Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)
Approved by Government of Tamil Nadu and Accredited by NAAC with 'A++' Grade (3rd Cycle-3.64 CGPA)
Dr. N.G.P. - Kalapatti Road, Coimbatore-641048, Tamil Nadu, India
Web: www.drngpasc.ac.in |Email: info@drngpasc.ac.in | Phone: +91-422-2369100

2025-26 for Under Graduate Programme

(Outcome Based Education model with Choice Based Credit System)

B.Sc. Biotechnology Degree

(For the students admitted during the academic year 2025-26 and onwards)

Programme: Biotechnology

Eligibility:

A candidate who has passed in Higher Secondary Examination with any Academic Stream or Vocational Stream as one of the subjects under Higher Secondary Board of Examination and as per the norms set by the Government of Tamil Nadu or an Examination accepted as equivalent there to by the Academic Council, subject to such conditions as may be prescribed there to are permitted to appear and qualify for the **Bachelor of Biotechnology Degree Examination** of this College after a programme of study of three academic years.

Programme Educational Objectives:

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. To demonstrate a substantial understanding of concepts in key areas of Biotechnology and its applications.

2.To supplement the academic input of students by way of seminars, conferences, guest lectures and industrial visits.

3.To describe the common methods and applications of biotechnology with regards to microorganisms, plants, animals and Pharma industries.

PROGRAMMEOUTCOMES:

On the successful completion of the program, the following are the expected outcomes.

PO Number	PO Statement
PO1	Students will be able to identify, analyze and understand Problems related to biotechnology and finding valid conclusions with basic knowledge in biotechnology.
PO2	Graduates will be able to justify societal, health, safety and legal issues and understand his responsibilities in biotechnological practices.
PO3	Provide education that leads to comprehensive understanding of the principles and practices of biotechnology that will help to undertake any responsibility as an individual and as a team in a multidisciplinary environment.
PO4	Graduates will be able to demonstrate knowledge of project Management when dealing with Biotechnology problems.
PO5	Students will possess hands-on technical skills necessary for Supporting biotechnology research activity and empower students with the ability to think and solve problems in the field of biotechnology.

Credit Distribution Pattern for UG Programme:

Part	Subjects	No. of Papers	Credit	Semester No.
I	Tamil /Hindi /French/Malayalam	4	4 x3 =12	I to IV
II	English	4	4 x3 =12	I to IV
III	Core (Credits2,3,4,5)	16-19	70	I to VI
	Inter Departmental Course (IDC)	4	16	I to IV
	Discipline Specific Elective (DSE)	3	3 x4 =12	V &VI
	Skill Enhancement Course (SEC)	4	8	III,IV,V& VI
	Industrial Training	1	2	V
IV	Environmental Studies (AECC)	1	2	I
	Basic Tamil/ Advanced Tamil/ Human Rights &Womens' Rights (AECC)	1	2	II
	Generic Elective (GE) (AEEC)	1	2	V
	Innovation &IPR/Innovation, IPR & Entrepreneurship (AECC)	1	2	VI
V	NSS/NCC/YRC/RRC/Yoga/ Sports/Clubs	-	2	I-II
TOTAL			**142**	

UG CURRICULUM

BIOTECHNOLOGY
AY 2025- 2026

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
First Semester												
Part - I												
25TLU1TA/ 25TLU1HA/ 25TLU1MA/ 25TLU1FA	Language - I	Tamil-I /Hindi- I/ Malayalam-I/ French-I	4	1	-	5	60	3	25	75	100	3
Part - II												
25ELU1EA	Language - II	English–I	4	-	1	5	60	3	25	75	100	3
Part - III												
25BTU1CA	Core -I	Cell Biology	4	1	-	5	60	3	25	75	100	4
25BTU1CB	Core -II	Microbiology	4	1	-	5	60	3	25	75	100	3
25BTU1CP	Core Practical- I	Cell Biology and Microbiology	-	-	4	4	48	6	40	60	100	2
25CEU1IB	IDC-I	Chemistry	4	-	-	4	48	3	25	75	100	4
Part-IV												
25MBU1AA	AECC -I	Environmental Studies	2	-	-	2	24	-	50	-	50	2
Part -V												
25BTU1XA	Extension Activity	NSS/NCC/YRC/ RRC/Yoga/Sports	-	-	-	-	-	-	50	-	50	1
Total			**22**	**3**	**5**	**30**	**360**				**700**	**22**

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Second Semester												
Part - I												
25TLU2TA/ 25TLU2HA/ 25TLU2MA/ 25TLU2FA	Language - I	Tami-II/Hindi-II/Malayalam-II/French-II	4	1	-	5	60	3	25	75	100	3
Part - II												
25ELU2EA	Language - II	English–II	4	-	1	5	60	3	25	75	100	3
Part - III												
25BTU2CA	Core -III	Genetics	4	1	-	5	60	3	25	75	100	4
25BTU2CB	Core -IV	Biochemistry	4	1	-	5	60	3	25	75	100	3
25BTU2CP	Core Practical-II	Genetics and Biochemistry	-	-	4	4	48	6	40	60	100	2
25PYU2IA	IDC-II	Biophysics	4	-	-	4	48	3	25	75	100	4
Part-IV												
25TLU2AA/ 25TLU2AB/ 25CRU2AA	AECC -II	Basic Tamil/ Advanced Tamil/Human Rights and Women's Rights	2	-	-	2	24	-	50	-	50	2
Part -V												
25BTU2XA	Extension Activity	NSS/NCC/YRC/ RRC/Yoga/Sports/ Health and Wellness	-	-	-	-	-	-	50	-	50	1
Total			**22**	**3**	**5**	**30**	**360**				**700**	**22**

