1.3.1 Sample Syllabus Enshrined in National Education Policy – 2020 and Sustainable Development Goals into the Curriculum

IMPLEMENTATION OF OBE UNDER NEP 2020- SAMPLE

EVALUATION OF ATTAINMENT OF OUTCOMES

COs attainment: Attainment of course outcomes for each course is calculated through different components included in Continuous Internal Assessments and End semester examination.

Bench marks and Criteria for the attainment of COs:

To meet the expected level of attainment a student must score more than 50% of the marks to assess the attainment of COs. The threshold limit can be fixed based on the level of students.
Attainment level 1: If at least 60% of the students met the expected level of attainment.
Attainment level 2: If at least 70% of the students met the expected level of attainment.
Attainment level 3: If at least 80% of the students met the expected level of attainment.

Attainment process:

Step 1: The faculty should fix a question paper pattern (blue print) of the type of questions that would be asked, the different cognitive levels it would address and the course outcome that the student would attain. The pattern and question paper prepared by respective faculty should be verified by the HoDs. A sample format is given below:

B.Sc. (Name of the program)
Semester (Mention the semester)
Major Core xxx – (Mention the course)
Course Code: xxxx
Assessment summary for End Semester Examination

Course Outcome	Cognitive Level	End Semester examination of questions and marks Based on K level and CO
CO 1	Remember	3 (3)
CO 2	Understand	8 (41)
CO 3	Apply	3 (3)
CO 4	Analyse	5 (15)
CO 5	Evaluate	1 (8)
Total		20 (70)

QUESTION PAPER – Blue print

PART	Q.No.	COGNITIVE LEVEL (CL) with No. of question and Marks						Total marks
		K1 – R	K2 – U	K3 – AP	K4- AN	K5 – E	K6 - C	
Part A 10 x 1 = 10 marks	1.	1 (1)						1
	2.			1 (1)				1
	3.	1 (1)						1
	4.				1 (1)			1
	5.				1 (1)			1
	6.	1 (1)						1
	7.			1 (1)				1
	8.				1 (1)			1
	9.		1 (1)					1
	10.			1 (1)				1
Part B 5 x 4 = 20 marks	11.a		1 (4)					4
	11.b							
	12.a		1 (4)					4
	12.b							
	13.a		1 (4)					4
	13.b							
	14.a				1 (4)			4
	14.b							
	15.a		1 (4)					4
	15.b							
Part C 5 x 8 = 40 marks	16.a		1 (8)					8
	16.b							
	17.a		1 (8)					8
	17.b							
	18.a				1 (8)			8
	18.b							
	19.a					1 (8)		8
	19.b							
	20.a		1 (8)					8
	20.b							
No. of CL based Questions with marks		3 (3)	8 (41)	3 (3)	5 (15)	1 (8)		70
No. of CO based Questions with marks		CO 1 3 (3)	CO 2 8 (41)	CO 3 3 (3)	CO 4 5 (15)	CO 5 1 (8)		70
Total		**3**	**41**	**3**	**15**	**8**		70

The question paper is prepared based on the above blue print.

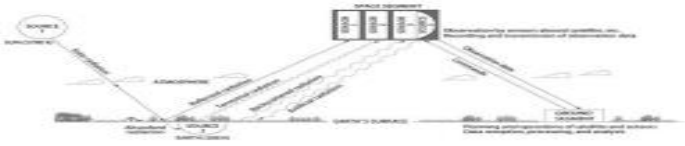
Sample question paper format:

HOLY CROSS COLLEGE (AUTONOMOUS)
Accredited with 'A+' Grade (CGPA 3.35 - IV Cycle) by NAAC
Nagercoil – 629 004
Kanyakumari District, Tamilnadu.

B.Sc. Zoology
Semester V
Major Core VII – Ecology and Toxicology
Course Code: ZC2053
Question Paper

Time: 3 hrs. **Max. marks: 70**

Q. No.	Questions	K Level	Course Outcome Level
	Part A (10 x 1 = 10 marks)		
	Answer all the questions		
1.	Study of the relationship of a group of organisms which are associated together as a unit in relation to its environment is --------- a. Autoecology b. Synecology c. Terrestrial ecology d. Population	R	CO-1
2.	The morphological changes that occur in daphnia as a result of change in temperature is called ---------- a. Cyclomorphosis b. Regeneration c) Rensch's rule d) Menkin's rule	Ap	CO-3
3.	The ratio between birth rate and death rate is ---------- a) Mortality b) Natality c) Vital index d) Growth rate	R	CO-1

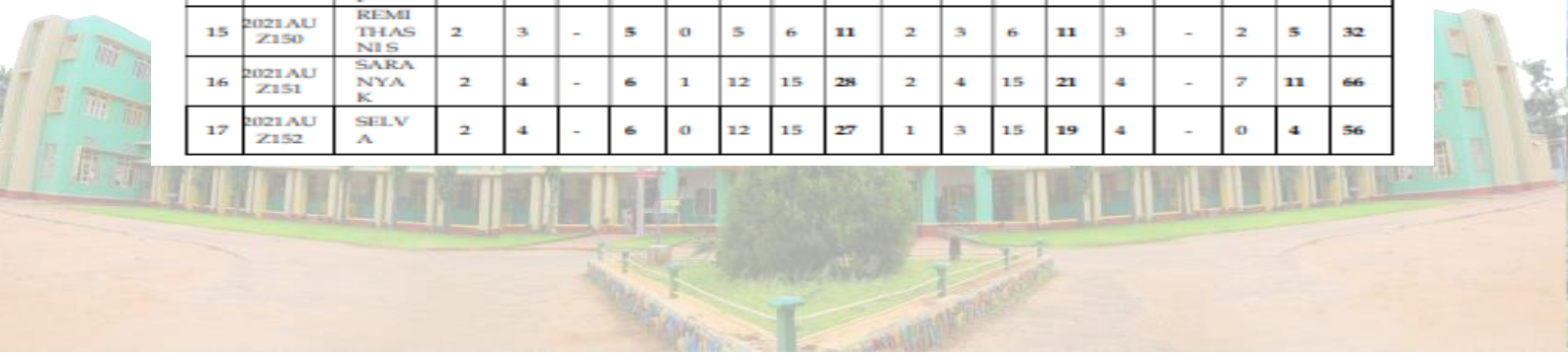
4.	Identify the diagram. 	An	CO-4
5.	Match the following and choose the correct answer 1. Effect of an abrupt transition between two communities 2. Region of transition between two communities. 3. A position occupied by a species in a community 4. A distinct species occupying a particular habitat. A B C D a) 1 2 3 4 b) 4 3 2 1 c) 2 1 4 3 d) 3 2 4 1	R	CO-1
6.	What does this image indicate? Give a one-word answer. 	An	CO-3
7.	Match the following and choose the correct answer. A. Systemic effect 1. Site of contact B. Immediate effect 2. Permanent C. Irreversible effect 3. 24 hrs. D. Local effect 4. Body system A B C D a) 1 3 2 4 b) 4 3 2 1 c) 2 3 4 1 d) 3 2 4 1	Ap	CO-3
8.	**Assertion(A):** Knock knee syndrome is caused by fluoride. **Reason(B):** Soil, water and air contain fluorine as fluoride. a. Statement 'A' and Statement 'B' are correct. b. Statement 'A 'and 'B' are wrong. c. Statement 'A' is correct and Statement 'B' wrong. d. Statement 'A' is wrong and Statement 'B' correct.	An	CO-4
9.	What is the cause of red tide? a) Algal bloom b) Aflatoxin c) Acid rain. d) Eutrophication	U	CO-2
10.	The G20 environment meeting was held on 28th July 2023 in Chennai. What was the main area discussed? Answer in one sentence.	Ap	CO-4
	Part B (5 x 4 = 20 marks)		
11.	a. Discuss the different branches of ecology. (OR) . Explain mutualism and commensalism as an interspecific relationship.	U	CO-2
12.	a. Explain population growth and regulation. (OR) b. Explain nitrogen cycle and its role in the environment.	U	CO-2
13.	a. Explain the structure of a community. (OR) b. Enumerate the types of animal distribution.	U	CO-2
14.	a. Differentiate toxicokinetics and toxicodynamics. (OR) b. Distinguish between; i. LC_{50} and LD_{50} ii. *in vivo* and *ex vivo* toxic experiments	An	CO-4
15.	a. Explain Bhopal episode and Chernobyl disaster. (OR) Compare bioaccumulation, biomagnification and biotransformation.	U	CO-2

Part C (5 x 8 = 40 marks)			
16.	a. Discuss the biological effects of temperature. (OR) b. Summarize the adaptations of desert living animals.	U	CO-2
17.	a. Explain the structure of an ecosystem. (OR) b. Discuss population growth and regulation.	U	CO-2
18.	a. Analyse the concept of climax and pattern of succession. (OR) Appraise the applications of remote sensing in agriculture, food and fisheries management.	An	CO-4
19.	Assess the toxic effects of heavy metals and radiations to living organisms. (OR) Evaluate the effect of toxicants on hematological and biochemical parameters of fish.	E	CO-5
20.	a. Explain the types of pollutants and its effect on the environment. (OR) b. Explain the different methods of Waste water treatment.	U	CO-2

Step 2: Considering the percentage of marks (related to each COs) asked in Internal test and end semester examination, the average weightage percent of each CO was calculated as an average of internal test/external exams for further calculation of direct attainment.

EXAMINATION – Sample

EXTERNAL																			
			CO 1 (6)				CO 2 (29)				CO 3 (22)				CO 4 (13)				70
S. NO	Register Number	Name of the student	Part-A	Part-B	Part-C	CO1 Total	Part-A	Part-B	Part-C	CO2 Total	Part-A	Part-B	Part-C	CO3 Total	Part-A	Part-B	Part-C	CO4 Total	Grand Total
1	2021AUZ092	VINNARASI A	2	4	-	6	1	8	13	22	2	3	14	19	2	-	0	2	49
2	2021AUZ133	AADHARSHA G K	0	4	-	4	1	8	14	23	2	2	14	18	1	-	4	5	50
3	2021AUZ134	ABI ESTHER R	2	4	-	6	0	9	14	23	2	4	13	19	4	-	7	11	59
4	2021AUZ135	ABINAYA SREE S	2	4	-	6	1	6	14	21	2	3	11	16	4	-	2	6	49
5	2021AUZ136	ABISHA I	2	4	-	6	1	4	11	16	2	2	12	16	4	-	2	6	44
6	2021AUZ138	ANTO MONISHA S	2	4	-	6	1	5	13	19	2	3	14	17	4	-	6	10	54
7	2021AUZ139	ANU FLOWERCY A	2	4	-	6	1	7	14	22	1	4	14	19	4	-	7	11	58
8	2021AUZ140	ANUSHA K	0	0	-	0	0	2	0	2	0	0	3	3	1	-	0	1	7
9	2021AUZ141	DEENU F	2	2	-	4	1	6	13	20	2	2	10	14	3	-	1	4	42
10	2021AUZ142	DHARSHINI N	2	4	-	6	0	10	15	25	0	4	16	20	2	-	4	6	58
11	2021AUZ144	KARUNYA R	1	4	-	5	1	7	15	23	2	0	7	9	3	-	8	11	40
12	2021AUZ145	KENISH MITHIYAL J	1	3	-	4	1	7	11	19	0	2	12	14	1	-	4	5	42
13	2021AUZ146	MATHIJA M	1	4	-	5	1	11	8	20	2	0	11	13	2	-	4	6	48
14	2021AUZ147	NISOLIN RAJEE I	2	4	-	6	0	9	15	24	2	4	14	20	3	-	8	11	61
15	2021AUZ150	REMI THASNI S	2	3	-	5	0	5	6	11	2	3	6	11	3	-	2	5	32
16	2021AUZ151	SARANYA K	2	4	-	6	1	12	15	28	2	4	15	21	4	-	7	11	66
17	2021AUZ152	SELVA	2	4	-	6	0	12	15	27	1	3	15	19	4	-	0	4	56



		LEKSHMI S																	
18	2021AUZ153	SHAFNA SHERIN M	2	3	-	5	1	6	5	12	2	2	10	14	4	-	2	6	37
19	2021AUZ154	UBAS ANA J	2	4	-	6	0	12	15	27	2	4	14	20	4	-	6	10	63
20	2021AUZ155	VARSHINI J	2	4	-	6	1	5	14	20	1	3	15	19	3	-	2	5	50
21	2021AUZ407	AKISHA MOL S	1	2	-	3	1	10	8	19	2	4	6	12	3	-	0	3	37
22	2021AUZ408	SOWMIYA T	2	2	-	4	1	7	13	21	2	3	10	15	3	-	7	10	47
23	2021AUZ443	ABISHA R	2	3	-	5	1	3	14	18	2	4	11	17	3	-	3	6	46
24	2021AUZ449	BERCLIN S	2	4	-	6	1	12	13	26	2	4	14	20	4	-	8	12	64
25	2021AUZ450	PRADISHA S	2	3	-	5	1	4	14	19	2	4	16	22	3	-	0	3	49
26	2021AUZ451	SAHAYA MINI A	2	4	-	6	1	8	14	23	2	4	13	19	3	-	2	5	53
Percentage of students scoring more than the target						**96**				**89**				**92**				**54**	**92**
Level						**3**				**3**				**3**				**2**	**3**

Measuring Course Outcomes attained through External Examinations: Target
Attainment level 1: 50% students scoring 50% and more marks
Attainment level 2: 60% students scoring 50% and more marks
Attainment level 3: 70% students scoring 50% and more marks
Measuring Course Outcomes attained through Internal Tests:
Attainment level 1: 50% students scoring 50% and more marks
Attainment level 2: 60% students scoring 50% and more marks
Attainment level 3: 70% students scoring 50% and more marks

DIRECT CO ATTAINMENT -INTERNAL AND EXTERNAL -sample

CO	Assessment through continuous internal assessment test (Average) %	Assessment through End Semester Examination %
CO1	50	96
CO2	92	89
CO3	75	92
CO4	73.5	54

The course outcomes for all the courses are calculated in terms of percentage using the formula.

$$CO\ x\ in\ \% = \frac{\text{Marks obtained by the students in COx}}{\text{Maximum marks allotted in COx}} X100$$

Where, x= [1 to N], N= Number of COs.

