



MANONMANIAM SUNDARANAR UNIVERISTY,
TIRUNELVELI-12

SYLLABUS

UG - COURSES – AFFILIATED COLLEGES

Course Structure for B. Sc. Botany

(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	PLANT DIVERSITY I –ALGAE	FCBO11	5
III	CORE	PLANT DIVERSITY I ALGAE - PRACTICAL-I	FCBOP1	3
III	ELECTIVE	ALLIED: ZOOLOGY - PAPER – I	FEZO11	3
		ALLIED PRACTICAL	FEZOP1	2
IV	SEC 1	ENVIRONMENTAL BIOTECHNOLOGY	FSBO12	2
IV	FC	BASICS OF BOTANY	FFBO11	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 – Chaturbhuj Sahay
2. Subodh Hindi Vyakaran – Phoolchand Jain
3. Sankshipt Hindi Vyakaran – Kamta Prasad
4. Vyavaharik Hindi – Nagappa
5. Abhinav Hindi Vyakran – 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. [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%81%E0%A4%B5%E0%A4%B0%20\(%E0%A4%85%E0%A4%82%E0%A4%97%E0%5%8D%E0%A4%B0%E0%A5%87%E0%A4%9C%E0%A4%BC%E0%A5%80%3A%20Thiruvallur\)%20%E0%A4%A6%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%BF%E0%A4%A3,%E0%A4%AE%E0%A4%BF%E0%A4%A4%E0%A4%BE%20%E0%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%81%E0%A4%B5%E0%A4%B0%20(%E0%A4%85%E0%A4%82%E0%A4%97%E0%5%8D%E0%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%E0%A4%A3,%E0%A4%AE%E0%A4%BF%E0%A4%A4%E0%A4%BE%20%E0%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. [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\(17.%E0%A4%B5%E0%A4%BE%E0%A4%B2%E0%A5%87%20%E0%A4%B9%E0%A4%BF%E0%A4%A8%E0%A5%8D%E0%A4%A6%E0%A5%81%E0%A4%A4%E0%A5%8D%E0%A4%B5%20%E0%A4%95%E0%A4%BE%20%E0%A4%B5%E0%A4%BF%E0%A4%B0%E0%A5%8B%E0%A4%A7%20%E0%A4%A5%E0%A4%BE%E0%A5%A4\)](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%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%B9%E0%A5%88%E0%A5%A4)

4. [i;kZoj.k laj{k.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%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%B9%E0%A5%88%E0%A5%A4)

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. [kZoj.k laj{k.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%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%B9%E0%A5%88%E0%A5%A4)

d. 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

e. 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

f. [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](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%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%B9%E0%A5%88%E0%A5%A4)



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>



PLANT DIVERSITY I ALGAE

Learning Objectives

- To provide a comprehensive knowledge on the biology of algae.
- To provide a basis for better understanding of thallus organization in various algal groups
- To understand methods of reproduction and life histories of different algal groups.
- To understand the methods of large scale cultivation of algae
- To comprehend the beneficial role of algae.

UNIT I

General characters, distribution, Classification (Fritsch-1935-1945),

UNIT II

Thallus organization (unicellular-Chlorella, Diatoms, colonial-Volvox, filamentous-, Oedogonium, siphonous-Caulerpa, parenchymatous- Gracilaria).

UNIT III

Reproduction-Vegetative, asexual, sexual reproduction and life histories (haplontic-, Chara diplontic- Sargassum, diplohaplontic-Ulva)

UNIT IV

Algal cultivation methods, indoor cultivation methods (any two) and large-scale cultivation of algae, (any two), harvesting of algae.

UNIT V

Algae as food and feed: Agar-agar, Alginic acid and Carrageenan; Diatomite. Application of algae as fuel, bio fertilizer and pharmaceutical. Role of algae as indicator of water pollution.

Recommended Texts:

1. Dehradun. Edward Lee, R. 2018. Phycology, 5th Ed., Cambridge University Press, London.
2. Kumar, H.D. 1999. Introductory Phycology. Affiliated East-West Press, Delhi
3. Singh, Pandey and Jain. 2020. A text book of Botany, 5th Edition, Rastogi Publication, Meerut.
4. Vashishta, P.C. 2014. S.Chand & Company Ltd, New Delhi.
5. Ian Morris. 1977. An introduction to the algae. Hutchinson & Co (Publishers) Ltd. London.