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Third Semester												
Part - I												
25TLU3TA/ 25TLU3HA/ 25TLU3MA/ 25TLU3FA	Language - I	Tamil-III/ Hindi-III/ Malayalam-III/ French-III	3	1	-	4	48	3	25	75	100	3
Part - II												
25ELU3EA	Language-II	English–III	3	1	-	4	48	3	25	75	100	3
Part - III												
25BTU3CA	Core -V	Molecular Biology	4	-	-	4	48	3	25	75	100	4
25BTU3CB	Core -VI	Biodiversity	4	-	-	4	48	3	25	75	100	4
25BTU3CP	Core Practical-III	Molecular Biology and Biodiversity	-	-	4	4	48	6	40	60	100	2
25MTU3IE	IDC-III	Basic Mathematics	4	-	-	4	48	3	25	75	100	4
25BTU3SM	SEC Practical -I	Biotechniques	2	-	4	6	72	6	40	60	100	2
Total			**20**	**2**	**8**	**30**	**360**				**700**	**22**

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Fourth Semester												
Part - I												
25TLU4TA/ 25TLU4HA/ 25TLU4MA/ 25TLU4FA	Language-I	Tamil-IV/ Hindi-IV/ Malayalam - IV/ French-IV	3	1	-	4	48	3	25	75	100	3
Part - II												
25ELU4EA	Language-II	English–IV	3	1	-	4	48	3	25	75	100	3
Part - III												
25BTU4CA	Core -VII	Immunology	5	-	-	5	60	3	25	75	100	5
25BTU4CB	Core -VIII	Bioinformatics	4	-	-	4	48	3	25	75	100	4
25BTU4CP	Core Practical-IV	Immunology and Bioinformatics	-	-	4	4	48	6	40	60	100	2
25CSU4IB	IDC-IV	Python for Biologists	4	-	-	4	48	3	25	75	100	4
25BTU4SM	SEC Practical-II	Recombinant DNA Technology	2	-	3	5	60	6	40	60	100	2
Total			**21**	**2**	**7**	**30**	**360**				**700**	**23**

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Fifth Semester												
Part - III												
25BTU5CA	Core -IX	Plant and Animal Biotechnology	4	1	-	5	60	3	25	75	100	5
25BTU5CB	Core -X	Environmental Biotechnology	4	1	-	5	60	3	25	75	100	5
25BTU5CC	Core -XI	Entrepreneurial Biotechnology	4	1	-	5	60	3	25	75	100	5
25BTU5CP	Core Practical-V	Plant, Animal and Environmental Biotechnology	-	-	6	6	72	6	40	60	100	3
25BTU5SA	SEC-III	Bioprocess Technology	3	-	-	3	36	3	25	75	100	2
25BTU5DA	DSE-I	Clinical Trials	4	-	-	4	48	3	25	75	100	4
25BTU5DB		Bioethics and Biosafety										
25BTU5DC		Molecular Signaling										
25BTU5TA	IT	Industrial Training	-	-	-	-	-	3	40	60	100	2
Part-IV												
	GE		2	-	-	2	24	3	50	-	50	2
Total			**21**	**3**	**6**	**30**	**360**				**750**	**28**

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Sixth Semester												
Part - III												
25BTU6CA	Core-XII	Genomics and Proteomics	4	1	-	5	60	3	25	75	100	5
25BTU6CB	Core- XIII	Bionanotechnology	4	1	-	5	60	3	25	75	100	5
25BTU6CP	Core Practical - VI	Genomics, Proteomics and Bionanotechnology	-	-	6	6	72	6	40	60	100	3
25BTU6SA	SEC-IV	Stem Cell Technology	4	-	-	4	48	3	25	75	100	2
25BTU6DA	DSE-II	Drug Design and Delivery	4	-	-	4	48	3	25	75	100	4
25BTU6DB		Biomaterials										
25BTU6DC		Synthetic Biology										
25BTU6DD	DSE-III	Biomarker Technology	4	-	-	4	48	3	25	75	100	4
25BTU6DE		Molecular Diagnostics										
25BTU6DF		Food Technology										
Part-IV												
25BIU6AA	AECC-III	Innovation and IPR	2	-	-	2	24	3	50	-	50	2
Total			**22**	**2**	**6**	**30**	**360**				**650**	**25**
Grand Total											**4200**	**142**

DISCIPLINESPECIFIC ELECTIVE

Students shall select the desired course of their choice in the listed elective course during Semesters V &VI

Semester V (Elective I)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	25BTU5DA	Clinical Trials
2	25BTU5DB	Bioethics and Biosafety
3	25BTU5DC	Molecular Signaling

Semester VI (Elective II)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	25BTU6DA	Drug Design and Delivery
2	25BTU6DB	Biomaterials
3	25BTU6DC	Synthetic Biology

Semester VI (Elective III)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	25BTU6DD	Biomarker Technology
2	25BTU6DE	Molecular Diagnostics
3	25BTU6DF	Food Technology

GENERIC ELECTIVECOURSES (GE)

The following are the courses offered under Generic Elective Course

Semester V(GE-I)

S. No.	Course Code	Course Name
1	25BTU5GA	Mushroom Technology

EXTRACREDITCOURSES

The following are the courses offered under self study to earn extra credits: Semester III

S. No.	Course Code	Course Name
1	25BTUSSA	Biofertilizer Technology
2	25BTUSSB	Environmental Management

Semester – I LANGUAGE – I: TAMIL - I							
Semester	**Course Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	25TLU1TA	TAMIL - I	LANGUAGE- I	48	12	-	3

Preamble	மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடுநாகரீகம், பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
	கலை மற்றும் மரபுகளை அறியச் செய்தல்
	மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்
Prerequisite	தமிழ் மொழி எழுதி, படிக்கும் திறன்

Course Outcomes (Cos)		
CO. No.	**Course Outcomes (COs) Statement**	**Bloom's Tax anomy Knowledge Level**
CO1	வாழ்க்கைத்திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத்திறனை ஊக்குவித்தல்	K2
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K3
CO3	பாடஇணைச்செயல்பாடுகள் (Co-curricular activities)	K3
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K4

