



MANONMANIAM SUNDARANAR UNIVERISTY,
TIRUNELVELI-12

SYLLABUS

UG - COURSES – AFFILIATED COLLEGES

Course Structure for B. Sc. Zoology
(Choice Based Credit System)

(with effect from the academic year 2024-2025 onwards)



Semester-I				
Part	Subject Status	Subject Title	Subject Code	Credit
I	LANGUAGE	TAMIL/MALAYALAM/HINDI	F1TL11/ F1MY11/ F1HD11	3
II	ENGLISH	ENGLISH	F2EN11	3
III	CORE	INVERTEBRATA	FCZO11	5
III	CORE	LAB ON INVERTEBRATA	FCZOP1	3
III	ELECTIVE	ALLIED BOTANY I	FEBO11	3
		LAB ON ALLIED BOTANY	FEBOP1	2
IV	SEC 1	ORNAMENTAL FISH FARMING AND MANAGEMENT	FSZO11	2
IV	FC	INTRODUCTION TO ZOOLOGY	FFZO11	2



Total Marks: 100 Internal Exam: 25 marks + External Exam: 75 marks

A. Scheme for internal Assessment:

Maximum marks for written test: **20 marks**

3 internal tests, each of **1 hour** duration shall be conducted every semester.

To the average of the **best two** written examinations must be added the marks scored in. The **assignment** for 5 marks.

The break up for internal assessment shall be:

Written test- 20 marks; Assignment -5 marks Total - 25 marks

B. Scheme of External Examination

3 hrs. examination at the end of the semester

A – Part : 1 mark question two - from each unit

B – Part : 5 marks question one - from each unit

C – Part : 8 marks question one - from each unit

➤ **Conversion of Marks into Grade Points and Letter Grades**

S.No	Marks	Letter Grade	Grade point (GP)	Performance
1	90-100	O	10	Outstanding
2	80-89	A+	9	Excellent
3	70-79	A	8	Very Good
4	60-69	B+	7	Good
5	50-59	B	6	Above Average
6	40-49	C	5	Pass
7	0-39	RA	-	Reappear
8	0	AA	-	Absent

➤ **Cumulative Grade Point Average (CGPA)**

$$CGPA = \frac{\Sigma (GP \times C)}{\Sigma C}$$

- **GP** = Grade point, **C** = Credit
- CGPA is calculated only for Part-III courses
- CGPA for a semester is awarded on cumulative basis

➤ **Classification**

- First Class with Distinction : $CGPA \geq 7.5^*$
- First Class : $CGPA \geq 6.0$
- Second Class : $CGPA \geq 5.0$ and < 6.0
- Third Class : $CGPA < 5.0$



பொதுத்தமிழ் 1

தமிழ் இலக்கிய வரலாறு 1

அலகு 1: தமிழ் இலக்கிய, இலக்கண வரலாறு அறிமுகம்.

1. இலக்கணம்:

அ. தொல்காப்பியம், இறையனார், களவியல் உரை, நம்பியகப் பொருள், புறப்பொருள் வெண்பா மாலை, நன்னூல் தண்டியலங்காரம், யாப்பருக்கலக்காரிகை- நூல்கள்

ஆ. மொழிப் பயிற்சி - ஒற்றுப்பிழை தவிர்த்தல்

- வல்லினம் மிகும் இடங்கள்
- வல்லினம் மிகா இடங்கள்
- ஈரொற்று வரும் இடங்கள்
- ஒரு, ஓர் வரும் இடங்கள்
- அது, அஃது வரும் இடங்கள்
- தான், தாம் வரும் இடங்கள்

பயிற்சி: வல்லினம் மிகும் இடங்கள், மிகா இடங்கள் தவறாக வரும்வகையில் ஒரு பத்தி கொடுத்து ஒற்றுப் பிழை திருத்தி எழுதச் செய்தல்.

2. சங்க இலக்கியம்-எட்டுத்தொகை, பாத்துப்பாட்டு
3. அற இலக்கியம்-பதினெண்கீழ்கணக்கு நூல்கள்
4. காப்பிய இலக்கியம் - ஐம்பெருங் காப்பியங்கள், ஐஞ்சிறு காப்பியங்கள், சமயக் காப்பியங்கள்
5. பக்தி இலக்கியமும் (பன்னிரு திருமுறைகள், நாலாயிர திவ்வியப் பிரபந்தம் - பகுத்தறிவு இலக்கியமும் (சித்தர் இலக்கியங்கள், புலவர் குழந்தையின் இராவண காவியம்)

அலகு 2: சங்க இலக்கியம்

எட்டுத்தொகை

1. நற்றிணை-முதல் பாடல் - நின்ற சொல்லர்
2. குறுந்தொகை 3 ஆம் பாடல் - நிலத்தினும் பெரிதே
3. ஐங்குறுநூறு-நெல் பல பொலிக! பொன் பெரிது சிறக்க! (முதல் பாடல்)-வேட்கைப் பத்து
4. கலித்தொகை -51 - சுடர்தொடிக் கேளாய் - குறிஞ்சிக் கலி
5. புறநானூறு-189 தெண்கடல் வளாகம் பொதுமையின்றி, நாடா கொன்றோ - 187

பத்துப்பாட்டு:

1. முல்லைப்பாட்டு (முழுவதும்)

அலகு 3: அற இலக்கியம்

1. திருக்குறள் - அறன் வலியுறுத்தல் அதிகாரம்
2. நாலடியார் -பாடல் 131 (கஞ்சியாழகும்)
3. நான்மணிக்கடிகை - நிலத்துக்கு அணியென்ப
4. பழமொழி நானூறு-தம் நடை நோக்கார்
5. இனியவை நாற்பது-37 இளமையை மூப்பு என்று