Each course outcome is calculated for all the students based on marks obtained by the students.

$$CO\ x\ Attainment\ in\ \% = \frac{\text{No.of Students scored more than or equal to 50\% of Marks in COx}}{\text{No of Students}} X100$$

Where, x= [1 to N], N= Number of Course Outcome

Course Outcome	Assessment Tool	Percentage of students scoring more than the target	Attainment level	Attainment of Course Outcome
CO1	Internal Test (40%)	50	1	(0.4x1) + (0.6x3) = 2.2
	End Semester Examination (60%)	96	3	
CO2	Internal Test (40%)	92	3	(0.4x3) + (0.6x3) = 3
	End Semester Examination (60%)	89	3	
CO3	Internal Test (40%)	75	3	(0.4x3) + (0.6x3) = 3

	End Semester Examination (60%)	92	3	
CO4	Internal Test (40%)	74	3	(0.4x3) + (0.6x1) = 1.8
	End Semester Examination (60%)	54	1	

Formula : Direct Attainment = 0.4 x Internal Test Average +0.6 x End Semester Examination average

CO ATTAINMENT LEVEL

Attainment level 1: 50% students scoring 50% and more marks
Attainment level 2: 60% students scoring 50% and more marks
Attainment level 3: 70% students scoring 50% and more marks

Indirect attainment

Course exit survey (Sample)

Course exit survey can be conducted on the defined COs or related to course outcomes of that course.

Questionnaire for students on Course Exit Survey

Program :
Semester :
Course title :
Course code :
Name :
Register Number :

CO	I am able to	Strongly agree 100	Agree 75	Neutral 50	Disagree 25	Strongly disagree 0
CO - 1	define abiotic, biotic and limiting factors, community structure, ecological succession, wild life conservation and toxicants.					
CO - 2	comprehend the physical and chemical properties of environment, biological effects, biogeochemical cycles, wild life conservation, environmental pollution and toxicology.					
CO - 3	identify the biotic factors, characteristics of communities, endangered species and causes for environmental problems.					
CO - 4	assess the structure and function of ecosystem, community, habitat for sustainable management of environmental system and for the remediation.					
CO - 5	evaluate the impact of environment changes on the biosphere.					

Indirect Method of CO Assessment: (Survey Based) - Weightage: (20%)

Course Outcomes	Number of Student response Rating					Total response	Attainment %	Attainment grade
	100	75	50	25	0			
CO1	15	10	3	-	-	28	15x100+10x75+3x50/28=86	86/100x3=2.57
CO2								
CO3								
CO4								
CO5								

100- Strongly agree, 75-Agree , 50 – Neutral, 25- Disagree, 0 -Strongly disagree

CO ATTAINMENT TEMPLATE

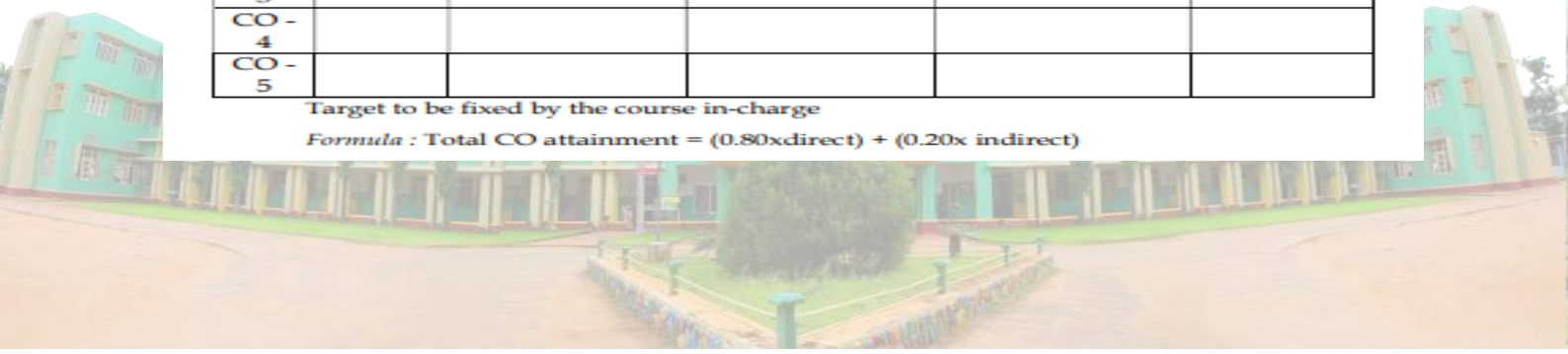
Course Outcomes	Direct Attainment	Indirect attainment
CO1	2.2	2.57
CO2		
CO3		
CO4		
CO5		

CO ATTAINMENT AND ATTAINMENT GAP TEMPLATE

CO	Target	Direct attainment	Indirect attainment	Total CO attainment	Gap (Target-Total)
CO - 1	2	2.2	2.57	2.27	+0.27
CO - 2					
CO - 3					
CO - 4					
CO - 5					

Target to be fixed by the course in-charge

Formula : Total CO attainment = (0.80xdirect) + (0.20x indirect)



POs AND PSOs ATTAINMENT

Step 1: The course outcomes for all courses were mapped with defined POs and PSOs with correlation levels -, 1, 2, and 3. The correlation levels were defined as: No correlation – Correlation level "-", Low - Correlation level 1 Moderate - Correlation level 2 , High - Correlation level 3. Attainment of each COs for all courses was calculated as described above.

Step 2: Attainment values of respective COs were mapped against their correlated POs and PSOs. Average values for each PO/PSO were considered as final attainment for the respective course. Similarly, attainment values of COs with each correlated POs and PSOs have been calculated for all courses.

Mapping with Programme Outcomes: sample

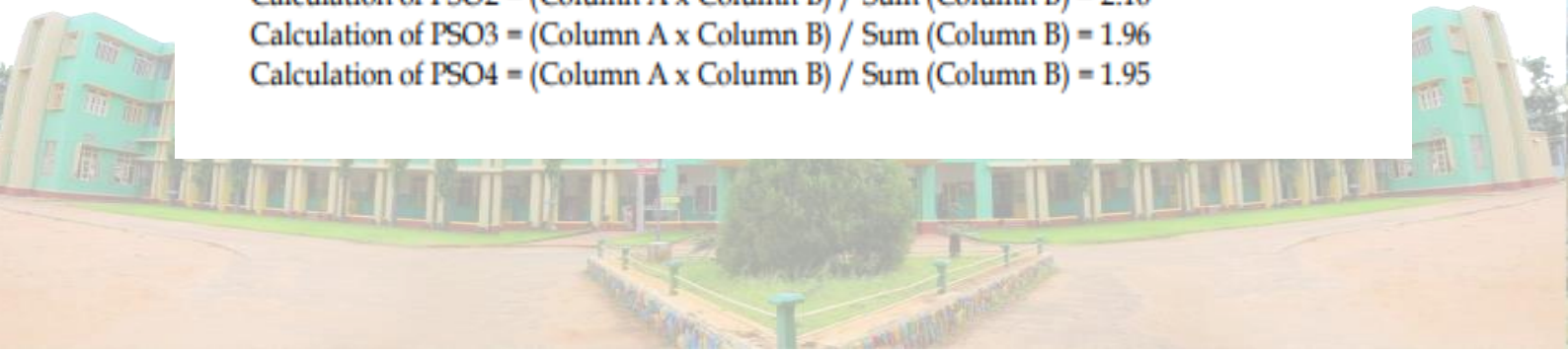
Course outcome attainment COs (A)		B									
		PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
CO1	2.2	3	1	3	2	2	1	3	3	3	3
CO 2	3	3	3	3	2	3	2	3	3	2	2
CO 3	3	3	2	3	2	2	2	2	3	3	1
CO 4	1.8	3	2	3	2	3	2	3	3	3	3
CO 5	0.8	3	2	3	2	3	3	3	3	3	3
Total	10.8	15	10	15	10	13	10	14	15	14	12
Average	1.8	3	2	3	2	2.6	2	2.8	3	2.8	2.6

CO-PO attainment

Calculation of PO1 = (Column A x Column B) / Sum (Column B) = 2.16
Calculation of PO2 = (Column A x Column B) / Sum (Column B) = 2.24
Calculation of PO3 = (Column A x Column B) / Sum (Column B) = 2.16
Calculation of PO4 = (Column A x Column B) / Sum (Column B) = 2.16
Calculation of PO5 = (Column A x Column B) / Sum (Column B) = 2.09
Calculation of PO6 = (Column A x Column B) / Sum (Column B) = 2.08

CO-PSO attainment

Calculation of PSO1 = (Column A x Column B) / Sum (Column B) = 2.1
Calculation of PSO2 = (Column A x Column B) / Sum (Column B) = 2.16
Calculation of PSO3 = (Column A x Column B) / Sum (Column B) = 1.96
Calculation of PSO4 = (Column A x Column B) / Sum (Column B) = 1.95



Indirect assessment was based on various surveys for POs and PSOs attainments like Graduate Exit Survey, Alumni Survey, and parent's feedback and taking their average.

Indirect attainment

Graduate exit survey

Kindly rate the following criteria on a scale of 1-5.

S.No	Questions	PO	Criteria Rating				
			Excellent	Very Good	Good	Average	Poor
1	How will you rate your ability to utilize scientific knowledge to pursue higher studies in the relevant field ?	1					
2	What is the level of competency you have developed to create innovative ideas and enhance entrepreneurial skills for economic independence?	4					
3	How far the skills that you have learnt were helpful to face challenging competitive examinations that offer rewarding careers?	2					
4	Leadership qualities gained because of the initiatives taken by the college and the respective departments to reflect upon green initiatives and take responsible steps to build a sustainable environment.	3					
5	Capability to handle ethical issues with social responsibility	5					
6	Confidence to communicate effectively and collaborate successfully with peers to become competent professionals.	6					

5. Excellent 4. Very Good 3. Good 2. Average 1. Poor

Alumni Survey Form

Kindly rate the following criteria on a scale of 1-5.

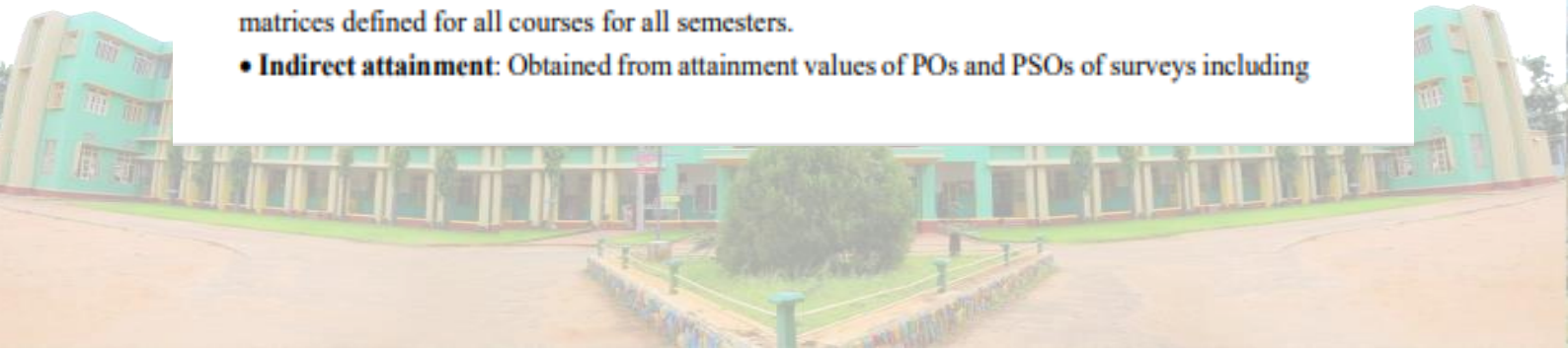
5.Excellent 4. Very Good 3. Good 2.Average 1.Poor (Criteria Rating)

Overall Rating for attainment of your PEOs & POs.

1. The curriculum has supported the higher education/ employability/ entrepreneurship need.
2. Benefit from value added and certificate courses seminars /conferences /workshops and internship conducted during your course.
3. Communication and presentation skills and leadership qualities obtained from the co-curricular and extracurricular activities has enriched the career.
4. Competence to function as a team and to show professional efficiency in your job.
5. Extent of Ethical, social and environmental values inculcated, helping you to relate issues with societal needs.

Step 3: Final Attainment of POs and PSOs:

- **Direct attainment**: Obtained by taking averages of all CO-PO and CO-PSO attainment matrices defined for all courses for all semesters.
- **Indirect attainment**: Obtained from attainment values of POs and PSOs of surveys including



Graduate exit, Alumni, and Parents feedback. Final attainments were calculated by considering 80% of direct assessment & 20% of the indirect assessment.