Mapping with Program Outcomes:					
Cos / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1		✓	✓		✓
CO2	✓			✓	
CO3		✓			✓
CO4			✓		
CO5	✓			✓	✓

25TLU1TA	TAMIL - I

Syllabus

Unit	Content	Hrs	Resources
1	**மறுமலர்ச்சிக் கவிதைகள்** 1. இலக்கிய வரலாறு -மறுமலர்ச்சிக் கவிஞர்களின் தமிழ்ப்பணிகள் 2. பாரததேசம்- பாரதியார் 3. படி - பாரதிதாசன் 4. தமிழரின் பெருமை- நாமக்கல் கவிஞர் 5. தமிழ்க் கொலை புரியாதீர் - புலவர் குழந்தை 6. **திரைத்தமிழ்** அ) 'விஞ்ஞானத்த வளர்க்கப் போறண்டி' எனத் தொடங்கும் பாடல் – உடுமலை நாராயண கவி ஆ) 'சும்மா கிடந்த நிலத்தை' எனத் தொடங்கும் பாடல் – பட்டுக்கோட்டை கல்யாண சுந்தரனார் இ) 'சமரசம் உலாவும் இடமே' எனத் தொடங்கும் பாடல் -மருதகாசி ஈ) 'உன்னை அறிந்தால்' எனத் தொடங்கும் பாடல் -கண்ணதாசன்	13	தமிழ்மொழிப்பாடம் முதற்பருவம் 2025-2026 https://www.youtube.com/watch?v=Up55uhkk9zI
2	**புதுக்கவிதைகள்** 1. இலக்கிய வரலாறு - புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் 2. கடமையைச் செய் - மீரா 3. ஓடு ஓடு சங்கிலி - சிற்பி பாலசுப்பிரமணியம் 4. ஒப்பிலாத சமுதாயம் - அப்துல் ரகுமான் 5. மரங்கள் - மு.மேத்தா 6. கரிக்கிறது தாய்ப்பால் - ஆரூர் தமிழ்நாடன் 7. ஐந்தாம் வகுப்பு 'அ' பிரிவு - நா. முத்துக்குமார் 8. ஹைகூ கவிதைகள் - 10 கவிதைகள்	13	தமிழ்மொழிப்பாடம் முதற்பருவம் 2025-2026 https://www.youtube.com/watch?v=dX9ZaNJMaco
3	**பெண்ணியம்** 1. தொலைந்து போனேன் - தாமரை 2. நீரில் அலையும் முகம் - அ. வெண்ணிலா 3. தற்காத்தல் - பொன்மணி வைரமுத்து 4. ஏனிந்த வித்தியாசங்கள் ? - மல்லிகா 5. புதையுண்ட வாழ்க்கை - சுகந்தி சுப்ரமணியன்	10	தமிழ்மொழிப்பாடம் முதற்பருவம் 2025-2026 https://www.youtube.com/watch?v=DLabokqWEdg
4	**சிறுகதைகள்** 1.இலக்கிய வரலாறு - சிறுகதையின் தோற்றமும் வளர்ச்சியும் 2. கனகாம்பரம் - கு.ப.ராஜகோபாலன் 3. கடிதம்- புதுமைப்பித்தன் 4. பொம்மை - ஜெயகாந்தன் 5. காய்ச்சமரம் - கி. ராஜநாராயணன் 6. காட்டில் ஒருமான் - அம்பை 7.வேட்கை - சூர்யகாந்தன்	14	தமிழ்மொழிப்பாடம் முதற்பருவம் 2025-2026 https://www.youtube.com/watch?v=78u7iTN3OU8

5	**பயிற்சிப் பகுதி** **அ. இலக்கணம்** 1. வல்லின ஒற்று மிகும், மிகா இடங்கள் - ஒற்றுப்பிழை நீக்கிஎழுதுதல் 2. ர,ற-ல,ழ,ள - ண,ந,ன வேறுபாடு - ஒலிப்பு நெறி, சொற்பொருள் வேறுபாடு அறிதல் **ஆ. படைப்பாக்கம்** 1. கவிதை- எழுதுதல் (15 வரிகள் முதல் 30 வரிகள் வரை) 2.சிறுகதை - எழுதுதல் (குறைந்தது 3 பக்கங்கள்)	10	தமிழ்மொழிப்பாடம் முதற்பருவம் 2025-2026 https://www.youtube.com/watch?v=B3wfM0QL6N8 https://www.youtube.com/watch?v=FchTlqAtwBU https://www.youtube.com/watch?v=gCP3gC-JQU4 https://www.youtube.com/watch?v=p9QOHD12Yeo
	Total	60	

Text book	1.	தமிழ் மொழிப்பாடம் – 2025-2026 தொகுப்பு: தமிழ்த்துறை, டாக்டர் என். ஜி. பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர் – 641048.
Reference Books	1.	பேராசிரியர் புலவர் சோம. இளவரசு, தமிழ் இலக்கிய வரலாறு, எட்டாம் பதிப்பு – 2024, மணிவாசகர் பதிப்பகம், சென்னை – 600 108.
	2.	பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு – 2023, இலக்கணம், இலக்கியவரலாறு, மொழித்திறன் – பூவேந்தன் பதிப்பகம், சென்னை – 600 004.