அலகு 4: காப்பிய இலக்கியம்

1. சிலப்பதிகாரம் - வழக்குரைகாதை



2. மணிமேகலை - பாத்திரம் பெற்ற காதை
3. பெரியபுராணம்- பூசலார் நாயனார்புராணம்
4. கம்பராமாயணம்-குகப் படலம்
5. சீறாப்புராணம் - மாணுக்குப் பிணை நின்ற படலம்
6. இயேசு காவியம்-ஊதாரிப்பிள்ளை

அலகு 5: பக்தி இலக்கியமும், பகுத்தறிவு இலக்கியமும்

பக்தி இலக்கியம்:

1. திருநாவுக்கரசர் தேவாரம்-நாமார்க்கும் குடியல்லோம் எனத் தொடங்கும் பாடல் மட்டும்
2. மாணிக்கவாசகர் திருவாசகம் - நமச்சிவாய வா ஆழ்க நாதன்தான் வாழ்க முதல் சிரம்குவிவார் ஓங்குவிக்கும் சீரோன் கழல் வெல்க வரை
3. பொய்கையாழ்வார்-வையந் தகனியா வர்கடலே
4. பூதத்தாழ்வார் - அன்பே தகனியா
5. பேயாழ்வார் - திருக்கண்டேன் பொன்மேனி கண்டேன்
6. ஆண்டாள் - திருப்பாவை மார்களித் திங்கள் (முதல் பாடல்)

பகுத்தறிவு இலக்கியம்;

1. திருமூலர் - திருமந்திரம் (270,271,274,275 285)
2. பட்டினத்தார் - திருவிடை மருதூர் (காடே திரிந்து - எனத் தொடங்கும் பாடல் பா. எண்; 279,280)
3. கடுவெளி சித்தர் - பாபஞ்செய் எதிரி மனமே (பாடல் முழுவதும்)
4. இராவண காவியம் - தாய்மொழிப் படலம் 18 ஏடுகை இல்ல ரில்லை முதல் - 22 செந்தமிழ் வளர்த்தார் வரை

Reference Books:

- மு. வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்ய அக்காதமி, புதுடெல்லி
- மது. ச. விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
- தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை;.
- தமிழ் இளகிய வரலாறு - முனைவர் சிற்பி பாலசுப்ரமணியன், முனைவர்.சொ. சேதுபதி
- புதி யதமிழ் இலக்கிய வரலாறு - முனைவர் சிற்பி பாலசுப்ரமணியன், நீல. பத்மநாபன்

Web Sources:

- [இணைய தமிழ் நூலகம் - சென்னை நூலகம் - Online Tamil Library - ChennaiLibrary.com](http://இணைய_தமிழ்_நூலகம்_-_சென்னை_நூலகம்_-_Online_Tamil_Library_-_ChennaiLibrary.com)
- [முகப்பு - சிறுகதைகள் \(sirukathaigal.com\)](http://முகப்பு_-_சிறுகதைகள்_(sirukathaigal.com))
- www.tamilvirtualuniversity.org
- [Buy tamil books online 10% to 50% discount, Tamil Novels, Tamil Audio Books online - Buy tamil books online - Established 2010 \(noolulagam.com\)](http://Buy_tamil_books_online_10%_to_50%_discount,_Tamil_Novels,_Tamil_Audio_Books_online_-_Buy_tamil_books_online_-_Established_2010_(noolulagam.com))
- www.katuraitamilblogspot.com



MALAYALAM

PAPER I- PROSE, COMPOSITION AND TRANSLATION

Unit 1

This unit focus on the importance of Malayalam fiction, -the origin and development of Malayalam Short story –renaissance in short story—Thakazhi-Basheer-Karoor- - Navothana katha:

For detailed study:

1. Marappavakal- Karoor Neelakantappilla.
2. Uthuppante kinar.-Karoor Neelakantappilla.
3. Ezhunnallathuduty-Karoor Neelakantappilla.

Unit II

Kathayum adhunikathayum- To familiarize – Romanticism -Modernism, Plot and narration in modern short stories

For detailed study:

1. Neippayasam –Madhavikutty
2. Kadaltheerathu-.O.V.Vijayan
3. Radha radhamathram-M.Mukundan

Unit III

Samakala katha– Post modernism- Globalization-Women –Dalit- Cyber – Environmental issues in short stories-

The theme, structure and narrative style of the authors -comparison-

For detailed study:

1. Viyarppadayalanganl-Sara Joseph
2. Jwala - Priya .A.S
3. Vartha sareeram –Santhosh Echikkanam
4. Otta vaikkol viplavam –V.J.James

Unit IV

This unit briefs the history of Malayalm Novel- major works, romantic period- of M T Vasudevan Nair , narrative style of Nalukettu- craft and characterization in Nalukettu

Unit V

This unit focus on Translation, Word level and syntactic level and also discuss the writing style of Essay- introduce proverbs and paraphrasing in Malayalam

Recommended Texts

1. Marappavakalum mattu kathakalum – Karoor Neelakantapilla. (only 3 stories (a.)Marappavakal (b)Uthuppante kinar (c) Ezhunnallathuduty))
2. Nalukettu- .Novel -M.T.Vasudevan Nair

Reading list (print and online)

1. Adhunika Malayala Sahithya Charithram Prasthanangalilude – Dr. K.M.George (Ed.)
2. Cherukadha Innale Innu - M.Achuthan
3. Kadha Thedunna Kadha - N.Prabhakaran
4. M.T. Vakkinte Vismayam – V.R.Sudheesh
5. Kadhayum Kalavum –K.S.Ravikumar
6. Malayala Novalilee Desakaalanganl- E. Ramkrishnan
7. Maranunna Malayala Noval- K.P. Appan
8. Andhanaya Daivam- P.K.Rajasekharan
9. Shyalee shilppam- Dr.K.M. Prabhakra Warier
10. Bhasha gadhyam- C.V. Vasudeva Bhattathiri
11. Karur Kadha patanam- M.M.Basheer