PROGRAM LEVEL PO & PSO DIRECT ATTAINMENT:

The PO and PSO attainment for Program is calculated using the following formula.

$$\text{POm Direct Attainment} = \frac{\sum_{i=1}^{x} \text{POm Attainment of course}(i)}{x}$$

Where, m = Program Outcomes varies from 1 to 12
X =Number of Courses mapped with POm

$$\text{PSOm Direct Attainment} = \frac{\sum_{i=1}^{x} \text{PSOm Attainment of course}(i)}{x}$$

Where, m = Program Specific Outcomes varies from 1 to 4
X = Number of Courses mapped with PSOm

PO- DIRECT AND INDIRECT ATTAINMENT –Template

PO	Direct attainment (Based on CO-PO attainment)	Indirect attainment (Based on exit survey)	Total PO attainment
PO - 1			
PO - 2			
PO - 3			
PO - 4			
PO - 5			

Total PO attainment: (0.80 x direct) + (0.20 x indirect)

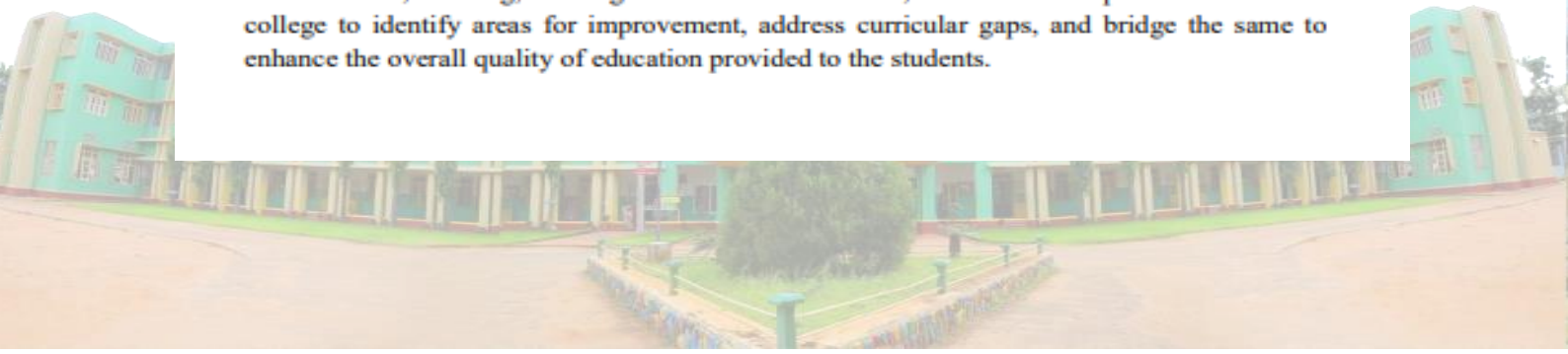
ACTION TAKEN

Levels of achievement are set by the OBE committee in discussion with the experts based on last three year's results. These levels will be reviewed and will be updated each year by incorporating the previous year's result.

OBE attainment results will be analyzed department wise and necessary actions will be taken to improve the level of attainment if it is low or no attainment. In addition, each department will pursue initiatives to improve the quality of teaching and syllabus to increase the target value.

CONCLUSION

Student progress mapping helps teachers identify the academic strength and weakness and assess the outcome attainment of each student. OBE attainment is reviewed department wise and remedial measures are taken when the attainment value is less than the target value in terms of curriculum, teaching, learning and evaluation. Overall, this assessment process enables the college to identify areas for improvement, address curricular gaps, and bridge the same to enhance the overall quality of education provided to the students.



Enhancing Skills with SECs- NEP 2020

Course Structure

Distribution of Hours and Credits

Curricular Courses

Course	S I	S II	S III	S IV	S V	S VI	Total	
							Hours	Credits
Part I –Language	6 (3)	6 (3)	6 (3)	6 (3)	-	-	24	12
Part II-English	6 (3)	6 (3)	6 (3)	6 (3)	-	-	24	12
Part-III								
Core Course Core Project	4 (4) 4 (4)	4 (4) 4 (4)	4 (4) 4 (4)	4 (4) 4 (4)	5 (4)+ 5 (4)+ 5 (4)+ 5 (4)	6(5)+ 6(4)+ 6(4)	70	61
Elective /Discipline Specific Elective Courses	6 (5)	6 (5)	6 (5)	6 (5)	4(3) 4 (3)	5(3) 5(3)	42	32
Part IV								
Non-major Elective	2 (2)	2 (2)	-	-	-	-	4	4
Skill Enhancement Course	-	2 (2)	1 (1) 2 (2)	1 (1) 2 (2)	-		8	8
Foundation Course	2(2)	-	-	-	-	-	2	2
Value Education	-	-	-	-	2 (2)	-	2	2
Summer Internship /Industrial Training	-	-	-	-	(2)	-	-	2
Environmental Studies	-	-	1	1 (2)	-	-	2	2
Extension activity	-	-	-	-	-	(1)	-	1
Professional Competency Skill						2 (2)	2	2
Total	**30 (23)**	**30 (23)**	**30 (22)**	**30 (24)**	**30 (26)**	**30 (22)**	**180**	**140**

Co-curricular Courses

Course	S I	S II	S III	S IV	S V	S VI	Total
LST (Life Skill Training)	-	(1)	-	(1)			2
Skill Development Training (Certificate Course)	(1)						1
Field Project		(1)					1
Specific Value-added Course	(1)		(1)				2
Generic Value-added Course				(1)		(1)	2
MOOC		(1)		(1)		(1)	3
Student Training Activity: Clubs & Committees / NSS				(1)			1
Community Engagement Activity: RUN				(1)			1
Human Rights Education					(1)		1
Gender Equity Studies						(1)	1
Total							**15**

Total number of Compulsory Credits =Academic credits +Non-academic credits: 140 + 15

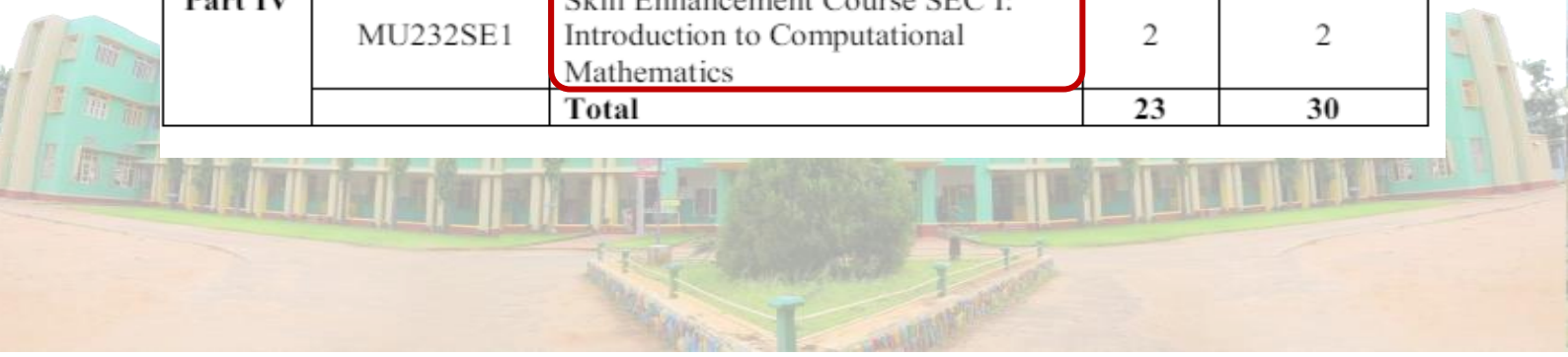
Courses Offered

Semester I

Course	Course Code	Title of the Course	Credits	Hours/Week
Part I	TU231TL1 FU231FL1	Language: Tamil French	3	6
Part II	EU231EL1	English	3	6
Part III	MU231CC1	Core Course I: Algebra & Trigonometry	4	4
	MU231CC2	Core Course II: Differential Calculus	4	4
	MU231EC1	Elective Course I: Allied Mathematics I- Algebra and Differential Equations	5	6
Part IV	MU231NM1	Non Major Elective NME I: Mathematics For Competitive Examinations- I	2	2
	MU231FC1	Foundation Course: Bridge Mathematics	2	2
		Total	**23**	**30**

Semester II

Course	Course Code	Title of the Course	Credits	Hours/Week
Part I	TU232TL1 FU232FL1	Language: Tamil French	3	6
Part II	EU232EL1	English	3	6
Part III	MU232CC1	Core Course III: Coordinate and Spatial Geometry	4	4
	MU232CC2	Core Course IV: Integral Calculus	4	4
	MU232EC1	Elective Course II: Vector Calculus and Fourier Series	5	6
Part IV	MU232NM1	Non-major Elective NME II: Mathematics for Competitive Examinations- II	2	2
	MU232SE1	Skill Enhancement Course SEC I: Introduction to Computational Mathematics	2	2
		Total	**23**	**30**



Co-curricular Courses

Part	Semester	Code	Title of the Course	Credit
Part V	I & II	UG232LC1	Life Skill Training I: Catechism	1
		UG232LM1	Life Skill Training I: Moral	
	I	UG231C01 UG231C--	Skill Development Training (SDT) Certificate Course	1
	II	MU232FP1	Field Project	1
	I & III	MU231V01- MU231V--/ MU233V01 – MU233V--	Specific Value-added Course	1+1
	II, IV& VI	-	MOOC	1+1+1
	III & IV	UG234LC1	Life Skill Training II: Catechism	1
		UG234LM1	Life Skill Training II: Moral	
	IV & VI	UG234V01- UG234V--/ UG236V01-	Generic Value-added Course	1 +1
		UG236V--		
	I - IV	UG234ST1	Student Training Activity – Clubs & Committees / NSS	1
	IV	UG234CE1	Community Engagement Activity - RUN	1
	V	UG235HR1	Human Rights Education	1
	VI	UG236GS1	Gender Equity Studies	1
			Total	**15**

Specific Value-added Course

S. No.	Course code	Title of the course	Total hours
I	MU231V01	Web Designing using HTML	30

c) Skill Enhancement Course (SEC) - Computer Literacy

Internal Components

Component	Marks
Objective type questions (30x1)	30
Exercise (Book) compulsory (2x10)	20
Total	**50**

External Components

Component	Marks
Exercise 1	20
Exercise 2	10
Procedures for both Exercises	20
Total	**50**

d) Skill Enhancement Course (SEC) - Meditation and Exercise

Internal Components

Component	Marks
Objective type questions (20x1)	20
Exercise (2x10)	20
Assignment	10
Total	**50**

External Components

Component	Marks
Quiz	20
Written test : Open choice –10 out of 15 questions (10x3)	30
Total	**50**

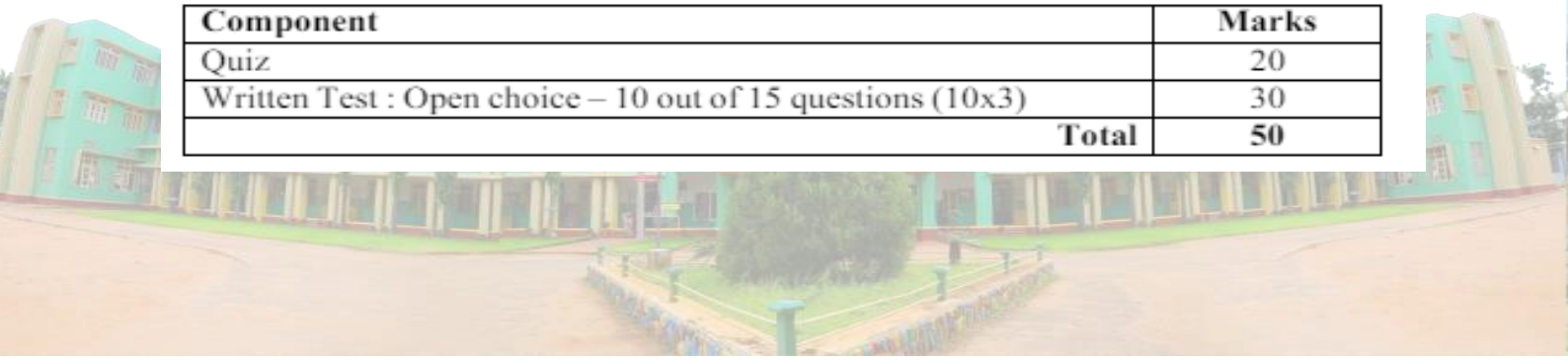
e) Ability Enhancement Course (AEC) - Environmental Studies

Internal Component

Component	Marks
Project Report	30
Viva voce	20
Total	**50**

External Component

Component	Marks
Quiz	20
Written Test : Open choice – 10 out of 15 questions (10x3)	30
Total	**50**