References Books:

1. Aziz, F and Rasheed, R. 2019. A Course Book of Algae. Publisher: University of Sulaimani. ISBN: 978-9922-20-391-1.
2. Mihir Kumar, D. 2010. Algal Biotechnology. Daya Publishing House, New Delhi.
3. Chapman V.J. and Chapman D.J, 2013. The Algae. Alpha Numera.
4. Fritsch, F.E. 1945. Structure and reproduction of Algae. Cambridge University



press.

5. Round, FE. 1984. The Ecology of Algae. Cambridge University Press.
6. Lee, R.D. 2008. Phycology 4th Edition, Cambridge University Press, New York.
7. Bold, H.C and Wynne, M.J. 1978. Introduction to the Algae: Structure and Function. Prantice Hall of India New Delhi.

Web Resources:

1. <https://www.crcpress.com/Therapeutic-and-Nutritional-Uses-of-Algae/Pereira/p/book/9781498755382>
2. <https://www.crcpress.com/Therapeutic-and-Nutritional-Uses-of-Algae/Pereira/p/book/9781498755382>
3. <https://www.crcpress.com/Algae-Anatomy-Biochemistry-and-Biotechnology-Second-Edition/Barsanti-Gualtieri/p/book/9781439867327>
4. <https://www.crcpress.com/Marine-Algae-Biodiversity-Taxonomy-Environmental-Assessment-and-Biotechnology/Pereira-Neto/p/book/9781466581678>
5. <https://www.kopykitab.com/Botany-For-Degree-Students-ALGAE-by-B-R-Vashishta-Dr-A-K-Sinha-Dr-V-P-Singh>
6. <https://www.wileyindia.com/a-textbook-of-algae.html>
7. <https://www.kobo.com/in/en/ebook/algae-biotechnology>
8. <https://www.ikbooks.com/books/book/life-sciences/botany/a-textbook-algae/9788188237449/>

PLANT DIVERSITY I ALGAE - PRACTICAL-I

Learning Objectives

- To develop skills to identify algae based on habitat, thallus structure and the internal organization.
- To identify microalgae in a mixture.
- To develop skills to prepare the microslides of algae.
- To study the economic importance of species of algae.
- To understand importance of algae to animals and humans

PRACTICALS

1. Micro-preparation of the types prescribed in the syllabus.
2. Identifying the micro slides relevant to the syllabus.
3. Identifying types of algal mixture.
4. Economic importance of Algae as: (i) Food (ii) Feed (iii) Biofertilizers (iv) SCP (v) Agar Agar (vi) Alginate (vii) Diatomaceous earth.
5. Field visit to study fresh water/marine water algal habitats.

Recommended Texts

1. Kumar, H.D. 1999. Introductory Phycology. Affiliated East-West Press, Delhi.
2. Bendre, M. Ashok and Ashok Kumar, A. 2020. TextBook of Practical Botany-1 (10th ed). Rastogi Publications, Meerut.



3. Round, FE. 1984. The Ecology of Algae. Cambridge University Press.
4. Aziz, F and Rasheed, R. 2019. A Course Book of Algae. Publisher: University of Sulaimani. ISBN: 978-9922-20-391-1.
5. Singh, Pandey and Jain. 2020. A text book of Botany, 5th Edition, Rastogi Publication, Meerut.

Reference Books:

1. Nancy Serediak and M. Huynh. 2011. Algae identification lab Guide. Accompanying
2. manual to algae identification field guide, Ottawa Agriculture and Agri food Canada publisher.
3. Chapman, V.J and Chapman, D.J. 1960. The Algae, ELBS & MacMillan, London.
4. Lee, R.D. 2008. Phycology 4th Edition, Cambridge University Press, New York.
5. Dehradun. Edward Lee, R. 2018. Phycology, 5th Ed., Cambridge University Press, London.