HINDI - Hindi ka Samanya Gyan, Vyakaran aur Nibandh

Unit I

Buniyadi Hindi

- Swar
- Vyanjan
- Barah Khadi
- Shabd aur
- Vakya Rachna

Unit II

Hindi Shabdavali

- Rishto ke Naam
- Gharelu padartho ke Naam

Unit III

Vyakaran

- Sadharan Vakya aur Sangya
- Sarvanam
- Visheshan
- Kriya aadi shabdo ka prayog

Unit IV

Chote Gadyansh ka Pathan

- Bacho ki Kahaniya (1 to 5)
- Patra-Patrikao mein prakashit Gadyansho ka Pathan

Unit V

Nibandh

- Sant Tiruvalluvar
- E.V.R Thandai Periyar
- Naari Sashaktikaran
- Paryavaran Sanrakshan
- Vibhinna pratiyogi parikshao ke bare mein jaankari dena

Pratiyogi priksa par adharit nibandho dwara bhasha ki kshamta badhane vale prashikshan kary.

Reference Books

1. Hindi ke Avyay Vakyansh – Chaturbhuji Sahay
2. Subodh Hindi Vyakaran – Phoolchand Jain
3. Sankshipt Hindi Vyakaran – Kamta Prasad
4. Vyavaharik Hindi – Nagappa
5. Abhinav Hindi Vyakaran – Nagappa
6. Saral Hindi Vyakaran – Shyamchandra Kapur
7. Vyakaran Pradeep – Ramdev
8. Laghu Bal Kathaye – Ramashankar



9. Manoranjak Kahaniya – Premchand

10. CONCISE GRAMMAR OF THE HINDI LANGUAGE - H.C Scholberg

11. Hindi Grammar – Edwin Greaves

Related Online Contents (MOOCs, SWAYAM, NPTEL, YouTube, Websites, etc.)

1. fr#oYyqoj%[https://bharatdiscovery.org/india/%E0%A4%A4%E0%A4%BF%E0%A4%B0%E0%A5%81%E0%A4%B5%E0%A4%B2%E0%A5%8D%E0%A4%B2%E0%5%81%E0%A4%B5%E0%A4%B0#:~:text=%E0%A4%A4%E0%A4%BF%E0%A4%B%E0%A5%81%E0%A4%B5%E0%A4%B2%E0%A5%8D%E0%A4%B2%E0%A5%81E0%A4%B5%E0%A4%B0%20\(%E0%A4%85%E0%A4%82%E0%A4%97%E0%5%8DE0%A4%B0%E0%A5%87%E0%A4%9C%E0%A4%BC%E0%A5%80%3A%20Thiruvallur\)%20%E0%A4%A6%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%BF%E%4%A3,%E0%A4%AA%E0%A4%BF%E0%A4%A4%E0%A4%BE%20E0%A4%AE%E0%A5%87%E0%A4%82%20%E0%A4%B5%E0%A4%BF%E0%A4%B6%E0%A5%8D%E0%A4%B5%E0%A4%BE%E0%A4%B8%20%E0%A4%B0%E0%A4%96%E0%A4%A4%E0%A5%87%20%E0%A4%A5%E0%A5%87%E0%A5%A4](https://bharatdiscovery.org/india/%E0%A4%A4%E0%A4%BF%E0%A4%B0%E0%A5%81%E0%A4%B5%E0%A4%B2%E0%A5%8D%E0%A4%B2%E0%5%81%E0%A4%B5%E0%A4%B0#:~:text=%E0%A4%A4%E0%A4%BF%E0%A4%B%E0%A5%81%E0%A4%B5%E0%A4%B2%E0%A5%8D%E0%A4%B2%E0%A5%81E0%A4%B5%E0%A4%B0%20(%E0%A4%85%E0%A4%82%E0%A4%97%E0%5%8DE0%A4%B0%E0%A5%87%E0%A4%9C%E0%A4%BC%E0%A5%80%3A%20Thiruvallur)%20%E0%A4%A6%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%BF%E%4%A3,%E0%A4%AA%E0%A4%BF%E0%A4%A4%E0%A4%BE%20E0%A4%AE%E0%A5%87%E0%A4%82%20%E0%A4%B5%E0%A4%BF%E0%A4%B6%E0%A5%8D%E0%A4%B5%E0%A4%BE%E0%A4%B8%20%E0%A4%B0%E0%A4%96%E0%A4%A4%E0%A5%87%20%E0%A4%A5%E0%A5%87%E0%A5%A4)

2. bZ-os-jkelkeh
[https://hi.wikipedia.org/wiki/%E0%A4%AA%E0%A5%87%E0%A4%B0%E0%A4%BF%E0%A4%AF%E0%A4%BE%E0%A4%B0#:~:text=%E0%A4%87%E0%A4%B0%E0%A5%8B%E0%A4%A1%20%E0%A4%B5%E0%A5%87%E0%A4%82%E0%A4%95%E0%A4%9F%20%E0%A4%A8%E0%A4%BE%E0%A4%AF%E0%A4%95%E0%A4%B0%20%E0%A4%B0%E0%A4%BE%E0%A4%AE%E0%A4%BE%E0%A4%B8%E0%A4%BE%E0%A4%AE%E0%A5%80%20\(17.%E0%A4%B5%E0%A4%BE%E0%A4%B2%E0%A5%87%20%E0%A4%B9%E0%A4%BF%E0%A4%A8%E0%A5%8D%E0%A4%A6%E0%A5%81%E0%A4%A4%E0%A5%8D%E0%A4%B5%20%E0%A4%95%E0%A4%BE%20%E0%A4%B5%E0%A4%BF%E0%A4%B0%E0%A5%8B%E0%A4%A7%20%E0%A4%A5%E0%A4%BE%E0%A5%A4](https://hi.wikipedia.org/wiki/%E0%A4%AA%E0%A5%87%E0%A4%B0%E0%A4%BF%E0%A4%AF%E0%A4%BE%E0%A4%B0#:~:text=%E0%A4%87%E0%A4%B0%E0%A5%8B%E0%A4%A1%20%E0%A4%B5%E0%A5%87%E0%A4%82%E0%A4%95%E0%A4%9F%20%E0%A4%A8%E0%A4%BE%E0%A4%AF%E0%A4%95%E0%A4%B0%20%E0%A4%B0%E0%A4%BE%E0%A4%AE%E0%A4%BE%E0%A4%B8%E0%A4%BE%E0%A4%AE%E0%A5%80%20(17.%E0%A4%B5%E0%A4%BE%E0%A4%B2%E0%A5%87%20%E0%A4%B9%E0%A4%BF%E0%A4%A8%E0%A5%8D%E0%A4%A6%E0%A5%81%E0%A4%A4%E0%A5%8D%E0%A4%B5%20%E0%A4%95%E0%A4%BE%20%E0%A4%B5%E0%A4%BF%E0%A4%B0%E0%A5%8B%E0%A4%A7%20%E0%A4%A5%E0%A4%BE%E0%A5%A4)