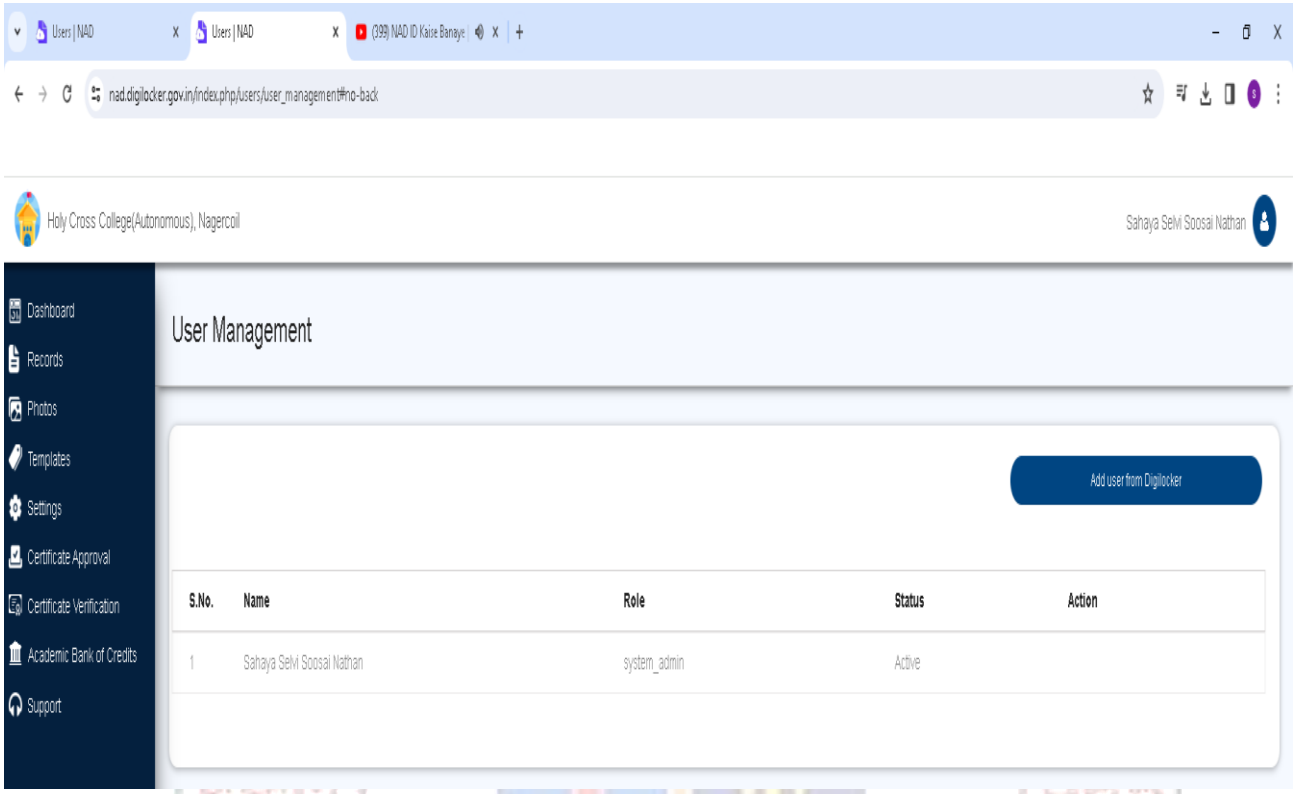
Promoting Well-being with Yoga and Meditation, NEP 2020

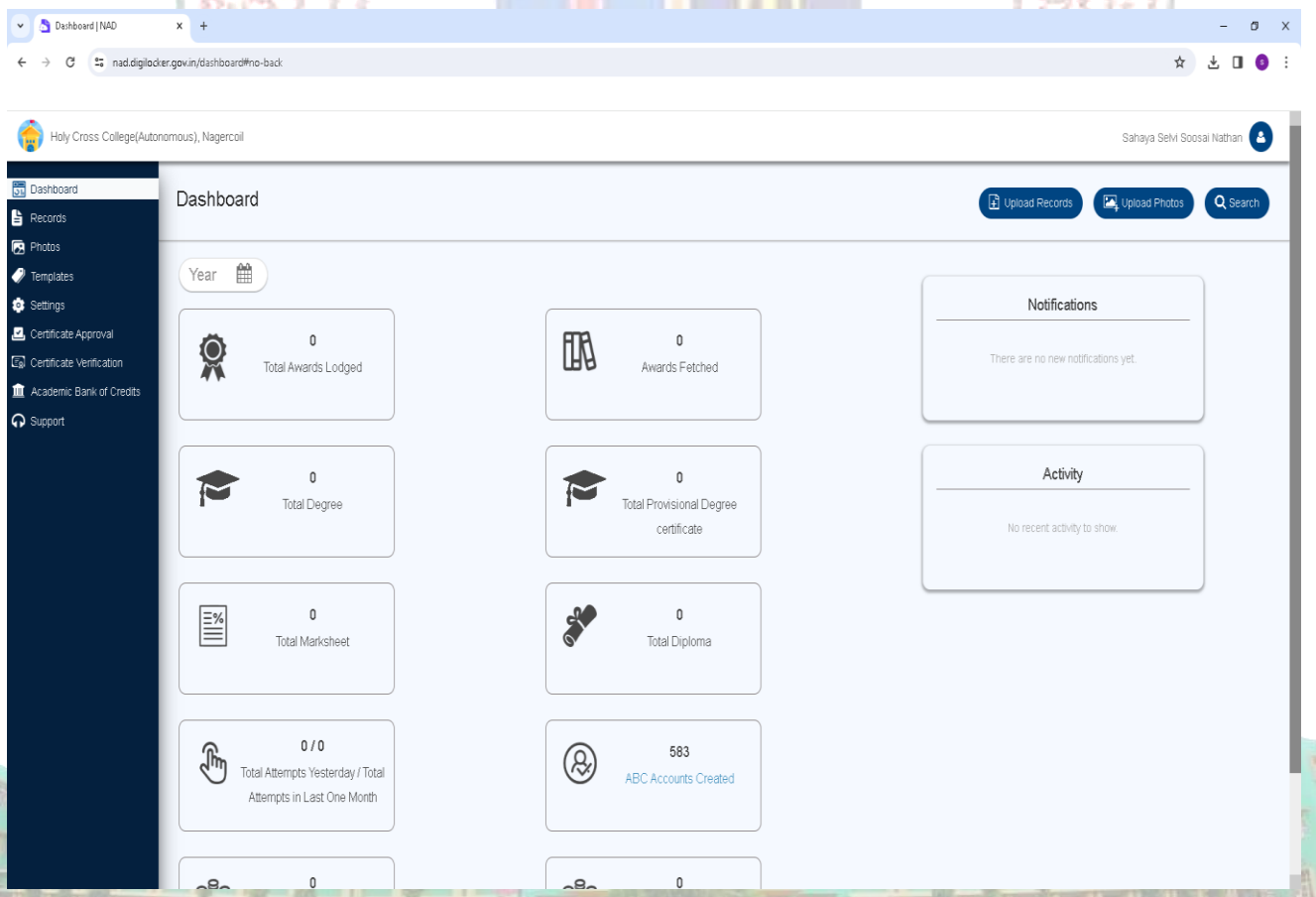
Courses offered for B.Sc Chemistry programme

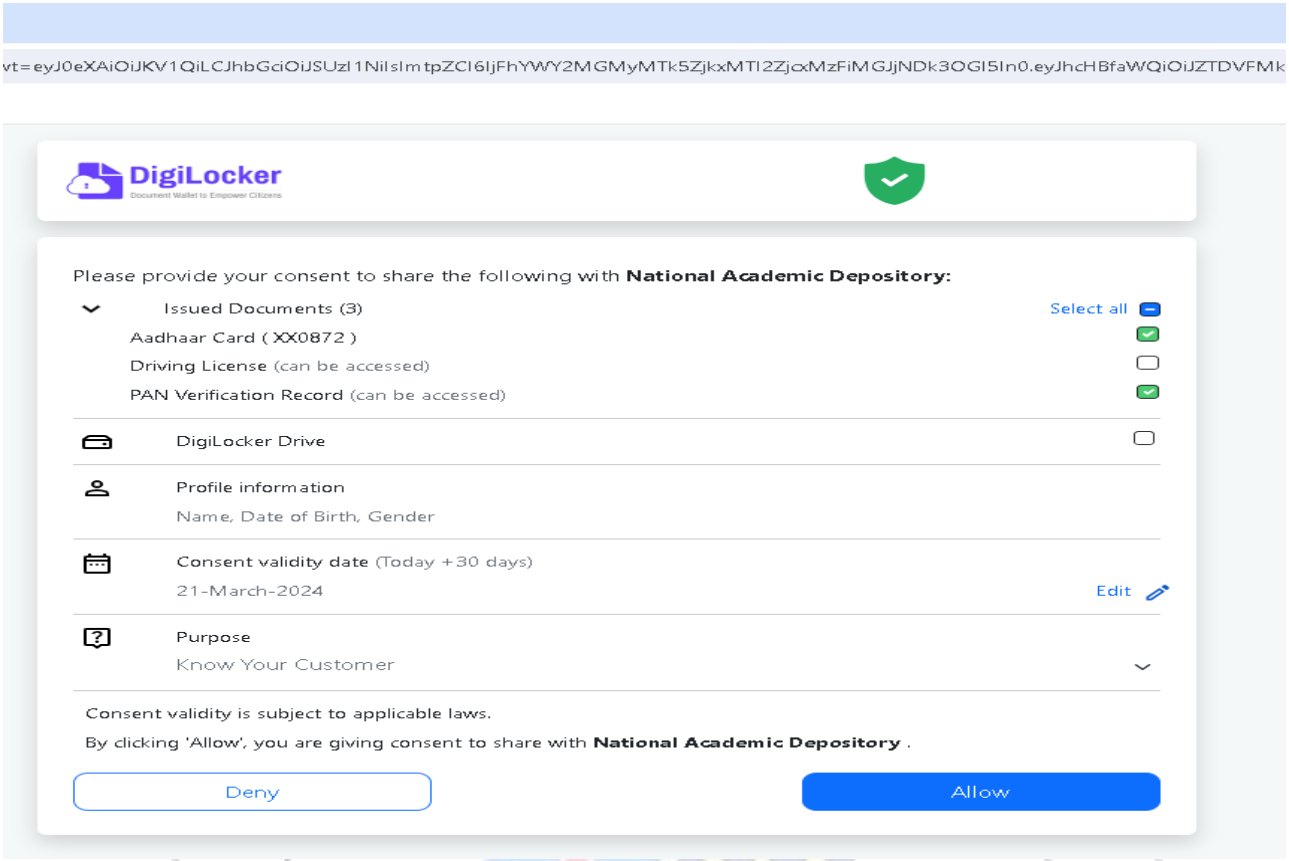
Semester	Course	Course code	Title of the course	Hours /week	Credits
I	Part I	TL2011/ FL2011	Language	6	4
	Part II	GE2011	General English	6	4
	Part III	CC2011	Major Core I : General Chemistry - I	4	4
		CC20P1	Major Practical I : Volumetric Analysis and Inorganic Preparation	2	-
		CA2011	Allied I Theory: Chemistry for Life Sciences	4	3
		CA20P1	Allied I Practical :Volumetric and Organic Analysis	2	-
	Part IV	APS201	Add on course I : Professional English for Physical Sciences-I	2	2
		CNM201	Non Major Elective (NME) :Applied Chemistry - I	2	2
		SEC201/ SEC202	Meditation and Exercise/ Computer Literacy	2	2
	Part V	FCV201	Foundation course I : Values for Life	-	-
		STP201	STP - Clubs & Committees / NSS	-	-
II	Part I	TL2021/ FL2021	Language	6	4
	Part II	GE2021	General English	6	4
	Part III	CC2021	Major Core II : General Chemistry - II	4	4
		CC20P1	Major Practical I : Volumetric Analysis and Inorganic Complex Preparation	2	2
		CA2021	Allied I Theory: Chemistry of Biomolecules	4	3
		CA20P1	Allied I Practical : Volumetric and Organic Analysis	2	2
	Part IV	APS202	Add on course II : Professional English for Physical Sciences-II	2	2
		CNM202	Non Major Elective (NME) :Applied Chemistry - II	2	2
		SEC201/ SEC202	Meditation and Exercise / Computer Literacy	2	2
	Part V	FCV201	Foundation course I : Values for Life	-	1
		SLP201	Service Learning Programme (SLP) : Community Engagement Course	-	-
		STP201	STP : Clubs & Committees / NSS	-	-