Journal and Magazines	இலக்கிய இதழ்கள்
E-Resources and Website	https://www.tamilvu.org

Learning Method	Lecture/ Tutorial / Student Seminar/GD/Assignment

Focus of the Course	Skill Development / Employability

Semester – I LANGUAGE –I: HINDI – I							
Semester	**Course Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	25TLU1HA	HINDI – I	LANGUAGE- I	48	12	-	3

Preamble	The writing ability and develop reading skill
	The various concepts and techniques for criticizing literature
	The techniques for expansion of ideas and translation process
Prerequisite	To understand the language Hindi for communication

Course Outcomes (Cos)		
CO.No.	**Course Outcomes (COs) Statement**	**Bloom's Tax anomy Knowledge Level**
CO1	Learn the fundamentals of novels and stories	K2
CO2	Understand the principles of translation work	K3
CO3	Expose the knowledge writing critical views on fiction	K3
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K4

Mapping with Program Outcomes:					
Cos / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1		✓	✓		✓
CO2	✓			✓	
CO3		✓			✓
CO4			✓		
CO5	✓			✓	✓

25TLU1HA	HINDI – I

Syllabus

Unit	Content	Hrs	Resources
1	गद्य – नूतन गद्य संग्रह (जयप्रकाश) पाठ1- रजिया पाठ, 2- मक्रील पाठ 3- बहता पानी निर्मला पाठ4- राष्ट्रपिता महात्मा गाँधी	13	Text Book
2	कहानी कुंज- डॉ वी.पी. 'अमिताभ'(पाठ 1-4)	13	Text Book
3	व्याकरण : शब्दविचार (संज्ञा, सर्वनाम,विशेषण)	12	Text Book
4	अनुच्छेद लेखन	12	Text Book
5	अनुवाद अभ्यास-III (केवल अंग्रेजी से हिन्दी में) (पाठ1 to 10)	10	Text Book
	Total	60	

Text books	1.	प्रकाशक: सुमित्र प्रकाशन 204 लीला अपार्ट्मेंट्स, 15 हेस्टिंग्स रोड'अशोक नगर इलाहाबाद-211001
	2.	प्रकाशक: गोविन्द प्रकाशन सदर बाजार, मथुरा उत्तरप्रदेश-281001
	3.	पुस्तक: व्याकरण प्रदिप – रामदेव प्रकाशक: हिन्दी भवन 36 टेगोर नगर इलाहाबाद-211024
	4.	पुस्तक: व्याकरण प्रदिप – रामदेव प्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024
	5.	प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17
Reference Books		-

Journal and Magazines	-
E-Resources and Website	-

Learning Method	Lecture/ Tutorial / Student Seminar/GD/Assignment

Focus of the Course	Skill Development / Employability

Semester – I MALAYALAM- I							
Semester	**Course Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	25TLU1MA	MALAYALAM- I	LANGUAGE- I	48	12	-	3

Preamble	The writing ability and develop reading skill
	The various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
	The competency in translating simple Malayalam sentences into English and vice versa
Prerequisite	To understand the language Malayalam for communication

Course Outcomes (Cos)		
CO. No.	**Course Outcomes (COs) Statement**	**Bloom's Tax anomy Knowledge Level**
CO1	Learn the fundamentals of novels and stories	K2
CO2	Understand the principles of translation work	K3
CO3	Expose the knowledge writing critical views on fiction	K3
CO4	Apply creative ability	K3
CO5	Build the power of creative reading	K4

Mapping with Program Outcomes:					
Cos / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1		✓	✓		✓
CO2	✓			✓	
CO3		✓			✓
CO4			✓		
CO5	✓			✓	✓

25TLU1MA	MALAYALAM- I

Syllabus

Unit	Content	Hrs	Resources
1	**Novel** PathummayudeAdu	14	Text book
2	**Novel** PathummayudeAdu	10	Text book
3	**Short Story** Nalinakanthi	14	Text book
4	**Short Story** Nalinakanthi	10	Text book
5	**Practical Application** Expansion of ideas, General Essay and Translation	12	Text book
	Total	60	

Text books	1.	Vaikkam Muhammed Basheer, "PathummayudeAdu" (NOVEL), DC Books & Kottayam
	2.	T.Padmanabhan, "Nalinakanthi" (Short Story), DC Books & Kottayam.
Reference Books	1.	MalayalaNovel Sahithyam.
	2.	MalayalaCherukathaInnale Innu.

Journal and Magazines	-
E-Resources and Website	-

Learning Method	Lecture/ Tutorial / Student Seminar/GD/Assignment

Focus of the Course	Skill Development / Employability

Semester – I FRENCH - I							
Semester	**Course Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	25TLU1FA	FRENCH - I	LANGUAGE- I	48	12	-	3

Preamble	The competence in general communication skills with oral, written and comprehension & expression
	The culture, life style and the civilization aspects of the French people as well as of France
	The students to acquire competency in translating simple French sentences into English and vice versa
Prerequisite	To understand the language French for communication

Course Outcomes (Cos)		
CO. No.	**Course Outcomes (COs) Statement**	**Bloom's Tax anomy Knowledge Level**
CO1	Learn the Basic verbs, numbers and accents	K2
CO2	Apply the adjectives and the classroom environment in France	K3
CO3	Select the Plural, Articles and the Hobbies	K3
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K4

Mapping with Program Outcomes:					
Cos / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1		✓	✓		✓
CO2	✓			✓	
CO3		✓			✓
CO4			✓		
CO5	✓			✓	✓

25TLU1FA	FRENCH - I

Syllabus

Unit	Content			Hrs	Resources
1	**Objectifs de Communication**	**Tâche**	**Activités de réception et de production orale**	14	Text book Salut I Page 10
	• Saluer • Enter en contact • avec quelqu'un. • Se presenter. • S'excuser	En cours de cuisine, premiers contacts avec les members d'un groupe	• Comprendre des personnes qui se saluent. • Ēchanger pour entrer en contact, se présenter, saluer, s'excuser. • Communiquer avec *tu* ou *vous*. • Comprendre les consignes de classe • Ēpeler son nom et son prénom. Computer jusqu'à 10.		
2	• Demander de se presenter. • Présenter quelqu'un . •	Dans la classe de français, se presenter et remplir une fiche pour le professeur.	• Comprendre les informations essentielles dans un échange en milieu professionnel. Ēchanger pour se presenteret présenterquelqu'un.	12	Text book Enchanté I Page 20
3	• Exprimer ses gouts.	Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation	• Dans une soirée de recontresrapid comprendre des personnes qui échangent sur elles et sur leurs goût • Comprendre une personne qui parler des goûts de quelqu'un d'autre	14	Text book J'adore I Page 30
4	Demander à quelqu'un de faire quelque chose. Demander poliment. Parler d'actions passes. Tu veux bien?	Organiser un programme d'activités pour accueillir une personne importante	Comprendre une personne demande un service à quelqu'un. Demander à quelqu'un de faire quelque chose. • Imaginer et raconter au passé à partir de situations dessinées.	10	Text book Autoévaluation du module I Page 40 – Préparation au DELF A1 page 42 Tu veux bien page 46
5	**Practical Application** Make in Own Sentences			10	-
	Total			60	