3. ukjh l'kfDrdj.k%

<https://www.hindikiduniya.com/essay/women-empowerment-essayinhindi/#:~:text=%E0%A4%AE%E0%A4%B9%E0%A4%BF%E0%A4%B2%E0%A4%BE%20%E0%A4%B8%E0%A4%B6%E0%A4%95%E0%A5%8D%E0%A4%A4%E0%A4%BF%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%95%E0%A5%8D%E0%A4%AF%E0%A4%BE%20%E0%A4%B9%E0%A5%88%20%3F&text=%E0%A4%AE%E0%A4%B9%E0%A4%BF%E0%A4%B2%E0%A4%BE%20%E0%A4%B8%E0%A4%B6%E0%A4%95%E0%A5%8D%E0%A4%A4%E0%A4%BF%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%95%E0%A5%8B%20%E0%A4%AC%E0%A5%87%E0%A4%B9%E0%A4%A6%20%E0%A4%86%E0%A4%B8%E0%A4%BE%E0%A4%A8,%E0%A4%B8%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%AE%20%E0%A4%AC%E0%A4%A8%E0%A4%BE%E0%A4%A8%E0%A4%BE%20%E0%A4%AE%E0%A4%B9%E0%A4%BF%E0%A4%B2%E0%A4%BE%20%E0%A4%B8%E0%A4%B6%E0%A4%95%E0%A5%8D%E0%A4%A4%E0%A4%BF%E0A%95%E0%A4%B0%E0%A4%A3%20%E0%A4%B9%E0%A5%88%E0%A5%A4>

4. i;kZoj.k laj{k.k%

a. https://hi.wikipedia.org/wiki/%E0%A4%AA%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B5%E0%A4%B0%E0%A4%A3_%E0%A4%B8%E0%A4%88%E0%A4%B0%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%A3#:~:text=%E0%A4%AA%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B5%E0%A4%B0%E0%A4%A3%20%E0%A4%B8%E0%A4%82%E0%A4%B0%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%A3%20%E0%A4%95%E0%A4%BE%20%E0%A4%B8%E0%A4%AE%E0%A4%B8%E0%A5%8D%E0%A4%A4%20%E0%A4%AA%E0%A5%8D%E0%A4%B0%E0%A4%BE%E0%A4%A3%E0%A4%BF%E0%A4%AF%E0%A5%8B%E0%A4%82,%E0%A4%AA%E0%A5%83%E0%A4%A5%E0%A5%8D%E0%A4%B5%E0%A5%80%20%E0%A4%B8%E0%A4%AE%E0%A5%8D%E0%A4%AE%E0%A5%87%E0%A4%B2%E0%A4%A8'20%E0%A4%86%E0%A4%AF%E0%A5%8B%E0%A4%9C%E0%A4%BF%E0%A4%A4%20%E0%A4%95%E0%A4%BF%E0%A4%AF%E0%A4%BE%20%E0%A4%97%E0%A4%AF%E0%A4%BE%E0%A5%A4

b. http://gadyakosh.org/gk/%E0%A4%86%E0%A4%88%E0%A4%AF%E0%A5%87!_%E0%A4%AA%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B5%E0%A4%B0%E0%A4%A3_%E0%A4%AC%E0%A4%9A%E0%A4%BE%E0%A4%8F%E0%A4%81!/_%E0%A4%85%E0%A4%A8%E0%A5%8D%E0%A4%A4%E0%A4%B0%E0%A4%BE_%E0%A4%95%E0%A4%B0%E0%A4%B5%E0%A4%A1%E0%A4%BC%E0%A5%87

c. http://gadyakosh.org/gk/%E0%A4%86%E0%A4%88%E0%A4%AF%E0%A5%87!_%E0%A4%AA%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B5%E0%A4%B0%E0%A4%A3_%E0%A4%AC%E0%A4%9A%E0%A4%BE%E0%A4%8F%E0%A4%81!/_%E0%A4%85%E0%A4%A8%E0%A5%8D%E0%A4%A4%E0%A4%B0%E0%A4%BE_%E0%A4%95%E0%A4%B0%E0%A4%B5%E0%A4%A1%E0%A4%BC%E0%A5%87



PAPER II –GENERAL ENGLISH - I

Learning Objectives

- To enable learners to acquire self awareness and positive thinking required in various life situations.
- To help them acquire the attribute of empathy
- To assist them in acquiring creative and critical thinking abilities
- To enable them to learn the basic grammar
- To assist them in developing LSRW skills

Unit I

SELF-AWARENESS (WHO)&POSITIVE THINKING (UNICEF)

