COURSE PLAN OF TEACHERS

For the session: 2021—22

(SAMPLE)

1. ASSAMESE
2. BOTANY
3. CHEMISTRY
4. ECONOMICS
5. EDUCATION
6. ELECTRONICS
7. ENGLISH
8. GEOGRAPHY
9. HINDI
10. HISTORY
11. MATHEMATICS
12. PHILOSOPHY
13. PHYSICS
14. ZOOLOGY

Class	Topic / Unit : 3	Remarks
1.	Introduction	
2.	Padma Nath Gohain Barua and his literary achievement	
3.	Summary of the Drama 'Gaon Burha'	
4.	The 'Gaon Burha' as a Social Drama	
5.	Why 'Gaon Burha' is not a tragedy Drama	
6.	Comedy elements in the Drama	
7.	The Social Scenario in 'Gaon Burha'	
8.	The motive of the Drama	
9.	The characters of the Drama	
10.	The Dialogue of the Drama	
11.	Revision	
12.	Class Test	
13.	Jyotiprasad Agarwala and his literary achievement	
14.	The background of the Drama 'Labhita'	
15.	Subjectmatter of the Drama	
16.	The characters of the Drama	
17.	The heroin of the Drama 'Labhita'	
18.	The Dialogue of the Drama	
19.	The Social scenario of the Drama	
20.	Chapter wise discussion	
21.	The characteristics of Jyotiprasad's Drama	
22.	The songs of Drama 'Labhita'	
23.	Revision	
24.	Class Test	

DIGBOI COLLEGE, DIGBOI
Deptt. of Assamese
COURSE PLAN- 2022
January - May (Even Semester)

Name of the Teacher : Deepa Sarmah Borthakur
Course : Honours
Semester : B.A. 6th Semester
Name of the Paper : Language and Script of Assam (C-14)
Unit Assigned : 1, 3, 4
Marks Assigned : 16, 16, 16

Class	Topic / Unit : 1	Remarks
1.	The Language of Assam	
2.	The Sino-Tibetan Language of Assam	
3.	The Boro and Deuri Language	
4.	The Rabha and Garo Language	
5.	Dimasa and Karbi Language	
6.	The Mishing Language and Rajbansi Language	
7.	The Kakbarak Language of Tripura	
8.	The Tai Language of Assam	
9.	The Tai Ahom Language and Tai Phake Language	
10.	The Tai Khamti and Tai Aiton Language	
11.	The Tai Khamiyang and Tai Turung Language	
12.	Dialects of Assam	
13.	The Kamrupi Dialect	
14.	Sub-Dialects of Kamrupi Dialect	
15.	The Guwalporiya Dialect	
16.	Revision	

Class	Topic / Unit : 3	Remarks
1.	The Characteristics of Sino-Tibetan Language	
2.	The Characteristics of Boro Language	
3.	The Characteristics of Karbi Language	
4.	The Characteristics of Mishing Language	
5.	The Characteristics of Khamti Language	
6.	The Characteristics of Tai Phake Language	
7.	The Characteristics of Tai Turung Language	
8.	The Austric Language of Assam	
9.	Class Test	
10.	Revision	

Class	Topic / Unit : 4	Remarks
1.	Aryan language 'Assamese' and Non-Aryan language of Assam	
2.	Non-Aryan elements in Assamese language	
3.	The Ahom words in Assamese language	
4.	The Bodo elements in Assamese language	
5.	The Rabha elements in Assamese language	
6.	The Mishing elements in Assamese language	
7.	The Tiwa and Garo language elements in Assamese language	
8.	Indian words in Assamese language	
9.	English words in Assamese language	
10.	Assamese elements in Non-Aryan language	
11.	Assamese elements in Boro, Mishing, Karbi, Tiwa & Rabha language	
12.	Revision	
13.	Class Test	

DIGBOI COLLEGE, DIGBOI

COURSE PLAN- 2022

June - December (Odd Semester)

Deptt. of Assamese

Name of the Teacher : Deepa Sarmah Borthakur
Course : Honours
Semester : B.A. 5th Semester
Name of the Paper : Assamese Drama (C-11)
Unit Assigned : 2 & 3
Marks Assigned : 16, 24,

Class	Topic / Unit : 2	Remarks
1.	Introduction of Sri Sri Sankardev	
2.	Ankiya Naat of Sankardev	
3.	Characteristics of Ankiya Naat	
4.	Summary of 'Rukmini Haran Naat'	
5.	Sloka and Bhatima in 'Rukmini Haran Naat'	
6.	Rasa of 'Rukmini Haran Naat'	
7.	Language of 'Rukmini Haran'	
8.	Similarity between 'Rukmini Haran' and 'Ram Bijoy"	
9.	The Characters of 'Rukmini Haran'	
10.	Revision	
11.	Class Test	

Class	Topic / Unit : 2	Remarks
1.	Sanskrit literature 'Nitisatak Sloka'	
2.	The author of 'Nitisatak Sloka'	
3.	Assamese translation from 'Nitisatak Sloka'	
4.	The history of 'Asokan Edicts'	
5.	Difference 'Asokan Edicts' found in difference places in India	
6.	The subjectmatter of the Edicts	
7.	The language of the Asokan Edicts	
8.	Assamese translation from Asokan Edicts 'Girnar-1' & 'Kalsi-1'	
9.	Pali literature 'Dhammapada' & its 'Appamada Bagga'	
10.	Subjectmatter of 'Appamada Bagga'	
11.	Assamese translation of 'Appamada Bagga'	
12.	The language of Appamada Bagga	
13.	Prakrit literature 'Gathasattasai' and its writer	
14.	Assamese translation from 'Gathasattasai'	
15.	Language of the same	
16.	Subjectmatter of the same	
17.	Apabhramsa literature 'Sandesha Rasaka'	
18.	The author of 'Sandesha Rasaka'	
19.	Subjectmatter of the 'Rasaka'	
20.	Assamese translation from 'Sandesha Rasaka'	
21.	Revision	
22.	Class Test.	

DIGBOI COLLEGE, DIGBOI
Deptt. of Assamese
COURSE PLAN- 2022
January - May (Even Semester)

Name of the Teacher : Deepa Sarmah Borthakur
Course : Honours
Semester : 2nd Semester
Name of the Paper : Introduction to Linguistics (C-3)
Unit Assigned : 1, 2 & 5 (b)
Marks Assigned : 16, 16, 8

Class	Topic / Unit : 1	Remarks
1.	ভাষাৰ সংজ্ঞা, উপাদান আৰু ভাষাৰ বৈশিষ্ট্য Defination of language on western and eastern language experts.	
2.	Elements of language	
3.	Sound & Form of language	
4.	The characteristics of language	
5.	Sentence & Tune of language	
6.	Variation of language	
7.	Variation of language and idiolect	
8.	Dialect	
9.	Social Dialect	
10.	Ethnic Dialect	
11.	National and State language	
12.	International language	
13.	Lingua Franca 'Assamese & Nagamese'	
14.	Pidjin and Creole language	
15.	Revision	
16.	Class Test	

Class	Topic / Unit : 2	Remarks
18.	Linguistics : Difference between traditional Grammar, Philosophy and Linguistics	
19..	Branches of Linguistics	
20.	Descriptional Linguistics	
21.	Historical Linguistics	
22.	Comparative Linguistics and Opposite Linguistics	
23.	Socio-Linguistics	
24.	Mental Linguistics	
25.	Applied Linguistics	
26.	Revision	
27.	Class Test	

Class	Topic / Unit : 5 (B)	Remarks
28.	Language studies in India	
29.	Language studies in Assam	
30.	Revision	
31.	Class Test	

DIGBOI COLLEGE, DIGBOI
Deptt. of Assamese
COURSE PLAN- 2022
January - May (Even Semester)

Name of the Teacher : Deepa Sarmah Borthakur
Course : Honours
Semester : 4th Semester
Name of the Paper : Indo-Aryan Languages & Assamese (C-9)
Unit Assigned : 1 & 2
Marks Assigned : 16 & 20

Class	Topic / Unit : 1	Remarks
1.	Development of Indo-Aryan language	
2.	Classification of Indo-Aryan language	
3.	Old Indo-Aryan language	
4.	Middle Indo-Aryan language	
5.	Significance of word 'Prakrit' and its development	
6.	The characteristics of 'Prakrit' language	
7.	Pali language & significance of word 'Pali'	
8.	The characteristics of Pali language	
9.	The origin and development of Pali language	
10.	The origin & development 'Prakrit' language	
11.	Uses of Prakrit language in Sanskrit Drama	
12.	Apabhramsa language	
13.	The characteristics of Apabhramsa language	
14.	Revision	
15.	Class Test	

DIGBOI COLLEGE, DIGBOI
Deptt. of Assamese
COURSE PLAN- 2022
June - December (Odd Semester)

Name of the Teacher : Deepa Sarmah Borthakur
Course : Honours
Semester : 1st Semester
Name of the Paper : History of Assamese Literature (C-1)
Unit Assigned : 2
Marks Assigned : 16

Class	Topic / Unit : 2	Remarks
1.	Introduction of Assamese folk literature	
2.	Folk literature and Assamese folk songs	
3.	Classification of Assamese folk songs	
4.	Assamese 'Anusthanmulak geet'	
5.	Bihu geet, Bangeet, Biyanaam etc.	
6.	Spiritual songs	
7.	Work - songs	
8.	Ballad	
9.	Baromahi geet & Juna	
10.	Pratna Assamese literature	
11.	Charyapada	
12.	Similarity between langauage of Charyapada & Assamese	
13.	'Sunya Purana' and Assamese language	
14.	Revision	
15.	Class Test	

DIGBOI COLLEGE, DIGBOI
Deptt. of Assamese
COURSE PLAN- 2022
June - December (Odd Semester)

Name of the Teacher : Deepa Sarmah Borthakur
Course : Honours
Semester : 1st Semester
Name of the Paper : History of Assamese Literature (C-2)
Unit Assigned : 4
Marks Assigned : 16

Class	Topic / Unit : 4	Remarks
1.	Introduction of Assamese Magazine 'Ramdhenu' & its Editor	
2.	'Ramdhenu' Jugar Patabhumi	
3.	The poet and poetry of Ramdhenu period	
4.	Characteristics of poem in Ramdhenu period	
5.	Short story of Ramdhenu period	
6.	The characteristics of short story	
7.	The Novel of Ramdhenu period	
8.	Drama of Ramdhenu period	
9.	Ramdhenu period is a glorious period in Assamese literature	
10.	Revision	
11.	Class Test	

DIGBOI COLLEGE, DIGBOI
Deptt. of Assamese
COURSE PLAN- 2022
June - December (Odd Semester)

Name of the Teacher : Deepa Sarmah Borthakur
Course : Honours
Semester : B.A. 3rd Semester
Name of the Paper : Selection from Assamese Poetry (C-6)
Unit Assigned : 2
Marks Assigned : 14

Class	Topic / Unit : 2	Remarks
1.	Assamese folk poetry	
2.	About Ajan Phokir, the writer of 'Jikir'	
3.	Summary of the Jikir	
4.	Assamese translation from the Text 'Jikir'	
5.	Word meaning of the Jikir	
6.	Significance of the 'Jikir'	
7.	Similarity between 'Borgeet' & 'Jikir'	
8.	Similarity between 'Dehbisarar Geet' and 'Jikir'	
9.	Description about Ballad	
10.	The historical background of the Naharar Malita	
11.	Summary of the Naharar Malita	
12.	Symbolic meaning of the Malita	
13.	The historical character 'Nahor'	
14.	Revision	
15.	Class Test	

DIGBOI COLLEGE, DIGBOI
Deptt. of Assamese
COURSE PLAN- 2022
June - December (Odd Semester)

Name of the Teacher : Deepa Sarmah Borthakur
Course : Honours
Semester : 3rd Semester
Name of the Paper : Studies on the Culture of Assam (C-7)
Unit Assigned : 1 & 3
Marks Assigned : 16, 18

Class	Topic / Unit : 1	Remarks
1.	Definition of Culture	
2.	Classification of Culture	
3.	The characteristics of Culture	
4.	The Elements of Culture	
5.	Relation between Society and Culture	
6.	Relation between Religion & Culture	
7.	Civilisation and Culture	
8.	Culture and Person	
9.	Culture and Language	
10.	Revision	
11.	Class Test	

Class	Topic / Unit : 3	Remarks
1.	Folk customs of different tribes in Assam	
2.	Brief description of 'Sonowal-Kachari' Tribe	
3.	Folk customs of Sonowal-Kachari-Birth related customs	
4.	Marriage related customs of Sonowal Kachari	
5.	Death related customs	
6.	Festivals and folk customs of Sonowal Kachari	
7.	Folk belief of Sonowal-Kachari tribe	
8.	Food related belief	
9.	Introduction about 'Mishing' tribe of Assam	
10.	Folk customs of Mishing Tribe	
11.	Birth related customs	
12.	Marriage related customs	
13.	Death related customs	
14.	Festivals related customs	
15.	Folk belief of Mishing Tribe	
16.	Food related belief	
17.	Revision	
18.	Class Test	

COURS PLAN FOR MAJOR COURSE (CBCS)
2021-22 (EVEN SEMESTER)

Name of the Teacher:- Achyut Saikia
Department of Assamese
Digboi College, Digboi

Class: BA 2nd Semester
Name of the paper: Poetics
Paper Code: C-4
Unit Assignes: 1 & 2
Marks Assign: 24

Class	Topic/Unit	Remarks
1	Introduction to the course	
2	Shabashakti	
3	Do	
4	Rasa	
5	Do	
6	Dvani	
7	Do	
8	Guna and Riti	
9	Do	
10	Class Test	
11	Realism	
12	Do	
13	Modernism	
14	Do	

15	Revision	
16	Revision	
17	Revision	
18	Revision	

Class: BA 4th Semester
Name of the paper: Theory and Practice of Comparative literature
Paper Code: C- 8
Unit Assignes: Full Paper
Marks Assign: 80

Class	Topic/Unit	Remarks
1	Introduction to the course	
2	The idea of comparative literature	
3	Formation and development	
4	Definition	
5	Relation between combative literature and comparative study	
6	Various aspects of comparative literature	
7	Do	
8	Do	
9	Comparative literature: Indian perspective	
10	Comparative literature in India	
11	Do	
12	Do	
13	Comparative Indian Literature	
14	Do	
15	Comparative literature in Assam	
16	Studies on comparative literature in Assam	
17	Do	
18	Class test	
19	Practice of comparative literature	
20	Studies on comparative literature	
21	Comparision to literature with other art form	
22	Cinematic form of the short story Banaprastha	
23	About the author	
24	Aesthetic value	

25	do	
26	changes	
27	Revision	
28	Revision	

Class: BA 6th Semester
Name of the paper: Introduction to world literature
Paper Code: DSE-3
Unit Assignes: 1, 3, 4, 5(a)
Marks Assign: 50

Class	Topic/Unit	Remarks
1	Introduction to the course	
2	Idea of world literature	
3	Do	
4	Literature and human mind	
5	Literature and society	
6	Literature and aesthetic value	
7	Human value and emotions as universal truth	
8	World literature and translation	
9	Class test	
10	Revision	
11	Mopasannt as story writer	
12	Characteristics of the short stories of Mopasannt	
13	The Necklace – plot construction	
14	Characteristics	
15	Other aspects	
16	Anton Chekhov as a story writer	
17	Characteristics	
18	Maruchhir Swapna – plot construction	
19	Characteristics	
20	Other aspects	
21	O Henry as a story writer	
22	Characteristics	
23	The gift of Magi – plot construction	

24	Characteristics	
25	Other aspects	
26	Revision	
27	Thomas hardy as a poet	
28	The poem dead man walking	
29	Discussiion	
30	Diety of first Desire by Garcia Lorkca	
31	Overall discussion	
32	Somoyar Santanbor by Alexender Block (Assamese Translation)	
33	Discussion	
34	Incident by Counti Culer	
35	Discussion	
36	The Black Man's son by Oswald Durant	
37	Discussion	
38	Revision	
39	Afke's Ten by Nenke Van Hekhtum	
40	Itroduction of the writer	
41	Afke's Ten in Assamese by Mahendra Bora	
42	Plot construction of the novel	
43	Characterisation	
44	Other aspects	
45	Discussion about the translation	
46	Artistic value of the novel	
47	Revision	

Class: BA 6th Semester
Name of the paper: Selection from Assamese Prose
Paper Code: C-13
Unit Assignes: 2(a)
Marks Assign: 10

Class	Topic/Unit	Remarks
1	Introduction	
2	Various aspects of novel	
3	Manomati by Rajanikanta Bordoloi	
4	About the author	
5	Background of Assamese novel	
6	Plot construction of the novel	
7	Characterisation	
8	Do	
9	Other aspects	
10	Do	
11	Revision	
12	Revision	

DIGBOI COLLEGE , DIGBOI

COURSE PLAN(2021- 2022)

Name of the Teacher – DR . Mrinal Kumar Gogoi (ASSAMESE Dept.) .