Web resources:

1. <https://www.amazon.in/Practical-Manual-Algae-Sundara-Rajan/dp/8126106492>
2. https://books.google.co.in/books/about/Practical_Manual_of_Algae.html?id=8d5DAAAACAAJ&redir_esc=
3. [https://freebookcentre.net/biology-books-download/Concepts-of-Botany-Algae-\(PDF-21P\).html](https://freebookcentre.net/biology-books-download/Concepts-of-Botany-Algae-(PDF-21P).html)
4. <https://www.ebooks.com/en-in/book/210152662/algae/sachin-kumar-mandotra/>
5. https://books.google.co.in/books/about/Algae.html?id=s1P855ZWc0kC&redir_esc=y

ALLIED ZOOLOGY - I INVERTEBRATA

Course Objectives

- To acquire a basic knowledge of diversity and organization of Protozoa, Coelenterata, Helminthes and Annelida
- To acquire a basic knowledge of diversity and organization of Arthropoda, Mollusca and Echinodermata
- To comprehend the taxonomic position and diversity among Protochordata, Pisces and Amphibia
- To comprehend the taxonomic position and diversity among Reptilia, Aves and Mammalia
- To acquire detailed knowledge of select invertebrate and chordate forms

UNIT I

Diversity of Invertebrates–I Principles of taxonomy. Criteria for classification–Symmetry and Coelom–Binomial Nomenclature. Classification of Protozoa, Coelenterata, Helminthes and Annelida upto classes with two examples.



UNIT II

Diversity of Invertebrates–II Classification of Arthropoda, Mollusca and Echinodermata upto class level with examples

UNIT III

Diversity of Chordates–I Classification of Prochordata, Pisces and Amphibia upto orders giving two examples.

UNIT IV

Diversity of Chordates–II Classification of Reptilia, Aves and Mammalia upto orders giving two examples.

UNIT V

Animal organization Structure and organization of

- (i) Earthworm
- (ii) Rabbit
- (iii) Prawn

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/>



ALLIED ZOOLOGY LAB COURSE - I

Learning Objectives

- To understand the structure and label the various parts of the dissected organisms and to sketch the required system using virtual dissections, charts and web resources.
- To compare and discuss the differences in the mouth parts of cockroach and mosquitos by mounting and drawing
- To identify and discuss the significance of pigeon feather. To identify and understand the different invertebrate and chordate forms and classify them using lab manuals
- To compare and criticise various types of invertebrate and chordate animals.
- Analyse the campus fauna enables them to understand, identify and classify the various fauna surrounding them. It also enables them to compile all the data and to discuss the importance of conservation of fauna

UNIT I

Dissection:

1. Cockroach – digestive system
2. Cockroach – nervous system
3. Fish – digestive system (sardine or any other fish)

UNIT II

Mounting:

1. Mouth Parts – Cockroach
2. Mouth Parts – Mosquito/ Honey bee
3. Scales – Placoid, Cycloid and Ctenoid
4. Prawn appendages

UNIT III

Spotters: Paramecium, Plasmodium, Scypha, Leucosolenia, Corals. Taenia solium – entire, Ascaris male and female. Earthworm, Prawn ,Scorpion, Pila, Starfish, Amphioxus, Shark, Frog, Calotes, Pigeon feather and Rabbit.

UNIT IV

Field visit – Study of fauna on the campus

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
6. Lal S S, (2009). Practical Zoology Vertebrate, Rajpal and Sons Publishing

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. <http://www.csrtimys.res.in/>
5. <http://csb.gov.in/>
6. <https://nisa.icar.gov.in/>
7. <https://www.nationalgeographic.com/animals/invertebrates/>

ENVIRONMENTAL BIOTECHNOLOGY

Learning Objectives

- To introduce the student to the various developed and applications of environmental biotechnology.
- To provide knowledge about the scope of bioremediation and bioleaching using GMOs.
- To study about pollution of water bodies.
- To know about bioremediation.
- To study about biomineralization.

UNIT I

Introduction: The environment-soil, water and air, Pollution and its causes (outline only)

UNIT II

Source and treatment of polluted waters and effluents: Pollution of water bodies by heavy metals and pesticides – removal of heavy metals and pesticides by Biosorption. Removal of oil spills by using microbes. Biological treatment of sewage – characteristics of sewage and objectives in sewage treatment – Anaerobic digestion.