Life Story

- 1.1 Chapter 1 from Malala Yousafzai, I am Malala
- 1.2 An Autobiography or The Story of My Experiments with Truth (Chapters 1, 2 & 3) M.K.Gandhi

Poem

- 1.3 Where the Mind is Without Fear – Gitanjali 35 – Rabindranath Tagore
- 1.4 Love Cycle – Chinua Achebe

Unit II

EMPATHY

Poem

- 2.1 Nine Gold Medals – David Roth
- 2.2 Alice Fell or poverty – William Wordsworth

Short Story

- 2.3 The School for Sympathy – E.V. Lucas
- 2.4 Barn Burning – William Faulkner

Unit III

CRITICAL & CREATIVE THINKING

Poem

- 3.1 The Things That Haven't Been Done Before – Edgar Guest
- 3.2 Stopping by the Woods on a Snowy Evening – Robert Frost

Readers Theatre

- 3.3 The Magic Brocade – A Tale of China
- 3.4 Stories on Stage – Aaron Shepard (Three Sideway Stories from Wayside School" by Louis Sachar)

Unit IV

Part of Speech

- 4.1 Articles
- 4.2 Noun
- 4.3 Pronoun
- 4.4 Verb
- 4.5 Adverb
- 4.6 Adjective
- 4.7 Preposition



Unit V

Paragraph and Essay Writing

- 5.1 Descriptive
- 5.2 Expository
- 5.3 Persuasive
- 5.4 Narrative

Text books (Latest Editions)

1. MalalaYousafzai. I am Malala, Little, Brown and Company, 2013.
2. M.K. Gandhi. An Autobiography or The Story of My Experiments with Truth (Chapter – I), Rupa Publications, 2011.
3. Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings): A Collection of Prose Translations Made by the Author from the Original Bengali. MacMillan, 1913.
4. N.Krishnasamy. Modern English: A Book of Grammar, Usage and Composition Macmillan, 1975.
5. Aaron Shepard. Stories on Stage, ShepardPublications, 2017.
6. J.C. Nesfield. English Grammar Composition and Usage, Macmillan, 2019.

Web Resources

1. MalalaYousafzai. I am Malala (Chapter 1) <https://archive.org/details/i-am-malala>
2. M.K Gandhi. An Autobiography or The Story of My Experiments with Truth(Chapter-1)- Rupa Publication, 2011 <https://www.indiastudychannel.com/resources/146521-Book-Review-An-Autobiography-or-The-story-of-my-experiments-with-Truth.aspx>
3. Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings)<https://www.poetryfoundation.org/poems/45668/gitanjali-35>
4. Aaron Shepard.Stories on Stage, Shepard Publications, 2017 <https://amzn.eu/d/9rVzINv>
5. JC Nesfield. Manual of English Grammar and Composition. <https://archive.org/details/in.ernet.dli.2015.44179>

INVERTEBRATA

Course Objectives

- To understand the basic concepts of lower animals and observe the structure and functions.
- To illustrate and examine the systematic and functional morphology of various groups of invertebrates.
- To differentiate and classify the various groups of animal modes of life and to estimate the biodiversity
- To compare and distinguish the general and specific characteristics of reproduction in lower animals.
- To infer and integrate the parasite and economic importance of invertebrate animals.



UNIT I

Protozoa: Introduction to Classification, taxonomy and nomenclature. General characters and classification of Phylum Protozoa up to classes. Type study: Paramecium and Plasmodium - Parasitic protozoans (Entamoeba, Trypanosoma & Leishmania) - Economic importance Nutrition in protozoa - Host-parasitic interactions in Entamoeba and Plasmodium - Locomotion in protozoa Porifera: General characters and classification up to Classes. Type study: Sycon- Canal system in sponges. Reproduction in sponges

UNIT II

Coelenterata: General characters and classification up to classes – Type study: Obelia - Corals and coral reefs - Economic importance of corals and coral reefs - Polymorphism in Hydrozoa. Platyhelminthes: General characters and classification of up to classes. Type study: Fasciola hepatica. Parasitic adaptations. Host-parasitic interactions of Helminthine parasites

UNIT III

Aschelminthes : General characters and classification of up to classes - Type study: Ascaris lumbricoides. Nematode Parasites and diseases - Wuchereria bancrofti, Enterobius vermicularis, Ancylostoma duodenale. - Parasitic adaptations. Annelida: General characters and classification up to Classes. Type study: Nereis, - Metamerism - Modes of life in Annelids.

UNIT IV

Arthropoda: General characters and classification of Phylum Arthropoda up to Classes. Detailed study: Penaeus indicus. Affinities of Peripatus – Larval forms in Crustacea. Economic importance of Insects. Insect pests of Agricultural Importance- - Pest of rice: Rice stem borer (Scirpophaga incertulas) – Pest of Sugarcane: The shoot borer (Chilo infuscatellus) – Pest of coconut: The rhinoceros beetle (Oryctes rhinoceros). Principles of Integrated Pest Management.

UNIT V

Mollusca: General characters and classification of Phylum Mollusca up to Classes. Detailed study: Pila globosa. Foot and torsion in Mollusca. Economic importance of Cephalopods. Echinodermata: General characters and classification of Phylum Echinodermata up to Classes. Detailed study: Asterias. Water vascular system in Echinodermata – Larval forms of Echinoderms.

Text Books (Latest Editions)

1. Ekambaranatha Iyer, 2000. A Manual of Zoology, 10th edition, Viswanathan,



S., Printers & Publishers Pvt Ltd

2. Jordan, E.L. and Verma P.S, 1995. Invertebrate Zoology, 12th edn. S. Chand & Co.
3. Kotpal, R.L, 1992. Protozoa, Porifera, Coelenterata, Annelida, Arthropoda, Mollusca, Echinodermata.

