and biological control. Integrated pest management (IPM).

#### **References:**

1. Chapman R.F., 1993. The Insects Structure and Functions. ELBS London.

2. Chandler A.C. and Read C.P. 1961. Introduction to Parasitology. John Wiley and Sons, New York.
3. David, B.V. and Muralirangam, N.C. and Meera Muralirangam.1992. Harmful and beneficial Insects. Popular Book Depot.
4. David, B.V 1992. Pest Management and Pesticides. Indian Scenario, Namrutha Publications.
5. Krishnan. N.T. 1993. Economic Entomology. JJ Publications, Madurai.

\*\*\*\*\*

**Elective course II - U13ZY10E  
WILD LIFE BIOLOGY**

**Semester : V** **Elective Course : II**  
**Instruction Hours/Week : 4** **Credit : 4**

**UNIT – I**

Wildlife concept: Importance of Wild life conservation:-ecological, ethical, educational, scientific, commercial, aesthetic, and recreational. Conservation methods:- In situ conservation-sanctuaries, national parks, biosphere reserves, Ex situ conservation-captive breeding, modern zoo, safari, nocturnal zoo.

**UNIT – II**

Inventory studies:-Total species list, total genus or family list, parallel-line searches, encounter rates, documenting rarities, sample collection: labeling, preservatives, collection of plants, fungi, invertebrates, fishes, amphibians, reptiles, birds and mammals.

**UNIT – III**

Conservation priorities: IUCN classification - extinct, critically endangered, endangered, vulnerable, conservation dependent, low risk, data deficient, not evaluated. Flagship species, Umbrella species, Hotspots, Important Bird Areas, Tiger Reserves. Protected areas of Tamil Nadu

**UNIT – IV**

Wildlife census techniques: Direct count: Line transects, Point counts. Mark-recapture. Indirect count: pellet count, calls, scent mark, camera trap, radio telemetry, remote sensing.

**UNIT – V**

Conservation project: A. Tiger project- Tiger species, distribution, threats, conservation action taken, B. Elephant project: Elephants species, distribution, threats, conservation action taken. C. Crocodile Project-crocodile species, distribution, threats, conservation action taken.

**References**

1. Sutherland W.J.2000.The conservation hand book: research, management and policy Blackwell Science Ltd
2. Martin and Bateson, 2007. Measuring Behaviour. Cambridge University Press.
3. Andrawartha, H.C. and L.C. Birch. 1974. The distribution and abundance of animals. The University of Chicago Press, London.

4. Agarwal, V.P. 1980. Forests in India. Oxford and IBH Publishing Co. New Delhi.
5. Davis, M. 1981, Infectious diseases of wild mammals. The IOWA state.
6. Giles, R.H. 1984. Wild life management techniques. The wild life society, Washington and Natraj Publishers, Dehra Dun.
7. Saharia, V.B. 1982. Wild life in India. Nataraj Publishers, Dehra Dun.

\*\*\*\*\*

**MAJOR PRACTICAL III – U13ZY11P**  
(Pertaining to Genetics ZY7, ZY8 and ZY13)

**Semester : V & VI**

**Core Course: IX**

**Instruction Hours/Week: 2+3**

**Credit : 5**

**Genetics:**

1. Drosophila – Culture, Identification of Sex, Mutant forms (from pictures), Genetic importance.
2. Human Karyotypes: Normal, Down's, Klinefelter's and Turner's syndromes.

**Evolution:**

1. Fossils: Trilobite, Nautilus.
2. Mimicry: Leaf insects, Stick insects, Monarch and Viceroy butterfly
3. Colouration: Chameleon, Lycodon.

**Environmental Biology:**

1. Estimation of Dissolved oxygen.
2. Mounting and Identification of Plankton (Fresh water or marine)
3. Spotters: Animal association (parasitism, mutualism and commensalisms), Inter tidal fauna (rocky, sandy, and deep sea), Secchi disc, Thermometer, Barometer, Luxmeter, Sedgwick Rafter Cell.
4. Food web.

**Biodiversity:**

Field visit

**Biophysics:**

1. Spotters: Spectrophotometer, pH meter and Electrophoretic unit.

**Biostatistics:**

1. Construction of Bar and Pie diagram.
  2. Calculation of Mean, Median and Mode, Standard deviation and Standard error.
- A record of lab work should be maintained along with tour report and submitted at the time of the practical examination.

\*\*\*\*\*

**MAJOR PRACTICAL IV- U13ZY12P**  
(Pertaining to ZY14 and ZY15)

**Semester : V & VI**

**Core Course: X**

**Instruction Hours/Week: 3+3**

**Credit : 5**

**Developmental Biology**

1. Observation of the structure of live spermatozoa of Calotes / Rat.
2. Observation of prepared micro slides.

**Spotters:** (a). Egg, cleavage, blastula and yolk plug stages in frog.  
(b). Egg, 24, 48, and 72 hrs developmental stages in chicks

**Immunology**

1. ABO Blood grouping, Rh Type.
2. Vidal Test-Agglutination (Demonstration).
2. Observation of lymphoid organs in rat (Chart, Virtual)
3. Spotters: Immuno electrophoresis (from picture), Lymphoid organs in rat.