Course - Honours /GENERIC –HONOURS .

Class/Semester - B A 2nd Semester (CBCS) .

Name of the paper – C-4 (Poetics) .

Units Assigned – Unit – 3 , 4 & 5 .

Marks Assigned - 16+16 +16 .

Class .	Topic/ Unit .	Remarks	
1	What is Poetics		
2	Relation between Alamkara and Chanda		
3	What is Alamkara and its definition		
4	Different types of Alamkara		
5	Different types of Sabdalamkara and Athalamkara -1		
6	Different types of Sabdalamkara and Athalamkara -2		
7	Sabdalamkara : Anupras, Jamak		
8	Sabdalamkara : Punaruktabadabhas		
9	Athalamkara : Upama, Rupak -1		
10	Athalamkara : Upama, Rupak -2		
11	Utpekhya, Apohnuti		
12	Sandes, Otiyokti		
13	Samasokti, Byatirek etc		
14	What is Rhyme and Metre		
15	Elements of Rhyme		
16	Porba		
17	Charan		
18	Stobak		
19	Mora		
20	Assamese Rhyme and its Characters		
21	Different types of Assamese Rhyme		
22	Unit of Assamese Chanda-Riti		
23	Swarabritta, Matrabritta & Jaogik Riti		
24	Old Assamese Rhyme		
25	Muktak Chanda and its Characters-1		
26	Muktak Chanda and its Characters-2		
27	Amitakhyor Chanda-1		
28	Amitakhyor Chanda-2		
29	Revision		
30	Class test		

Class /Semester - B A 4th Semester (CBCS) .
Name of the paper – C-10 (Selection from Assamese Prose) .
Units Assigned – Unit – 1 & 5 .
Marks Assigned - 16+18 .

Class .	Topic/ Unit .	Remarks	
1	Origin and development of Assamese Prose-1		
2	Origin and development of Assamese Prose-2		
3	Ankia Naat and Prose of Sankardeva		
4	Sanskrit Prose and Assamese literature		
5	Prose of Bhattadeva-1		
6	Prose of Bhattadeva-2		
7	Bhattadeva's Kathagita & Kathabhagavat		
8	Charitra kirtan at Assam		
9	The prose of Charit-puthi		
10	The other prose of Vaisnava period		
11	Prose-history of Ahom Kingdom		
12	Buranji Sahitya-1		
13	Buranji Sahitya-2		
14	Practical literature Prose of medieval periods -1		
15	Practical literature Prose of medieval periods -2		
16	Prose of Arunodoi periods -1		
17	Prose of Arunodoi periods -2		
18	Modern Assamese Prose		
19	Jonaki Yug & Assamese Prose		
20	Recent Assamese prose and its evaluation -1		
21	Recent Assamese prose and its evaluation -2		
22	Prose of Assamese Novel		
23	Prose of Assamese Short story		
24	Other prose of Post-war period		
25	Prose of BK Baruah & his article " Asomiya bhasar jnyati-kutum"-1		
26	Prose of BK Baruah & his article " Asomiya bhasar jnyati-kutum"-2		
27	Prose of Lila Gogoi		
28	"Buranji Bichari" by Lila Gogoi		
29	Hiren Gohain's prose and Assamese modern Literature		
30	Characteristics of Hiren Gohain's prose		
32	"Adhunik aru Adhunikatabad" by Hiren Gohain		
33	Prose of Nagen Saikia		
34	Contemporary Assamese Prose Writers		
35	"Asomiya Nri-Gosthi aru Bhasa-Gosthi samuh" by N Saikia-1		
36	"Asomiya Nri-Gosthi aru Bhasa-Gosthi samuh" by N Saikia-2		

37	Revision		

Class /Semester - B A 6th Semester (CBCS) .
Name of the paper – DSE-4(a) (Special Author) .
Units Assigned – Full Paper
Marks Assigned - 80

Class .	Topic/ Unit .	Remarks	
1	Introduction of modern Assamese literature		
2	Dr. B K Bhattacharya: Parichoy		
3	B.K. Bhatta as a writer		
4	B K Bhatta as a novelist		
5	B K Bhatta as a short story writer		
6	B K Bhatta as a poet		
7	B K Bhatta as a editor		
8	Ramdhenu and B K Bhatta		
9	Ramdhenu and modern Assamese literature		
10	Ramdhenu period and Assamese prose		
11	Mrityunjoy an Introduction		
12	Social value of Mrintyunjoy		
13	Characteristics of Mrintyunjoy		
14	Iyaruingon An Introduction		
15	Characteristics of Iyaruingom		
16	Rajpothe ringiyai An Introduction		
17	Other novels of B K Bhatta		
18	Chinaki xuuti: as a short story		
19	Various elements of Ass. Culture in his work		
20	Assamese culture and B K Bhatta		
21	Sative in his various work		
22	B K Bhatta as a translator		
23	B K Bhatta as a social worker		
24	Personality of B K Bhatta		
25	Class test		
26	Class test		
27	Short question about B K Bhatta		

Class /Semester - B A 6th Semester (CBCS) .
Name of the paper – 13 (Iyaruingom) .
Units Assigned – 2
Marks Assigned - 20

Class .	Topic/ Unit .	Remarks	
1	Introduction about B K Bhatta		
2	His literary works		
3	Novel: definition and classification		
4	Plot construction of the novel		
5	Characters of the novel		
6	Rreflexction of contemporary assamese society in this novel		
7	Critical analysis of the novel		
8	REVISION		
9	REVISION		
10	REVISION		

COURSE PLAN FOR MAJOR COURSE (CBCS)
SESSION JAN 2021-DEC 2022
EVEN SEMESTER

Name of the Teacher:- Simanta Bordoloi
Department of Assamese
Digboi College, Digboi

Class: BA 2nd Semester
Name of the paper: Poetics
Paper Code: C4
Unit Assignes: Unit-2 (Classicism, Mysticism, Romanticsm, Realism, Modernism)
Marks Assign: 16

Class	Topic/Unit	Remarks
1	Deinition of Classicism and its evolution	
2	characteristcs of Classicism	
3	differenes between Classicism neoclassicism and Romanticism	
4	Definition of Mysticism	
5	Characteristics of Mysticism	
6	Romanicism and its evolution	
7	Characteristics of Romanticism	
8	Definition of Realism and its evvolution	
9	Characteristics of realsm	
10	Modernsm: its evolution	
11	Characteristics of modernism	
12	Revision	
13	Revision	

14	Revision	

Class: BA 4th Semester
Name of the paper: Selection from Assamese Prose
Paper Code: C 10
Unit Assignes: Unit-2 (Old Assamese Prose: Katha Gita, Tunkhungia Buranji, Guru Charit Katha – slected Prose)
Marks Assign: 14

Class	Topic/Unit	Remarks
1	Bhattadevor Chamu Paricoy	
2	Geetar chamu paricoy	
3	Katha Geetar tattik dish	
4	Bhattadevor Gadyar Boishistya	
5	Buranji Sahityar Uttpatti aru Bikash	
6	Buranjir Gadya	
7	Tunkhungia Buranjir Bishoybastur alochona	
8	Charity Sahityar Utpatti are Bikash	
9	Charit puthir Gadya	
10	Nirbachito pathyanshor aluchona	
11	Revision	
12	Revision	
13	Revision	
14	Revision	

Class: BA 4th Semester
Name of the paper: Selection from Assamese Prose
Paper Code: C 10
Unit Assignes: Unit-3 (Orunudoy jugar Asomiya Gadya:Nirbachita Path – Jatrikar Jatra, Asomiya lorar Mitra,)
Marks Assign: 14

Class	Topic/Unit	Remarks
1	Arunodoy jugar patabhumi	
2	Arunudoy just bhasha are gadya	
2	Jatrikar Jatrar alochona	
3	Anandaram Chemical Phukanar Chamu Parichoy	
4	Asomiya lorar mitrar alochana	
5	Arunudoy jugar sahityar Baishistya	
6	Arunudoy starar gadyariti	
7	Missionary gadyar Baishistya	
8	Revision	
9	Revision	
10	Revision	
11	Revision	
12	Revision	

Class: BA 4th Semester
Name of the paper: Selection from Assamese Prose
Paper Code: C 10
Unit Assignes: Unit-4 (Jonaki jugar Gadya:Nirbachita Path – Bahire rongchong Bhitore Kuabhaturi, Dhanar Byabohar, Jatiya Choitanya, Satawan Sal)
Marks Assign: 14

Class	Topic/Unit	Remarks
1	Jonaki jugar patabhumi	
2	Hemchandra Baruar Sahitya kriti	
3	Hemchandra Baruar Gadyariti	
4	Bahire rongchong bhitore kuabhaturir alochana	
5	Satyanath Borar chamu porichoy	
5	Satyanath Borar gadyariti	
6	Dhanar byboharr aluchona	
7	Banikanta Kakatir parichoy	
8	Banikanta Kakatir Gadyarti	
9	Jatiya Choitanya: eti Alochana	
10	Benudhar Rajkhuar chamu porichoy	
11	Satawan Saal: Eti Alochona	
12	BenudarRajkhuwar Gadyariti	
13	Jonakir Gadyar Boishistya	
14	Revision	
15	Revision	
16	Revision	
17	Revision	

Class: B.A. 6th Semester
Name of the paper: Selection from Assamese Prose
Paper Code: C - 13
Unit Assignes: Unit–1 (Assamese Short Story)
Marks Assign: 16

Class	Topic/Unit	Remarks
1	Asomiya Chutigalpar chamu parichoy	
2	Purabi Bormudoi galpar Boishistya	
3	Burhi Air Sadhu galpar Alochana	
4	Lakshminandan Borar Galpa	
5	Sokha Damodar Galpar Alochana	
7	Saurav Kumar Chalihar Galpa	
8	Ehat Daba Galpar Alochana	
9	Kula Saikiar Galpa	
10	Duwar GAlpar Alochana	
11	Revision	
12	Revision	
13	Revision	
14	Revision	

Class: B.A. 6th Semester
Name of the paper: Selection from Assamese Prose
Paper Code: C -13
Unit Assignes: Unit–3 (Asomiya Jiboni aru atma jiboni)
Marks Assign: 16

Class	Topic/Unit	Remarks
1	Asomiya Jiboni Sahityar parochoy	
2	Jiboni aru Atmajibonir parthakya	
3	Gunabhiram Baruar chamu parichoy	
4	Ananda Ram Dhekiyal Phukanar Jibon Charitrar Alochana	
5	Lakshminath Bezbaruarr Parichoy	
6	Mur Jibon Sowaran: Alochana	
7	Indira Miri: Jibon Aru Sahitya Karma	
8	Nefar Bichitra Abhigyata: Alochana	
9	Revision	
10	Revision	
11	Revision	
12	Revision	

Class: B.A. 6th Semester
Name of the paper: Selection from Assamese Prose
Paper Code: C - 13
Unit Assignes: Unit–4 (Assamese bhraman kahini)
Marks Assign: 12

Class	Topic/Unit	Remarks
1	Hem Baruah: Jibon Aru Sahitya	
2	Asomiya Bhraman sahityar chamu Parichoy	
3	Bhraman Sahityar Boishistya	
4	Israil GranthaKhanar Somaluchana	
5	Do	
6	Do	
7	Revision	
8	Revision	
9	Revision	
10	Revision	

Class: B.A. 6th Semester
Name of the paper: Selection from Assamese Prose
Paper Code: C -13
Unit Assignes: Unit-5 (Asomiya byaktigata rosona aru bigyan sahitya)
Marks Assign: 16

Class	Topic/Unit	Remarks
1	Homen Borgohainr gadya	
2	Jibonor joygaan: Alochana	
3	do	
4	do	
5	Dinesh Chandra Goswamir Gadya	
6	Gor Basuar babe Electronic byobastha: Alochana	
7	do	
8	do	
9	Revision	
10	Revision	
11	Revision	
12	Revision	

COURS PLAN FOR MAJOR COURSE (CBCS)
JAN 2022-DEC 22
ODD AND EVEN SEMESTER

Name of the Teacher : Dr. Lakshmi Devi

Course- Honours/ Generic: Honours

Class / Semester : 2nd Semester

Name of the Paper : C3 (Introduction of Linguistics)

Units Assigned : Unit - 4

Marks Assigned : 16+

Class	Topic / Unit	Remarks
1.	Language Classification	
2.	Typological Classification	
3.	Genealogical Classification	
4.	Inorganic Language	
5.	Organic Language	
6.	Indo – European Language	
7.	Austronisian Language	
8.	Sino – Tibetan Language	
9.	Austro – Asiatic Language	
10.	Dravidian Language	
11.	Nigero – Congo Language	
12.	Afro – Asiatic Language	
13.	Japanic Language	
14.	Tai – Kadai Language	
15.	Altaic Language	

Course- Honours/ Generic: Honours

Class / Semester : 2nd Semester

Name of the Paper : C3 (Introduction to Linguistics)

Units Assigned : Unit – 5

Marks Assigned : 16

Class	Topic / Unit	Remarks
1.	What is Grammar	
2.	Traditional Grammar	
3.	Modern Grammar	
4.	Boidik Period	
5.	Western Period	
6.	Naturalists and Conventionalisits	
7.	Dionysius Thrax	
8.	Homeric and Attic	
9.	Donatus and Priscian	
10.	Speculative Grammarians	
11.	Scholastic Tradition	
12.	Transformational Generative Grammar	
13.	Fardinand De Saussure	
14.	Modern Linguistics	

Course- Honours/ Generic: Honours

Class / Semester : 4th Semester

Name of the Paper : C9 (Indo- Aryan Language and Assamese)

Units Assigned : Unit – 3+4

Marks Assigned : 20+24

Class	Topic / Unit	Remarks
1.	Sanskrit, Pali and Prakrit Bhasar Tulana	
2.	Sanskrit, Pali and Prakrit Vowels	
3.	Sanskrit, Pali and Prakrit Consonants	
4.	Sanskrit, Pali and Prakrit Sabdarup	
5.	Sanskrit, Pali and Prakrit Verbs	
6.	Asomiya Bhasar Janma Katha	
7.	Asomiya Bhasar Bikas	
8.	Pratna Asomiya Bhasa	
9.	Pracheen Asomiya Bhasa	
10.	Madhya Asomiya Bhasa	
11.	Adhunik Asomiya Bhasa	

Course- Honours/ Generic: Honours

Class / Semester : 4th Semester

Name of the Paper : Assamese prose Literature

Units Assigned : 3

Marks Assigned : 12

Class	Topic / Unit	Remarks
1.	Introduction of Bhattadeva	
2.	Text of Katha Geeta	
3.	Prose style of Katha Geeta	
4.	Bhattadeva's Prose style	
5.	Indtroduction of Lakshminath Bezbaruah	
6.	Text of Mor Jiban Sonwarn	
7.	Prose Style Mor Jiban Sonwarn	
8.	Lakshminath Bezbaruah Prose Style	

Course- Honours/ Generic: Honours

Class / Semester : 4th Semester

Name of the Paper : Assamese Language and script

Units Assigned : 3

Marks Assigned : 16

Class	Topic / Unit	Remarks
1.	Introduction of Bodo Lanaguage	
2.	Language Characteristics o f Bodo Language	
3.	Introduction of Karbi Language	
4.	Language Characteristics of Karbi Language	
5.	Introduction of Tai Khamti Language	
6.	Language Characteristics of Tai Khamti	
7.	Introduction of Tai Phake Language	
8.	Language Characteristics of Tai Phake	
9.	Introduction of Tai Turung	
10.	Language Characteristics of Tai Turung	

Course- Honours/ Generic: Honours

Class / Semester : 4th Semester

Name of the Paper : Assamese language

Units Assigned : 2

Marks Assigned : 16

Class	Topic / Unit	Remarks
1.	Assamese Language	
2.	Characteristics of Assamese Language	
3.	Dialect of Assamese Language	
4.	Types of Assamese Dialect	
5.	Kamrupi Dialect, Gowalpariya Dialect	
6.	Character istics of Kamrupi Dialect	
7.	Characteristics of Gowalporiya Dialect	
8.	Sub Dialect of Kamrupi Dialect	
9.	Characteristics of Kamrupi Sub Dialect	
10.	Sub Dialect of Gowalporiya Dialect	
11.	Characteristics of Gowalporiya Sub Dialect	

Course- Honours/ Generic: Honours

Class / Semester : 6th Semester

Name of the Paper : Language and Script of Assam (C 14)