Reference Books (Latest editions, and the style as given below must be strictly adhered to)

1. Ruppert and Barnes, R.D. (2006). Invertebrate Zoology, VIII Edition. Holt Saunders International Edition.
2. Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). The Invertebrates: A New Synthesis, III Edition, Blackwell Science
3. Barrington, E.J.W. (1979). Invertebrate Structure and Functions, II Edition, E.L.B.S. and Nelson
4. Hyman L.H, 1955. The invertebrates - Vol. I to Vol. VII – Mc Graw Hill Book Co.
5. Parker, J. and Haswell, 1978. A text book of Zoology Vol. I - Williams and Williams.

Web Resources

1. <https://www.nationalgeographic.com/animals/invertebrates/>
2. <https://www.britannica.com/science/parasitic-disease>
3. <https://www.nio.res.in/>
4. <https://greatbarrierreef.org/>

LAB ON INVERTEBRATA

Learning Objectives

- To dissect and mount various body parts and to study the various functional details of invertebrates
- To understand the organs, organ system and their functions in lower animals.
- To dissect and mount various body parts and to study the various functional details of chordates
- To identify the different groups of invertebrate animals by observing their external characteristics.
- To identify the different groups of Invertebrates to gather adequate knowledge and to record.

UNIT I

Dissection:

1. Cockroach: Nervous system
2. Cockroach: Reproductive system

UNIT II

Dissection:

3. Cockroach: Digestive system



UNIT III**Mounting:**

1. Mouth Parts – Cockroach
2. Mouth Parts - Honey bee, Mosquito, House fly
3. Prawn appendages
4. Earth worm – body setae, penial setae (Demo)

UNIT IV

Spotters: (i). Protozoa: Amoeba, Paramoecium, Paramoecium Binary fission and Conjugation, Entamoeba histolytica, Plasmodium vivax (ii). Porifera: Sycon, Gemmule (iii). Coelenterata: Obelia – Colony & Medusa, Aurelia, Physalia, Gorgonia, (iv). Platyhelminthes: Planaria, Fasciola hepatica, Fasciola larval forms – Miracidium, Redia, Cercaria, Taenia solium, (v). Nematelminthes: Ascaris (Male & Female), (vi). Annelida: Nereis, Chaetopteurs, Hirudinaria, Trochophore larva (vii). Arthropoda: Cancer, Palaemon, Scorpion, Scolopendra, Sacculina, Limulus, Peripatus, Larvae - Nauplius, Mysis, Zoea,. (viii). Mollusca: Chiton, Pila, Unio, Pteredo, Murex, Sepia, Loligo, Octopus, (ix). Echinodermata: Asterias, Ophiothrix, Cucumaria, Antedon, Bipinnaria larva

UNIT V

Record / Observation Note (SUBMISSION IS MANDATORY)

Text Books (Latest Editions)

1. Ekambaranatha Iyyar and T. N. Ananthkrishnan, 1995 A manual of Zoology Vol.I (Part 1, 2) S. Viswanathan, Chennai
2. Ganguly, Sinha and Adhikari , 2011 . Biology of Animals: Volume I, New Central Book Agency; 3rd revised edition. 1008 pp.
3. Sinha, Chatterjee and Chattopadhyay, 2014. Advanced Practical Zoology, Books & Allied Ltd; 3rd Revised edition, 1 07 0 pp.
4. Lal ,S. S, 2016 . Practical Zoology Invertebrate, Rastogi Publications.
5. Verma, P. S. 2010. A Manual of Practical Zoology: Invertebrates, S Chand, New Delhi

Reference Books (Latest editions, and the style as given below must be strictly adhered to)

1. Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). The Invertebrates: A New Synthesis, III Edition, Blackwell Science
2. Barnes, R.D. (1982). Invertebrate Zoology, V Edition. Holt Saunders International Edition.
3. Barrington, E.J.W. (1979). Invertebrate Structure and Functions. II Edition, E.L.B.S. and Nelson



4. Boradale, L.A. and Potts, E.A. (1961). Invertebrates: A Manual for the use of Students. Asia Publishing Home.
5. Lal, S.S. 2005. A text Book of Practical Zoology: Invertebrate, Rastogi, Meerut

Web Resources

1. <https://nbb.gov.in/>
2. <https://www.agshoney.com/training.htm>
3. <https://icar.org.in/>
4. <https://nisa.icar.gov.in/>
5. <https://www.nationalgeographic.com/animals/invertebrates/>

ALLIED BOTANY-I

Learning Objectives

- To study morphological and anatomical features of algae
- To familiarize with the general characters and economic uses of fungi, bacteria and virus
- To familiarize with the general characters and life histories of bryophytes, pteridophytes and gymnosperms
- To comprehend on the ultrastructure of cell organelles
- To explain the concept of genetics and plant biotechnology

UNIT I

Algae: General characters of algae - Structure, reproduction and life cycle of the following genera - Sargassum , economic importance of algae.

UNIT II

Fungi, Bacteria and Virus: General characters of fungi, structure, reproduction and life cycle of the following genera – Penicillium and economic importance of fungi. Bacteria - general characters, structure and reproduction of Escherichia coli and economic importance of bacteria. Virus - general characters, structure of TMV.

UNIT III

Bryophytes, Pteridophytes and Gymnosperms: General characters of Bryophytes, Structure and life cycle of Marchantia General characters of Pteridophytes, Structure and life cycle of Selaginella
General characters of Gymnosperms, Structure and life cycle of Cycas.

UNIT IV

Cell Biology: Prokaryotic and Eukaryotic cell- structure. Cell organelles - ultra structure and function of chloroplast, mitochondria and nucleus.



UNIT V

Genetics and Plant Biotechnology: Mendelism - Law of dominance, Law of segregation, Law of independent assortment. Monohybrid and dihybrid cross - Test cross - Back cross. Plant tissue culture - MS medium, plant tissue culture protocol. Application in biotechnology.