**Microbiology**

1. Fixing and staining of bacteria using simple stain.
2. Bacteria culture (demonstration)
3. Differentiation of bacteria in a smear using gram staining.
3. Spotters: Autoclave, Petri plate, Micropipette, Laminar flow, Inoculation loop.

**Biotechnology**

1. Isolation of DNA (Demonstration only)
2. Spotters: Bioreactor, Plasmid (PBR<sup>322</sup>, SV<sup>40</sup>), PCR. Transgenic animals: fish, cow, goat, rat.

A record of lab work should be maintained and submitted at the time of the practical examination.

\*\*\*\*\*

**ENVIRONMENTAL BIOLOGY AND MANAGEMENT - U13ZY13**

**Semester : VI**

**Core Course : XI**

**Instruction Hours/Week : 6**

**Credit : 6**

**UNIT – I**

Environmental Biology: Definition, Scope. Abiotic factors : Water, Soil, Temperature, Light. Biotic factors. Animal relationship; Symbiosis , Commensalism, Mutualism , Antagonism, Antibiosis, parasitism, Predation and Competition.

## UNIT – II

Ecosystem: Definition, Structure, Pond ecosystem, Primary & Secondary productions. Food chain, Food web, Trophic levels, Energy flow, Pyramid of biomass, Pyramid of energy. Biogeochemical cycle: Nitrogen and Phosphorous.

## UNIT – III

Community ecology: Characteristics, Ecological succession.

Population ecology: Definition, Density, Estimation, Natality & Mortality, Age distribution, Age pyramids, Population growth, Population equilibrium.

## UNIT – IV

Pollution and Management: Types, Sources, Effects, Air, Water, Land, Noise, Thermal, Pesticide, Radioactive, Green House effect, Ozone and its importance. Global warming, Acid rain, Bio accumulation, Bio magnification, Bio remediation.

## UNIT – V

Biodiversity: Concept, Types and Components, Global "Biodiversity hotspots", IUCN species categories – extinct, threatened, near threatened, and least concern.

### References:

1. Clarke, G.L. 1954. Elements of Ecology, John Wiley & Sons. N.Y.
2. Kendeigh, S.C., 1961. Animal Ecology. Prentice Hall.
3. Odum, E.P., 1971. Fundamentals of Ecology. W.B. Saunders Company, Philadelphia.
4. Rastogi, V.B. and M.S. Jayaraj, 1989. Animal Ecology and Distribution of Animals.
5. Verma, P.S. and V.K. Agarwal, 1996. Principles of Ecology. S. Chand & Co New Delhi.
6. Bharucha Erach. The Biodiversity of India. Mapin Publishing Pvt.. Ltd., Ahmedabad.
7. Krishnamurthy, K.V. 2003. Introduction to Biodiversity. Oxford and IBH.

\*\*\*\*\*

## DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY -U13ZY14

**Semester : VI**

**Core Course : XII**

**Instruction Hours/Week : 6**

**Credit : 6**

## UNIT – I

Fertilization; External and internal fertilization, sperm – egg interaction, Physiological changes. Cleavage; Patterns of cleavage – radial, spiral, and bilateral. Types– meroblastic, holoblastic and superficial. Factors affecting cleavage, Blastulation.

## UNIT – II

Gastrulation in frog, Morphogenic movements, Fate maps, Organizer, Development of Eye, Foetal membranes in chick, Placentation in mammals.

### UNIT – III

Stem cells : Definition, Types, Unique properties, Proliferation and Differentiation. Totipotent, Pluripotent, Multipotent and Unipotent.

Stepwise developmental changes in human embryo, Test tube baby.

### UNIT – IV

Scope of immunology – Immunity: Innate, acquired, passive and active. Lymphoid organs: Structure and function of Primary: thymus, bone marrow, Bursa. Secondary: Spleen, tonsil, lymph node, Payer's patches. MHC: Types and functions.

### UNIT – V

Antigens: Structure, types, properties, haptens and adjuvant.

Antibodies: Structure of immunoglobulin, types of immunoglobulin, biological properties, humoral immunity and cell mediated immunity, ELISA.

### References:

1. Arumugam, N. 2005. A Text Book of Embryology, Saras Publications, Nagarcoil.
2. Balinsky, B.I. 1981. An introduction to Embryology. W.B. Saunders company.
3. Berry. A.K. 2007. An introduction to Embryology. Emkay publications, New Delhi.
4. Berry. A.K. 2005. A text book of Immunology. Emkay publications, New Delhi.
5. Chakravarthy. A.K. 1996. Immunology, Tata McGraw Hill Publishing Co Ltd.

\*\*\*\*\*

## MICROBIOLOGY AND BIOTECHNOLOGY -U13ZY15

Semester : VI

Core Course : XIII

Instruction Hours/Week : 6

Credit : 6

### UNIT – I

Introduction: History and scope of microbiology, General structure of microbes (Bacteria, viruses, algae and fungi), Outline classification, Bacterial growth culture media, bacterial growth curve.