Units Assigned : Unit – 5

Marks Assigned : 16

Class	Topic / Unit	Remarks
1.	Introduction script	
2.	Types of Script	
3.	Brahmi Script	
4.	Kusan Script	
5.	Gutpa Script	
6.	History of Assam Script	
7.	Development of Assamese Script	
8.	Roman Script	
9.	Devanagaree Script	
10.	Assamese Paleography	
11.	Type of Assamese Script	
12.	Tai Script	
13.	Other Language Script	

Course- Honours/ Generic: Honours

Class / Semester : 6th Semester

Name of the Paper : Language and Script of Assam (C14)

Units Assigned : Unit – 2

Marks Assigned : 16

Class	Topic / Unit	Remarks
1.	Assamese Language	
2.	Characteristics of Assamese Language	
3.	Dialect	
4.	Assamese Dialect	
5.	Type of Assamese Dialect	
6.	Kamrupi Dialect	
7.	Sub Dialect of Kamrupi	
8.	Gowalpariya Dialect	
9.	South Western Kamrupi Dialect	
10.	North Western Kamrupi Dialect	
11.	Eastern South Kamrupi Dialect	
12.	North South Kamrupi Dialect	
13.	Sub-Dialect of Gowalporiya Dialect	
14.	Characteristics of Gowalporiya Dialect	

Course- Honours/ Generic: Honours

Class / Semester : 6th Semester

Name of the Paper : World Literature

Units Assigned : Unit – 2

Marks Assigned : 15

Class	Topic / Unit	Remarks
1.	Kalidash	
2.	Kalidas Drama	
3.	Abhijyanam Sukantalm Introduction	
4.	Character of Abhijynam Sukuntalm	
5.	About the friends of Sukuntala	
6.	Durbasa Rishir Abhisap	
7.	Sukuntala Releate to Nature	

Course- Honours/ Generic: Honours

Class / Semester : 6th Semester

Name of the Paper : Introduction to World Literature

Units Assigned : Unit – 5

Marks Assigned : 20

Class	Topic / Unit	Remarks
1.	Asurateerath	
2.	King Lear	
3.	Character of King Lear	
4.	King Lear and Asurateeratha	
5.	Characteristics of Tragedy	
6.	Afkes Ten	
7.	Character of Afkes Ten	
8.	Novel of Child	
9.	Proverty of Afkes Ten	

Course- Honours/ Generic: Honours

Class / Semester : 6th Semester

Name of the Paper : Various aspects of Language and Literature

Units Assigned : 4

Marks Assigned : 16

Class	Topic / Unit	Remarks
1.	Literature of Sociology	
2.	Relation between sociology and literature	
3.	Theory of Literature Sociology	
4.	Importance of Literature Sociology	

Name of the teacher: Dr. Tilak Chandra Dutta

Course Plan(Jan-June)2022

Course-Honours

Class: 2nd Semester

Name of the paper: C-IV (Archegoniate)

Units Assigned: Unit-2,3

Marks Assigned:10

Class	Unit/Course	Remarks
1 2 3 4 5 &6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	Unit-2: General characteristics; Adaptations to land habit; Classification; Range of thallus organization.(6-lectures) Unit-3: **Type Studies- Bryophytes (12 lectures)** Classification (up to family), morphology, anatomy and reproduction of *Riccia,* *Marchantia, Pellia,* *Porella, Anthoceros,* *Sphagnum ,Funaria and* *Polytrichum*; Reproduction and evolutionary trends in *Riccia, Marchantia,* *Anthoceros* and	Total 23 classes

	Funaria (developmental stages not included). Ecological and economic importance of bryophytes with special reference to *Sphagnum*.	

Course-Generic elective

Class: 2nd Semester

Name of the paper: GE-II(Plant physiology)

Units Assigned: Unit-4

Marks Assigned

Class	Unit/Course	Remarks
1 2 3 4 5 6 7 8	**Unit 1: Plant-water relations** **(8 lectures)** Importance of water, water potential and its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation.	8 classes

Class:: MSc 2nd Semester

Name of the paper: DSE-306E (Genetics and Crop Improvement)

Units Assigned: Unit-1,2,3,45,6

Marks Assigned:100(4 Credits)

Class	Units/Course	Remarks
	Unit 1: Mutation:	Total 45 Classes
1	at chromosomal level: euploidy and	
2	aneuploidy, deletion, duplication,	
3		
4	translocation and cytogenetics and	
5	breeding behaviour of translocation	
6		
7	heterozygote and deficiency, position effect,	
8		
9	induction of polyploidy; (b) at molecular level:	
10		
11	Frame shift and substitution mutation, DNA damage	
12	and repair,	
	Spontaneous and induced mutation; mutagens and	
13	their mode of action and	
14	(c) at biochemical level: One gene - one enzyme hypothesis,	
15	biochemical degradation of phenylalanine in man,	
16	biochemical mutation in Neurospora.	
17	**Unit 2: Genetic basis of plant breeding**: Genetic consequence of hybridisation, quantitative	
18	inheritance,	
19		
20	population structure,	
21	Hardy Weinburg Law, combining ability,	
22	heritability, genetic advance,	
23	genetic base, choice of breeding methods,	
24		
25	germplasm activities and exploration.	
26	**Unit 3: Breeding procedure for self pollinated**, cross pollinated and vegetatively propagated	
27		
28	plants, mutation and ploidy breeding including	
29		
30	haploidy in crop improvement;	
31		
32	Heterosis, dominance and over dominance hypothesis, inbreeding depression,	
33	estimation of heterosis, types of hybrids and	
34		
35	development of hybrid seeds. Concept and	
36		
37	utility of distant hybridisation.	
38		
39	**Unit 4: Breeding for disease and insect**	
40	**resistance,** Types of genetic resistance, vertical and	
41	horizontal resistance, mechanism of disease and	
42	insect resistances, factors or genes of resistance,	
43	source of resistance,	
44	breeding methods, advantage and	

45	limitations of resistance breeding. **Unit 5: In vitro technique in plant breeding**: cell and tissue culture, primary culture, cell line, cell clones, callus culture, somaclonal variation, micropropagation, somatic embryogenesis, haploidy, protoplast fusion and somatic hybridisation, transgenesis, artificial seeds, application and achievements of in vitro techniques in plant breeding. **Unit 6: Breeding of wheat, rice, sugarcane**, cotton, potato and major pulses in India with special reference to their origin, classification and production of improved varieties	

Course-Honours

Class: 4th Semester

Name of the paper: -C-VIII (Molecular Biology)

Units Assigned: Unit-1,2,3,43,5&6

Marks Assigned:53

Class	Unit/Course	Remarks
1 2 3 4 5 6 7 8 9	**Unit 1: Nucleic acids : Carriers of genetic information** **(4 lectures)** Historical perspective; DNA as the carrier of genetic information (Griffith's, Hershey & Chase, Avery, McLeod & McCarty **Unit 2. The Structures of DNA and RNA / Genetic Material** **(10 lectures)**	49 classes

	DNA Structure: Miescher to Watson and Crick- historic perspective, DNA structure, Salient features of double helix, Types of DNA (DNA, RNA), Types of genetic material, denaturation and renaturation,; Organization of DNA- Prokaryotes, Viruses, Eukaryotes.RNA Structure Organelle DNA -- mitochondria and chloroplast DNA. **Unit 2:The replication of DNA** **(10 lectures)** Chemistry of DNA synthesis (Kornberg's discovery); General principles – bidirectional, semi-conservative and semi discontinuous replication, RNA priming; Various models of DNA replication, including rolling circle, θ (theta) mode of replication, replication of linear ds-DNA. **Unit 3: Central dogma and genetic code** **(2 lectures)** Key experiments establishing-The Central Dogma (Adaptor hypothesis and discovery of mRNA template), Genetic code; experimental proof of triplet codon (deciphering & salient features**)** **Unit 4: Transcription** **(6 lectures)** Transcription in prokaryotes and eukaryotes. Principles of transcriptional regulation; Prokaryotes: lac operon in *E.coli.*	

48 49	Eukaryotes: transcription factors, Gene silencing. **Unit 5: Processing and modification of RNA** **(8 lectures)** Split genes-concept of introns and exons, removal of introns, spliceosome machinery, splicing pathways, group I and group II intron splicing, eukaryotic mRNA processing(5' cap, 3' polyA tail); Ribozymes; RNA editing; mRNA transport. **Unit 6: Translation** **(8 lectures)** Ribosome structure and assembly, mRNA; Charging of tRNA, aminoacyl tRNA synthetases; Various steps in protein synthesis, proteins involved in initiation, elongation and termination of polypeptides; Fidelity of translation; Inhibitors of protein synthesis; Post-translational modifications of proteins.	

Course-Generic elective

Class: 4th Semester

Name of the paper: Plant Physiology

Units Assigned: Unit-1

Marks Assigned:7

Class	Unit/Course	Remarks
1 2 3 4 5	**Unit 4: Ecosystem** **(8 lectures)** Structure; energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and	Total 8 classes

6 7 8	productivity; Biogeochemical cycling; Cycling of carbon, nitrogen and phosphorous	

Course-Honours

Class: 6th Semester

Name of the paper: DSE605 Plant Breeding

Units Assigned: Unit-1,2,3,4,5

Marks Assigned 53

Class	Unit/Course	Remarks
1&2 3 4&5 6&7 8 9&10 11,12,&13 14,15,16 17,18,19 20,21 22,23 24,25,26 27, 28 29 30 31 32,33,34,35,36 37 38 39 40 41	**Unit 1: Plant Breeding(10 lectures)** Introduction and objectives. Breeding systems: modes of reproduction in crop plants. Important achievements and undesirable consequences of plant breeding. **Unit 2: Methods of crop improvement** **(20 lectures)** Introduction: Centres of origin and domestication of crop plants, plant genetic resources; Acclimatization; Selection methods: For self pollinated, cross pollinated and vegetatively propagated plants; Hybridization: For self, cross and vegetatively propagated plants – Procedure, advantages and limitations. **Unit 3: Quantitative inheritance(10 lectures)** Concept	Total 61 classes

42,43,44,45,46,47 48,49 50 51,52 53,54,56 57,58,59 60,61	, mechanism, examples of inheritance of Kernel colour in wheat, Skin colour in human beings. Monogenic vs polygenic Inheritance. **Unit 4: Inbreeding depression and heterosis (10 lectures)** History, genetic basis of inbreeding depression and heterosis; Applications. **Unit 5: Crop improvement and breeding (10 lectures)** Role of mutations; Polyploidy; Distant hybridization and role of biotechnology in crop improvement.	

Course Plan(August to December,2022

Course-Honours

Class: 1st Semester

Name of the paper: C-102

Units Assigned: Unit-4,5,6&7

Marks Assigned:26

Class	Unit/Course	Remarks
1 2	**Unit4: The cell, Cell wall and plasma membrane** **(8 lectures)**	31 classes

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 26 27 28 29 30 31	Cell as a unit of structure and function; Cell theory and its exception; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell (End symbiotic theory); Chromosome (types, structure and function). Chemistry, structure and function of Plant cell wall. Overview of membrane function; fluid mosaic model; Chemical composition of membranes; Membrane transport – Passive, active and facilitated transport, endocytosis and exocytosis. **Unit 5: Cell organelles (16 lectures)** **Nucleus:** Structure-nuclear envelope, nuclear pore complex, nuclear lamina, molecular organization of chromatin; nucleolus. **Cytoskeleton:** Role and structure of microtubules, microfilaments and intermediary filament. **Chloroplast, mitochondria and peroxisomes:** Structural organization; Function; Semiautonomous nature of mitochondria and chloroplast. **Endomembrane system:** Endoplasmic Reticulum – Structure, targeting and insertion of proteins in the ER, protein folding, processing; Smooth ER and lipid synthesis, export of proteins and lipids; Golgi Apparatus – organization, protein glycosylation, protein sorting and export from Golgi Apparatus; Lysosomes **Unit 6: Cell division** **(6 lectures)** Phases of eukaryotic cell cycle, mitosis and meiosis; Regulation of cell cycle- checkpoints, role of protein kinases.	

Class: 1st Semester

Name of the paper: C-101

Units Assigned: Unit-2&4

Marks Assigned:10

Class	Unit/Course	Remarks
1 2 3 4 5 6 7 8 9 10 11 12	**Unit 2: Algae (10 lectures)** General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Classification of algae; Morphology and life-cycles of the following: *Nostoc*, *Chlamydomonas*, *Oedogonium*, *Vaucheria*, *Fucus*, *Polysiphonia*. Economic importance of algae. **Unit 4: Lichen** (**2 lectures)** General account, types and importance	12 classes

Course- Honours

Class: 3rd Semester

Name of the paper: C-VII(Genetics)

Units Assigned: Unit1,2,3,4,5,6&7

Marks Assigned:53

Class	Unit/Course	Remarks
1 2 3 4 5 6 7 8 9 10 11 12 13	**Unit 1: Mendelian genetics and its extension** **(16 lectures)** Mendelism: History; Principles of inheritance; Chromosome theory of inheritance; Autosomes and sex chromosomes, euchromatin & herterochomatin; Probability and pedigree analysis;	61 classes

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44&45 46&47 48&49 50 51 52 53 54 55 56 57 58 59 60	Incomplete dominance and codominance; Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Recessive and Dominant traits, Penetrance and Expressivity, Numericals; Polygenic inheritance. **Unit 2: Extrachromosomal Inheritance(6 lectures)** Chloroplast mutation: Variegation in Four o'clock plant; Mitochondrial mutations inyeast; Maternal effects- shell coiling in snail; Infective heredity- Kappa particles in *Paramecium.* **Unit 3: Linkage, crossing over and chromosome mapping** (**12 lectures)** Linkage and crossing over- Cytological basis of crossing over; Recombination frequency, two factor and three factor crosses; Interference and coincidence; Numericals based on gene mapping; Sex Linked, sex-limited and sex-influence traits **Unit 4: Variation in chromosome number and structure(8 lectures)** Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy, hereditary abnormalities in human due to anuneuploidy **Unit 5: Fine structure of gene(6 lectures)** Classical vs molecular concepts of gene; Cis-Trans complementation test for functional allelism;	

61	Structure of Phage T4, rII Locus. **Unit 6: Gene mutations** **(6 lectures)** Types of mutations; Molecular basis of Mutations; Mutagens – physical and chemical (Base analogs, deaminating, alkylating and intercalating agents); Detection of mutations: ClB method.Role of Transposons in mutation.DNA repair mechanisms. **Unit 7. Population and Evolutionary Genetics** **(6 lectures)** Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection, mutation, genetic drift. Genetic variation and Speciation.	