Recommended Texts

1. Singh, V., Pande, P.C and Jain, D.K. 2021. A Text Book of Botany. Rastogi Publications, Meerut.
2. Bhatnagar, S.P and Alok Moitra. 2020. Gymnosperms, New Age International (P) Ltd., Publishers, Bengaluru.
3. Sharma, O.P. 2017. Bryophyta, MacMillan India Ltd. Delhi.
4. Lee, R.E. 2008. Phycology, IV Edition, Cambridge University Press, New Delhi.
5. Rao, K., Krishnamurthy, K.V and Rao, G.S. 1979. Ancillary Botany, S. Viswanathan Pvt. Ltd., Madras.

Reference books:

1. Parihar, N.S. 2012. An introduction to Embryophyta –Pteridophytes - Surjeet Publications, Delhi.
2. Alexopoulos, C.J. 2013. Introduction to Mycology. Willey Eastern Pvt. Ltd.
3. Vashishta, P.C. 2014. Botany for Degree Students Gymnosperms. Chand & Company Ltd, Delhi.
4. Coulter, M. Jhon, 2014. Morphology of Gymnosperms. Surjeet Publications, Delhi.
5. Vashishta, P.C. 2014. Botany for Degree Students Algae. 2014. Chand & Company Ltd, Delhi.
6. Parihar, N.S. 2013. An introduction to Embryophyta –Bryophytes -, Surjeet Publications, Delhi.
7. Pandey B.P. 1986, Text Book of Botany (College Botany) Vol I &II, S.Chand and Co. New Delhi.

Web Resources

1. <https://www.kobo.com/us/en/ebook/the-algae-world>
2. [http://www.freebookcentre.net/biology-books-download/Fungi-\(PDF-15P\).html](http://www.freebookcentre.net/biology-books-download/Fungi-(PDF-15P).html)
3. <http://scitec.uwichill.edu.bb/bcs/bl14apl/bryo1.htm>
4. <https://www.toppr.com/guides/biology/plant-kingdom/pteridophytes/>
5. <https://arboretum.harvard.edu/wp-content/uploads/2013-70-4-beyond-pine-cones-an-introduction-to-gymnosperms.pdf>



6. <https://www.us.elsevierhealth.com/medicine/cell-biology>
7. <https://www.us.elsevierhealth.com/medicine/genetics>
8. <https://www.kobo.com/us/en/ebook/plant-biotechnology-1>

ALLIED BOTANY PRACTICALS

Learning Objectives

- To develop skill-based detection of the morphology and microstructure of different plant groups
- To comprehend the ultra structure of various cell organelles
- To be familiar with the basic concepts of mendelian genetics and laws of inheritance.
- To Understand the methods involved in plant tissue culture

PRACTICALS

1. Make suitable micro preparation and observation of slides/ specimen of the types prescribed in Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms.
2. Micro photographs of the cell organelles - ultra structure.
3. Simple genetic problems.- Monohybrid and dihybrid
4. Microphotographs related to plant tissue culture.
5. Field trip (Minimum 2 days) to places under the guidance of teachers to study plants in their natural habitat and submit a report.

Recommended Texts

1. Sharma,O.P.2017. Bryophyta,MacMillanIndia Ltd,NewDelhi.
2. Sharma,O.P.2012. Pteridophyta,Tata McGraw-Hills Ltd,NewDelhi.
3. Subramaniam, N.S. 1996. Laboratory Manual of Plant Taxonomy. Vikas Publishing House Pvt. Ltd., New Delhi.
4. Benjamin, A. Pierce. 2012. Genetics- A conceptual Approach. W.H. Freeman and Company, New York, England.
5. Noggle G.R and G.J. Fritz. 2002. Introductory Plant Physiology. Prentice Hall of India, New Delhi.

Reference Books

1. Strickberger, M.W. 2005. Genetics (III Ed). Prentice Hall, New Delhi, India.
2. Nancy Serediak and M. Huynh. 2011. Algae identification lab Guide. Accompanying manual to algae identification field guide, Ottawa Agriculture and Agri food Canada publisher.
3. Mohammed Gufran Khan, Shite Gatew and Bedilu Bekele. 2012. Practical manual for Bryophytes and Pteridophytes. Lambert Academic Publishing.



4. Aler Gingauz.2001. Medicinal Chemistry. Oxford University Press & Wiley Publications.
5. Steward, F.C. 2012. Plant Physiology Academic Press, US

Web sources

1. <https://www.amazon.in/Practical-Manual-Pteridophyta-Rajan-Sundara/dp/8126106883>
2. <https://www.google.co.in/books/edition/Gymnosperms/3YrT5E3Erm8C?hl=en&gbpv=1&dq=gymnosperms&printsec=frontcover>
3. <https://www.amazon.in/Computational-Phytochemistry-Satyajit-Dey-Sarker-ebook/dp/B07CV96NZJ>
4. <https://medlineplus.gov/genetocs/understanding/basics/cell/>
5. <https://apan.net/meetings/apan45/files/17/17-01-01-01.pdf>
6. http://www.cuteri.eu/microbiologia/manuale_microbiologia_pratica.pdf
7. <https://www.amazon.in/Manual-Practical-Bryophyta-Suresh-Kumar/dp/B0072GNFX4>

ORNAMENTAL FISH FARMING AND MANAGEMNT

COURSE OUTCOMES

Students will able to

- Highlight the importance of ornamental fish culture in entrepreneurship development.
- Know the identification, culture and maintenance of commercially important ornamental fishes.
- (iii)Acquire knowledge of the techniques of ornamental fish breeding, rearing, disease control and economics of ornamental fish farming.

Unit I

Introduction to ornamental fish keeping: Scope and importance of ornamental fish culture. Identification of commercially important ornamental fishes - Indigenous and exotic varieties.