### UNIT – II

Food microbiology: Food poisoning, Food spoilage, Food preservation.

Industrial microbiology: Production of antibiotics (penicillin).

Soil microbiology: Role of soil microbes in Nitrogen fixation.

Medical microbiology: Diseases caused by Bacteria - Cholera, Tuberculosis.

Viruses- AIDS, Poliomyelitis. Causative organisms, symptoms, impact on the host and control measures.

### UNIT – III

Biotechnology: - Definition, Scope. **Vectors:** Plasmids- PBR322, Cosmids PJB 8, SV-40. Principles and methods of gene cloning, application.

### UNIT – IV

Transgenic plants, herbicide, insecticide and virus resistant plants. Transgenic animals mice, cattle, fishes and poultry. Socio economic issues of Biotechnology .



## UNIT – V

PCR, DNA finger printing, methodology and application, methods of gene therapy, gene silencing, biosensors – Biochips, Recombinant vaccines.

### References:

1. Ananthanarayanan, R. and Jayaram Panickar, C.K. 1999. A Text Book of Microbiology. Orient Longman.
2. Mani. A. Narayanan, L.M. Selvaraj A.M. and Arumugam, N. 1996- Microbiology. Saras Publications.
3. Sharma P.D. 1995. Microbiology, Rastogi & Company, Meerut.
4. Balasubramanian, D. 1996. Concepts of Biotechnology. University Press (India) Ltd. Hyderabad.
5. Arumugam, N. 2005. Biotechnology. Saras Publications.

\*\*\*\*\*

## Elective Course -U13ZY16E AQUACULTURE

Semester : VI

Elective Course : III

Instruction Hours/Week : 5

Credit : 4

## UNIT – I

Scope of Aquaculture, Water quality management: O<sub>2</sub>, Salinity, pH, Temperature and Turbidity, Aquatic weed, Insect and Predators

## UNIT – II

Fish culture : Catla, Rohu, Mugil, Methods of fish farming, Fish farm design, Selection of site, Types of ponds, Fish feed. Fish diseases and control.

## UNIT – III

Ornamental fresh water fish culture: Aquarium design, Common cultivable species, Fish live feed, Maintenance. Commercial importance.

## UNIT – IV

Oyster culture: Cultivable marine species, Economic importance.  
Pearl culture: Methods, Economic importance. .

## UNIT – V

Prawn culture: Types of culture, Common cultivable species, Common diseases, Commercial importance.  
Government organizations: MPEDA, CIBA, IFRI, NIOT and CMFRI.

### References

1. Arumugam.N. 2008. Aquaculture, Saras Publications.

2. Rath, R.,K. 2000. Freshwater Aquaculture. Scientific Publishers, PO No 91, Jodhpur. India
3. Jhingran, AVG, 1991, Fish and Fisheries of India, Hindustan Publishing Co.
4. Baradach, JE, JH Ryther and WO McLarney, 1972, Aquaculture. The farming and Husbandary of Fresh water and Marine Organisms. Wiley Interscience, New York.

\*\*\*\*\*

### ALLIED CHEMISTRY I – U13ACH1

**Semester : I**

**First Allied Course: 1**

**Instruction Hours/Week: 5**

**Credit: 3**

#### UNIT - I

**Shapes of Molecules:** Application of valence shell electron pair repulsion theory to simple molecules -  $\text{BF}_3$ ,  $\text{CH}_4$  and  $\text{H}_2\text{O}$ . **Molecular Orbital Theory:** Some important basic concepts of MO theory - LCAO, bonding and antibonding orbitals and bond order - application of MO theory to  $\text{H}_2$ ,  $\text{He}_2$ ,  $\text{N}_2$ ,  $\text{O}_2$ ,  $\text{F}_2$ .

#### UNIT - II

**Chemical Thermodynamics:** First law of thermodynamics - state and path functions- need for the second law - Carnot's cycle and thermodynamic scale of temperature, spontaneous and non spontaneous processes- entropy - Gibb's free energy. Entropy change and free energy change to decide spontaneity, elementary idea of third law - statement and explanation.

#### UNIT - III

**Chemotherapy:** Definition of chemotherapy- examples each for (i) Analgesics, (ii) antibacterial, (iii) anti-inflammatory, (iv) antipyretic, (v) antibiotic, (vi) antitubercular, (vii) antiviral, (viii) antitussive, (ix) antiallergic, (x) antidiabetics, (xi) antihypertensive, (xii) anaesthetics (local and general) Structure not necessary. **Organic reactions:** Osazone test, biuret test, condensation reactions for aldehydes and ketones, Esterification reaction, Diazotization followed by coupling and phthalein fusion test.

#### UNIT - IV

**Amino Acids and Proteins:** Amino acids - classification based on structure - essential and non-essential amino acids - proteins - classification based on physical properties and biological functions, structure of proteins- primary, secondary and tertiary (elementary treatment).