Course- Generic Elective

Class: 3rd Semester

Name of the paper: GE-301

Units Assigned: Unit1,&2

Marks Assigned:13

Class	Unit/Course	Remarks
1,2,3&4 4&6 7&8 9&10 11 12	**Unit 1: Meristematic and permanent tissues** **(8 lectures)** Root and shoot apical meristems; Simple and complex tissues **Unit 2: Organs(4 lectures)** Structure of dicot and monocot root stem and leaf.	12 Classes

Course- Honours

Class: 5th Semester

Name of the paper: Core Course-511

Units Assigned: Unit1,2,3,4,5,6&7

Marks Assigned:53

Class	Unit/Course	Remarks
	Unit 1: Introduction(4 classes)	62 classes
1 2 3 4	History (contributions of G.B. Amici, W. Maheshwari, B.M. Johri, W.A. Jensen, J. Hofmeister, E. Strasburger, S.G. Nawaschin, P. Heslop-Harrison) and scope.	
5&6	**Unit 2: Reproductive development(6 classes)**	
7&8 9 10	Induction of flowering; flower as a modified determinate shoot. Flower development.	
11	Genetic and molecular aspects	
12	**Unit 3: Anther and pollen biology(10 classes)**	
13 14	Anther wall: structure and functions,	
15	microsporogenesis,	
16 17	callose deposition and its significance.	
18	Microgametogenesis;	
19	pollen wall structure,	
20	MGU (male germ unit) structure,	
21	NPC system; palynology and scope (a brief account);	
22 23	pollen wall proteins; pollen viability, storage and germination.	
24 25		
26	**Unit 4: Ovule(10 lectures)**	
27	Structure;Ovule	
28	types; special structures	
29 30	–endothelium, obturator,	
31	aril, caruncle and hypostase;	
32 33	female gametophyte– megasporogenesis	
34 35	(monosporic, bisporic and	
36	tetrasporic) and megagametogenesis	
37	(details of *Polygonum* type). **Unit 4: Pollination and fertilization(6 Classes)**	

38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57&58 59 60 61&62	Pollination types and significance; adaptations; structure of stigma and style; path of pollen tube in pistil; double fertilization. **Unit 5: Self incompatibility(10 lectures)** Basic concepts (interspecific, intraspecific, homomorphic, heteromorphic, GSI and SSI); Methods to overcome self- incompatibility: mixed pollination, bud pollination, stub pollination. **Unit 6: Embryo, Endosperm and Seed(10 classes)** Structure and types; general pattern of development of dicot and monocot embryo and endosperm; suspensor: structure and functions; embryo-endosperm relationship; nutrition of embryo; unusual features; embryo development in *Paeonia*. seed structure, importance and dispersal mechanisms **Units 7: Polyembryony, apomixes and parthenocarpy** Introduction; classification; causes and applications.(**6 classes)**	

MSC 1st Semester

Paper Name:DSE-106 cyto-genetics and crop improvement

Units Assigned: Unit1,2,3,4,5,6

Marks Assigned:100

MSc 1st Sem.	Units/course	Remarks
1 2	Unit1: Cell theory and exceptions, Gross structure and chemistry of eukayotic and prokaryotic	Total 21 classes

3 4 5 6 7 8 9 10 12 14 15 16 17 18 19 20 21	chromosomes, specialized chromosomes and their cytogenetic significances, mitotic apparatus. Synaptenemal complex, chromosome theory of inheritance, concept of karyotype and idiogram. Unit 2: Polygenic inheritance: Previous knowledge of mendelism and modifications, inheritance of kernal colour of wheat, corolla length in tobacco, transgressive variation. Unit 3: Multiple alleles: alleles, multiple alleles and isoalleles, sexual incompatibility in plants, blood group alleles in man, multiple alleles and complex loci. Unit 4: Linkage, recombination and gene mapping: Morgan's works on Drosophila, Coupling and repulsion hypothesis, cytological evidence of crossing over, gene mapping, interference and coincidence. Unit 5: Genetical control of sex: Chromosomal basis of sex determination, balanced theory of sex determination, environmental and hormonal control of sex, concept of sex linked, sex limited and sex influenced characters. Unit 6: Extranuclear transmission of traits; maternal effect and maternal inheritance, Killer trait in paramecium, Co_2 sensitivity in Drosophila, plastid inheritance and male sterility in plants, organeller genetics - episomes, mitochondria and chloroplast.	

MSc 3rd Semester

Paper Name:DSE-106 cyto-genetics and crop improvement

Units Assigned: Unit-1,2,3,4,5,6

Marks Assigned:100(4 Credits)

Class	Unit/Course	Remarks
	Unit1: Molecular genetics;	Total Class 44
1	Basic concepts of molecular genetic	
2	markers: viz. microsatellite,	
3	SNP, RFLP, RAPD,	
4	AFLP, ISSR.	
	Unit 2: DNA: Structure and function;	
5	DNA as the genetic material;	
6	Nucleosome; DNA sequence	
7	(DNA sequencing methods :	
8	Sanger as well as Maxam and Gilbert);	
9	repetitive and unique sequence);	
10	DNA homology (Tm ; DNA- DNA	
	hybridization technique, cot value);	
11	Organization of genome (Satellite DNA;	
	repetitive	
12	DNA, palindromic sequence);	
13	fine structure of gene; Organization of genes	
14	(continuous gene,	
	split or interrupted gene; overlapping gene,	
	pseudogene).	
15	**Unit 3: Replication of DNA: Unit of**	
	replication, enzymes involved ,:	
16	replication of linear DNA	
17	(leading and lagging strand replication), circular	
	DNA, and	
18	mitochondrial DNA; telomere replication (end	
	replication problem, telomerase);	
19	PCR and its application. Reverse transcriptase	
20	and its significance.	
21	**Unit 4: RNA synthesis and processing:**	
22	Sense and Antisense strands,	
23	Types and functions of RNA	
24	(mRNA, rRNA, tRNA, micro-RNA,	
25	siRNA, Ribozymes) :	
	Transcription process (initition, elongation,	
26	termination),	
27	RNA polymerases, Transcription factors:	
	Activators and repressor;	
28	RNA processing –	
	capping, polyadenylations, splicing,	
29	editing; Regulation of prokaryotic gene	
	expression,:	
30	Operon ,inducible and 54 repressible systems,	
31	structure and function of lactose and tryptophan	
	operon;	
32	Regulation of eukaryotic gene expression;	
33	Riboswitch, RISC**.**	
34	**Unit 5: Microbial genetics**:	
35	Mutation, Auxotrophs; polytrophs;	
36	Replica plating technique;	
37	plasmids; Transposons;	
	Transformation;	
38,39&40	Conjugation,	
41	Transduction;	
42,43&44	**Unit 6 : Recombinant DNA technology**:	

	Importance of microorganisms in recombinant DNA technology; Basic steps in r DNA technology; uses of genetic engineering for human welfare;	

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Name of the Teacher- Dulu Moni

DIGBOI COLLEGE, DIGBOI

Course Plan:- June 2021 to May 2022

Name of the Teacher- Dulu Moni Das

Department: Botany

Course –Honours /Generic: Honours

Class/Semester- 1st semester (H)

Paper code:-BC101T

Name of the Paper- Microbiology & Phycology

Units Assigned- 1, 2, 3, 4

Marks Assigned- 33; Method of teaching:- Online mode

Class	Topic/ Unit	Remarks
1.	Introduction to virus & discovery of virus.	Explanations
2.	Physiochemical & biological Character of virus.	Explanations
3.	Classification of virus.	Explanations
4.	Replication in virus, Lytic cycle.	Explanations
5.	Lysogenic cycle & TMV.	Explanations
6.	Viroids & Prions.	Explanations
7.	Economic importance of virus with reference to vaccine production.	Notes in Google classroom
8.	Role of virus in research & medicine diseases diagnosis.-	-Do-
9.	Discovery of bacteria & history of bacteriology.	Explanations
10.	Classification of bacteria.	Explanations
11.	Cell structure & Cell wall of bacteria.	Explanations
12.	Nutrition & growth of bacteria.	Explanations
13.	Economic importance of bacteria with reference to role in agriculture.	Notes G Cl
14.	Economic importance of bacteria with reference to role in industry medicine.	Notes G Cl
15.	General characters, ecology & distribution of Algae.	Explanations
16.	Cell structure of Algae.	Explanations
17.	Pigmentation, reserved food material & flagellation in algae.	Explanations
18.	Range of thallus structure in Algae.	Notes
19.	Classification in Algae.	Explanations
20.	Classification in Algae.	Explanations
21.	Classification in Algae.	Explanations
22.	Role of Algae in environment.	Notes G Cl
23.	Role of Algae in agriculture.	Notes G Cl
24.	Role of Algae in biotechnology.	Notes G Cl
25.	Role of Algae in industry.	Notes G Cl

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Name of the Teacher- Dulu Moni

Course –Honours / Generic – Honours
Class/Semester- 1st semester (H)
Paper Code: BC101P.
Name of the Paper- Microbiology & Phycology
Units Assigned- Practical
Marks Assigned- 24

Class	Topic/ Unit	Remarks
1.	Study about Photograph of T- Phage virus & TMV.	Practical class
2.	Line drawing of Lytic & Lysogenic cycle.	
3.	Study about Permanent slides of binary fission, endospore & conjugation in bacteria.	
4.	Study about nodule bacteria by gram stain method.	
5.	Study about nodule bacteria by gram stain method.	

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Name of the Teacher- Dulu Moni

Course –Honours / Generic – Generic

Class/Semester- 1st semester (G)

Paper code:-BNC101T

Name of the Paper- Biodiversity

Units Assigned- 1, 3.

Marks Assigned- 15

Class	Topic/ Unit	Remarks
1.	History, General account on virus.	Explanations
2.	Living & non living characters of virus.	Notes in G Cl
3.	Replication of virus.	Explanations
4.	Lytic & Lysogenic cycle in virus.	Explanations
5.	Discovery, history and general account on Bacteria.	Explanations
6.	Reproduction in bacteria.	Explanations
7.	Vegetative & asexual reproduction in bacteria.	Explanations
8.	Sexual reproduction in bacteria.	Explanations
9.	Economic importance of bacteria.	Explanations
10.	General characters on fungi.	Explanations
11.	Ecology & significance of fungi.	Explanations
12.	Range of thallus organization in fungi.	Explanations
13.	Cell structure of fungi.	Explanations
14.	Nutrition in fungi.	Explanations
15.	Classification in fungi.	Explanations
16.	Vegetative & asexual reproduction in fungi.	Explanations
17.	Sexual reproduction in fungi	Explanations
18.	General account on Zygomycetes, Life history of *Rhizopus* sp.	Notes G Cl
19.	General account on Ascomycetes	Explanations
20.	Life cycle of *Penecillium* sp.	Explanations
21.	General account on Basidiomycetes	Explanations
22.	Life history of *Puccinia* sp.	Explanations
23.	Life history of Agaricus sp.	Explanations
24.	General account on Lichen.	Notes G Cl
25.	General account on Mycorrhiza.	Notes G Cl
26.	Economic importance of Mycorrhiza.	NotesG Cl

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Name of the Teacher- Dulu Moni

Course –Honours / Generic – Generic

Class/Semester- 1st semester (G).

Paper code:- BNC101P.

Name of the Paper- Biodiversity

Units Assigned- Practical

Marks Assigned- 12

Class	Topic/ Unit	Remarks
1.	Study about Photograph of T- Phage virus & TMV.	Practical class
2.	Line drawing of Lytic & Lysogenic cycle.	
3.	Study about Permanent slides of binary fission, endospore & conjugation in bacteria.	
4	Study about nodule bacteria by gram stain method.	
5	Study about nodule bacteria by gram stain method.	
6	Study about fungi	

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Course –Honours / Generic – Honours

Class/Semester- 2nd semester (H)

Paper code:-203 T

Name of the Paper- Mycology & Phytopathology

Units Assigned- 1, 2, 3, 4, 5, 6.

Marks Assigned- 53

Class	Topic/ Unit	Remarks
1.	General Characters of fungi & affinity with plants & animals.	Explanations
2.	Thallus organization & cell wall composition of fungi.	Notes in G Cl
3.	Nutrition & Classification of fungi.	Explanations
4.	General characters of Chytridiomycetes	Explanations
5.	Zygomycetes, reproduction & life cycle of *Rhizopus* sp.	Explanations
6.	Ascomycetes , life cycle of *Saccharomycetes* sp.	Explanations
7.	Life cycle of *Aspergillus* sp., *Penecillium* sp.	Explanations
8.	Life cycle of *Neurospora* sp. & *Peziza* sp.	Explanations
9.	General character of Basidiomycetes.	Explanations
10.	Life cycle of *Puccinia* sp.	Explanations
11.	Life cycle of *Ustilago* sp.	Explanations
12.	Life cycle of *Agaricus*.	Explanations
13.	Bioluminescence & Mushroom Cultivation.	Notes
14.	General characters of Oomycetes	Explanations
15.	Life cycle of *Phytophthora* sp.	Explanations
16.	Life cycle of *Albugo* sp.	Explanations
17.	General account & classification of Mycorrhiza.	Explanations
18.	Mycorrhiza; use & economic importance	Notes in G Cl
19.	General account & classification of Lichen	Explanations
20.	economic importance of Lichen	Notes
21.	Applied mycology.	Explanations
22.	Applied mycology	Explanations
23.	Introduction & terms used in phytopathology	Explanations
24.	Host parasite interaction.	Notes G Cl
25.	Methods to control plant diseases.	Notes G Cl
26.	Viral diseases of plants	Explanations
27.	Bacterial diseases of plants	Explanations
28.	Fungal diseases of plants	Explanations
29.	Fungal diseases of plants	Explanations
30.	Fungal diseases of plants	Explanations

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Name of the Teacher- Dulu Moni

Course –Honours / Generic:– Honours

Class/Semester:- 2nd semester (H).

Paper code:-203T

Name of the Paper- Mycology & Phytopathology

Units Assigned- Practical

Marks Assigned- 32

Class	Topic/Unit	Remarks
1.	Practical on Fungi.	5 Specimens
2.	Lichen morphology	3 Specimens
3.	Phytopathology	5 Specimens

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Name of the Teacher- Dulu Moni

Course –Honours / Generic – Generic

Class/Semester- 2nd semester (G)

Paper code:-BNC202T

Name of the Paper- Plant Physiology & Metabolism

Units Assigned- 1, 2, 5.

Marks Assigned- 15

Class	Topic/ Unit	Remarks
1.	Water in relation to plant.	Explanations
2.	Water potential & its components.	Explanations
3.	Transpiration.	Explanations
4.	Signification of Transpiration.	Notes
5.	Root pressure & Guttation.	Explanations
6.	Factors affecting transpiration.	Explanations
7.	Mineral nutrition.	Explanations
8.	Macro & micro elements.	Explanations
9.	Role of essential elements.	Explanations
10.	Transport of ions across cell membrane.	Explanations
11.	Active & Passive transport.	Explanations
12.	Carrier molecules, channels & pumps.	Explanations
13.	Respiration, Glycolysis .	Explanations
14.	Anaerobic respiration.	Explanations
15.	TCA cycle.	Explanations
16.	Oxidative phosphorylation	Explanations
17.	Pentose Phosphate Pathway	Explanations

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Name of the Teacher- Dulu Moni

Course –Honours / Generic – Generic

Paper code:- BNC202P Name of the Paper- Plant Physiology & Metabolism

Units Assigned- Practical

Marks Assigned- 12

Class	Topic/ Unit	Remarks
1.	Experiment on Plasmolysis	Practical
2.	Demonstration on Hill reaction	Practical
3.	Experiment on CO_2 evolution during photosynthesis	Practical
4	Compare in rate of respiration in different plants	Practical

Course – Honours/ Generic:-Honours

Paper Code:-C5

Class/Semester- 3rd semester (H)

Name of the Paper- Anatomy of Aniosperm (Theory)

Units Assigned- 1, 2, 3, 4

Marks Assigned-: 52+ 13=65

Class	Topic/ Unit	Remarks
1.	Introduction to plant Anatomy	Explanations
2.	Application of Systametics in forensics and pharmacognosy	Notes
3.	Tissue and tissue system	Explanation
4.	Polarity and cytodifferentiation	Explanation
5.	Organogenesis and embryogenic development	Explanation, Oral Assessment
6.	Trachery elements and sieve elements	Explanation
7.	Pits and plasmodesmata ingroeth of wall and transfer cells.	Explanation
8.	Adcrustation and incrustation	Explanation
9.	Hydathodes cavities lithocites and ergastic substance	Explanation
10.	Theories of apex organisation	Explanation
11.	Structure of dicot and monocot stem	Explanation
12.	Structure of dicot and monocot root	Explanation
13.	Structure of leaf and Kranz anatomy	Explanation & Notes
14.	Secondary growth	Explanation & Notes
15.	Cambium activity	Explanation
16.	Cork Cambium activity	Explanation, & Notes

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Name of the Teacher- Dulu Moni

Course – Honours/Generic:-Honours

Paper Code:- C5 P

Class/Semester- 3rd semester (H)

Name of the Paper- Plant Anatomy (Practical)

Marks Assigned- 27

Class	Topic/ Unit	Remarks
1.	Study about dicot stem showing secondary growth	Practical
2.	Study about dicot root showing secondary growth	Practical
3.	Study about dicot and monocot leaf	Practical
4.	Study of permanent slides	Practical
5.	Study of permanent slides	Practical
6.	Study of permanent slides	Practical
7.	Ecological adaptation	Practical

Course – Honours/Generic:-Generic

Paper Code:-GE3

Class/Semester- 3rd semester (G)

Name of the Paper- Anatomy and embryology of Angiosperm (Theory)

Units Assigned- 2 & 3

Marks Assigned- 12+3=15

Class	Topic/ Unit	Remarks
1.	Introduction to plant Anatomy	Explanations
2.	Structure of dicot and monocot stem	Explanations & Notes
3.	Structure of dicot and monocot root	Explanations & Notes
4.	Structure of leaf	Explanations & Notes
5.	Secondary growth	Explanation, Oral Assessment
6.	Cambium activity	Explanation
7.	Cork Cambium activity	Explanation
8.	Wood anatomy	Explanation

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Name of the Teacher- Dulu Moni

Course – Honours/Generic:-Generic

Paper Code:-GE3

Class/Semester- 3rd semester (G)

Name of the Paper- Anatomy and embryology of Angiosperm (Theory)

Marks Assigned- 12+3=15

Class	Topic/ Unit	Remarks
1.	Study about dicot stem showing secondary growth	Practical
2.	Study about dicot and monocot leaf	Practical
3.	Study of permanent slides	Practical
4.	Study of permanent slides	Practical
5.	Ecological adaptation	Practical