Unit II

Biology of egg layers and live bearers: Breeding, hatchery and nursery management of egg layers (eg. Goldfish) and live bearers (eg.Guppy).

Unit III

Aquarium plants and their propagation: Food and feeding in ornamental fishes. Formulated feed and Live feed; Live feed culture. Identification of locally available live feed organisms.



Unit IV

Aquarium design and construction: Accessories - aerators, filters and lighting
Maintenance of aquarium and water quality management. Ornamental fish diseases, their prevention, control and treatment methods.

Unit V

Conditioning, packing, transport and quarantine methods. Economics, trade regulations, domestic and global export potential and marketing strategies.

References:

1. Swain SK., Sarangi N. and Ayyappan S. (2010). Ornamental fish farming. ICAR, New Delhi.
2. Living Jewels – A handbook on freshwater ornamental fish, (1999) MPEDA, Kochi.
3. Dey V.K.A. (1997). A handbook on aquafarming ornamental fishes. MPEDA, Kochi.
4. Ahilan, B., Felix N. and Santhanam R. (2008), Text book of aquariculture. Daya Publishing House, New Delhi.

Web Resources

1. <http://ecoursesonline.iasri.res.in/course/view.php?id=297>
2. <https://www.ofish.org/>
3. <https://krishijagran.com/agripedia/income-generation-by-ornamental-fish-culture/>
4. <https://99businessideas.com/ornamental-fish-farming/>

INTRODUCTION OF ZOOLOGY**LEARNING OBJECTIVES**

- To Know the different types of animals in the animal kingdom.
- To gain knowledge of the various branches of biology.
- To attain knowledge on the livestock development in India and its future prospects

UNIT 1

Animal Biodiversity and Systematics: Taxonomic hierarchy: Classification of animal kingdom- Two kingdoms and Five kingdom classification- Binomial nomenclature- Different phyla of animal kingdom – Salient features of Invertebrates and Chordates with examples.

UNIT 2

Cell Biology & Genetics: Cell theory- Ultrastructure of a typical Prokaryotic and Eukaryotic cell- importance of cell organelles. General Account on Mendelism and inheritance- DNA and RNA- Central dogma of Molecular Biology.



UNIT 3

Biochemistry and Physiology: Introduction to the role of essential biological Compounds- Proteins, Carbohydrates, Lipids, Water and Vitamins. Introduction to organ system of vital physiological functions.

UNIT 4

Environmental Biology: Basics of atmosphere and its strata- habitats- concept and components of ecosystem. Developmental Biology: General account of gametogenesis- fertilization and developmental stages. Evolution: Origin of life - Darwinism- Modern synthetic theory.

UNIT 5

Entrepreneurial Courses in Zoology: General introduction and applications: Aquaculture - Aquarium keeping - Apiculture - Sericulture - Lac culture - Vermiculture - Poultry keeping- Dairy farming- Biotechnology-Ecotourism.

References:

1. Ekambaranatha Iyer, (2000), A Manual of Zoology, 10th edition, Viswanathan, S., Printers & Publishers Pvt Ltd
2. Jordan, E.L. and Verma P.S, (1995), Invertebrate Zoology, 12th edn. S. Chand & Co.
3. Kotpal, R.L.(2019), Modern text book of Zoology: Invertebrates. Rastogi Publication, New Delhi.
4. Kotpal (2015). Modern Textbook of Zoology Vertebrates, Rastogi publishers, New Delhi.
5. H.C, Nigam. (2010), Biology of Chordates., Vishal Publications, New Delhi
6. Gupta. P.K., (2017), Cell and Molecular Biology, Fifth Revised Edition, Rastogi Publication, Meerut, India.
7. Singh. H.R, & Neeraj Kumar (2017), Animal Physiology and Biochemistry, Vishal Publishing Co.
8. Erach Bharucha. (2005). Text book of Environmental Studies for undergraduate courses, University Grants Commission, New Delhi.
9. Shukla, G.S. & Upadhyay, V.B. (2014). Applied and Economic Zoology, Rastogi Publications.
10. Cherian M.C. & Ramachandran, (1952), Bee keeping in South India – Govt.Press,Chennai.
11. Johnson and Jeyachandra, (2000), Apiculture –, Marthandam, TamilNadu.
12. Kesary, M and M.Johnson, (1998), Sericulture, Department of Zoology, N.M.. Christian College, Marthandam.
13. Ganga. G, (2019), Introduction to Sericulture, Oxford and IBH Publishing



14. Jhingaran, V.G., (1997), Fish and Fisheries of India, Hindustan Publishing Corporation (India).
15. Poultry farm manual: A reference guide for Central and State Poultry Farms, (2014),- www.dadf.gov.in and www.dadh.nic.in Delhi.
16. Gnanamani M.R, (2010), Modern aspects of commercial poultry keeping, Deepam Publications, Madurai.
17. Santhanakumar, G & A.M. Selvaraj. (1993), Concepts of Aquaculture. Meenam Publications. Nagercoil Lekshmi Papers, Thirumal Complex, Opp. Chakkaravarthi theatre. Chettikulam Jn., Nagercoil – 629 002.
18. Sundararaj, V. & B. Srikrishnadhas, Cultivable Aquatic Organisms, Narendra Publishing House, 1417, Kishan Dutt street, Maliwara, Delhi – 110 006
19. Singh, Herbans and Earl Moore, (1968), Livestock and Poultry Production, Prentice Hall India.
20. Seethaleksmy, M and Dr. Samthi, R, (2012), Vermitechnology, Saras Publications, Nagercoil.

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2. <http://globalacademicgroup.com...pdf>
3. <http://tbmicollege.ac.in>gallery>
4. <http://www.researchgate.net>3473>
5. <http://www.periyaruniversity.ac.in>
6. <http://www.profitableventure.com>>
7. <http://www.thinkwithniche.cpm>five>
8. <http://www.99businessideas.com>