#### UNIT - V

**Colloids:** Definition - classification of colloidal solutions - preparation, purification, properties - Non-settling, osmotic pressure, Tyndall effect, electrical charge, electrophoresis,

Imbibition.**Chemical kinetics:** Order of reactions and their determinations - activation energy, effect of temperature on reaction rate.

**References:**

01. P.L. Soni Textbook of Inorganic chemistry
02. P.L. Soni Textbook of Organic chemistry
03. P.L. Soni Textbook of Physical chemistry

\*\*\*\*\*

**ALLIED CHEMISTRY PRACTICAL – U13ACH2P**

**Semester : I & II**  
**Instruction Hours/Week:6**

**First Allied Course: II**  
**Credit: 3**

**I VOLUMETRIC ANALYSIS**

**(for pcs st iii&iv)**

1. Acidimetry and alkalimetry
  - (a) Strong acid vs strong base
  - (b) Weak acid vs strong base
2. Permanganimetry
  - (a) Estimation of ferrous sulphate/Mohr's salt
  - (b) Estimation of oxalic acid
3. Iodometry
  - (a) Estimation of  $K_2Cr_2O_7$

**II ORGANIC ANALYSIS**

Qualitative analysis of the following organic compounds

1. Carboxylic acid
2. Amide
3. Primary aromatic amine
4. Aromatic aldehyde
5. Aromatic ketone
6. Carbohydrate
7. Simple phenol

\*\*\*\*\*

## ALLIED CHEMISTRY II – U13ACH3

Semester : II

First Allied Course: III

Instruction Hours/Week: 5

Credit: 3

### UNIT - I

**Coordination Chemistry:** Complexes - Classification, IUPAC Nomenclature of mononuclear complexes. Chelation and its industrial importance with particular reference to EDTA. Biological role of haemoglobin and chlorophyll. Applications of complexes in qualitative and quantitative analytical chemistry.**Industrial Chemistry:** Fuel gases - Water gas, producer gas, L.P.G. gas, gobar gas and natural gas. Fertilizers - NPK and mixed fertilizers, micronutrients and their role in plant life and biofertilizers.

### UNIT - II

**Surface Chemistry:** Adsorption - factors affecting the adsorption of gases by solids - types of adsorption - differences between physisorption and chemisorption - catalysis - homogeneous and heterogeneous catalysis - examples.**Photochemistry:** Laws governing the absorption of light - Lambert's law and Beer's law - laws of photochemistry - Grotthus law, Stark-Einsten's law and - quantum efficiency.

### UNIT - III

**Fundamental concepts in Organic chemistry:** Bond length - bond energy - polar and nonpolar molecules - resonance effect - rules governing resonance - hydrogen bonding - effect on boiling points - effect on water solubility.**Synthetic polymers:** Definition - Teflon, alkyd and epoxy resins, polyesters - general treatment only.

### UNIT - IV

**Dyes:** Definition - classification of dyes based on structure and method of application.**Fats and oils:** Definition of fats and oils - distinction between fats and oils - properties - analysis of fats and oils - saponification value, iodine value.**Carbohydrates:** Introduction - Classification - Preparation, properties and structural elucidation of glucose.

### UNIT - V

**Electrochemistry:** Specific and equivalent conductivities - their determinations- effect of dilution on conductivity - an elementary idea about basic theory - Ostwald's dilution law, Kohlraush law, conductivity measurements and conductometric titrations.**Phase rule:** Definition of phase, component and degree of freedom. Explanation of one - component system (Water).

### References:

1. P.L. Soni Textbook of Inorganic chemistry
2. P.L. Soni Textbook of Organic chemistry
3. P.L. Soni Textbook of Physical chemistry

\*\*\*\*\*

**ALLIED BOTANY I – U13ABO1**  
**PLANT BIODIVERSITY, TAXONOMY, ANATOMY, EMBRYOLOGY, MICROBIOLOGY AND PLANT**  
**PATHOLOGY**

**Semester : III**

**Second Allied Course : I**

**Instruction Hours/Week :5**

**Credit : 3**

**Unit-I** (Teaching-1 h / week)

General characteristics of Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms. Life cycles of Algae: *Polysiphonia*, Fungi: *Agaricus*, Bryophyta: *Funaria*, Pteridophyta: *Lycopodium* and Gymnosperms: *Cycas*.

**Unit-II** (Teaching-1 h / week)

Bentham and Hooker's system of classification of Angiosperms - Characteristic features and economic importance of families Annonaceae, Rutaceae, Fabaceae and Cucurbitaceae.

**Unit-III** (Teaching-1 h / week)

Characteristic features and economic importance of families, Asteraceae, Apocynaceae, Euphorbiaceae and Poaceae.

**Unit-IV** (Teaching-1 h / week)

Tissue system – Meristem - Parenchyma, Collenchyma, Chlorenchyma, Sclerenchyma, Xylem and Phloem - Anatomical primary structure of Dicot root, stem and leaf - Secondary thickening of Dicot stem - Structure of mature anther, Structure of Ovule and embryosac, fertilization, Development of Dicot embryo.