Securing Academic Records Digitally with NAD, NEP 2020

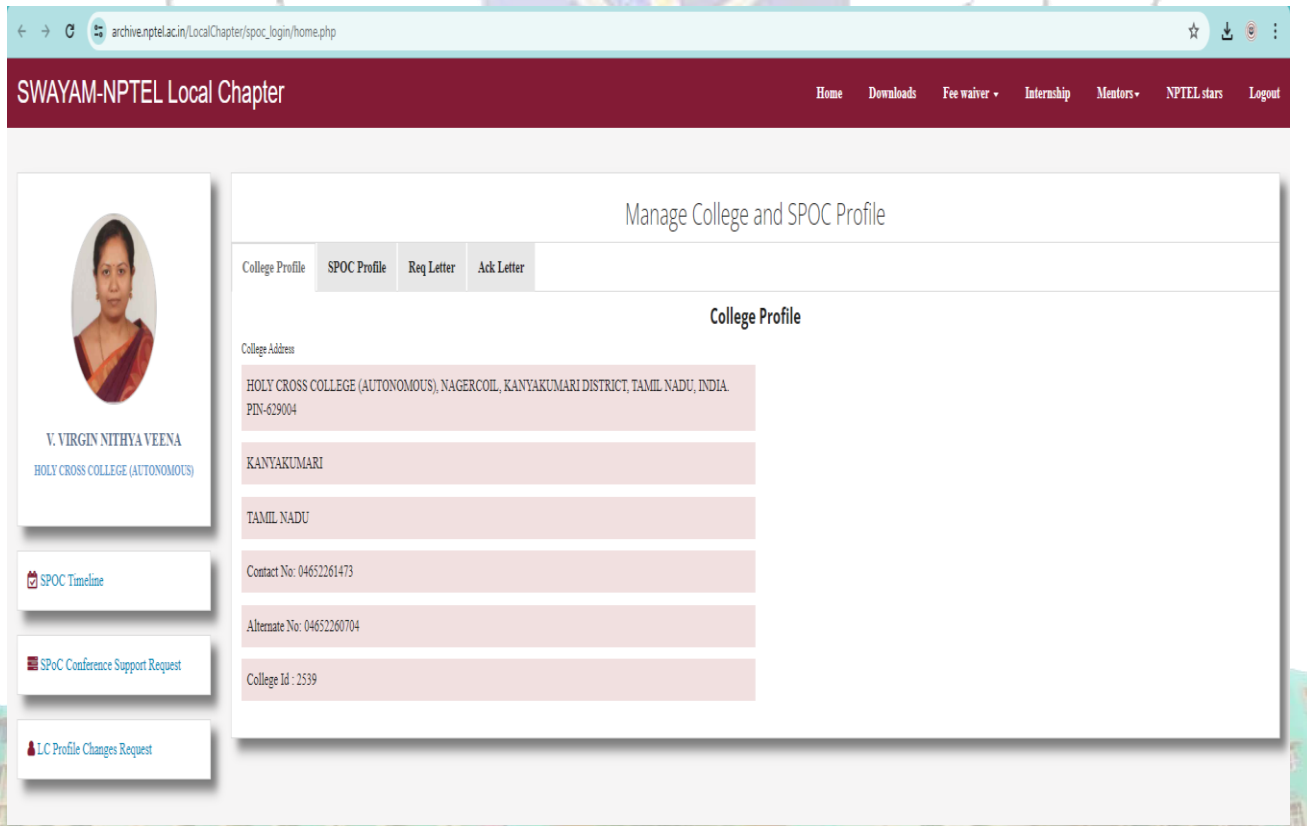
NAD ID: 041486







Bridging Education with MOOC/ SWAYAMs, NEP 2020



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College Name	LC Id	Status	Address	State	SPOC Name	Co-ordinated by
SLBS ENGINEERING COLLEGE	2533		SLBS ENGINEERING COLLEGE, DANGIAWAS B.O, JODHPUR, JODHPUR, RAJASTHAN, 342027 JODHPUR-342027	RAJASTHAN	PROF(DR.) SURENDRA BOHRA	IIT MADRAS
RAJAGIRI COLLEGE OF SOCIAL SCIENCES	2535		RAJAGIRI COLLEGE OF SOCIAL SCIENCES, KALAMASSERY, RAJAGIRI P.O, KANAYANNUR, ERNAKULAM, KERALA, 683104 KOCHI-683104	KERALA	BINDIYA M VARGHESE	IIT MADRAS
INDIAN INSTITUTE OF INFORMATION TECHNOLOGY KOTTAYAM	2536		INDIAN INSTITUTE OF INFORMATION TECHNOLOGY KOTTAYAM, VALAVOOR POST PALA, KOTTAYAM, KERALA, 686635 KOTTAYAM-686635	KERALA	DR. BAKKYARAJ T	IIT MADRAS
MALLA REDDY INSTITUTE OF PHARMACEUTICAL SCIENCES	2537		MALLA REDDY INSTITUTE OF PHARMACEUTICAL SCIENCES, DOOLAPALLI B.O, QUTHBULLAPUR MANDAL, HYDERABAD, TELANGANA, 500100 HYDERABAD-500100	TELANGANA	DR. J. SANGEETHA	IIT MADRAS
GOVERNMENT ENGINEERING COLLEGE, AJMER	2538	Active	GOVERNMENT ENGINEERING COLLEGE AJMER, BADLIA B.O, AJMER, AJMER, RAJASTHAN, 305025 AJMER-305025	RAJASTHAN	SATYA NARAYAN TAZI	IIT MADRAS
HOLY CROSS COLLEGE (AUTONOMOUS)	2539	Active	HOLY CROSS COLLEGE (AUTONOMOUS), NAGERCOIL, KANYAKUMARI DISTRICT, TAMIL NADU, INDIA. PIN-629004 KANYAKUMARI-629004	TAMIL NADU	V. VIRGIN NITHYA VEENA	IIT MADRAS
MASS COLLEGE OF ARTS & SCIENCE	2540		MASS COLLEGE OF ARTS & SCIENCE, KALLAPULIYUR B.O, KUMBAKONAM, THANJAVUR, TAMIL NADU, 612501 THANJAVUR-612501	TAMIL NADU	MATHIALAGAN RAMASAMY	IIT MADRAS
GOVT ENGINEERING COLLEGE BIKANER	2541		GOVT ENGINEERING COLLEGE BIKANER, KARNI INDUSTRIAL AREA, PUGAL ROAD BANGALANAGAR S.O, BIKANER, BIKANER, RAJASTHAN, 334004 BIKANER-334004	RAJASTHAN	RISHI RAJ VYAS	IIT MADRAS

Learning with CBCS, NEP 2020

CBCS FOR UG PROGRAMME

Study Component	No. of Courses	Credit /Course	Total Credits
Part I - Tamil /French	4	3	12
Part II–English	4	3	12
Part III			
Core Course	14	4-5	68
Core Project	1	4	4
Elective Courses	8	3	24
Part IV			
Non-major Elective	2	2	4
Skill Enhancement Course	5	1-2	8
Foundation Course	1	2	2
Environmental Studies	1	2	2
Value Education	1	2	2
Summer Internship/Industrial Training	1	2	2
Extension Activity	1	1	1
Professional Competency Skill	1	2	2
Part V			
Life Skill Training – Catechism, Moral	2	1	2
Skill Development Training (Certificate Course)	1	1	1
Field Project	1	1	1
Specific Value-added Course	2	1	2
Generic Value-added Course	2	1	2
MOOC	3	1	3
Student Training Activity -Clubs & Committees / NSS	1	1	1
Community Engagement Activity - RUN	1	1	1
Human Rights Education	1	1	1
Gender Equity Studies			
	Total		**140 + 15**

9. CBCS for PG Programme

Components	No. of Courses	Credit/Course	Total
Core Course/Lab Course	12	4-5	57
Elective Course	6	3	18
Project	1	7	7
Skill Enhancement Course	3	2	6
Internship/ Industrial Activity	1	2	2
Extension Activity	1	1	1
Co-curricular Courses			
Life Skill Training	2	1	2
Field Project	1	1	1
Specific Value-added Course	2	1	2
Generic Value Added Courses	2	1	2
MOOC	2	1	2
Community Engagement Activity	1	1	1
Total			91 + 10

Course Structure

Distribution of Hours and Credits

Course	Sem. I	Sem. II	Vacation	Sem. III	Sem. IV	Total	
						Hours	Credits
Core – Theory	6 (4) + 6 (4) + 6 (4) + 6 (4)	6 (5) + 6 (5) + 6 (4) + 6 (4)	-	6 (4) + 6 (4) + 6 (4)	6 (5) + 6 (5) + 6 (5) + 6 (5)	90	66
Elective	6 (5)	6 (5)	-	6 (5)	6 (5)	24	20
Project	-	-	-	6 (4)	-	6	4
Total	**30 (21)**	**30 (23)**		**30 (21)**	**30 (25)**	**120**	**90**
Non-academic Courses							
Life Skill Training – I	-	(1)	-	-	-	-	1
Service-Learning Programme (SLP)-Community Engagement Course		(1)		(1)			2
Life Skill Training – II	-	-	-	-	(1)	-	1
Summer Training Programme	-	-	(1)		-	-	1
Total	-	**(2)**	**(1)**	**(1)**	**(1)**	-	**5**

Total Number of Hours = 120

Total Number of Credits = 90+5

Non-academic courses are mandatory and conducted outside the regular working hours.

6. Course Structure

Distribution of Hours and Credits

Curricular Courses

Course	S I	S II	S III	S IV	S V	S VI	Total	
							H	C
Part I - Language	6 (3)	6 (3)	6 (3)	6 (3)			24	**12**
Part II - English	6 (3)	6 (3)	6 (3)	6 (3)			24	**12**
Part III								
Core Course Core Project	5 (5) + 5 (5)	5 (5) + 5 (5)	5 (5) + 5 (5)	5 (5) + 5 (5)	5 (4) + 5 (4) + 5 (4) + 5 (4)	6(5) + 6(4) + 6(4)	78	**69**
Elective Course	4 (3)	4 (3)	4 (3)	4 (3)	4 (3) + 4 (3)	5 (3) + 5 (3)	34	**24**
Part IV								
Non-major Elective	2 (2)	2 (2)					4	**4**
Skill Enhancement Course		2 (2)	1(1) + 2 (2)	1 (1) + 2 (2)			8	**8**
Foundation Course	2 (2)						2	**2**
Environmental Studies			1	1 (2)			2	**2**
Value Education					2 (2)		2	**2**
Summer Internship /Industrial Training					(2)		-	**2**
Extension Activity						(1)	-	**1**
Professional Competency Skill						2 (2)	2	**2**
Total	**30 (23)**	**30 (23)**	**30 (22)**	**30 (24)**	**30 (26)**	**30 (22)**	**180**	**140**

Co-curricular Courses

Course	S I	S II	S III	S IV	S V	S VI	Total
LST (Life Skill Training)	-	(1)	-	(1)			2
Skill Development Training (Certificate Course)	(1)						1
Field Project		(1)					1
Specific Value-added Course	(1)		(1)				2
Generic Value-added Course				(1)		(1)	2
MOOC		(1)		(1)		(1)	3
Student Training Activity: Clubs & Committees / NSS				(1)			1
Community Engagement Activity: RUN				(1)			1
Human Rights Education					(1)		1
Gender Equity Studies						(1)	1
Total							**15**

Total number of Compulsory Credits =Academic credits +Non-academic credits: 140 + 15

Implementation of SDGs in Curriculum

SDG 1

Semester IV

Elective IV (b): Rural Development
Sub. Code: PF1746

No. of Hours per Week	Credits	Total No. of Hours	Marks
6	4	90	100

Objectives

1. To understand the rural poverty, indebtedness and special programme for rural development.
2. To improve sustainability in rural development.

Unit I: Introduction

Introduction – Nature of rural economy – Concept of rural development – Scope and importance of rural development – V.M. Dandekar's approach to rural development – Dimensions of rural Development: Agricultural growth in India – Irrigation – Agrarian reforms – Rural Electrification – Rural transport.

Unit II: Rural Industries

Rural Non – Farm Economy : Concepts and definitions of rural industries – Needs and economic significance of rural industries – Current trends of KVI – Rural industries and employment generation – Rural industries and poverty alleviation – Role of KVIC in the development of rural industries – Rural industries in the liberalization period. Present problems of rural industries in India- Remedies.

Unit III: Poverty and Unemployment

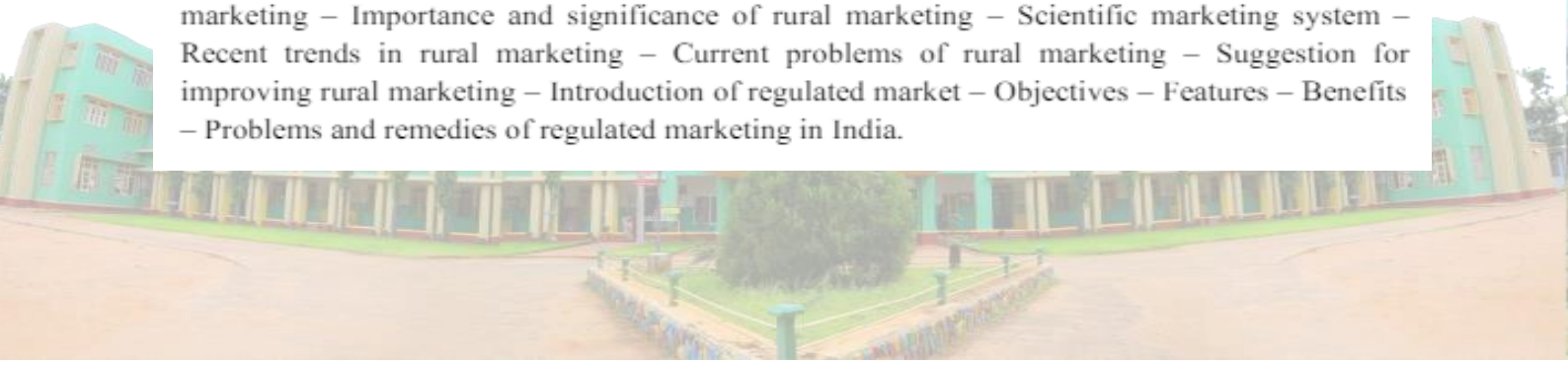
Poverty and Unemployment – Rural poverty: Nature, causes and remedies – Rural employment: Nature, causes and remedies – Rural indebtedness: Magnitude causes – Relief measures – Role of SHGs and Micro Finance in this context – Rural industrialization.

Unit IV: Programme of Rural Development

Programmes of Rural Development – Objectives and Assessment of programmes schemes – Food for Works Programme – Employment Guarantee Scheme – Small Farmers Development Agency – Marginal farmers and agricultural labour – NREGP – TRYSEM – Special Component – Plant for SCs – Tribal Development Progrmme – Employment Assurance Scheme – Swarn Jayanti Gram Swarozgar Yojana – Mahatma Gandhi National Rural Employment Guarantee Scheme.

Unit V: Rural Marketing

Rural Marketing – Introduction of rural products and marketing – Nature of rural marketing – Importance and significance of rural marketing – Scientific marketing system – Recent trends in rural marketing – Current problems of rural marketing – Suggestion for improving rural marketing – Introduction of regulated market – Objectives – Features – Benefits – Problems and remedies of regulated marketing in India.