UNIT III

Soil and air pollution and their treatment: Soil pollution by Xenobiotics. Degradation of Xenobiotics – pathways of phenol, pentachlorophenol and polychlorinated biphenyl degradation.

UNIT IV

Bioremediation: Introduction to bioremediation, ex situ and in situ bioremediation.

UNIT V

Biometallurgy and related topics: Biomineralization – bioleaching - Biofilms and biocorrosion.

Recommended Texts

1. Alan Scragg. 1999. Environmental Biotechnology. Pearson Education Limited.
2. Dubey R.C. 2004. A text book of Biotechnology aspects of microbiology, British Sun Publication.
3. Joseph C. Deniel. 1996. Environmental aspects of microbiology, British Sun Publication.
4. Keeshav Thehan. 1997. Biotechnology, New age international (P) Limited, New Delhi.
5. Chandra, A.M and Ghosh, S.K. 2010. Remote sensing and Geographical Information System, Narosa Publishing House Pvt. Ltd. New Delhi.

Reference Books:

1. Sharma, P.D. 2005. Environmental Microbiology, Narosa Publishing House Pvt. Ltd., New Delhi.
2. Raina Maier M. Iran Pepper L., Charles P. Gerba, 2000, Environmental Microbiology, Academic press, U.K
3. Alexander N. Glazer and Hiroshi Nikaido. 1994. Microbial Biotechnology.
4. Special issue on Bioremediation and biodegradation. Indian Journal of Experimental Biology, September 2003. Vol. 41(9). National Institute of Science Communication and Information Resources, CSIR New Delhi.
5. Keddy, P.A. 2017. Plant Ecology: Origins, processes, consequences. 2nd ed. Cambridge University Press. ISBN. 978-1107114234.

Web Resources

1. <https://www.elsevier.com/books/environmental-biotechnology/vallero/978-0-12-407776-8>
2. <http://www.freebookcentre.net/biology-books-download/Environmental-Biotechnology.html>
3. <https://www.amazon.in/INTRODUCTION-ENVIRONMENTAL-BIOTECHNOLOGY-K-Chatterji-ebook/dp/B00K7YGIWI>
4. https://books.google.co.in/books/about/Textbook_of_Environmental_Biotechnology.html?id=Q2ROFx0WtBQC&redir_esc=y
5. <http://library.umac.mo/ebooks/b28045907.pdf>



BASICS OF BOTANY

Learning Objectives

- To learn about the classification, distinguishing traits, geographic distribution, and reproductive cycle of algae, fungi, lichens, and bryophytes.
- To Enable the learners to understand various cell structures and functions of prokaryotes and eukaryotes and the salient features and functions of cellular organelles.
- To gain knowledge on the morphology of various plant parts and their modifications
- To Understand of laws of inheritance, genetic basis of loci and alleles.
- To become familiar with important plant physiological processes like absorption and transpiration

UNIT I

BIODIVERSITY

Salient features of various Plant Groups : Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms- Viruses - Bacteria.

UNIT II

CELL BIOLOGY

Cell as the basic unit of life -Ultra Structure of Prokaryotic and Eukaryotic Cell (Plant Cell) - Cell Wall - Cell Membrane, Chloroplasts, Ribosomes.

UNIT III

PLANT MORPHOLOGY

Structure and Modification of Root, Stem and Leaf - Inflorescences –racemose and cymose types. Fruits types.

UNIT IV

GENETICS

Concept of Heredity and Variation - Mendel's Laws of Inheritance. Monohybrid and dihybrid cross.

UNIT V

PLANT PHYSIOLOGY

Water relations -: Diffusion, Osmosis, Plasmolysis, Imbibition . Transpiration –Types, significance

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, Mac Millan India Ltd. Delhi.
4. Lee, R.E. 2008. Phycology, IV Edition, Cambridge University Press, New



Delhi.

5. Pandey B.P. 1986, Text Book of Botany (College Botany) Vol I and II, S.Chand and Co. New Delhi.
6. 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.

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>