**Unit-V** (Teaching-1 h / week)

Bacterial morphological types and cell structure - Plant viruses - TMV Structure - Bacterial disease of plants: Citrus canker by *Xanthomonas*. Viral disease of plants: Bunchy top of Banana. Fungal disease of plants: Cotton wilt by *Fusarium*. Control of plant diseases

**References**

- A. K. Ganguly (1971). General Botany - Vol. I. The New Book Stall, Calcutta.
- K.N.Rao, K.V.Krishnamurthy and G.Rao (1979). Ancillary Botany. Viswanathan Pvt. Ltd.
- N. Kumar (1999). Introduction to Horticulture. Rajalakshmi Publication, Nagercoil.
- B. P. Pandey (1992). A Textbook of Plant Pathology, Pathogen and Plant Disease. S. Chand & Co. Ltd., New Delhi.

\*\*\*\*\*

**ALLIED COURSE - II : PRACTICAL – U13ABO2P**

**(Pertaining to AZY1 and AZY3)**

**Semester : IV**

**Second Allied Course : III**

**Instruction Hours/Week :2+3**

**Credit : 3**

1. To describe plants in technical terms and to identify the family based on morphological and floral characteristics
2. To dissect out median longitudinal section of a flower, construct the floral diagrams and describe it in terms of floral formula.
3. To make suitable anatomical preparation of dicot and monocot stem .
4. To identify disease of infected plant materials (Citrus canker)
5. To identify the cell organelles from the photograph
6. To find out monohybrid and dihybrid crosses and ratios from the genetic chart (3:1, 9:3:3:1 and 2:1)
7. To critically comment on the simple experimental set-ups in photosynthesis and respiration.
8. To critically comment on tissue culture experimental set up (Callus and multiple shoots).
9. To study adaptations in:  
Hydrophytes (eg.: *Hydrilla*)  
Xerophytes (eg.: *Nerium*)  
Halophytes (Spotter only)

\*\*\*\*\*

**ALLIED BOTANY II- U13ABO3**

**CYTOLOGY, GENETICS, PLANT PHYSIOLOGY, ECOLOGY, EVOLUTION AND BIOTECHNOLOGY**

**Semester : IV**

**Second Allied Course : III**

**Instruction Hours/Week :5**

**Credit : 3**

**Unit-I** (Teaching-1 h / week)

Cell cycle - mitosis and meiosis – Ultrastructure of plant cell, chloroplast, mitochondria, golgi complex, endoplasmic reticulum, nucleus, chromosome, DNA and RNA.

**Unit-II** (Teaching-1 h / week)

Mendelian Genetics - Monohybrid cross, Dihybrid cross - Interaction of factors - Sex determination in plants, Mutation and Polyploidy.

**Unit-III** (Teaching-1 h / week)

Absorption of water - Transpiration – Photosynthesis: light reaction – dark reaction (Calvin cycle only). Respiration: Glycolysis - Kerb’s cycle. Plant Growth Hormones - Auxins and Gibberllins.

**Unit-IV** (Teaching-1 h / week)

Ecological factors (biotic and abiotic) and adaptation (Hydrophytes, Xerophytes, Mesophytes and Halophytes). Lamarckism and Darwinism.

**Unit-V** (Teaching-1 h / week)

General account on Principles of Tissue Culture - MS Medium, Callus culture - Organogenesis - Regeneration - Application of tissue culture

**References**

- A. K. Ganguly (1971). General Botany - Vol. I. The New Book Stall, Calcutta.
- K. N. Rao, K. V. Krishnamurthy and G. Rao (1979). Ancillary Botany. Viswanathan Pvt. Ltd.
- P. K. Gupta. Elements of Biotechnology. Rastogi and Company.
- B. C. Suman and V. P. Sharma. Mushroom Cultivation and Uses. Agrobios (India), Jodhpur.
- A. Muneeswaran (1987). A Textbook of Botany. Sun Publications, Madurai.
- K. G. Ramawat (2000). Plant Biotechnology. S. Chand & Co. Ltd., New Delhi.

\*\*\*\*\*

**OFFICE AUTOMATION - U13SBE1**

**Semester : I**

**Skill Based Elective Course- I**

**Instruction Hours/Week: 2**

**Credit: 2**

**Unit - I**

MS- Word- Introduction to Computers - Hardware - Software, Operating System: Windows XP -MS-Paint, Notepad, WordPad, Introduction to MS-Word, Creating, Editing and Formatting Document - Working with Drawing objects - Text Manipulation

**Unit-II**

Working with Tables – Columns – Labels - Plotting, editing and Filling drawing objects-Bookmark – Header & Footer - Checking and Correcting a document - Creating Labels –Envelops – Mail Merge – Formatted output and Report generation Printing Documents, Working with Internet.