SDG 2

Semester I

Core II: Recent Issues in Indian Economy

Sub. Code: PF1712

No. of Hours per Week	Credits	Total No. of Hours	Marks
6	4	90	100

Objectives

1. To understand the availability of resources, recent issues of Indian economy, reforms and sectoral Performance.
2. To improve skill development and encourage self employment specially gender based.

Unit I: Frame Work of Indian Economy

Need for Economic Policy in India – Aims of Economic Policy – Instruments –National income estimates in India-Trends in National Income growth and structure- The theory of Demographic transition-Growth rate of population-Density of population-Population policy-Unemployment – Causes and remedies- Human development-Measures-Progress-Balanced regional development and indicators-Policy measures to remove regional disparities- Poverty Eradication Programmes.

Unit II: Economic Reforms in India and Public Sector

Rationale of Economic Reforms: Liberalisation, Privatisation and Globalisation – Impact on India -Economic Reforms- Role of the public sector-Evolution of the public sector-Objectives-Causes for the expansion of Public enterprises-price policy- Role of the privatesector-limitations-Public versus Private Sector

Unit III: Agricultural Performance and Food Security

Agricultural Growth, Productivity Trends and crop patterns – Issues and concerns in Indian Agriculture – Agricultural Marketing – Regulated markets-Co-operative Marketing-Agricultural taxation- New Agricultural Strategy and Green Revolution-Agreement on Agriculture Under WTO –Food Security: Food self sufficiency and Food security-Public distribution system .

Unit IV: Policies and Performance of Infrastructure

Infrastructure and Economic development- Transport- Road transport and Railway - communication – Energy- Power- Growth Rates of the Economic Infrastructure – Water transport-Social Infrastructure: Components – Health, Education–Urban infrastructure- Policies.

Unit V: Planning in India

Planning in India – Evaluation of X, XI and XII Plan–Objectives and Development strategies –Human capital formation in India- Panchayat and NGOs – SHGs – Role of Self Help Groups in Indian Economy - NREGP

Semester I
Food and Nutrition (NMEC)
Sub. Code: BNM171

No. of Hours per Week	Credits	Total No. of Hours	Marks
4	2	60	100

Objectives

To study the sources and nutritive value of food.

To be aware of food adulteration and ill effects of junkfood.

Unit I

Energy value of food, major classes of food- carbohydrates, proteins, fats and oils, Vitamins, minerals – sources and requirements. Probiotics – a general account. Balanced diet functions and deficiency symptoms - causes and prevention. Food colourants - Natural and artificial.

Unit II

Nutritive value of rice and wheat

Cereals - Rice, processing and products; Wheat- processing, bread manufacturing and other value added products of wheat.

Beverages: Non-alcoholic- Coffee, tea and cocoa-processing.

Alcoholic- Beer, wine and distilled liquors

Unit III

Food Preservation: Importance of preservation. Methods of preservation - low and high temperature, use of oil and spices, salt and sugar. Preparation of jam, jelly, pickles and squashes.

Nutritive value of meat, fish and egg

Meat and meat products; sea foods- storage and processing of fish and fish products Egg- egg products

Unit IV

Food Additives: Definition and types. Milk and milk products, ice cream and related products; cheese, reduced fat dairy products. Food adulteration- harmful effects, simple physical tests for detection of food adulterants.

Unit V

Food borne infection and their prevention- Botulism, Salmonellosis and Shigellosis. Food intoxication- bacterial toxins and fungal toxins.

Text Book

Sumathi R Madamti & Rajagopal, M.V. (1984). *Fundamentals of Food and Nutrition.* New Delhi: New Age Publishers.

Semester VI

Elective IV (b): Organic Farming

Sub. Code: BC1765

No. of Hours per Week	Credits	Total No. of Hours	Marks
5	4	60	100

Objectives

To sensitize the need and generating knowledge and skill on various organic farming practice 2. To carry out organic agricultural farming and retailing it.

Unit I

Organic Farming- Introduction, A legacy of damaged soils. Retail chemicals farming made cheap and easy. Contamination of food products by pesticides and chemicals. Threat to biodiversity. Present status of organic farming in India

Unit II

Soil: Assessment of soil, Fertility of soil, Importance of organic matter, Water retentivity and aeration of soil, Soil pH, Soil reclamation.

Unit III

Balanced Nutrient Supply- Sources of nutrients for organic farming. FYM, Rural Compost, City Compost, Oil cakes, Animal waste, Bio-fertilizer and Vermicompost.

Nutrient content of the above source (data chart).

Green manure, Liquid manure (Panchagavya)

Unit IV

Plants: Choosing the right crop for the environment, Best management practices for organic farming

Types of farming – Definition, Concepts and benefits – Pure Organic Farming, Integrated Organic system (Combination of organic and inorganic) and mixed farming

Unit V

Pest Management – Integrated pest and disease management. Organic pesticides, Bio-pesticides, Feasibility of complete dependence of organic sources.

Required management practices for organic farming certification

Text Book

Arun K. Sharma. (2005). *Handbook of Organic Farming*. India: Agrobios

SDG 3

Semester III

Major Elective - Public Health Management

Course Code: PW2032

Hours / week	Credits	Total Hours	Marks
5	4	60	100

Objectives:

- To get more knowledge about Health.
- To know various administrative structures in health care.

Course Outcome

Co No.	Upon completion of this course, students will be able to	PSO addressed	CL
Co-1	Understand the concepts of health and importance of Public Health.	PSO-6	U
Co-2	Explain the symptoms, treatment, and prevention of communicable and non- communicable diseases.	PSO-6	U
Co-3	Apply the skills of population policy in promotion of family planning.	PSO-7	Ap
Co-4	Analyze the communication media in health education.	PSO-6	An
Co-5	Understand the recent national health programme and schemes in India.	PSO-6	U
Co-6	Discuss the various systems promoting Health care in India	PSO-6	An

Unit: I

Concept of Health: Dimensions of Health: Physical, mental, social, emotional and spiritual. Indicators of health: Mortality, morbidity, disability, nutritional status, environmental status, socio economic status and healthcare delivery. Public Health: Definition, meaning, functions and importance of Public Health.

Unit: II

Diseases: Concept, definition, causative factors and its types. Symptoms, mode of transmission, treatment and prevention of major communicable diseases: (Air borne, water borne, Vector Borne) - TB, Sexually Transmitted Infections (STI), hepatitis, poliomyelitis, diphtheria, diarrhea, malaria, cholera, typhoid, leprosy and HIV/AIDS- Psycho social intervention in communicable diseases. Epidemic and Pandemic diseases in global level.

Unit: III

Non - communicable diseases: Causes, symptoms, treatment and prevention of major non
- communicable diseases: cancer, diabetes, asthma, hypertension, cardiac disorders,Occupational Health problems - Psycho social intervention in non - communicable diseases
- Role of medical social worker.

Unit: IV

Family Planning and Health Education: Definition and Scope. Birth control Methods – National Population Policy 2000 - Social Work intervention in promotion of Family Planning. Health education: definition, objectives, approaches, principles. Information, Communication and Education (IEC); Health advocacy and Health campaigning.

Unit: V

Health Care Planning and Management: Healthcare Planning - Meaning, Definition, Objectives, goals. Health Care System in India: PHC, CHC, Taluk hospital, District hospital, Medical College, specialized hospitals (Public, Private, Indigenous and Voluntary). National Health Policy 2017 - Achievements and Short comings. National Health Programmes and schemes - NHM : NRHM and NUHM

Reference Books:

1. Anderson Clifford R., (1977) Your guide to health, (1st Edition) Oriental Watchman,Pune, Publishing House.
2. Davidson Stanley, Passmore R., Brock J. F, Truswell A. S., Edinburgh, (1979)HumanNutrition & Dietetics,(7th Edition) , London, Churchill Living stone.
3. Suraj Gupte, (1991) Speaking of Child Care, (8th Edition) New Delhi,SterlingPublishersPvt. Ltd.
4. Park.K,(2013)Preventive and Social Medicine,(21stEdition),Jabalpur, India Banarsida'sBhanot Publishers.
5. Rabindra Nath Pati, A.P.H. (2008) Family Planning, (1stEdition), New Delhi. PublishingCorporation.

Semester III

Major Elective - Mental Health and Psychiatric

Disorders Course Code: PW2034

Hours / Week	Credits	Total Hours	Marks
5	4	60	100

Objectives:

1. To impart knowledge of Psychiatric Illness
2. To train the students to practice Psychiatric Social Work Effectively

Course Outcome

Co No.	Upon completion of this course, students will be able to	PSO addressed	CL
Co-1	Understand and use inner wisdom to work in the field of mental health.	PSO-6	U
Co-2	Identify the concepts related to mental health and mental illness and theoretical underpinnings related to it.	PSO-6	U
Co-3	Explain the general classification of mental disorder.	PSO-6	U
Co-4	Develop the psycho- social interventions in preventive, promotive and curative services that work towards enhancing the dignity of persons living with mental illness.	PSO-6	C
Co-5	Cite the examples of other mental disorder.	PSO-6	U
Co-6	Identify the psychiatric disorder in children, adolescence and women.	PSO-6	U
Co-7	Understand the psychiatric interviewing and National mental health programme	PSO-6	U

Unit: I

Mental Health: Definition and meaning of Mental Health, Mental Disorder- Psychiatry: Concepts, Criteria and characteristics of Mental Health and Neuro transmitters of mental functioning- History of Psychiatry in India. International Classification of Mental Disorder – ICD 10 and DSM 5. Changing trends in Mental Health.

Unit: II

General Classification of mental disorders – Functional and Non-functional: Functional (Non-organic) Mental disorders : Psychotic disorders and Neurotic disorders; Psychotic disorders

: Schizophrenia, Mood disorders, Delusional disorders; Neurotic disorders : Anxiety disorder, Phobic disorder, Obsessive Compulsive Disorder (OCD), Hysteria, Hypochondriasis. Non- functional (Organic) Mental disorders : Delirium, Dementia, Amnestic Syndrome.

Unit: III

General Classification of Mental Disorders – Personality disorders, Psychosexual disorders, Psychoactive Substance Abuse: Personality Disorders – types. Psychosexual disorders – Dhat Syndrome, Erectile dysfunction, Premature ejaculation, Paraphilias, Male or female arousal disorders. Psychoactive Substance Abuse.

Unit: IV

General Classification of Mental Disorders – Psycho somatic disorders, Stress related disorders, Child Psychiatric disorders and Others: Psychosomatic disorders – Peptic ulcer, bronchial asthma, ulcerative colitis, psoriasis, allergic dermatitis, hypertension, irritable bowel syndrome. Stress related disorders – Acute Stress Reaction, Post Traumatic Stress Disorder (PTSD), Adjustment disorder. Child Psychiatric Disorders – Autism, Developmental disorders, Mental Retardation, Attention Deficit Disorders (ADD), Attention Deficit/Hyperactivity Disorder (ADHD). Emotional disorders, Habit disorders. Digital disorders. Trans Cultural Psychiatry.

Unit: V

Psychiatric interviewing and National mental health programme: Case History Taking and Mental Status Examination. Uses of Rating scaling in assessment and intervention. Mental Healthcare Act, 2017. National Mental Health Policy, District mental health programme.

References Books:

1. Francis J. Turner (1996) Social Work Treatment-Interlocking Theoretical approaches,(4th Edition) ,New York.The FREE press, A division of Simon & Schuster Inc.
2. Seker.K, Parthasarathy.R, Muralidhar.D, Chandrasekar Rao.M,(2007) Handbook of psychitric social work,(2nd Edition) , Bangalore, National Institute of Mental Health and Neuro Science.
3. Dr.Ramakrishanan.K, Dr.Arun Kumar.N, (2010) Psychiatry Made Easy, (1st Edition), Trichy, ATHMA Institute of Mental Health and Social Science.
4. Jennifer, John Wiley & Sons, (1981) An outline of modern psychiatry, (5th Edition) **Hoboken.**

SDG 5

Semester II
Core VIII: Introduction to Literary Theories
Course Code: PE2024

Hours / Week	Credits	Total Hours	Marks
6	4	90	100

Objectives:

1. To introduce key essays representing the contemporary Literary theories
2. To have an understanding of these theoretical texts
3. To expose the students to the prominent thinkers
4. To promote intellectual growth by strengthening their abilities to read the text analytically.

Course Outcomes

CO	Upon completion of this course the students will be able to:	PSOs Addressed	CL
CO-1	understand the ways of looking at literature	PSO-2	U
CO-2	understand and analyse key concepts	PSO-2	An
CO-3	apply the knowledge to research	PSO-3	Ap
CO-4	generate new knowledge based on sound theoretical insight	PSO-2	C

Unit I: Structuralism

Vladimir Propp : Morphology of the Folktale

Levi Strauss : Structural Study of Myth

Self Study

'Structuralism' Routledge Companion to Critical Theory

Unit II: Post Structuralism:

Roland Barthes : From Work to Text

Paul de Man : Resistance to Theory

Self Study

'Post Structuralism' Routledge Companion to Critical Theory

Unit III: Postmodernism

Jurgen Habermas : Modernity- An Incomplete Project

Jean-François Lyotard : Defining the Postmodern

Self Study

'Post Modernism' Routledge Companion to Critical Theory

Unit IV: Gender and Queer Studies

Helene Cixous : The Laugh of the Medusa

Judith Butler : *Gender Trouble* (Chapter-1)

Self Study

Gender and Queer Studies - Routledge Companion to Critical Theory

Unit V: Postcolonial Studies

Edward Said : *Culture and Imperialism (Chapter 1)*

Achebe : An Image of Africa: Racism in Conrad's *Heart of Darkness*

Self Study

'Race and Postcoloniality' Routledge Companion to Critical Theory

Reference Books:

Roland Barthes. (1988). *The Semiotic Challenge*. Translated by Richard Howard. Blackwell.