Course – Honours/Generic:- Honours

Paper Code:-C9

Class/Semester- 4th semester (H)

Name of the Paper- Plant Ecology and Phytogeography(Theory)

Units Assigned- 1 to 10

Marks Assigned- 52+13=65

Class	Topic/ Unit	Remarks
1.	Basic concept & introduction to ecology	Explanations
2.	Biotic & abiotic factors & interactions	Explanations
3.	Components of ecosystem	Explanations
4.	Pedology, Physical, chemical & biological structure of soil.	Explanations
5.	Soil profile	Explanations
6.	Role of soil in development of vegetation.	Explanations
7.	Water quality & characters.	Explanations
8.	Hydrological cycle	Explanations
9.	Water in development of vegetation & climate.	Explanations
10.	Light & temperature in development of vegetation	Explanations
11.	Fire in development of vegetation	Explanations
12.	Biotic interaction	Explanations
13.	Biotic interaction	Explanations
14.	Biotic interaction	Explanations
15.	Plant community	Explanations
16.	Synthetic characters of Plant community	Explanations

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17.	Analytical characters of Plant community	Explanations
18.	Plant Succession	Explanations
19.	Plant Succession	Explanations
20.	Plant Succession	Explanations
21.	Biogeochemical cycle	Notes
22.	Biogeochemical cycle	Notes
23.	Biogeochemical cycle	Notes
24.	Adaptation in Hydrophytes	Explanations
25.	Adaptation in Xerophytes	Explanations
26.	Adaptation in Epiphytes & Halophytes	Explanations
27.	Ecosystem	Explanations
28.	Structure of Ecosystem	Explanations
29.	Function of Ecosystem	Explanations
30.	Energy flow in Ecosystem	Explanations
31.	Habitat degradation	Explanations
32	Ecological issues & problems.	Explanations
33.	Globel ecological problems.	Explanations
34.	Concept on EIA	Explanations
35.	Conservation Biology, Ex situ & in situ conservation.	Explanations
36.	WWC, IUCN, NBWL, NBA	Explanations
37.	Concept on Biodiversity.	Explanations
38	Flagship, Keystone & Endemic Species	Explanations
39	Introduction to biodiversity.	Explanations
40	Importance & conservation of biodivrsity	Explanations
41	Introduction to Phytogeography, Static & Dynamic Phytogeography	Explanations
42	Phytogeographical regions of the world	PPT
43	Phytogeographical regions of India	PPT
44	Theories to explain distribution of Plants	Notes
45	Origin of Life	Explanations
46	Chemical origin of Life	Explanations
47	Theories of organic Evolution	Explanations
48	Theories of organic Evolution	Explanations
49	Theories of organic Evolution	Explanations

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Course – Honours/ Generic:-Honours

Paper Code:-C9

Class/Semester- 4th semester (H)

Name of the Paper- Plant Ecology and Phytogeography (Practical)

Marks Assigned- 27

Topic/ Unit	Remarks
Instruments used in Plant ecology.	2 practicals
Practical related to plant ecology.	5 practical
Practical related to ecological adaptation.	4 Specimens
Field visit	Daylong programme.

Course – Honours/Generic:- Generic

Paper Code:- GE4

Class/Semester- 4th semester (G)

Name of the Paper- Plant Ecology and Taxonomy (Theory)

Units Assigned- 1, 4,

Marks Assigned-: 16

Class	Topic/ Unit	Remarks
1.	Basic concept & introduction to ecology	Explanations,
2.	Relation of Ecology with other disciplines	Explanation & Notes
3.	History of ecology	Explanation & Notes
4.	Biotic & abiotic factors & interactions	Explanation
5.	Components of ecosystem	Explanation
6.	Characteristics of plant community	Explanation
7.	Characteristics of plant community	Explanation, Oral Assessment
8.	Ecotone and edge effect	Explanation
9.	Ecotone and edge effect	Notes
10	Succession	Explanation
11	Succession types	Explanation
12	Mechanism of Succession	Explanation & Notes

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Course – Honours/Generic:- Generic

Paper Code:- GE4

Class/Semester- 4th semester (G)

Name of the Paper- Plant Ecology and Taxonomy (Practical)

Marks Assigned-: 14

Class	Topic/ Unit	Remarks
1.	Instruments used in Plant ecology.	1 Practical
2.	Practical related to plant ecology.	4 Practical
3.	Practical related to ecological adaptation.	1 Practical

Course –Honours / Generic –Honours

Class/Semester- 5th semester (H)

Paper code:-DSE 4

Name of the Paper- Industrial & Environmental microbiology

Units Assigned- 1, 2, 3, 4, 5, 6, 7

Marks Assigned- 52+13=65

Class	Topic/ Unit	Remarks
1.	Scopes of Microbes in industry and environment	Explanations
2.	Scopes of Microbes in industry and environment	Explanations
3.	Scopes of Microbes in industry and environment	Explanations & notes
4.	Types of Bioreactors	Explanations
5.	Types of Bioreactors	Notes
6.	Types of Bioreactors	Notes
7.	Types of fermentation	Explanations
8.	Microbes used in industrial processes	Explanations
9.	Filtration, Centrifugation	Explanations
10.	Centrifugation types, cell disruption	Explanations
11.	Solvent extraction, precipitation	Explanations
12.	Ultrafiltration	Explanations
13.	Enzyme activity	Explanations
14.	Enzyme activity	Explanations
15.	Enzyme activity	Explanations & notes
16.	Fermentation of citric acid	Explanations & notes
17.	Fermentation of glutamic acid	Explanations & notes
18.	Fermentation of alcohol	Explanations &

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		notes
19.	Fermentation of antibiotic	Explanations & notes
20.	Enzyme immobilization	Explanations & notes
21.	Enzyme immobilization	Notes
22.	Enzyme immobilization	Notes
23.	Large scale application of immobilized enzyme	Notes
24.	Microbes in air , water and soil.	Explanations
25.	Method of isolation of microbes	Explanations & notes
26.	Pollution of water	Explanations
27.	Sewage treatment	Explanations
28.	Sewage treatment	Explanations & notes
29.	Determination of BOD, COD	Explanations
30.	Determination of TDS, TOC	Explanations
31.	Microorganism as indicator of water quality	Explanations
32	Water sample analysis for coliform and fecal coliform	Explanations
33.	Microbes in agriculture	Explanations
34.	Microbes in agriculture	Explanations & notes
35.	Microbes in soil remediation	Explanations & notes
36.	Microbes in soil remediation	Explanations

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Course –Honours / Generic –Honours

Class/Semester- 5th semester (H)

Paper code:-DSE 4

Name of the Paper- Industrial & Environmental microbiology

Marks Assigned- 27+8=35

Class	Topic/ Unit	Remarks
1	Principals and functions of instruments in microbial laboratory	2 Practical classes
2.	Hands on sterilization techniques and preparation of culture media	2 Practical classes
3.	Isolation of soil microorganism	1 Practical classes
4.	Estimation of soil microorganism	1 Practical classes

Course –Honours / Generic –Honours

Class/Semester- 6th semester (H)

Paper code:-DSE 6

Name of the Paper- Natural resource management

Units Assigned- 1, 2, 3, 4, 5, 6, 7,8,9

Marks Assigned- 52+13=65

Class	Topic/ Unit	Remarks
1.	Definition and types of Natural resource	Explanations
2.	Concept, approaches of sustainable utiliuzation	Explanations
3.	Soil degradation and management	Explanations
4.	Soil degradation and management	Notes
5.	Types of water bodies	Notes
6.	Threats and management strategies of water bodies	Notes
7.	Biodiversity-definition and types	Notes
8.	Management strategies & Threats of Biodiversity	Notes
9.	Biodiversity Hot Spot (Terrestrial & Marine),	Notes
10.	IUCN Species categories	Notes
11.	In situ & Ex situ conservation, Bio-prospecting; IPR; CBD	Notes
12.	National Biodiversity Action Plan	Notes
13.	Biodiversity and Sustainable development	Notes

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14.	Forest resource	Explanations
15.	Definition, Cover and its significance (with special reference to India); Major and minor forestproducts	Explanations
16.	Depletion; Management of forest resource	Explanations
17.	Renewable and non-renewable sources of energy	Explanations
18.	EIA, GIS	Explanations
19.	Participatory Resource Appraisal	Explanations
20	Ecological Footprint with emphasis on carbon footprint	Explanations & notes
21	Resource Accounting	Explanations & notes
22	Waste management	Explanations & notes
23	National and international efforts in natural resource management and their conservation approaches	Explanations & notes
24	National and international efforts in natural resource management and their conservation approaches	Explanations & notes

Course –Honours / Generic –Honours

Class/Semester- 6th semester (H)

Paper code:-DSE 6

Name of the Paper- Natural resource management

Marks Assigned- 27

Class	Topic/ Unit	Remarks
1	Estimation of solid waste generated by a domestic system (biodegradable and non-biodegradable) and its impact on land degradation	Practical
2.	Collection of data on forest cover of specific area	Practical
3.	Calculation and analysis of ecological footprint.	Practical

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Name of the Teacher- Dulu Moni

Course –DSE=I

Class/Semester- 1st semester (H)

Paper code:-LSC106

Name of the Paper- Microbiology-I: General Microbiology

Marks Assigned- 80

Class	Topic/ Unit	Remarks
1.	Classification of Microorganisms	Explanations & Notes
2.	New approaches to bacterial taxonomy	Explanations
3.	Basis of microbial classification; Bergey's manuals;	Explanations & Notes
4.	Advantages and limitations of DNA and RNA systematic	Explanations & Notes
5.	Ribotyping	Explanations & Notes
6.	Microbial metabolism: Free energy	Explanations & Notes
7.	Biochemistry of fermentation (Alcohol and lactic acid fermentation)	Explanations & Notes
8.	Biochemistry of fermentation (Alcohol and lactic acid fermentation)	Explanations & Notes
9.	EMPpathway	Explanations & Notes
10.	HMP shunt	Explanations & Notes
11.	Entner-Douderff (E-D) pathway	Explanations & Notes
12.	Pasteur effect, protein degradation	Explanations & Notes
13.	Electron transport system;	Explanations & Notes
14.	Phosphorylation, Mechanism of phosphorylations.	Explanations
15.	Virus: Process of infection	Explanations
16.	Function of DNA and RNA in viruses	Explanations
17.	Replication of viruses	Explanations
18.	Lysogeny, & Lytic cycle	Explanations
19.	Viroids	Explanations
20	Prions, Interferons	Explanations & notes
21	Interferons	Explanations & notes

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Course –DSE=I

Class/Semester- 1st semester (H)

Paper code:-LSC106 Lab course

Name of the Paper- Microbiology-I: General Microbiology

Marks Assigned- 50

Class	Topic/ Unit	Remarks
1	Gram Stain of Bacteria	Practical
2	Pure culture technique	Practical
3	Growth of bacteria	Practical
4	Identification of appropriate antibiotic against microbe	Practical

Course –DSE=II

Class/Semester- 2nd semester (H)

Paper code:-LSC206

Name of the Paper- Microbiology-II: Applied Microbiology

Marks Assigned- 70

Class	Topic/ Unit	Remarks
1.	Microbial Ecology: The ecology of micro organisms in different environmental conditions;	Explanations & Notes
2.	Role of microorganisms in biogeochemical cycles	Explanations
3.	Role of microorganisms in biogeochemical cycles	Explanations & Notes
4.	Role of rhizosphere and phylloplane microorganisms	Explanations & Notes
5.	Role of rhizosphere and phylloplane microorganisms	Explanations & Notes
6.	Biochemistry of N2– fixation	Explanations & Notes
7.	Microbiology of air	Explanations & Notes
8.	Microbiology of water	Explanations & Notes
9.	Air sanitation, Microbiology in relation to water pollution;	Explanations & Notes
10.	Coliform group and its importance in water pollution	Explanations & Notes
11.	Bacterial analysis of water, Detection of coliform group in water	Explanations & Notes
12.	Purification of water; waste water (sewage) treatments.	Explanations &

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		Notes
13.	Microbiology of milk and milk products	Explanations & Notes
14.	Spoilage and preservation of foods	Explanations
15.	Food produced (fermented foods) by microbes	Explanations
16.	Some important diseases caused by bacteria, actinomycetes, virus and fungi; b)	Explanations
17.	Some important diseases caused by bacteria, actinomycetes, virus and fungi; b)	Explanations
18.	Bacterial toxins	Explanations
19.	Importance of microorganisms in industry, Industrial process of Microbial fermentation of alcohol	Explanations
20	Fermentation of citric acid and lactic acid	Explanations & notes
21	Manufacture of antibiotics in industry (Penicillin, Streptomycin).	Explanations & notes

Course –DSE=II

Class/Semester- 2nd semester (H)

Paper code:-LSC206 Lab course

Name of the Paper- Microbiology-I: Microbiology-II: Applied Microbiology

Marks Assigned- 50

Class	Topic/ Unit	Remarks
1	Microbial population of soil and rhizosphere	Practical
2	Microbial population of water	Practical
3	Coliform water testing	Practical
4	Isolation of lactic acid bacteria	Practical

Name: Dr. Dimpy Das
Course Plan; July 2021 to July 2022
Semester: 1st Semester (Honours)
Name of Paper: BC102T; Biomolecules and Cell Biology
Units Assigned: 3 (unit 1, 2,3)
Marks Assigned: 27

Class	Topic/Unit	Remarks
20	Unit 1: Biomolecules Types and significance of chemical bonds; structure and properties of water, pH and buffers Carbohydrates: nomenclature and classification; monosaccharides; disaccharides; oligosaccharides and polysaccharides. Lipids: Definition and major classes of storage and structural lipids; fatty acids structure and functions; essential fatty acids, triacyl glycerols structure, functions and properties, phosphoglycerides. Proteins: structure of amino acids; levels of protein structure- Primary, secondary, tertiary and quarternary; protein denaturation and biological roles of proteins. Nucleic acids: structure of nitrogenous bases; structure and function of nucleotides, types of nucleic acids, structure of A,B,Z types of DNA; types of RNA; structure of tRNA.	Seminar presentation by students on "Nucleic acids and their functions".
4	Unit 2: Bioenergetics Laws of thermodynamics, concept of free energy, endergonic and exergonic reactions, coupled reactions, redox reactions, ATP structure, its role as a energy currency molecule.	
6	Unit 3: Enzymes Structure of enzymes, holoenzymes, apoenzymes, cofactors, coenzymes and prosthetic group. Classification of enzymes; features of active site, substrate specificity, mechanism of action (activation energy, look and key hypothesis, induced-fit theory), Michaelis – Menten equation, enzyme inhibition and factors affecting enzyme activity.	PPT

Semester: 1st Semester (Generic)
Name of Paper: BG101T; Biodiversity
Units Assigned: 2 (Unit 6,7)
Marks Assigned: 15

Class	Topics/Unit	Remarks
10	Unit 6: Bryophytes General characteristics, adaptations to land habit, classification, range of thallus organization. Classification (up to family), morphology, anatomy and reproduction of Marchantia and Funaria. Ecological and economic importance of bryophytes with special mention of Sphagnum.	PPT
8	Unit 7: Pteridophytes	Seminar presentation

	General characteristics, classification, Early land plants (Cooksonia and Rhynia). Classification (up to family), morphology, anatomy and reproduction of Selaginella, Equisetum and Pteris. Heterospory and seed habit, stelar evolution. Ecological and economical importance of Pteridophytes.	by students on " Stelar organization and its evolution in Pteridophytes".

Semester: 3rd Semester (Honours)
Name of Paper: BC306T; Economic Botany
Units Assigned: Whole paper
Marks Assigned: 53

Class	Topic/Unit	Remarks
6	Unit 1: Origin of cultivated plants Concept of centres of origin, their importance with reference to Vavilov's work. Indigenous Knowledge System (IKS). Examples of major plant introductions; crop domestication and loss of genetic diversity; evolution of new crops/varieties, importance of germplasm diversity.	
6	Unit 2: Cereals Wheat and rice (origin, morphology, processing and uses); brief account of wheat	
6	Unit 3: Legumes Origin, morphology and uses of chick pea, pigeon pea and fodder legumes. Importance to man and ecosystem.	
4	Unit 4: Sources of sugars and starches Morphology and processing of sugarcane, products and by-products of sugarcane industry. Potato – morphology, propagation and uses.	
6	Unit 5: Spices Listing of important spices, their family and part used. Economic importance with special reference to fennel, saffron, clove, cinnamommum, cardamom and black pepper.	
4	Unit 6: Beverages Tea, Coffee (morphology, processing and uses)	
8	Unit 7: Sources of oils and fats General description, classification, extraction, their uses and health implications groundnut, coconut, linseed, soybean, mustard and coconut (Botanical name, family and uses). Essential oils: general account, extraction methods, comparison with fatty oils and their uses.	
3	Unit 8: Natural rubber Para rubber; tapping, processing and uses.	
8	Unit 9: Drug-yielding plants Therapeutic and habit forming drugs with special reference to *Cinchona, Rawolfia, Andrographis, Aloe vera* and *Phyllanthus* (Morphology, processing, uses and health hazards).	Seminar presentation by students on "Morphology, uses and health hazards of Rauwolfia serpentine"
3	Unit 10: Timber plants General account with special reference to teak, sal, pine	

	and sisu.	
3	Unit 11: Fibres Classification based on the origin of fibres; cotton, coir and jute (morphology, extraction and uses)	
4	Unit 12: Aromatics and petrocrops General account and special reference to Aquilaria, Cymbopogon, Vetiveria, Jetropa, Ricinus, Pogostemon.	