**Unit-III**

Ms – Excel - Ms – Excel: Introduction – Data Entry – Cell Formatting - Plotting Graphs –Workbook Features – Library Functions

## Unit-IV

Conditional Functions and Data Sorting – Limit the data on a worksheet - Data Validation –Data consolidation - Chart creation - Checking and Correcting Data - Tracking and Managing Changes- Advanced Features

## Unit-V

Ms – PowerPoint- Introduction - Creating, Editing and Formatting Presentation – Applying Transition and Animation Effects - Applying Design Templates - Viewing and Setting up a Slide Show - Navigating among Different Views - Ms Outlook: Introduction to Folder List – Address

### Book.References

1. Jill Murphy, Microsoft Office Word- Comprehensive Course, Labyrinth Publications, 2003.
2. McGraw-Hill/Irwin-Deborah Hinkle, Microsoft Office 2003 PowerPoint: A Professional Approach, Comprehensive w/ Student CD, New Delhi, 2003.
3. Nellai Kannan, C., MS-Office, Nels Publications, Tamil Nadu, 2002.

\*\*\*\*\*

## DESKTOP PUBLISHING - U13SBE2

**Semester: III**

**Skill Based Elective Course: II**

**Instruction Hours/Week: 2**

**Credit: 2**

**PHOTOSHOP:**

**UNIT – I**

**Photoshop Tools :**

Move, Type, Marquee, Lasso, Crop, Shapes, Healing, Brush, Patch, Cloning Stamp, Eraser, Gradient, Blur, Smudge, Dodge, Pen, Eye Dropper, Patch selection and Zoom tool.

**Layer:**

New layer, Layer set, Duplicate layer, Rasterize and Merge down

**Layer Styles:**

Drop shadow, inner shadow, outer glow & inner glow, Bevel and Emboss, Gradient overlay, Stroke. Text formatting



## **UNIT – II**

### **File:**

Save, File formats, Page set up.

### **Edit:**

Check spelling, Copy merged, Fill, Transform, Define pattern.

### **Image:**

Motion blur, Twirl, lens flare, Glowing edges, lighting effects, solarize, water paper, Stained glass, Mosaic Tiles.

### **Window:**

Character and Paragraph settings.

## **COREL DRAW:**

## **UNIT – III**

### **Drawing Tools:**

Pick, Shape, Knife, eraser, Smudge, Roughen brush, free transform, Zoom ,hand, Free hand, Bezier, Artistic, Pen, Poly line, Point, Interactive connective, Spiral tool.

### **Colour Tool:**

Paint Bucket Tool, Eye Dropper, Fill Tools. Fill Options, Stroke Options.

## **UNIT – IV**

### **Special Effects:**

3D effects, Add perspective, Blend, Contour, Artistic media, lens, and Power clip.

### **Shaping Options:**

Weld, trim, Intersect.

### **Text Effects:**

Format text, bullet, and fit text to path, align and straighten, spell check.

### **File Menu:**

Save, Save as, Import, Page set Up.

**PAGE MAKER:**

**UNIT – V**

**Page Maker Tools:**

Pointer, Rotate, Line, Rectangle, Ellipse, Polygon, Hand, Text, Crop, Rectangle frame tools. Text layout, Style and Objects: Alignments, Styles, fill, frame options, Stroke, Group, Lock, unlock, mask, polygon settings character and paragraph settings.

**Text Editing:**

Edit story: Undo, Redo, Cut, Copy, Paste, paste Special, Spelling check and Find.

**File:**

Page set up, save, Save as.

**Reference Book:**

**CorelDraw**

CorelDraw IN Simple Steps – Shalini Gupta Corel DRAW Bible - DEBORAH MILLER

**PhotoShop**

Teach Yourself Adobe Photoshop – Rose Carla Adobe Photoshop Cs Classroom in a Book by Adobe Press

**PageMaker**

Using Microsoft Word - Asmita Bhatt Pagemaker In Easy Steps - Scott Basham Ctoa Material By Genesis.

\*\*\*\*\*

**OFFICE AUTOMATION & DESKTOP PUBLISHING LAB - U13SBE3P**

**Semester : III**

**Skill Based Elective Course : III**

**Instruction Hours/Week: 2**

**Credit: 2**

**Unit – I (Office Automation)**

1) Ms – Word : Text Formatting , Mail Merge,

2) Ms – Excel : Implement the Statistical & Mathematical Function

( Using Min ,Max, Median, Average, Standard Deviation, Correlation, Logical 'if' Condition ) for the given data, Prepare a Chart for a given Data using Pie diagram / Histogram

**Unit – II (Photoshop)**

- 3) Design a College Broacher / Birthday Card.
- 4) Cropping, rotating and Overlapping the image.
- 5) Create a single image from Multiple image.
- 6) Creating an image with multilayer's.

**Unit – III (Corel Draw)**

- 7) Design a Visiting Card \ Greeting Card using Draw & Text tools.
- 8) Create a logo for a Company \ College .

**Unit – IV (Page Maker)**

- 9) Type and format a letter using text tool.
- 10) Prepare a Invitation for College Day \ Sports Day.

\*\*\*\*\*

**ENVIRONMENTAL STUDIES - U13ES**

**Semester : II** **Environmental Studies Course**  
**Instruction Hours/Week: 2** **Credit: 2**  
**Unit 1 :**

**Environment and Natural Resources :**

Definition, scope, importance of Environmental Studies - Need for public awareness.