Text book	1.	Regine Merieux, Yves Loiseau. 2012. LATITUDES – 1: Méthode de français (Page No: 9-55) Les Editions Dider, Paris, ImprimeenRoumanie par Canale en Janvier
Reference Book	1.	-

Journal and Magazines	-
E-Resources and Website	-

Learning Method	Lecture/ Tutorial / Student Seminar/GD/Assignment

Focus of the Course	Skill Development / Employability

SEMESTER – I LANGUAGE II: ENGLISH – I							
Semester	**Course Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	**25ELU1EA**	**ENGLISH - I**	**LANGUAGE- II**	**48**	**-**	**12**	**3**

Preamble	This course has been designed for students to learn and understand • the effect of dialogue, imagery and varied genres • any spontaneous spoken discourse and respond to them with proper sentence structure • the transactional concept of English language.
Prerequisite	Basic comprehension of Language Skills

Course Outcomes (Cos)		
CO Number	**Course Outcomes (COs) Statement**	**Bloom's Taxonomy Knowledge Level**
CO1	Identify the various aspects in poetry.	K2
CO2	Infer linguistic and non-linguistic features of the context for understanding and interpreting.	K3
CO3	Construct sentences and convey messages effectively in real life situations.	K3
CO4	Apply different reading strategies with varying speed.	K3
CO5	Prepare modules with their own ideas and present them coherently in a grammatically correct form.	K3

Mapping with Program Outcomes:					
Cos / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	✓	✓	✓		
CO2		✓	✓		
CO3	✓		✓	✓	✓
CO4		✓		✓	
CO5	✓		✓		✓

25ELU1EA	LANGUAGE II: ENGLISH – I

Syllabus

Unit	Content	Hrs	Resources
I	**Genre Studies** **Mathew Arnold: Dover Beach**- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques– Annotations **Niyi Osundare: Our Earth Will Not Die**- Author's Biography- title indications-outline- paraphrasing the poem- context of poem- form- poetic devices-enjambment- techniques– Annotations **Charles Lamb: Christ's Hospital Five and Thirty Years Ago**- Author's biography- Narrative structure- Exploration of the text- passage analysis- insight of ideas- cohesion and context- style- language techniques- Annotation **James Hanson: A Famed Life - Ten Minute Comedy for Two Women** - Author's Biography- Plot Summary- Detailed summary and Analysis- Themes- Important Quotations- Characters- Description - analysis- Terms- Symbols- Critical analysis **Sheila Nayampalli Baruna: Alone** - Author's Biography- narrative structure- passage analysis- insight of ideas- cohesion and context- style- language techniques.	12	Text Book
II	**Listening Skills** Listening vs. hearing- Types of listening, Tips to enhance Listening Skills, Non-verbal and Verbal signs of active listening- Comprehensive Listening- Listening to pre-recorded audios on speeches, interviews and conversations-Listening Activities- Listening and responding to complaints (formal situation), Listening to problems and offering solutions (informal)	13	britishcouncil.org cambridgeenglish.org
III	**Speaking Skills** Formal occasions- Introducing oneself, Introducing others, Enquiries and Seeking permission, neural speaking -Making short presentations- Informal occasions- Requests, Offering help, Congratulating, Farewell party, graduation speech- Giving instructions to do a task and to use a device, Giving and asking directions	11	britishcouncil.org cambridgeenglish.org
IV	**Reading Skills** Study Skills: Skimming and Scanning- Reading different kinds of texts- Types of reading-Developing a good reading speed, reading aloud, Referencing skill- Word Power (Denotation and Connotation) - Reading comprehension, Data interpretation – Charts, Graphs, Advertisements - Cognitive Skills- Inference Making – Interpretation	12	britishcouncil.org cambridgeenglish.org
V	**Writing Skills** Sentence patterns, Note- making and note taking-Strategies - Paragraph writing: Structure and Principles - Academic Writing - Formal and Informal Letters, Report, Book /Movie Review - Infographics Writing	12	britishcouncil.org cambridgeenglish.org
	Total	**60**	

	Note: Case studies related to the above topics to be discussed (Examined Internal only)

Text book	1.	https://www.poetryfoundation.org/poems/43588/doverbeach
	2.	https://portal.abuad.edu.ng/lecturer/documents/1586771577our_earth_will_not_die.doc
	3.	http://l-adam-mekler.com/chucktwo.pdf
	4.	https://offthewallplays.com/wpontent/uploads/2017/04/1_pdfsam_A-famed-life-full-with-title-page.pdf
	5.	Nation, I. S. P and Jonathan Newton. 2009. *Teaching ESL/EFL Listening and Speaking*. Routledge, New York, United States of America.
	6.	Prabha, Dr. R. Vithya & S. Nithya Devi. 2019. *Sparkle.* (1st Edn.) McGraw - Hill Education, Chennai, India.
Reference Books	1.	Rudzka, Brygida -Ostyn, 2003. Word Power: *Phrasal Verbs and Compounds: A Cognitive Approach,* Mouton de Gruyter, New York, United States of America.
	2.	Swales, John M. & Feak, Christine B. 2012. *Academic Writing for Graduate Students: Essential Tasks and Skills*, University of Michigan Press, Michigan, United States of America.
	3.	Sen, Leena. 2007. *Communication Skills*, Second Edition, Prentice Hall India Learning Private Limited, New Delhi, India.
	4.	O. Greene, John. 2021. *Essentials of Communication Skill and Skill Enhancement: A Primer for Students and Professionals*, Routledge publishers, United Kingdom.