Semester: 3rd Semester (Generic)
Name of Paper: BG303T; Plant anatomy and embryology
Units Assigned: 2 (Unit 6 and 7)
Marks Assigned: 10

Class	Topic/Unit	Remarks
8	Unit 6: Pollination and fertilization Pollination mechanisms and adaptations, double fertilization; seed structure appendages and dispersal mechanisms	
8	Unit 7: Embryo and endosperm Endosperm types, structure and functions; dicot and monocot embryo; embryo-endosperm relationship.	

Semester: 5th Semester (Honours)
Name of Paper: BD503T; Research Methodology
Units Assigned: Whole Paper
Marks Assigned: 53

Class	Topic/Unit	Remarks
10	**Unit 1: Basic concepts of research** Research definition and types of research (Descriptive vs analytical; applied vs fundamental; quantitative vs qualitative; conceptual vs emperical). Research methods vs methodology. Literature review and its consolidation; Library research; field research; laboratory research.	Guest Lecture,
6	**Unit 2: General laboratory practices** Common calculations in botany laboratories. Understanding the details on the label of reagent bottles. Molarity and normality of common acids and bases. Preparation of solutions. Dilutions. Percentage solutions. Molar, molal and normal solutions. Technique of handling micropipettes; knowledge about common toxic chemicals and safety measures in their handling.	
3	**Unit 3: Data collection and documentation of observations** Maintaining a laboratory record; tabulation an generation of graphs. Imaging of tissue specimens and application of scale bars. The art of field photography.	
5	**Unit 4: Overview of biological problems** History; key biology research areas, Model organisms in biology (A brief overview): genetics, physiology, biochemistry, molecular biology, cell biology, genomics, proteomics – transcriptional regulatory network.	PPT Seminar presentation by students on "Model

		organisms and its uses in biological studies".
6	**Unit 5: Methods to study plant cell/ tissue structure** Whole mounts, peel mounts, squash preparations, clearing, maceration and sectioning; tissue preparation: living vs fixed, physical vs chemical fixation, coagulating fixatives, non-coagulant fixatives; tissue dehydration using graded solvent series; paraffin and plastic infiltration; preparation of thin and ultrathin sections.	
5	**Unit 6: Plant microtechniques** Staining procedures, classification and chemistry of stains. Staining equipment. Reactive dyes and fluorochromes (including genetically engineered protein labelling with GFP and other tags). Cytogenetic techniques with squashed plant materials.	
6	**Unit 7: The art of scientific writing and its presentation** Numbers, units, abbreviations and nomenclature used in scientific writing. Writing references. Powerpoint presentation. Poster presentation. Scientific writing and ethics. Introduction to copyright- academic misconduct/ plagiarism.	PPT

Semester: 2nd Semester (Honours)
Name of Paper: Archegoniate
Units Assigned: 2 (Unit 4 and 5)
Marks Assigned: 15

Class	Topic/Unit	Remarks
6	Unit 4: Pteridophytes General characteristics, classification; early land plants (Psilophyton and Rhynia).	PPT
14	Unit 5: Type studies – Pteridophytes Classification (up to family). Morphology, anatomy and reproduction of Psilotum, Selaginella, Equisetum and Ophioglossum, Marselia. Apospory and apogamy, heterospory and seed habit, telome theory, stelar evolution, Ecological and economic importance.	Seminar presentation by students: Life cycle of heterosporous ferns.

Semester: 2nd Semester (Generic)
Name of Paper: Plant physiology and metabolism
Units Assigned: 2 (Unit 8 and 9)
Marks Assigned: 15

Class	Topic/Unit	Remarks
6	Unit 8: Plant growth regulators Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene.	Virtual seminar presentation on "Auxin and its physiological significance".
6	Unit 9: Plant response to light and temperature Photoperiodism (SDP, LDP, Day neutal plants); phytochrome (discovery and structure), red and far	

	red light response on photomorphogenesis; Vernalization.	

Semester: 4th Semester (Honours)
Name of Paper: BC410T, Plant Systematics
Units Assigned: Whole Paper
Marks Assigned: 53

Class	Topic/Unit	Remarks
12	Unit 1: Significance of plant systematic Introduction to systematic; kingdom concept, plant identification, classification, nomenclature. evidences from palynology, cytology, phytochemistry and molecular data; Field inventory; functions of herbarium, important herbaria and botanical gardens of the world and India, Virtual herbarium; E-flora; Documentation; flora, monographs, journals; Keys: single access and multi access.	PPT
6	Unit 2: Taxonomic hierarchy Concept of taxa (family, genus, species); categories and taxonomic hierarchy; species concept (taxonomic, biological evolutionary).	
10	Unit 3: Morphology and botanical nomenclature Angiosperm morphology, principles and rules (ICN= International Code of Nomenclature of Algae, fungi and plants); Ranks and nams; typification, author citation, valid publication, rejection of names, principle of priority and its limitations; Names of hybrids.	PPT
12	Unit 4: Systems of classification Major contributions of Theophrastus, Bauhin, Tournefort, Linnaeus, Adanson, de Candolle, Bessey, Hutchinson, Takhtajan and Cronquist; Classification systems of Bentham and Hooker (up to series), Engler and Prantl (up to series); Brief reference of Angiosperm Phylogeny Group (APG III) classification.	PPT and video recording.
10	Unit 5: Biometrics, numerical taxonomy and cladistics Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences)	
12	Unit 6: Phylogeny of Angiosperms Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence, monophyly, paraphyly, polyphyly and clades). Origin and evolution of life (mechanism and theories), Origin and evolution of angiosperms; co-evolution of angiosperms and animals; Methods of illustrating evolutionary relationship (phylogenetic tree, cladogram).	

Semester: 4th Semester (Generic)
Name of Paper: BG404T, Plant ecology and taxonomy

Units Assigned: 7 (Unit 6, 7, 8, 9, 10, 11 and 12)
Marks Assigned: 30

Class	Topic/Unit	Remarks
2	Unit 6: Introduction to plant taxonomy Identification, classification, nomenclature.	
4	Unit 7: Identification Functions of herbarium, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi access	PPT
6	Unit 8: Taxonomic evidences from palynology, cytology, phytochemistry and molecular data.	
2	Unit 9: Taxonomic hierarchy Ranks, categories and taxonomic groups	
6	Unit 10: Botanical nomenclature Principles and rules (ICN); ranks and names; binomial system, typification, author citation, valid publication, rejection of names, principle of priority and its limitatuins.	PPT
6	Unit 11: Classification Types of classification – artificial, natural and phylogenetic. Bentham and Hooker (up to series), Engler and Prantl (up to series).	PPT and video recording
4	Unit 12: Biometrics, numerical taxonomy and cladistics Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences)	

Semester: 6th Semester (Honours)
Name of Paper: BC614T; Plant Biotechnology
Units Assigned: Whole Paper
Marks Assigned: 53

Class	Topic/Unit	Remarks
10	**Unit 1: Plant tissue culture** Historical perspective; composition of media; nutrient and hormone requirements (role of vitamins and hormones); totipotency; organogenesis; embryogenesis (somatic and zygotic); protoplast isolation, culture and fusion; tissue culture applications (micropropagation, androgenesis, virus elimination, secondary metabolite production, haploids, triploids and hybrids; cryopreservation; germplasm conservation).	
6	**Unit 2: Recombinant DNA technology** Restriction endonucleases (History, types I-IV, biological role and application); restriction mapping (Linear and circular); cloning vectors; prokaryotic (pUC18 and pUC19, pBR322, Ti plasmid, BAC); Lambda phage, M13 phagemid, cosmid, shuttle vector; eukaryotic vectors (YAC).	
8	**Unit 3: Gene cloning** Recombinant DNA, bacterial transformation and selection of recombinant clones, PCR-mediated gene cloning; gene	Presentation by students.

	construct; construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by genetic selection; complementation, colony hybridization.	
5	**Unit 4: Methods of gene transfer** Agrobacterium-mediated, direct gene transfer by electroporation, microinjection, microprojectile bombardment; selection of transgenics- selectable marker and reporter genes (Luciferase, GUS, GFP).	
8	**Unit 5: Application of biotechnology** Pest resistant (Bt-cotton); herbicide resistant plants (RoundUp Ready soybean); transgenic crops with improved quality traits (Flavr Savr tomato, golden rice); improved horticultural varieties (Moondust carnations); role of transgenics in bioremediation (superbug); edible vaccines; industrial enzymes (Aspergillase, Protease, Lipase); genetically engineered products – Human Growth Hormone; Humulin; Biosafety concerns.	

M. Sc.

Semester: 1st semester
Name of Paper: LSC102; Cell biology and genetics
Units Assigned: Genetics (Section-B: Unit 4, 5 and 6)
Marks Assigned: 30

Class	Topic/Unit	Remarks
16	**Unit 4:** Deviations of Mendelism, pleiotropy, penetrance and expressivity, phenocopy, multiple alleles and multiple genes; chromosomal mechanism of sex determination, sex-linked, sex limited and sex influenced characters; cytoplasmic inheritance, linkage and crossing over: phase, group, mechanism and stages of occurrence of crossing over; gene mapping in eukaryotes, three-point test cross. Epigenetics: concepts and molecular basis.	
10	**Unit5:** Mutation: numerical and structural chromosomal mutation, autoploidy and alloploidy, spontaneous and induced mutation: mutagens and their action, gene mutation, frame shift and substitutional mutation, DNA damage and repairing.	
7	**Unit 6:** Concept of population genetics and Hardy – Weinberg law, Human genetics: genetic disorders and syndromes, euthenics, eugenics and euphenics; Genetic counselling: Basic idea on human genome project (HGP), genomic library and gene targeting.	

Semester: 2nd semester
Name of Paper: LSC203; Taxonomy, Evolution and Biodiversity
Units Assigned: Section- A (Unit 1 and 2),(Section-B: Unit 3)
Marks Assigned: 30

Class	Topic/Unit	Remarks
6	**Section – A** **Unit 1:** Definition of taxonomy, species concept: typological, nominalistic, biological and evolutionary; species category: polytypic species, subspecies; Mechanisms of speciation.	
5	**Unit2:** Concepts of structural, biochemical and molecular systematic; Sources of taxonomic characters (Numerical, geographical, ecological and parasitological). Molecular techniques in taxonomy.	
6	**Section – B** **Unit 3:** Emergence of evolutionary thinking: Lamarck, Darwin: variation, adaptation, natural selection. Genes in population and Hardy – Weinberg equilibrium, forces of evolution, mutation, migration, non-random mating, genetic drift, natural selection (Fitness).	

Name: Dr. Dimpy Das
Course Plan: August 2022 to December 2022
Semester: 1st Semester (Honours)
Name of Paper: BC102T; Biomolecules and Cell Biology
Units Assigned: 3 (unit 1, 2,3)
Marks Assigned: 27

Class	Topic/Unit	Remarks
20	Unit 1: Biomolecules Types and significance of chemical bonds; structure and properties of water, pH and buffers Carbohydrates: nomenclature and classification; monosaccharides; disaccharides; oligosaccharides and polysaccharides. Lipids: Definition and major classes of storage and structural lipids; fatty acids structure and functions; essential fatty acids, triacyl glycerols structure, functions and properties, phosphoglycerides. Proteins: structure of amino acids; levels of protein structure- Primary, secondary, tertiary and quarternary; protein denaturation and biological roles of proteins. Nucleic acids: structure of nitrogenous bases; structure and function of nucleotides, types of nucleic acids, structure of A,B,Z types of DNA; types of RNA; structure of tRNA.	
4	Unit 2: Bioenergetics Laws of thermodynamics, concept of free energy, endergonic and exergonic reactions, coupled reactions, redox reactions, ATP structure, its role as an energy currency molecule.	

6	Unit 3: Enzymes Structure of enzymes, holoenzymes, apoenzymes, cofactors, coenzymes and prosthetic group. Classification of enzymes; features of active site, substrate specificity, mechanism of action (activation energy, look and key hypothesis, induced-fit theory), Michaelis – Menten equation, enzyme inhibition and factors affecting enzyme activity.	Seminar presentation by students on "Mechanism of enzyme action".

Semester: 1st Semester (Generic)
Name of Paper: BG101T; Biodiversity
Units Assigned: 2 (Unit 6 and 7)
Marks Assigned: 15

Class	Topics/Unit	Remarks
10	Unit 6: Bryophytes General characteristics, adaptations to land habit, classification, range of thallus organization. Classification (up to family), morphology, anatomy and reproduction of Marchantia and Funaria. Ecological and economic importance of bryophytes with special mention of Sphagnum.	PPT
6	Unit 7: Pteridophytes General characteristics, classification, Early land plants (Cooksonia and Rhynia). Classification (up to family), morphology, anatomy and reproduction of Pteris. Heterospory and seed habit, stelar evolution. Ecological and economical importance of Pteridophytes.	PPT

Semester: 3rd Semester (Honours)
Name of Paper: BC306T; Economic Botany
Units Assigned: Whole paper
Marks Assigned: 53

Class	Topic/Unit	Remarks
6	Unit 1: Origin of cultivated plants Concept of centres of origin, their importance with reference to Vavilov's work. Indigenous Knowledge System (IKS). Examples of major plant introductions; crop domestication and loss of genetic diversity; evolution of new crops/varieties, importance of germplasm diversity.	
6	Unit 2: Cereals Wheat and rice (origin, morphology, processing and uses); brief account of wheat	
6	Unit 3: Legumes Origin, morphology and uses of chick pea, pigeon pea and fodder legumes. Importance to man and ecosystem.	Seminar presentation by students
4	Unit 4: Sources of sugars and starches Morphology and processing of sugarcane, products and by-products of sugarcane industry. Potato –	Seminar presentation by students

	morphology, propagation and uses.	
6	Unit 5: Spices Listing of important spices, their family and part used. Economic importance with special reference to fennel, saffron, clove, cinnamommum, cardamom and black pepper.	
4	Unit 6: Beverages Tea, Coffee (morphology, processing and uses)	
8	Unit 7: Sources of oils and fats General description, classification, extraction, their uses and health implications groundnut, coconut, linseed, soybean, mustard and coconut (Botanical name, family and uses). Essential oils: general account, extraction methods, comparison with fatty oils and their uses.	
3	Unit 8: Natural rubber Para rubber; tapping, processing and uses.	Seminar presentation by students
8	Unit 9: Drug-yielding plants Therapeutic and habit forming drugs with special reference to *Cinchona, Rawolfia, Andrographis, Aloe vera* and *Phyllanthus* (Morphology, processing, uses and health hazards).	
3	Unit 10: Timber plants General account with special reference to teak, sal, pine and sisu.	
3	Unit 11: Fibres Classification based on the origin of fibres; cotton, coir and jute (morphology, extraction and uses)	
4	Unit 12: Aromatics and petrocrops General account and special reference to Aquilaria, Cymbopogon, Vetiveria, Jetropa, Ricinus, Pogostemon.	