Natural resources — classification - Associated problems

- a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.
- b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
- e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
- f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

## **Unit 2: Ecosystems**

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following ecosystem:
  - a. Forest ecosystem
  - b. Grassland ecosystem
  - c. Desert ecosystem
  - d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

## **Unit 3: Biodiversity and its conservation**

- Introduction — Definition: genetic, species and ecosystem diversity.
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation
- Hot-spots of biodiversity.
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity In-situ and Ex-situ conservation of biodiversity.

## **Unit 4: Environmental Pollution**

### Definition

- Cause, effects and control measures of
  - a. Air pollution
  - b. Water pollution
  - c. Soil pollution
  - d. Marine pollution
  - e. Noise pollution
  - f. Thermal pollution
  - g. Nuclear hazards

- Solid waste Management : Causes, effects and control measures of urban and industrial wastes.

- Role of an individual in prevention of pollution.

- Pollution case studies.

- Disaster management floods, earthquake, cyclone and landslides.

### **Unit 5 : Social Issues and the Environment**

- From Unsustainable to Sustainable development

- Urban problems related to energy

- Water conservation, rain water harvesting, watershed management

- Resettlement and rehabilitation of people; its problems and concerns. Case Studies

- Environmental ethics : Issues and possible solutions.

- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.

- Wasteland reclamation.

- Consumerism and waste products.

- Environment Protection Act.

- Air (Prevention and Control of Pollution) Act.

- Water (Prevention and control of Pollution) Act

- Wildlife Protection Act

- Forest Conservation Act

- Issues involved in enforcement of environmental legislation.

- Public awareness.

### **REFERENCE**

a) Agarwal, K.C. 2001 Environmental Biology, Nidi Pubi. Ltd. Bikaner.

b) Sharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad — 380 013, India, Email:mapin@icenet.net (R)

c) Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p

d) Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)

e) Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumabai, 1196p

f) De A.K., Environmental Chemistry, Wiley Eastern Ltd.

g) Down to Earth, Centre for Science and Environment (R)

h) Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev.,

Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p

- i) Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- j) Heywood, V.H & Weston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.
- k) Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.
- l) Mckinney, M.L. & School, R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition. 639p.
- m) Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
- n) Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
- o) Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
- p) Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Pubi. Co. Pvt. Ltd. 345p. q) Sharma B.K., 2001. Environmental Chemistry. Geol Pubi. House, Meerut
- r) Survey of the Environment, The Hindu (M)
- s) Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science (TB) t) Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Stadards, Vol I and II, Enviro Media (R)
- u) Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB) v) Wanger K.D., 1998 Environmental Management. W.B. Saunders Co.Philadelphia, USA 499p (M) Magazine
- (R) Reference
- (TB) Textbook

\*\*\*\*\*

**VALUE EDUCATION - U13VE**

**Semester :V**

**Value Education Course**

**Instruction Hours/Week: 2**

**Credit: 2**

**UNIT 1: PHILOSOPHY OF LIFE**

Human Life on Earth ( Kural 629), Purpose of Life ( Kural 46) Meaning and Philosophy of Life( Kural 131, 226) The Law of Nature (Kural 374) Glorifying All form of Life in this Universe (Kural 322, 327) – Protecting Nature /Universe (Kural 16, 20, 1038)

**UNIT 2: INDIVIDUAL QUALITIES**

Basic Culture (Kural 72, 431) Thought Analysis (Kural 282, 467, 666) Regulating desire (Kural 367), Guarding against anger (Kural 158, 305, 306, 314), To get rid of Anxiety

(Kural 629), The Rewards of Blessing (Kural 3), Benevolence of Friendship (Kural 786), Love and Charity (Kural 76), Self – tranquility/Peace (Kural 318)

### **UNIT 3: SOCIAL VALUES (INDIVIDUAL AND SOCIAL WELFARE)**

Family (Kural 45), Peace in Family (Kural 1025), Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) , The Pride of Womanhood (Kural 56) Five responsibilities/duties of Man : a) to himself, b) to his family, c) to his environment, d) to his society, e) to the Universe in his lives (Kural 43, 981), Thriftiness (Thrift)/Economics (Kural 754), Health (Kural 298), Education (Kural 400), Governance (Kural 691), People’s responsibility/ duties of the community (Kural 37), World peace (Kural 572)

### **UNIT 4: MIND CULTURE**

Mind Culture (Kural 457) Life and Mind - Bio - magnetism, Universal Magnetism (God – Realization and Self Realization) - Genetic Centre – Thought Action – Short term Memory – Expansiveness – Thought – Waves, Channelising the Mind, Stages - Meditation (Kural 261, 266, 270), Spiritual Value (Kural 423)

### **UNIT 5: TENDING PERSONAL HEALTH**

Structure of the body, the three forces of the body, life body relation, natural causes and unnatural causes for diseases (Kural 941), Methods in Curing diseases (Kural 948, 949)  
The Five units, simple physical exercises.