Journal and Magazines	https://academic.oup.com/journals
E-Resources and Website	https://learnenglish.britishcouncil.org/ https://www.cambridgeenglish.org/learning-english/activities-for-learners/

Learning Method	Chalk and Talk/Assignment/Seminar/ Group Discussion/Case Study

Focus of the Course	Skill Development/ Employability

Semester - I
Core: CELL BIOLOGY

Semester	Course Code	Course Name	Category	L	T	P	Credits
I	25BTU1CA	CELL BIOLOGY	CORE	48	12	-	4

Preamble	This course has been designed for students to learn and understand • The basic components and functions of cell organelles • The cell signaling, cycle, progression and its regulation • The pathological progressions of a cell
Prerequisite	Knowledge on Basic of Cell and Cell organelles

Course Outcomes (COs)

CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Define the process of cell architecture and composition	K2
CO2	Paraphrase the membrane organization for nutrient uptake	K2
CO3	Report the mode of transport relating to inter and intracellular mechanisms	K3
CO4	Sketch signaling events within cells	K3
CO5	Illustrate the cell cycle events and pathological progressions documentation, inspection and certification	K3

Mapping with Program Outcomes:

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	
CO5	✓			✓	✓

25BTU1CA	CORE: CELL BIOLOGY

Syllabus

Unit	Content	Hours	E-Contents / Resources
I	History - cell theory – scope – types and shapes - organization of prokaryotic and eukaryotic cell and their differences. Cytoskeleton – microtubules. Nucleus, endoplasmic reticulum (rough and smooth), golgi apparatus, mitochondria, ribosomes, chromosome, chloroplast, lysosome, peroxisome.	13	Text Book
II	Cell membrane - structure and function, transport of nutrients and ions across the membranes. Diversity of plasma membranes (Trilamilar, bimolecular leaflet, lattice, micellar, fluid mosaic model). Desmosomes, plasmodesmata. Cell junctions – adherent, gap and tight junctions.	12	Reference Book
III	Membrane transport types. General classes of transport systems- uniport, symport, antiport. Diffusion- passive and facilitated. Active transport- primary and secondary. The P-type ATPases (Na+K + -ATPase), ion channels (ligand- gated and voltage-gated).	10	Reference Book
IV	Cell Signalling-Intercellular signaling & intracellular signaling- forms of cell signaling-types of receptors-Signalling molecules-Responses to the Signaling Pathway-Termination of Signaling Pathways.	12	Text Book
V	Cell cycle - Mitosis – meiosis and their significance. Cell Ageing – mechanism – theories (Free radical theory and somatic mutation theory). Cell death - necrosis, apoptosis. Difference between necrosis and apoptosis. Mechanism of apoptosis. Characteristics of cancer cell. Tumor cells - Stages of progression.	13	Text Book
	Total	**60**	

Text Book	1.	Rastogi SC, 2015, "Cell Biology", 3rd edition, New Age International Publishers, India
Reference Books	1.	Islam A, 2011, "Text Book of Cell Biology", 2nd edition, Books and Allied (P) Ltd. , India
	2.	De Roberties D, 2020, "Cell and Molecular Biology", 8th edition, Wolters Kluwer _ New Delhi
	3.	Lodish H & Baltimore D, 2016, "Molecular Cell Biology", 8th edition, W.H. Freeman & Company, New York, USA
	4.	Karp G, 2002, "Cell and Molecular Biology", 3rd edition, John Wiley Sons. Inc, USA

Journal and Magazines	Journal of Cell Biology JCB
E-Resources and Website	physiology.org

Learning Methods	Power Point, Chalk and Talk

Focus of the Course	Acquire Knowledge in Basics of Cells and Cell Organelles

Semester - I
Core: MICROBIOLOGY

Semester	Course Code	Course Name	Category	L	T	P	Credits
I	25BTU1CB	MICROBIOLOGY	CORE	48	12	-	3

Preamble	This course has been designed for students to learn and understand • Science of Microbiology and general techniques used • Beneficial and harmful activities of microorganisms to humans • Clinical Applications of microbiology
Prerequisite	Knowledge on Basic Microbiology

Course Outcomes (COs)

CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Understand the fundamentals concepts of microbiology	K1
CO2	Know the basics of media preparation and different sterilization techniques, Distinguish different phases in microbial growth and learn about nutritional classification	K2
CO3	Discuss the structure, reproduction and the causative diseases of bacteria	K3
CO4	Discuss the structure, reproduction and the causative diseases of Virus	K3
CO5	Discuss the structure, reproduction and the causative diseases of fungus	K3

Mapping with Program Outcomes:

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓		✓	
CO2	✓		✓	✓	✓
CO3			✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