Semester: 3rd Semester (Generic)
Name of Paper: BG303T; Plant anatomy and embryology
Units Assigned: 2 (Unit 6)
Marks Assigned: 5

Class	Topic/Unit	Remarks
8	Unit 6: Pollination and fertilization Pollination mechanisms and adaptations, double fertilization; seed structure appendages and dispersal mechanisms	

Semester: 5th Semester (Honours)
Name of Paper: BD503T; Research Methodology
Units Assigned: Whole Paper
Marks Assigned: 53

Class	Topic/Unit	Remarks
10	**Unit 1: Basic concepts of research** Research definition and types of research (Descriptive vs analytical; applied vs fundamental; quantitative vs qualitative;	Guest Lecture,

	conceptual vs emperical). Research methods vs methodology. Literature review and its consolidation; Library research; field research; laboratory research.	
6	**Unit 2: General laboratory practices** Common calculations in botany laboratories. Understanding the details on the label of reagent bottles. Molarity and normality of common acids and bases. Preparation of solutions. Dilutions. Percentage solutions. Molar, molal and normal solutions. Technique of handling micropipettes; knowledge about common toxic chemicals and safety measures in their handling.	
3	**Unit 3: Data collection and documentation of observations** Maintaining a laboratory record; tabulation an generation of graphs. Imaging of tissue specimens and application of scale bars. The art of field photography.	
5	**Unit 4: Overview of biological problems** History; key biology research areas, Model organisms in biology (A brief overview): genetics, physiology, biochemistry, molecular biology, cell biology, genomics, proteomics – transcriptional regulatory network.	PPT
6	**Unit 5: Methods to study plant cell/ tissue structure** Whole mounts, peel mounts, squash preparations, clearing, maceration and sectioning; tissue preparation: living vs fixed, physical vs chemical fixation, coagulating fixatives, non-coagulant fixatives; tissue dehydration using graded solvent series; paraffin and plastic infiltration; preparation of thin and ultrathin sections.	
5	**Unit 6: Plant microtechniques** Staining procedures, classification and chemistry of stains. Staining equipment. Reactive dyes and fluorochromes (including genetically engineered protein labelling with GFP and other tags). Cytogenetic techniques with squashed plant materials.	Seminar presentation by students.
6	**Unit 7: The art of scientific writing and its presentation** Numbers, units, abbreviations and nomenclature used in scientific writing. Writing references. Powerpoint presentation. Poster presentation. Scientific writing and ethics. Introduction to copyright- academic misconduct/ plagiarism.	Seminar presentation by students.

M. Sc.

Semester: 1st semester
Name of Paper: LSC102; Cell biology and genetics
Units Assigned: Genetics (Section-B: Unit 4, 5 and 6)
Marks Assigned: 30

Class	Topic/Unit	Remarks
16	**Unit 4:** Deviations of Mendelism, pleiotropy, penetrance and expressivity, phenocopy, multiple alleles and multiple genes; chromosomal mechanism of sex determination, sex-linked, sex limited and sex influenced characters;	

	cytoplasmic inheritance, linkage and crossing over: phase, group, mechanism and stages of occurrence of crossing over; gene mapping in eukaryotes, three-point test cross. Epigenetics: concepts and molecular basis.	
10	**Unit5:** Mutation: numerical and structural chromosomal mutation, autoploidy and alloploidy, spontaneous and induced mutation: mutagens and their action, gene mutation, frame shift and substitutional mutation, DNA damage and repairing.	
7	**Unit 6:** Concept of population genetics and Hardy – Weinberg law, Human genetics: genetic disorders and syndromes, euthenics, eugenics and euphenics; Genetic counselling: Basic idea on human genome project (HGP), genomic library and gene targeting.	

Semester: 3rd Semester
Name of Paper: LSC303B: Pteridophytes and Gymnosperms
Units Assigned: Whole paper
Marks Assigned: 60

Class	Topic/Unit	Remarks
10	**Unit 1:** Paleobotany: Fossils and the process of fossilization, study of (a) Rhynia, Lepidodendron, Sphenophyllum. (b). Calymatotheca, Cycadeoidea and Cordaites.	PPT
16	**Unit 2:** Systematic study: Structure, reproduction and affinities of (a) Lycopsida, Sphenopsida, Filicopsida (b) Cycadales, Ginkgoales, Coniferales, Gnetales, Ephedrals.	PPT, Seminar presentation by students.
3	**Unit 3:** Diversity and economic importance: Classification, diversity and distribution of Gymnosperms in India with special reference to N.E. India.	
2	**Unit 4:** Economic importance: Economic importance of Pteridophytes and Gymnosperms.	

Name of the Teacher: SAPNA TIWARI

Course – M.Sc. Lifesciences

Paper Code: -LSD306: F. Microbiology-II

Class/Semester- 3rd semester

Name of the Paper- Molecular Microbiology

Class	Topic/ Unit	Remarks
1.	Replication of DNA: unit of replication, enzyme involved	Explanation, Notes & PPT
2.	Replication of linear DNA (leading & lagging strand replication)	Explanation, Notes & PPT
3.	Circular DNA & mitochondrial DNA; telomere replication (end replication problem, telomerase)	Explanation, Notes & PPT
4.	PCR & its application	Explanation, Notes & PPT
5.	Reverse transcriptase and its significance	Explanation & Notes
6.	Microbial genetics: Mutation, Auxotrophs, polytrophs	Explanation & Notes
7	Replica plate technique	Explanation & Notes
8	Molecular basis of bacterial mutation (Frame shift, substitution: spontaneous and induced mutation: mutagens and their mode of action)	Explanation & Notes
9	Plasmids: transposons	Explanation & Notes
10	Transformation: Conjugation, Transduction	Explanation & Notes
11	Recombinant DNA technology	Explanation & Notes
12	Importance of microorganisms in recombinant DNA technology	Explanation & Notes
13	Steps in rDNA technology	Explanation & Notes
14	Uses of genetic engineering for human welfare	Explanation & Notes
15	Microbial production of molecules using genetic engineering (insulin, interferon)	Explanation & Notes
16	Immunology; milestones in immunology	Explanation & Notes
17	Immunity, humoral and cell mediated immunity	Explanation & Notes
18	Immunoglobulins (uses, structure and function)	Explanation & Notes
19	Antigen detection and application of antigen antibody reaction; hybridoma monoclonal antibody	Explanation & Notes

DIGBOI COLLEGE, DIGBOI

Course Plan:- 2021-22

Name of the Teacher- Sadhana Talukdar

Department: Botany

Course – Honours

Paper Code:-

Class/Semester- 1st semester (Generic)

Name of the Paper- Biodiversity (Theory)

Units Assigned- 7 (Pteridophytes)

Class	Topic/ Unit	Remarks
1.	Morphology of Selaginella	Explanation
2.	Anatomy of Selaginella	Notes
3.	Reproduction of Selaginella	Explanation & Notes
4.	Morphology of Equisetum	Explanation & Notes
5.	Anatomy of Equisetum	Explanation & Notes
6.	Reproduction of Equisetum	Explanation & Notes

Course – Honours

Paper Code:-

Class/Semester- 1st semester (Generic)

Name of the Paper- Biodiversity (Practical)

Class	Topic/ Unit	Remarks
1.	Slide preparation of stem and reproductive structures of Selaginella	Practical
2.	Slide preparation of stem and reproductive structures of Equisetum	Practical

Course – Honours

Paper Code:- BGT303

Class/Semester- 3rd semester (Generic)

Name of the Paper- Plant Anatomy and Embryology (Theory)

Units Assigned- 2, 4

Class	Topic/ Unit	Remarks
1.	General account on Dicot and Monocot plants	Explanations
2	Anatomy of Dicot and Monocot Root	Explanation & Notes
3.	Anatomy of Dicot and Monocot stem	Explanation & Notes
4.	Anatomy of Dicot and Monocot leaf	Explanation & Notes
5.	General account of adaptations in Xerophytes and Hydrophytes	Explanation
6.	Morphological and Anatomical adaptations in Hydrophytes	Explanation & Notes
7.	Morphological and Anatomical adaptations in Xerophytes	Explanation & Notes

Course – M.Sc Lifesciences

Paper Code:-LSC103

Class/Semester- 1st semester

Name of the Paper- Techniques in Biology, Biostatistics and Bioinformatics

Class	Topic/ Unit	Remarks
1.	Introduction of Centrifugation and Working Principle	Explanation & Notes
2.	Types of Centrifugation and Applications	Explanation & Notes
3.	Principle, Instrumentation of Colorimetry	Explanation & Notes
4.	Principle, Instrumentation of Spectrophotometry	Explanation & Notes
5.	Principle, Instrumentation of Flame Photometry	Explanation & Notes
6.	Principle, Instrumentation of Atomic Absorption Spectroscopy	Explanation & Notes
7	Working Principle of XRD and NMR	Explanation & Notes
8	Introduction to Chromatography	Explanation & Notes
9	Types of Chromatography	Explanation & Notes
10	Electrophoresis and its types	Explanation & Notes

Course – M.Sc Lifesciences

Paper Code:-LSD106E

Class/Semester- 1st semester

Name of the Paper- Genetics and Crop Improvement

Units Assigned- 1, 2

Class	Topic/ Unit	Remarks
1.	Cell theory and Exceptions	Explanations & Notes
2.	Structure and Chemistry of Eukaryotic and Prokaryotic Chromosome	Explanations & Notes
3.	Specialized Chromosome	Explanation
4.	Mitotic Apparatus and Synaptonemal Complex	Explanation
5.	Chromosomal Theory of Inheritance	Explanation & Notes
6.	Concept of Karyotype and Idiogram	Explanations
7.	Mendels Laws and its modifications	Explanation
8.	General characters of Polygenic Inheritance	Explanations
9.	Kernel colour of Wheat, Corolla length in tobacco and Transgressive Variation	Explanations and Notes

Course – M.Sc Lifesciences

Paper Code:-LSC302

Class/Semester- 3rd semester

Name of the Paper- Algae and Bryophytes (Theory)

Units Assigned- 1, 2, 3

Marks Assigned-: 75

Class	Topic/ Unit	Remarks
1.	General characteristics of Algae	Explanations
2.	Cell Structure of Algae	Explanations
3.	TS of Flagella and its movement	Explanation & Notes
4.	Pigments and its distribution	Explanation & Notes
5.	Pyrenoids and Eyespots	Explanation & Notes
6.	Diversity in Thallus Organisation in Algae	Explanation & Notes
7.	Algal Food Reserves	Explanation & Notes
8.	Classification of Algae	Notes
9.	Reproduction in Algae	Explanation & Notes
10.	Origin and Evolution of Sex in Algae	Explanation
11.	Types of Lifecycles in Algae	Explanation & Notes
12.	Economic Importance of Algae	Explanation
13.	Diversity of Thallus structure, Reproduction and Classification of different classes of Algae	Explanation & Notes
14.	General account and Reproduction in Chara	Explanation
15.	General account and Reproduction in Oedogonium	Explanation

Course – M.Sc Lifesciences

Paper Code:- LSC304B

Class/Semester- 3rd semester

Name of the Paper- Lab Course on Mycology, Plant Pathology and Algae

Marks Assigned- 37.5

Class	Topic/ Unit	Remarks
1.	Preparation of slides of Algae (Oedogonium, Chara, Nostoc, Vaucheria, Batrachospermum, Polysiphonia)	Practical

Name of the Teacher: SAPNA TIWARI

Course – M.Sc Lifesciences

Paper Code:-LSC103

Class/Semester- 1st semester

Name of the Paper- Techniques in Biology, Biostatistics and Bioinformatics

Class	Topic/ Unit	Remarks
1.	Principles and methods of rDNA technology	Explanation & Notes
2.	Amniocentasis	Explanation & Notes
3.	Transgenic plants & animals	Explanation & Notes
4.	Applications of genetic engineering in agriculture, medicine & Industries	Explanation & Notes
5.	Introduction to Bioinformatics	Explanation
6.	Biological databases	Explanation & Notes
7	Sequence alignment	Explanation & Notes
8	Phylogenetic analysis	Explanation, notes & PPT
9	Homology modelling	Explanation & Notes
10	CADD	Explanation, Notes & PPT
11	Molecular docking	Explanation, Notes & PPT
12	QSAR	Explanation, Notes & PPT

Course – M.Sc Lifesciences

Paper Code:-LSD108

Class/Semester- 1st semester

Name of the Paper-Biodiversity Conservation

Class	Topic/ Unit	Remarks
1.	Concept of biodiversity	Explanation & Notes
2.	Conservation of biological diversity	Explanation & Notes
3.	Reduction in biological diversity	Explanation & Notes

Course – M.Sc Lifesciences

Paper Code:-LSD106:F

Class/Semester- 1st semester

Name of the Paper- Microbiology-I

Class	Topic/ Unit	Remarks
1.	Bacterial cell wall structure	Explanation & Notes
2.	Flow chart of NAM & NAG	Explanation & Notes
3.	Bacterial nutrition	Explanation & Notes
4.	Kinetics of bacterial growth	Explanation & Notes
5.	Pure culture and its characteristics	Explanation & Notes
6.	Bacterial photosynthesis	Explanation & Notes
7	Control of microorganisms	Explanation & Notes
8	Antibiotics	Explanation & Notes
9	Drug resistance in bacteria	Explanation & Notes
10	Microbial bioassay	Explanation & Notes

DIGBOI COLLEGE, DIGBOI

Course Plan (Jan22-May22)

Mrs. Jonali Dutta

Name of the Teacher-Mrs. Jonali Dutta
Course –Honours
Class/Semester-II
Name of the Paper-C4
Units Assigned-II,III,IV
Marks Assigned-26

Class	Topic/ Unit	Remarks
UNIT:II: System of variable composition		
1.	Introduction to thermodynamics, Partial molar quantities, Chemical potential	
2.	Gibb's Duhem Equation, Effect of temperature and pressure, Chemical potential of Mixing of ideal gases	
3.	Change in thermodynamic functions of mixing of ideal gases	
UNIT:III: Chemical equilibrium:		
4.	Criteria for thermodynamic equilibria, advancement of reaction ,Chemical equilibrium	
5.	Equilibrium constants,Kc, Kp and Kx, LaChatelier's principle	
6.	Effect of pressure ,temperature and concentration on equilibrium constant,	
7.	Thermodynamics, Fugaciy, free energy	
8.	Exoergic and endoergic reaction	
9.	Equilibrium between ideal gases and condensed phases	
UNIT:IV: Solution and colligative properties:		
10.	Definition of solution and dilute solution,Vapour pressure Raoult's Law ,Henry's Law	
11.	Colligative properties,Thermodynamics. Derivation of relative lowering of vapour pressure	
12.	Elevation of boing point	
13.	Depression of freezing point	
14.	Osmotic pressure,van't Hoff factor	
15.	Calculation of molar masses in case of association and dissociation, numerical	
16.	Relation between the colligative properties.	

DIGBOI COLLEGE, DIGBOI

Course Plan (Jan22-May22)

Name of the Teacher-Mrs. Jonali Dutta
Course –Generic
Class/Semester-II
Name of the Paper-Ge-201
Units Assigned-II,III
Marks Assigned- 13

Class	Topic/Unit	Remarks
Unit:II: Chemical equilibrium		
1.	Concept of chemical equilibrium, Free energy change	
2.	Thermodynamic derivation of relation between free energy and equilibrium,Kc,Kp	
3	Equilibrium constants, Kc,Kp and Kx, La Chatelier's principle	
4	Effect of pressure ,temperature and concentration on equilibrium constant	
5	Equilibrium constants of some reaction ideal gases	
UNIT:III:IONIC EQUILIBRIUM:		
6	Introduction to different types of electrolytes, dissociation of strong and weak electrolytes.	
7	Degree of ionisation, degree of dissociation, Dissociation constant	
8	Ostwald's dilution law,Calculation of pH of weak electrolytes	
9	Ionic product of water, pH scale,common ion effect, numerical	
10	Exact treatment of strong acids,pH of strong acids	
11	Hydrolysis of salts,acidic and basic nature of salts,degree of hydrolysis	
12	Hydrolysis constant,Expression of pH	
13	Numerical of hydrolysis,Introduction to buffer solution	
14	Application of buffer ,numerical	
15	Solubility and solubility product, numerical.	
16	Application of solubility product in analysis.	
17	Acid base titration and titration curves,Indicators	
18	Theory and choice of indicators.	

DIGBOI COLLEGE, DIGBOI

Course Plan (Jan22-May22)

Name of the Teacher-Mrs. Jonali Dutta
Course –Honours / Generic –Honours
Class/Semester-IV
Name of the Paper- C7 (physical chemistry)
Units Assigned-II, III
Marks Assigned- 26

Class	TOPIC/UNIT	Remarks
Unit: Electrochemistry		
1.	Introduction, Oxidation and Reduction, Electrolytic and electrochemical cells, Application	
2.	Quantitative treatment of Faraday's Laws,	
3.	ECE, reversible and irreversible ells, Electrode potential, cell potential, std. electrode potential	
4.	Nernst's equation, Determination of cell potential	
5.	Numerical on cell potential, Eq. constant, free energy, entropy enthalpy	
6	Hydrogen Electrode, Quinhydrone electrode, Single electrodes EMF of cell	
7.	pH determination using hydrogen and quinhydrone electrodes	
8.	Liquid Junction Potential, Concentration cell, Concentration cell without transference	
9.	Concentration cell with transference	
10.	Potentiometric titration	
UNIT: Electrical and magnetic properties		
1.	Basic ideas of electrostatics, electrostatics of dielectric media	
2	Clausius–Mosotti equation, Lorenz-Laurentz equation	
3	Dipole moment and molecular polarizability	
4	Diamagnetism, paramagnetism, molecular susceptibility and molecular interpretation.	