Jonathan Culler (1975). *Structuralist Poetics*. Routledge.

Jacques Derrida. (1976). "The exorbitant question of method" Of Grammatology, translated by Gayatri Chakravorthy Spivak, Johns Hopkins University Press.

Christopher. Norris. (1991). *Deconstruction: Theory and Practice*. 2nd ed. Routledge,

Peter Brooker, ed. (1992). *Modernism/Postmodernism*. Longman.

Steven Connor. (1996). *Postmodernist Culture: An Introduction to Theories of the Contemporary*. 2nd ed. Blackwell.

Bill Ashcroft and Pal Ahluwalia. (2001). "Edward Said". Routledge.

Homi K. Bhabha, ed. (1990). *Nation and Narration*. Routledge.

Joseph Bristow, ed. (1992). *Sexual Sameness: Textual Difference in Lesbian and Gay Writing*. Routledge

Diana Fuss, ed. (1992). *Inside/ Out: Lesbian Theories, Gay Theories*. Routledge.

SDG 6

SEMESTER I
ELECTIVE COURSE-I(b) CONSERVATION OF NATURAL RESOURCES AND POLICIES

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
BP231EC2	3	2	-	-	3	5	75	25	75	100

Pre-requisite

To create awareness of environmental problems and their consequences.

Learning Objectives

1.To know about natural resources.

2.To predict the reasons for degradation of natural resources and suggest measures to prevent these.

Course Outcomes

On completion of this course the student will be able to		
CO1	understand the concept of different natural resources and their utilization.	K1
CO2	critically analyze the sustainable utilization land, water, forest and energy resources	K2 & K6
CO3	evaluate the management strategies of different natural Resources	K3
CO4	reflect upon the different national and international efforts in resource management and their conservation.	K4
CO5	state the various environmental policy passed to conserve the natural resources.	K5

UNIT	CONTENTS	No.of hours
I	**NATURAL RESOURCES:** Definition – Importance – Classification – Human physiological socio-economic and cultural development – Human Population Explosion – Natural Resource Degradation – Concept of conservation – Value system – Equitable resource use for sustainable life system.	15
II	**FOREST RESOURCES:** Forest cover in India and the World – Importance – Desertification – Forest Wealth – Afforestation – Vanasamrakshna Samithi– Agroforestry – Social Forestry – Joint Forest Management Strategy for Forest Conservation. Wild Life: Resources – Importance – Benefits – Wild life Extinction – Causes for Extinction – List of Endanger species in India and in the World – Ecological approach in wild life management – Eco Tourism – Wild Life projects in India – Sanctuaries and National Parks In India – Man and Bio sphere Programme.	15
III	**LAND AND SOIL RESOURCES:** Soil, Complexity of soil nature, regional deposits, Land use and capability classification systems, Land use Planning models and their limitations. Impacts of natural and man-made activities on land characteristics and land use planning–	15

	Soil Erosion – Loss of Soil Nutrients – Restoration of Soil Fertility – Soil Conservation Methods and Strategies in India. Wet Land Conservation and Management – Ecological Importance of wet lands in India – Conservation Strategy and ecological Importance. Water Resources: Rivers and Lakes In India – Water Conservation and ground water level increase - Watershed Programme.	
IV	**MINERAL RESOURCES:** Use and exploitation – Environmental effects of extracting and using mineral resources – Restoration of mining lands – Expansion of supplies by substitution and conservation. Food Resources: World Food Problems – Changes caused by agriculture – overgrazing effects of modern agriculture – Fertilizer-Pesticide problems – Water Logging – Salinity – Sustainable agriculture, life stock breeding and farming.	**15**
V	**ENVIRONMENTAL POLICY IN INDIA:** Need for policies- Public Policy – Economic policies – Relationship between economic development and environment – Implementing Environmental Public Policy Strategies in pollution control – Constitutional provisions in India regarding environment – Public Awareness and Participation in Environmental Management – National Land Use Policy 1988 – Industrial Policy 1991.	

Self Study	Equitable resource use for sustainable life system, Agroforestry – Social Forestry, Watershed Programme, Food Resources, National Land Use Policy 1988 – Industrial Policy 1991.

Textbooks

1. Trivedi R.K.1994. Environment and Natural Resources Conservation.
2. Murthy J.V.S.1994. Watershed Management in India.
3. Raymond, F Dasmann. 1984. Environmental Conservation, John Wiley.
4. Nalini, K.S. 1993. Environmental Resources and Management, Anmol Publishers, New Delhi.
5. Shyam Divan and Armin Rosencranz. 2001. Environmental Law and Policy in India, Oxford Uni.Press.

Reference Books:

1.Haue, R and Freed V.H. 1975. Environmental Dynamics of Pesticides, Menum Press, London
2. Singh, B. 1992. Social Forestry for Rural Development, Anmol Publishers, New Delhi.
3. Shafi. R. 1992. Forest Ecosystem of the World.
4. Stacy Keach. 2016. Natural Resources Management. Syrawood Publishing House.
5. Rathor B.S. 2013. Management of Natural Resource for Sustainable Development. Daya Publishing House, New Delhi.

Web resources:

1. https://www.amazon.in/conservation-natural-resources-Gifford-Pinchot-ebook/dp/B07HX76TVN
2. https://books.google.co.in/books/about/Natural_Resource_Conservation_and_Enviro.html?id=T2SRuhxpUW8C&redir_esc=y
3. https://www.kobo.com/ww/en/ebook/natural-resources-conservation-law
4. https://www.scribd.com/book/552185119/Natural-Resources-Conservation-and-Advances-for-Sustainability
5. https://www.scribd.com/document/354699536/Conservation-of-Natural-Resources

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	2	3	2	3	2	3
CO2	3	3	3	3	2	2	1	3	1	3
CO3	3	3	3	2	2	2	1	3	1	3
CO4	3	3	3	2	2	2	1	3	1	3
CO5	3	3	3	2	2	2	1	3	1	3
Total	15	15	15	12	10	11	6	15	6	15
Average	3	3	3	2.4	2	2.2	1.4	3	1.4	3

S-Strong (3) M-Medium (2) L-Low(1)

SDG-7

SEMESTER – I
NON MAJOR ELECTIVE NME I: PHYSICS FOR EVERYDAY LIFE

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks			
								CIA		External	Total
PU231NM1	2	-	-	-	2	2	30	25		75	100

Pre-requisite:

Students should know about basic knowledge regarding mechanical objects, laser, optical devices and solar energy.

Learning Objectives:

1. To introduce fundamental physics concepts and their applications in everyday life.
2. To comprehend where all physics principles have been applied in everyday life and to appreciate the concepts with a greater understanding, as well as to learn about Indian scientists who have made significant contributions to Physics.

Course Outcomes

On the successful completion of the course, student will be able to:		
1.	understand the knowledge of basic scientific principles and fundamental concepts in motion of bodies.	K2
2.	understand the basic laws of physics in domestic appliances	K2
3.	recall the physics notions applied in various optical instruments	K1
4.	comprehend the utilization of solar energy in everyday life activities	K2
5.	know about the various physicists contribution towards science and technology	K2

K1 - Remember; K2 - Understand; K3 - Apply

Units	Contents	No. of Hours
I	**MECHANICAL OBJECTS** Spring scales – bouncing balls –roller coasters – bicycles –rockets and space travel.	6
II	**OPTICAL INSTRUMENTS AND LASER** Vision corrective lenses – polaroid glasses – UV protective glass – polaroid camera – colour photography – holography and laser.	6
III	**PHYSICS OF HOME APPLIANCES:** bulb – fan – hair drier – television – air conditioners – microwave ovens – vacuum cleaners	6
IV	**SOLAR ENERGY** Solar constant – General applications of solar energy – Solar water heaters – Solar Photo – voltaic cells – General applications of solar cells.	6

V	**INDIAN PHYSICIST AND THEIR CONTRIBUTIONS** C.V.Raman, Homi Jehangir Bhabha, Vikram Sarabhai, Subrahmanyan Chandrasekhar, Venkatraman Ramakrishnan, Dr. APJ Abdul Kalam and their contribution to science and technology.	6
TOTAL		30

Self -Study	Brief description about bulb, fan, Applications of solar energy

Text Books:

1. The Physics in our Daily Lives, Umme Ammara, Gugucool Publishing, Hyderabad, 2019.
2. For the love of physics, Walter Lawin, Free Press, New York, 2011.

Reference Books:

1. Gerardin Jayam. (2019). Physics in Everyday Life. Published by the Department of Physics, Holy Cross College (Autonomous), Nagercoil.

Web Resources:

1. https://www.scientificworldinfo.com/2021/09/importance-of-physics-in-our-daily-life.html
2. https://www.britannica.com/technology/laser

MAPPING WITH PROGRAMME OUTCOMESAND PROGRAMME SPECIFIC OUTCOMES

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	1	1	2	2	3	2	2	2	2
CO2	3	3	2	1	1	2	2	3	3	3	2	2
CO3	3	2	2	1	2	2	2	3	3	3	3	3
CO4	3	3	3	1	1	3	3	3	3	2	2	2
CO5	2	1	1	3	2	2	2	2	2	2	2	2
TOTAL	14	12	10	7	7	11	11	14	13	12	11	11
AVERAGE	2.8	2.4	2	1.4	1.4	2.2	2.2	2.8	2.6	2.4	2.2	2.2

3 – Strong, 2- Medium, 1- Low

SDG 8

SEMESTER II
NON MAJOR ELECTIVE NME II: ECONOMICS FOR INVESTORS

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
FU232NM1	2	-	-	-	2	2	30	25	75	100

Pre-requisite:
Basic Interest in Economics for Investors

Learning Objectives:
1. To understand concepts of saving and investments
2. To probe the various investment avenue and its practice applications

Course Outcomes

On the successful completion of the course, student will be able to:		
1.	identify the types and importance of savings and investments.	K1 & K2
2.	explain the available for investment avenues	K1 & K2
3.	understand the operations of different types of investment markets.	K2 & K3
4.	list the economic fundamentals and information.	K2 & K3
5.	determine the objective enabling investment plans, strategy, evaluate and restructure if required.	K2 & K3

K1 - Remember; **K2** - Understand; **K3** – Apply

Unit	Contents	No. of Hours
I	**Introduction** Saving and Investments – Meaning – Types - Importance – Role of Savings and Investment on the development of Individuals- Distributional Role of Investment – Income and Wealth.	6
II	**Investment Avenues** Traditional Investment – Cash, Deposits, Gold, Silver, Commodities Real Estates. Modern Investment – Direct Investment – Portfolio Investment – Insurance.	6
III	**Investment Markets** Capital Market – Share Market – Primary and Secondary – Bond Markets- Money Market – Metal Market - Commodities Markets.	6
IV	**Economic fundamentals for Investors** Domestic Economic Environment: Economic Growth and Development – National Income – Per Capita Income, Unemployment – Taxes, Trade Cycle – Infrastructure.	6
V	**Investment Methods and Strategies.** Cash Flow – Capital Gain – Risk Rewarding – Asset Accumulation - Risk Distribution – Asset Management.	6

Self study	Risk Distribution

Textbooks

1. Ken McElroy, (2004) *The ABCs of Real Estate Investing*, Hachette Book Group USA
2. Esme Faerber (2013), *All about Stocks* ,Tata Mc Graw Hill, New Delhi

Reference Books

1. William J. O' Neil (2009) *How to Make Money in Stocks: A Winning System in Good Times and Bad* (Fourth Edition), Mc Graw Hill Education, New Delhi.
2. John C Bogle (2017) *The Little Book of Common Sense Investing: The Only Way to Guarantee Your Fair Share of Stock Market Returns*, Wiley Publications.
3. Mary Buffett and David Clark (2002), *The New Buffettology* (Simon and Schuster)
4. Andrew Smithers(2022) *The Economics of the Stock Markets*, *The Intelligent Investor*, OUP Oxford publications.
5. Giovanni Rigters (2019) *Stock Market Investing for beginners & Dummies*, Giovanni Rigters publications.