25BTU1CB	CORE: MICROBIOLOGY

Syllabus

Unit	Content	Hours	E-Contents / Resources
I	History of Microbiology - Biogenesis Vs Abiogenesis, Contributions of Louis Pasteur, Robert Koch, Edward Jenner, Alexander Fleming. Microscopy – Bright field or Light, Dark Field, Phase contrast, Fluorescence; Electron Microscopy – Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM).	12	Text Book
II	Sterilization- Methods - Physical – Dry Heat, Moist Heat, Cold sterilization and Chemical sterilization. Preparation of Culture Media – types. Growth curve - Determination of Generation Time, Measurement of Growth – Viable count, Turbidometry and Direct Cell count. Nutritional classification of microbes.	12	Text Book
III	Classification (Bergy's manual) - Bacterial Structure, Reproduction of Bacteria. Diseases caused by *Mycobacterium tuberculosis* (Tuberculosis), *Salmonella typhi* (Typhoid), *Vibrio cholera* (Cholera), *Clostridium tetani* (Tetanus) and *Staphylococcus aureus* (Skin Infections), *Corynebacterium diptheriae* (Diptheria).	12	Reference Book
IV	Virus structure, Classification (Baltimore), Reproduction – Generalized and Specialized, Diseases caused by HIV (AIDS), Hepatitis B Virus (Jaundice), Varicella zoster (Chicken Pox), Polio myelitis (Polio), Viral gastroenteritis (stomach flu), Ebola and Corona virus 2019 (COVID-19)	12	Reference Book
V	Fungal structure - classification - reproduction. Diseases caused by *Tinea rubrum* (body ring worm), *Tinea pedis* (athlete's foot), *Candida* species (bronchitis), *Actinomycetes isrelii* (oral infection), *Aspergillus fumigatus* (sinus), Fungal Eye Infections - Keratitis, Endophthalmitis, Yeast infection (Vaginal), Jock itch (*Tinea cruris*).	12	Text Book
	Total	**60**	

Text Book	1.	Atlas M Ronald, 2015, "Principles of Microbiology", 2nd Edition, McGraw- Hill Publication, India.
Reference Books	1.	Pelzar M, 2001, "Microbiology", 5th Edition, McGraw Hill Education (India) Pvt Ltd, India.
	2.	Brij Mohan Meena, 2018, Microbiology, 1st Edition, Paradise Publisher - Jaipur.
	3.	Gerard J T, 2012, "Microbiology: An Introduction", 11th Edition, Benjamin Cummings Publishers, USA.
	4.	Joanne Willey, Kathleen Sandman, Dorothy Wood, 2020, "Prescott's Microbiology", 11th Edition, McGraw Hill Education, New York.

Journal and Magazines	https://link.springer.com/journal/12088
E-Resources and Website	https://vlab.amrita.edu/?sub=3&brch=76

Learning Methods	Chalk and Talk/Assignment/Seminar

Focus of the Course	Skill Development/Employability

Semester – I CORE PRACTICAL -I: CELL BIOLOGY AND MICROBIOLOGY							
Semester	Course Code	Course Name	Category	L	T	P	Credits
II	25BTU1CP	CELL BIOLOGY AND MICROBIOLOGY	CORE		-	48	2

Preamble	This course has been designed for students to learn and understand • Functions of Cells and its types • Methods of Microbial isolation • Various types of staining techniques
Prerequisite	Knowledge of cells and microbes

Course Outcomes (Cos)		
CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Prepare Solutions and Buffers	K2
CO2	Observe various plant parts under microscope.	K2
CO3	Create pure microbial cultures	K2
CO4	Perform different microbial staining and observation.	K2
CO5	Identify Bacterial growth and antibiotic sensitivity.	K2

Mapping with Program Outcomes:					
Cos / POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓			✓
CO2	✓	✓			✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

25BTU1CP	CORE PRACTICAL: CELL BIOLOGY AND MICROBIOLOGY

S.No	List of Programs
1	Calculations of Molarity, Normality and Percentage Solution and Preparation of buffer in different pH - Phosphate, Acetate, Tris buffer.
2	Microscopic observation of Monocot and Dicot Leaf, Root and Stem section.
3	Staining of plant cells - Onion epidermal cells.
4	Staining of starch granules.
5	Mitotic preparation from onion root tip.
6	Enumeration of microorganism from soil by serial dilution method and Pure Culture Techniques.
7	Staining of Bacteria– Simple, Negative and Gram staining.
8	Staining of Fungi.
9	Observation of fungi under stereomicroscope*.
10	Bacterial growth curve by turbidimetry method.
11	Antibiotic sensitivity test - Kirby Bauer Method.
12	Methylene Blue Reduction test.

Texk Books	1.	Becker JM, Caldwell GA and Zachgo A, 2007, "Biotechnology– A laboratory Course", 2nd edition, Academic Press, USA.
	2.	Davey J and Lord M, 2003, "Essential Cell Biology Volume 1: Practical Approach", 1st edition, OUP Oxford, UK.

Learning Method	Demonstration/ Hands on Experiments

Focus of the Course	Skill Development/ Employability

Semester – I IDC I: CHEMISTRY							
Semester	Course Code	Course Name	Category	L	T	P	Credits
I	25CEU1IB	CHEMISTRY	IDC	48	-	-	4

Preamble	This course has been designed for students to learn and understand • The concept of expressing concentration of solutions • The concepts of chemical kinetics and catalysis • About the bonding and basic organic chemistry.
Prerequisite	Knowledge on Basic Chemistry

Course Outcomes (Cos)		
CO Number	**Course Outcomes (COs) Statement**	**Bloom's Taxonomy Knowledge Level**
CO1	Understand the concept of concentration of the solutions.	K2
CO2	Infer the acid and basic properties of solutions.	K2
CO3	Interpret the concept of the bonding in molecules.	K2
CO4	Summarize the basic concepts of the stereo chemistry.	K2
CO5	Explain the Chemical kinetics and catalysis.	K2

Mapping with Program Outcomes:					
Cos / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	✓	✓	✓		✓
CO2	✓		✓	✓	
CO3		✓			✓
CO4			✓	✓	
CO5	✓	✓		✓	✓