### **Books for Reference:**

1. Philosophy of Universal Magnetism (Bio-magnetism, Universal Magnetism) The World Community Service Centre Vethatri Publications (for Unit IV)
2. Pope, G.U., Dr. Rev., Thirukkural with English Translation, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613004 (for All Units)
3. Value Education for Health, Happiness and Harmony, The World Community Service Centre Vethatri Publications Rs 35/- (for All Units)

\*\*\*\*\*

### **SOFT SKILLS - U13SS**

**Semester :V**

**Soft Skills**

**Instruction Hours/Week: 2**

**Credit: 2**

### **Learning objective**

Today’s world is all about relationship, communication and presenting oneself, one’s ideas and the company in the most positive and impactful way. This course intends to enable students to achieve excellence in both personal and professional life.

### **Unit I**

### Know Thyself / Understanding Self

Introduction to soft skills self discovery – Developing positive attitude – Improving perceptions – Forming values.

### Unit II

#### Interpersonal Skills/ Understanding Others

Developing interpersonal relationship –Team building –group dynamics –Net working- Improved work relationship

### Unit III

#### Communication Skills/ Communication with others

Art of Listening –Art of reading –Art of speaking –Art of writing –Art of writing emails-e mail etiquette

### Unit IV

#### Corporate Skills/ Working with Others

Developing body language –Practising etiquette and mannerism – Time management – Stress management.

### Unit V

#### Selling Self/ Job Hunting

Writing resume /cv-interview skills – Group discussion –Mock interview Mock GD –Goal setting –Career planning

### TEXT BOOKS

Meena. K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills: A Road Map to Success) P.R. Publishers & Distributors, No, B-20 &21, V.M.M Complex, Chatiram Bus Stand, Tiruchirapalli -620 002.

(Phone No: 0431-2702824: Mobile No: 94433 70597, 98430 7442)

Alex K. (2012) Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi -110 055.

Mobile No: 94425 14814(Dr.K.Alex)

### REFERENCE BOOKS

- (i) Developing the leader within you John C Maxwell
- (ii) Good to Great by Jim Collins
- (iii) The Seven habits of highly effective people Stephen Covey
- (iv) Emotional Intelligence Daniel Goleman
- (v) You can Win Shive Khara
- (vi) Principle centred leadership Stephen Covey

\*\*\*\*\*



## **GENDER STUDIES - U13GS**

**Semester :VI**

**Gender Studies Course**

**Instruction Hours/Week:1**

**Credit: 1**

### **Objectives**

To make boys and girls aware of each other 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 Determinism- Patriarchy- Feminism -Gender Discrimination -Gender Division of Labour -Gender Stereotyping-Gender Sensitivity - Gender Equity —Equality-Gender Mainstreaming Empowerment

### **Unit-II**

Women's Studies Vs Gender Studies: UGC's Guidelines - VII to XI Plans- Gender Studies: Beijing Conference and 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 Empowerment: Initiatives International Women's Decade - International Women's Year - National Policy for Empowerment of Women - Women Empowerment Year 2001- Mainstreaming Global Policies.

### **Unit-V**

Women's Movements and Safeguarding Mechanism:— In India National / State 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 - PNDT Act - Hindu Succession Act 2003 Eve Teasing Prevention Act - Self Help Groups 73 and 74 Amendment for PRIS.

## References

- Bhasin Kamala, Understanding Gender: Gender Basics, New Delhi: Women Unlimited 2004
- Bhasin Kamala, Exploring Masculinity: Gender Basics, New Delhi: Women Unlimited, 2004
- Bhasin Kamala, What is Patriarchy? : Gender Basics, New Delhi: Women Unlimited, 1993
- Pernau Margrit Ahmad Imtiaz, Reifeld Hermut (ed.) Family and Gender: Changing Values in Germany and India, New Delhi: Sage Publications, 2003
- Agarwal Bina, Humphries Jane and Robeyns Ingrid (ed.) Capabilities, Freedom, and Equality: Amartya Sen's Work from a Gender Perspective, New Delhi: Oxford University Press, 2006
- Rajadurai.S.V, Geetha.V, Themes in Caste Gender and Religion, Tiruchirappalli: Bharathidasan University, 2007
- Misra Geetanjali, Chandiramani Radhika (ed.) Sexuality, Gender and Rights: Exploring Theory and Practice in South and Southeast Asia, New Delhi: Sage Publication, 2005
- Rao Anupama (ed.) Gender & Caste: Issues in Contemporary Indian Feminism, New Delhi: Kali for Women, 2003
- Saha Chandana, Gender Equity and Gender Equality: Study of Girl Child in Rajasthan, Jaipur: Rawat Publications, 2003
- Krishna Sumi,(ed.) Livelihood and Gender Equity in Community Resource Management New Delhi: Sage Publication, 2004
- Wharton .S Amy, The Sociology of Gender: An Introduction to Theory and Research, USA: Blackwell Publishing, 2005.
- Mohanty Manoranjan (ed.) Class, Caste, Gender: Readings in Indian Government and Politics- 5, New Delhi: Sage Publications,2004.
- Arya Sadhna, Women, Gender Equality and the State, New Delhi: Deep & Deep Publications,2000.

\*\*\*\*\*