Web Resources

1. https://www.capitalmarket.com/
2. https://www.icmagroup.org/
3. https://www.nseindia.com
4. https://www.stockbrokers.com/guides/beginner-investors
5. https://www.nasdaq.com/articles/10-best-stock-trading-websites-for-beginners

MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	3	2	3	2	3	3	3	3	2
CO2	3	3	3	3	3	2	2	3	3	3	2	2
CO3	3	3	3	3	3	2	2	2	2	3	3	3
CO4	2	3	3	3	2	2	2	3	3	2	2	2
CO5	3	3	3	3	3	2	2	2	2	3	3	3
TOTAL	13	15	15	15	13	11	10	13	13	14	13	12
AVERAGE	2.6	3	3	3	2.6	2.2	2	2.6	2.6	2.8	2.6	2.4

3 – Strong, 2- Medium, 1- Low

SDG – 10

SEMESTER I
ELECTIVE COURSE I: c) HUMAN RIGHTS AND LITERATURE

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
EP231EC3	4	1			3	5	75	25	75	100

Pre-requisite: The basic knowledge about human rights

Learning Objectives:

1. To enable the students understand how literatures of the world engage with the issues of human rights across the globe.
2. To help the students gain insight into fictionalized accounts of violation and fight for human rights

Course Outcomes

On the successful completion of the course, student will be able to:		
1.	understand how literatures of the world engage with the issues of human rights across the globe.	K2, K1
2.	identify the challenges of contemporary significance through the readings on the history and ethos of human rights.	K4, K3
3.	analyse how the knowledge of human rights structure our ways of thinking, refining the perspectives of ourselves and others.	K4
4.	evaluate the discourses on human rights representation from a variety of angles.	K5
5.	create insights into a variety of imaginative perspectives on human rights issues.	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

Units	Contents	No. of Hours
I	**Prose** Lynn Hunt: "Introduction" *Inventing Human Rights* (15-34) Martin Luther King, Jr.: Where do We Go from Here? Address Delivered at the 11th Annual SCLC Convention Edward Said: Reflections on Exile	15
II	**Poetry** Langston Hughes: Let America be America Again Warsan Shire: Home V.I.S. Jeyepalan: The Song of the Defeated Ashraf Fayadh : Cracks in the Skin Bertolt Brecht: The Burning of the Books W. H. Auden: Refugee Blues	15
III	**Memoir** Anne Frank: *The Diary of a Young Girl* Michael Herr: *Dispatches*	15
IV	**Fiction** Sharon Bala: *The Boat People* Markus Zusak: *The Book Thief*	15
V	**Drama** Arthur Miller: *The Crucibles* Asif Currimbhoy: *The Refugee*	15

Self -Study	To know the background of the writers

Reference Books:

1. Gopichand. P & Nagasuseela P. (2010). *Indian Drama in English: A Kaleidoscopic View*. New Delhi: Sarup Book Publishers. Pvt. Ltd.
2. Robert Hogan.. (1967). *Arthur Miller*. U.S.A. : North Central Publishing Company.
3. Sarat Joshi C. (2011). *Protecting Human Rights of Refugees: Issues and International Intervention*. New Delhi: Akansha Publishing Macgowan.
4. Christopher. (2004). *Twentieth Century American Poetry*. New York: Blackwell Publishing.
5. Monroe K Spears. (1963). *The Poetry of W.H.Auden: The Disenchanted Island*. New York: Oxford University Press.

Web Resources:

1. https://www.humanrightscareers.com/issues/human-rights-education/
2. http://yojana.gov.in/public-account3jan.asp
3. https://www.un.org/en/about-us/universal-declaration-of-human-rights
4. https://www.ohchr.org/en/what-are-human-rights
5. https://www.equalityhumanrights.com/en/human-rights/what-are-human-rights

MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	2	2	3	3	2	3
CO4	3	3	3	3	3	3	3	2	2	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3
TOTAL	15	15	15	15	15	15	14	12	13	15	15	13	15
AVERAGE	3	3	3	3	3	3	2.8	2.4	2.6	3	3	2.6	3

3 – Strong, 2- Medium, 1- Low

SDG 12

Semester I
Major Core I: Micro Economics – I
Course Code: FC2011

Hours /Week	Credits	Total Hours	Marks
6	5	90	100

Objectives

1. To enable the students to understand the basic concepts of Economics, market structure and distribution theories.
2. To know the functioning of the different market situations, price fixation so as to start a small firm and be self employed

Course Outcomes

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO- 1	understand the basic concepts and definition of Economics	PSO - 1	U
CO- 2	discuss the utility functions and wants	PSO - 1	E
CO- 3	identify the economic functions inducing demand and supply	PSO - 1	Re
CO -4	analyse the functions of indifference curves	PSO - 1	An
CO- 5	explain the production functions including homogeneous, linear and Cobb Douglas production function	PSO - 1	U

Unit I: Basics of Micro Economics

Definitions – Main divisions of Economics – Pure or Applied science – Scope – Importance and Limitations – Distinction between Micro and Macro Economics – Basic concepts (demand, supply, utility, goods, standard of living, value, price, market)

Unit II: Consumption

Human wants – Characteristics and classification of human wants – Engel's law of family expenditure – Law of Demand – Giffen's Paradox - Law of diminishing marginal utility – Law of equi - marginal utility – Consumer's surplus

Unit III: Elasticity of Demand and Elasticity of Supply

Elasticity of demand – Importance - Types – Factors determining elasticity of demand – Measurement of elasticity of demand: Total outlay, percentage, geometric method – Elasticity of supply – Meaning – Determinants of elasticity of supply.

Unit IV: Indifference Curve Analysis

Meaning – Assumption – Properties – Marginal Rate of Substitution – Price effect – Income effect – Substitution effect - Uses.

Unit V: Production

Meaning – Factors of production - Land, labour, capital, organization – Economies and diseconomies - Division of labour - Scale of production – Laws of Returns – Production function – Types of production function – Meaning – Iso quant and its properties – Iso cost curves.

Text Books

1. Devairakkam, S. (2001). *Micro Economics*, (4th ed.). Tirunelveli: D.S.R Publications.
2. Maria John Kennedy. (1999). *Advanced Micro Economic Theory*, (10th ed.) Mumbai: Himalaya Publishing House.

Reference Books

1. Jhingan, M.L. (2016). *Micro Economics*, (8th Revised ed.). New Delhi: Vrinda Publications (P) Ltd.
2. Cauvery. (2012). *Micro Economic Theory*, (4th Revised ed.). New Delhi: S.Chand & Company Ltd.
3. Sankaran, S. (2012). *Micro Economics*, (7th ed.). Madras: Margham Publications.
4. Seth, M.L. (2006). *Micro Economics*. (22nd Revised ed.). Agra: Lakshmi Narain Agarwal Educational Publishers.

SDG -13

SPECIFIC VALUE-ADDED COURSE– NATURAL RESOURCES AND THEIR CONSERVATION

Course Code	Credit	Total Hours	Total Marks
BP231V01	1	30	100

Course Outcomes

On the successful completion of the course, student will be able to:		
1	explain the natural resources	K1
2	recognize the critical role natural resources play in supporting life and ecosystems.	K2
3	distinguish between various natural resource categories, including energy resources, and biological resources	K3
4	analyze the consequences of the over-exploitation of non-renewable resources.	K4
5	evaluate the impacts of climate change on natural resources and ecosystems	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate

Units	Contents	No. of Hours
I	Introduction to Natural Resources and Conservation- Definition and classification of natural resources Importance of natural resources for human well-being and ecosystem functioning, Overview of conservation goals and strategies, Introduction to ecological principles and systems thinking.	6
II	Renewable Resources - Study of renewable resources: water, forests, wildlife, fisheries, and soil,, Sustainable management practices for renewable resources, Case studies of successful renewable resource conservation projects.	6
III	Non-Renewable Resources - Exploration of non-renewable resources: minerals, fossil fuels, Environmental impacts of non-renewable resource extraction and utilization, Transitioning to alternative energy sources and sustainable mining practices, Biodiversity and Ecosystem services.	6
IV	Understanding biodiversity and its importance, Ecosystem services provided by diverse ecosystems, Threats to biodiversity and strategies for biodiversity conservation.	6
V	Climate Change and Resource Conservation- Impacts of climate change on natural resources and ecosystems- Mitigation and adaptation strategies for resource conservation in a changing climate, International agreements and policies addressing climate change and resource conservation.	6

Text Books:

1. Tom Tietenberg (Author), Lynne Lewis. 2023. Environmental and Natural Resource Economics, 12th Edition, Routledge.
2. Natural Resources. Nancy Dickmann .2023. Black Rabbit Books

References Books:

1. Daniel D.Chiras& John P.Regnold 2016 Text book of Natural Resource Conservation: Management for a Sustainable future, 2nd Edition. Narosa Publisher.
2. Barry C. Field. 2023. Natural Resource Economics: An Introduction, Fourth Edition 4th Edition. Waveland Press, Inc.

SDG-14

Semester VI
Elective IV (a): Marine Botany
Sub. Code: BC1764

No. of Hours per Week	Credits	Total No. of Hours	Marks
5	4	75	100

Objectives

To understand the different adaptations (morphological, physical, conduct) of living beings in the marine environment.
To recognize the marine pollution and conservation methods.

Unit I

Classification of marine habitat – pelagic, neritic and oceanic province, benthic – zonation – shore environment – muddy, rocky and sandy, waves and tides deep sea bottom – pelagic deposits. Oceanography: Marine environment - physical and chemical properties of sea water.

Unit II

Marine biodiversity – phytoplankton, Zooplankton,marine bacteria, marine fungi, seaweeds and sea grasses. Threats and conservation of seaweeds and sea grasses.

Unit III

Marine products: traditional uses - human food and agriculture. Marine colloids and hydrocolloids – Agar–agar, algin, alginates, carrageenan, diatomite. Marine bioactive compounds from mangroves, seaweeds and seagrasses.

Unit IV

Marine pollution: Pollution due to heavy metals - radioactive wastes, thermal, algal blooms and oil spills – possible remedies – oil eating bacteria – GMO and pollution abatement.

Mangroves – present status and stresses on mangroves, regeneration of mangroves, coral reefs – ecology, species interaction, economic importance and conservations.

Text Book

Newell and R.C Newell. (1977). *Marine Plankton- A Practical Guide*. U.K.: Hutchinson and Co Ltd.

Reference Books

Clinton.J.Dawes. (1981). *Marine Botany*. New York: John Wiley and Sons.

Tait, R.V. (2013). *Elements of Marine Ecology*. U.K.: Butterworth and co (Publisher) Ltd.

Pringsheim, E.G. (2016) *Pure Cultures of Algae*. New York: Hafner Publishing Company.

Sinha, P.C. (1998). *Marine Pollution*. New Delhi: Anmol Publications Pvt. Ltd.

SDG 15

SEMESTER I
SPECIFIC VALUE ADDED COURSE
NATURAL RESOURCES AND THEIR CONSERVATION

Course Code	Credits	Total Hours	Total Marks
BP231V01	1	30	100

Course Outcomes

On completion of this course the student will be able to		
CO1	explain the natural resources	K1
CO2	recognize the critical role natural resources play in supporting life and ecosystems.	K2
CO3	distinguish between various natural resource categories, including energy resources, and biological resources	K3
CO4	analyze the consequences of the over-exploitation of non renewable resources.	K4
CO5	evaluate the impacts of climate change on natural resources and ecosystems	K5

Unit : 1

Introduction to Natural Resources and Conservation- Definition and classification of natural resources Importance of natural resources for human well-being and ecosystem functioning, Overview of conservation goals and strategies, Introduction to ecological principles and systems thinking.

Unit : 2

Renewable Resources - Study of renewable resources: water, forests, wildlife, fisheries, and soil,, Sustainable management practices for renewable resources, Case studies of successful renewable resource conservation projects.

Unit : 3

Non-Renewable Resources - Exploration of non-renewable resources: minerals, fossil fuels, Environmental impacts of non-renewable resource extraction and utilization, Transitioning to alternative energy sources and sustainable mining practices, Biodiversity and Ecosystem services.

Unit : 4

Understanding biodiversity and its importance, Ecosystem services provided by diverse ecosystems, Threats to biodiversity and strategies for biodiversity conservation.

Unit : 5

Climate Change and Resource Conservation- Impacts of climate change on natural resources and ecosystems- Mitigation and adaptation strategies for resource conservation in a changing climate, International agreements and policies addressing climate change and resource conservation.

Reference Books

Daniel D.Chiras& John P.Regnold 2016 Text book of Natural Resource Conservation : Management for a Sustainable future, 2nd Edition. Narosa Publisher

SDG- 16

IV Semester
Twentieth Century World
Major Elective – IV A
Subject Code: PH1745

No. of Hours/Week	No. of Credits	Total. No. of Hours	Marks
6	4	80	70

Objectives

1. To analyze the causes for the two World Wars
2. To evaluate the development of the World after the II World War

Unit I

First World War- Causes- Course and the effects- Formation of the League of Nations- Russian Revolution- Causes- Course and the Impact of the Revolution.

Unit II

Rise of Fascism- Mussolini- Revolutionary Ideas of Mussolini- Impact- Rise of Nazism- Hitler- Formation of Nazi Party- Impact of Nazism in European Politics.

Unit III

Second World War- Causes- Course and the Effects- Formation of U.N.O- Organs of U.N.O- Specialized Agencies and their Achievements – Political Achievements- U.N.O and World Peace.

Unit IV

Cold War – Causes - Various Phases of Cold War – Truman Doctrine – Marshall Plan – NATO – SEATO – CENTO – Warsaw Pact- Consequences of Cold War- Non – Alignment Movement – Doctrine – Growth – Achievements – South Asian Association for Regional Co-Operation (SAARC) - Origin– Aims - Achievements.

Unit V

Fall of Communism in USSR- Dismemberment of the U.S.S.R and its Consequences- The Formation of Israel– The Palestinian Problem - Gulf War - Afghan War.

Book for Study

1. Palmer Perkins, (2010). *International Relation.* New Delhi, AITBS Publishers.
2. Cromwell, R.D. (1969). *World History in the Twentieth Century.* London, Replica Press Private Limited.

Books for References

1. Gupta, R. K. (2010). *Foreign Policy Perspectives.* New Delhi, Sumit Enterprises.
2. Puran Chandra, (2010). *Hand Book of Foreign Affairs and Diplomac.* New Delhi, Akansha Publishing House.
3. Abhay Srivastav, (2011). *India's Foreign Policy.* New Delhi, Mohit Publications.
4. Malhotra, S. K. (2013). *International Relations.* New Delhi, Black Prints.
5. Baskaran, R. (2015). *Second World War.* Chennai, New Century Book House Private Limited.