25CEU1IB	IDC: CHEMISTRY

Syllabus

Unit	Content	Hrs	Resources
I	**Solutions** Normality, molarity, molality, mole fraction, mole concept. Primary and secondary standards – Preparation of standard solutions. Principle of volumetric analysis (Acid base titrations). Indicators – Theory of indicators - Oswald and quinonoid theory.	10	Text Book
II	**Acids and Bases** Acid base theories – Strength of acids and bases – Equilibrium constant and ionic constant of water - pH, pKa, pKb, Buffer solution, pH and pOH simple calculations.	8	Text Book
III	**Chemical Bonding** Types of bonding - Ionic Bond - Nature of ionic bond - Factors influencing the formation of ionic bond - Covalent and coordinate bond - Molecular Orbital Theory - Configuration of H_2, N_2, O_2, F_2 - Bond order – Diamagnetism and paramagnetism.	10	Text Book
IV	**Stereo Chemistry** Isomerism, Structural isomerism - Symmetry of elements (Plane, Centre and Axis of symmetry), Optical isomerism of lactic acid and tartaric acid, Enantiomers, Diastereomers – Separation of racemic mixture, Geometrical isomerism (maleic and fumaric acid). R/S and E/Z configuration assignments for simple molecules.	10	Text Book
V	**Chemical Kinetics and Catalysis** Rate of reaction, rate law, order, molecularity, first order rate law, half-life period of first order equation, pseudo first order reaction, zero and second order reactions. Catalysis – Homogenous, heterogeneous and enzyme catalysis, Industrial applications of enzyme catalysis.	10	Text Book
	Total	**48**	

Text book	1.	Puri. B.R, Sharma. L.R and Pathania. M.S, 2017, "Principles of Physical Chemistry", Forty seventh Edition, John Wiley and Sons & USA.
	2.	Madhan. R.D, 2016, "Modern Inorganic Chemistry", Tenth edition, Mc Graw Hill Company & USA.
Reference Books	1.	Lee. J.D, 2002, "A New Concise Inorganic Chemistry", Ffifth Edition, ELBS &UK.
	2.	Jain. M.K and Sharma. S.C, 2012, "Modern Organic Chemistry", Vishal publishing Co & New Delhi.

	3.	Puri. B.R, Sharma. L.R and Kalia. K.C, 2016, "Principles of Inorganic Chemistry", Vishal Publishing & Co & New Delhi.
	4.	Glasstone. S and Lewis. D, 2014, "Elements of Physical Chemistry", Second Edition, Macmillan Ltd, London.

Journal and Magazines	https://onlinelibrary.wiley.com/journal/10974601
E-Resources and Website	https://tech.chemistrydocs.com/Books/Organic/Stereochemistry-of-Organic-Compounds-by-D-Nasipuri-Second-Edition.pdf

Learning Method	Chalk and Talk/Assignment/Seminar/ Group Discussion/Case Study

Focus of the Course	Skill Development/ Employability/ Entrepreneurial Development/ Innovations

Semester – I

AECC I: ENVIRONMENTAL STUDIES

Semester	Course Code	Course Name	Category	L	T	p	Credits
I	25MBU1AA	ENVIRONMENTAL STUDIES	AECC	24	-	-	2

Preamble	This course has been designed for students to learn and understand • Multi-disciplinary aspects of Environmental studies • Importance to conserve the biodiversity • Causes of Pollution and its control
Prerequisite	Aware the basics of environmental components

Course Outcomes (Cos)

CO Number	Course Outcomes (Cos) Statement	Bloom's Taxonomy Knowledge Level
CO1	To understand the importance of natural resources in order to conserve for the future	K1
CO2	To impart knowledge on Natural resources and its conservation	K2
CO3	To impart knowledge on Biodiversity and its conservation	K3
CO4	To create awareness on effects, causes and control of air, water, soil and noise pollution etc.,	K4
CO5	To build awareness about sustainable development and Environmental protection	K1

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓	✓	✓

25MBU1AA - AECC: ENVIRONMENTAL STUDIES
Syllabus

Unit	Content	Hours	E-Contents / Resources
I	Introduction to Environmental studies& Ecosystems: components of environment – atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance - Energy flow in an ecosystem: food chain, food web and ecological succession.	5	Text book and Website
II	Natural Resources: Renewable and Non-renewable Resources: Land Resources and land use - Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Conflicts over water (international & inter-state). Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs.	5	Text book and Website
III	Biodiversity and Conservation: Global biodiversity hot spots. India as a mega-biodiversity nation; Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	4	Text book and Website
IV	Environmental Pollution: types, causes, effects and controls; Air, water, soil, chemical and noise pollution. Nuclear hazards and human health risks. Environment Laws: Environment Protection Act; Prevention & Control of Pollution Act – Air & Water. Wildlife Protection Act; Forest Conservation Act; Indigenous knowledge used for sustainable forest use.	5	Text book and Website
V	Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Role of Information Technology in Environment and human health. Role of the Colleges, Teachers and Students in village adoption towards clean, green and make in villages in various aspects.	5	Text book and Website
	Total	**24**	

Text Book	1.	*Carson, R.* 2002. **Silent Spring.** *Houghton Mifflin Harcourt*
	2.	*Gadgil, M., & Guha, R.*1993. **This Fissured Land: An Ecological History of India**. *Univ. of California Press.*
Reference Books	1.	*Gleeson, B. and Low, N. (eds.)* 1999. **Global Ethics and Environment, London, Routledge**.
	2.	*Gleick, P.H.* 1993. **Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security.** *Stockholm Env. Institute, Oxford Univ. Press.*
	3.	*Groom, Martha J. Gary K. Meffe, and Carl Ronald carroll.* 2006, **Principles of Conservation Biology**. *Sunderland: Sinauer Associates.*
	4.	*Grumbine, R. Edward, and Pandit, M.K.* 2013. **Threats from India's Himalaya dams. Science,** *339: 36-37.*

Journal and Magazines	https://www.hzu.edu.in/bed/E%20V%20S.pdf
E-Resource and Websites	https://www.ugc.gov.in/oldpdf/modelcurriculum/env.pdf

Learning Methods	Chalk and Talk/ Seminar/ Assignment

Focus of the Course	Skill Development/Employability/Social Awareness and Environment