DIGBOI COLLEGE, DIGBOI

Course Plan (Jan22-May22)

Name of the Teacher-Mrs. Jonali Dutta
Course –Honours / Generic –Generic
Class/Semester-IV
Name of the Paper-GE 401
Units Assigned-5, 6
Marks Assigned- 12

Class	TOPIC/UNIT	Remarks
Unit 6: Solid		
1.	Forms of solid, symmetry elements, unit cells, crystal system	
2.	Bravais lattices, Laws of crystallography	
3.	Laws of symmetry, Latticeplanes, Miller indices	
4.	Bragg's Law, Structure of NaCl	
5.	Crystal defects, Glasses	
6	Liquid crystals	
UNIT: Liquid		
1.	Introduction, Surface tension,	
2	Determination of surface tension	
3	Viscosity ,effect of temperature	
4	Determination of Viscosity	

DIGBOI COLLEGE, DIGBOI

Course Plan (JAN 22to MAY22)

Name of the Teacher- JONALI DUTTA
Course –Honours / Generic –HONOURS
Class/Semester-VI
Name of the Paper-C-13+C-14
Units Assigned -1+1
Marks Assigned- 10+6

Class	Topic/ Unit	Remarks
UNIT-1(PC-13)		

1	Basic principal of solubility product in analysis and common ion effect	
2.	Principle involved in separation of cations in groups	
3	Interfering radicals	
4	Removal of interfering radical	
UNIT-1 UV-VIS spectroscopy (PC-14)		
5	Types of electronic transitions,chromophores and auxochromes	
6	Shifts of bands,intensity of absorption	
6	Woodward Fieser rule	
8	Determination of maximum wavelength	

Name of the Teacher- JONALI DUTTA
Course — Honours (CBCS)
Class/Semester-6th sem
Name of the Paper-DSE-603
Dissertation (Project work)
Marks Assigned- 100

Class	Topic/ Unit	Remarks
1.	Objective	
2.	Objective	
3.	Objective	
4.	Review of literature	
5.	Review of literature	
6.	Review of literature	
7.	Review of literature	
8.	Review of literature	
9	Dissertation writing	
10	Dissertation writing	
11	Dissertation writing	
12	Dissertation writing	
13	Dissertation writing	
14	Dissertation writing	

JUN-DEC. 2022

DIGBOI COLLEGE, DIGBOI

Course Plan (June 22 to Dec 22)

Name of the Teacher- JONALI DUTTA
Course –Honours / Generic –HONOURS
Class/Semester-FIRST
Name of the Paper-C-102-PYSICAL CHEMISTRY
Units Assigned- III and IV
Marks Assigned- 26

Class	Topic/ Unit	Remarks
UNIT-III :SOLID		
1	Introduction to solid states, Idea of lattice crystal, unit cell, crystal system etc	
2.	Seven crystal system and Bravies lattices	
3	Laws of crystallography, law of constancy of interfacial angle	
4	Concept of symmetry. Elements of symmetry, cubic system	
5.	Law of rational indices, miller indices	
6	point group ,space group .	
7	X-ray crystallography, Bragg's Law	
8.	Rotating crystal method and Powder methods	
9.	Numericals and question answer discussion	
10.	Structure of crystal, idea of voids in fcc system, structure of ionic crystals	
11.	Defects in crystals, glasses	
12.	Liquid crystals, Examples, Types, Revision	
UNIT –IV:IONIC EQUILIBRIUM		
	Introduction to different types of electrolytes, dissociation of strong and weak electrolytes, Examples	
14.	Degree of ionization, degree of dissociation, Dissociation constant, pH	
15.	Ostwald's dilution law, Calculation of pH of weak electrolytes	
16.	Ionic product of water ,pH scale, common ion effect, numericals	
17.	pH of strong acids, Revision	
18.	Hydrolysis of salts, acidic and basic nature of salts, degree of hydrolysis	
19.	Hydrolysis constant, Expression of pH	
20	Numerical of hydrolysis, Introduction to buffer solution	
21.	Mechanism, pH, buffer capacity	
22.	Application of buffer , numerical	
23.	Solubility and solubility product, numerical	
24.	Application of solubility product in analysis.	
25.	Acid base titration and titration curves, pH	
26.	Indicators ,theory and choice of indicators.	

DIGBOI COLLEGE, DIGBOI

Course Plan (June 22 to Dec 22)

Name of the Teacher- JONALI DUTTA
Course –Honours / Generic –HONOURS
Class/Semester-THIRD
Name of the Paper-C-7-PYSICAL CHEMISTRY
Units Assigned- III and IV
Marks Assigned- 20

CLASS	TOPIC/UNIT	REMARKS
UNIT: I Phase equilibria (Binary Solution)		
1.	Introduction ,Different types of binary solution, thermodynamics of binary solution	
2.	Gibb's Duhem Margules equation, Raoult's Law, ideal and non ideal solution, vapour pressure composition diagram	
3.	Boiling point vs composition diagram ,Fractional distillation	
4.	Azeotropes and distillation, Lever rule,	
5.	Partial miscibility of binary liquid CST	
6.	Nernst's distribution law, thermodynamic derivation, limitation and application	
7.	Steam distillation, revision	
Unit: I :Phase equilibria		
8.	Three component system,Triangular plot	
Unit :II :Chemical kinetics		
9.	Collision Theory	
10.	Absolute reaction rate	

DIGBOI COLLEGE, DIGBOI

Course Plan (June 22 to Dec 22)

Name of the Teacher- JONALI DUTTA
Course –Honours / Generic –GENERIC
Class/Semester-THIRD
Name of the Paper-Ge-301-PYSICAL CHEMISTRY
Units Assigned- III and IV
Marks Assigned- 14

CLASS	TOPIC/UNIT	REMARKS

UNIT:I-SOLUTION		
1	Ideal and non ideal solution, thermodynamics of ideal and non ideal solution	
2	VP vs Composition diagram, BPt. vs composition diagram, fractional distillation	
3	Azeotropes, Distillation	
4.	Partial miscibility of binary liquid, CST,UCST,LCST	
5	Immiscible liquid pair, Nernst distribution law, application	
6.	Steam distillation, Solvent extraction	
7.	Solvent extraction	
8.	Revision, Question Answer discussion	
UNIT:IV :Electrochemical Cell		
9.	Definition of reversible and irreversible cells ,concept of EMF and electrode potential, Electrochemical cell .	
10.	Nernst's equation ,cell potential, thermodynamics of ECC	
11.	Numerical on cell potential, Eq. constant, free energy, entropy enthalpy etc.	
12.	Hydrogen Electrode, Quinhydrone electrode, Single electrodes EMF of cell,	
13.	pH determination using hydrogen and quinhydrone electrodes	
14.	Liquid Junction Potential, Concentration cell, Concentration cell without tranference	
15.	Concentration cell with transference	
16.	Revision.	

DIGBOI COLLEGE, DIGBOI

Course Plan (June 22 to Dec 22)

Name of the Teacher- JONALI DUTTA

Course –Honours / Generic –Hons. CBCS

Class/Semester-FIFTH

Marks : 33

Name of the Paper C-12 : Physical Chemistry

Unit: I

CLASS	TOPIC/UNIT	REMAR
UNIT:I:QUANTUM CHEMISTRY:		
1	Introduction: EMR, wavelength, frequency, spectra	
2	Black body radiation, Planck's hypothesis, Photoelectric effect,de	
3	Heisenberg uncertainty principle, wave function, Schrodinger wave	
4	Normalised and orthogonal wave functions, interpretation of wave	
5	Expectation values ,postulate of quantum mechanics, Numericals	
6	Particle in one dimensional box, Normalized wave functions and	
7.	Particle in three dimensional box ,Energy levels	

8.	Solution of Schrodinger equation for diatomic rigid rotator	
9.	Solution of Schrodinger equation for harmonic oscillator	
10.	Solution of Schrodinger equation for H atom.Quantum numbers	
11.	Probability distribution, Shapes of S orbitals and p orbitals	
12.	Simple harmonic motion and vibrational energy levels	
13.	Angular momentum.	
14.	Introduction to chemical bonding, VBT and MOT	
15.	MO treatment of hydrogen molecule ion,	
16.	MO of H_2,	
17.	Comparison of VBT and MO	
18.	Localised and non localized MO of homonuclear and heteronuclear	
UNIT:II:Molecular spectroscopy:		
19	UNIT:I &II:General Principle and Microwave Spectroscopy:	
20.	Electromagnetic radiation,Different types of spectra ,and spectroscopy-	
21	Microwave spectroscopy,rigid diatomic atomic molecule,transitions	
22.	Intensities of spectral lines Calculation of bond length of diatomic	
23.	Isotropic substitution, Numerical, Question Answer discussion	
Electronic Spectroscopy:		
24	Frank-Condon Principal, Born Oppenheimer Approximation,	
25	Different types of electronic transition, Selection Rule Solvent effect	
26	Intensities of lines, Spin Multiplicity	
27.	Fluorescence, Phosphorescence,Dissociation, predissociation	
28.	Electronic transitions of polyenes from free electron	

DIGBOI COLLEGE, DIGBOI

Course Plan, JAN-JUN, 2022

NEELAKSHI HAZARIKA

Name of the Teacher- NEELAKSHI HAZARIKA
Course — Honours
Class/Semester- 4th Semester
Name of the Paper- 401, Inorganic Chemistry
Units Assigned- All
Marks Assigned- 53

Class	Topic/ Unit	Remarks
1.	Unit I: Coordination Chemistry IUPAC nomenclature of coordination compounds	
2.	isomerism in coordination compounds.	
3.	Stereochemistry of complexes with 4 and 6 coordination numbers.	
4.	Chelate effect	
5.	Polynuclear complexes	
6.	Labile and inert complexes.	
7.	Werner's theory,	
8.	valance bond theory (inner orbital complexes), electroneutrality	
9.	VBT of outer orbital complexes	
10.	Electroneutrality principle and back bonding.	

11.	Crystal field theory	
12.	measurement of 10Dq (Δo),	
13.	CFSE in weak and fields,	
14.	CFSE in weak and strong fields,	
15.	pairing energies	
16.	factors affecting the magnitude of 10Dq (Δo, Δt).	
17.	Octahedral vs. tetrahedral coordination,	
18.	tetragonal distortions from octahedral geometry	
19.	Jahn-Teller theorem	
20.	square planar geometry	
21.	Qualitative aspect of Ligand field and MO Theory.	
22.	Unit II: Transition Elements General group trends with special reference to electronic configuration, colour,	
23.	Variable valency	
24.	General trends in magnetic and catalytic properties	
25.	ability to form complexes.	
26.	Stability of various oxidation states and e.m.f. (Latimer diagram)	
27.	Bsworth diagrams	
28.	Difference between the first, second and third transition series.	
29.	Chemistry of Ti, V, Cr,	
30.	Chemistry of	
31.	Chemistry of Mn, Fe	
32.	Chemistry Co in various oxidation states	
33.	Unit III: Lanthanoids and Actinoids Electronic configuration	
34.	oxidation states, colour	
35.	spectral and magnetic properties	
36.	Lanthanide contraction and consequences	
37.	separation of lanthanides by ion-exchange method only	
38.	Comparision between actinoids and lanthanoids	
39.	Unit IV: Bioinorganic Chemistry Metal ion present in biological systems,	
40.	classification of elements according to their action in biological system	
41.	Geo chemical effect on distribution of metals	
42.	Sodium/ K-pump, Biological role of Na- K	
43.	Carbonic anhydrase, it’s structure and function	

44.	Carboxypeptidase, it's structure and function	
45.	Excess and deficiency of some trace metals.	
46.	Toxicity of Hg, reasons for toxicity, treatment and prevention	
47.	Toxicity of Pb, reasons for toxicity, treatment and prevention	
48.	Toxicity of As, reasons for toxicity, treatment and prevention	
49.	use of chelating agents in medicine.	
50.	Iron and its application in bio-systems	
51.	Haemoglobin, It's structure and application	
52.	storage of iron in biological system	
53.	transfer of iron in human body	

DIGBOI COLLEGE, DIGBOI

Course Plan, JAN-JUN, 2022

Name of the Teacher- NEELAKSHI HAZARIKA
Course – Honours
Class/Semester- 4th Semester
Name of the Paper- 401, Inorganic Chemistry
Units Assigned- All
Marks Assigned- 53

Class	Topic/ Unit	Remarks
1.	Unit I: Coordination Chemistry IUPAC nomenclature of coordination compounds	
2.	isomerism in coordination compounds.	
3.	Stereochemistry of complexes with 4 and 6 coordination numbers.	
4.	Chelate effect	
5.	Polynuclear complexes	
6.	Labile and inert complexes.	
7.	Werner's theory,	
8.	valance bond theory (inner orbital complexes), electroneutrality	
9.	VBT of outer orbital complexes	
10.	Electroneutrality principle and back bonding.	
11.	Crystal field theory	
12.	measurement of 10Dq (Δo),	
13.	CFSE in weak and fields,	
14.	CFSE in weak and strong fields,	
15.	pairing energies	
16.	factors affecting the magnitude of 10Dq (Δo, Δt).	
17.	Octahedral vs. tetrahedral coordination,	
18.	tetragonal distortions from octahedral geometry	
19.	Jahn-Teller theorem	

20.	square planar geometry	
21.	Qualitative aspect of Ligand field and MO Theory.	
22.	Unit II: Transition Elements General group trends with special reference to electronic configuration, colour,	
23.	Variable valency	
24.	General trends in magnetic and catalytic properties	
25.	ability to form complexes.	
26.	Stability of various oxidation states and e.m.f. (Latimer diagram)	
27.	Bsworth diagrams	
28.	Difference between the first, second and third transition series.	
29.	Chemistry of Ti, V, Cr,	
30.	Chemistry of	
31.	Chemistry of Mn, Fe	
32.	Chemistry Co in various oxidation states	
33.	Unit III: Lanthanoids and Actinoids Electronic configuration	
34.	oxidation states, colour	
35.	spectral and magnetic properties	
36.	Lanthanide contraction and consequences	
37.	separation of lanthanides by ion-exchange method only	
38.	Comparision between actinoids and lanthanoids	
39.	Unit IV: Bioinorganic Chemistry Metal ion present in biological systems,	
40.	classification of elements according to their action in biological system	
41.	Geo chemical effect on distribution of metals	
42.	Sodium/ K-pump, Biological role of Na- K	
43.	Carbonic anhydrase, it's structure and function	
44.	Carboxypeptidase, it's structure and function	
45.	Excess and deficiency of some trace metals.	
46.	Toxicity of Hg, reasons for toxicity, treatment and prevention	
47.	Toxicity of Pb, reasons for toxicity, treatment and prevention	
48.	Toxicity of As, reasons for toxicity, treatment and prevention	
49.	use of chelating agents in medicine.	

50.	Iron and its application in bio-systems	
51.	Haemoglobin, It's structure and application	
52.	storage of iron in biological system	
53.	transfer of iron in human body	

DIGBOI COLLEGE, DIGBOI

Course Plan, JAN-JUN, 2022

(w.e.f MAY,2021)

Name of the Teacher-NEELAKSHI HAZARIKA
Course– Generic
Class/Semester- 4th Semester, CBCS
Name of the Paper- CHEMISTRY-GE-401, Transition metals, Coordination Chemistry, States of Matter and Chemical Kinetics
Units Assigned-
Marks Assigned- 26

Class	Topic/ Unit	Remarks
1.	**Section A: Inorganic Chemistry** Unit I: Transition Series Elements (3d series) General group trends, electronic configuration,	
2.	variable valency, colour of transition elements	
3.	magnetic and catalytic properties of transition elements	
4.	ability to form complexes of transition elements	
5.	stability of various oxidation states, Latimer diagrams for Mn	
6.	Latimer diagrams for Fe.	
7.	Latimer diagrams for Cu	
8.	Lanthanoids and actinoids: Electronic configurations, oxidation states of lanthanoids	
9.	colour, magnetic properties of lanthanoids	
10.	lanthanide contraction, it's consequences	
11.	Separation of lanthanides (ion exchange method).	
12.	Electronic configurations, oxidation states of actinoids	
13.	colour, magnetic properties of actinoids	
14.	Unit II: Coordination Chemistry Introduction of coordination compound	
15.	Types of ligands,	
16.	Chelating ligand and chelate effect	
17.	Structural isomerism in complexes with Coordination numbers 4 and 6.	
18.	stereoisomerism in complexes with Coordination numbers 4 and 6.	
19.	Valence Bond Theory (VBT): Inner orbital complexes of Cr, Fe for coordination numbers 4 and 6)	

20.	Valence Bond Theory (VBT): Inner orbital complexes of Co, Ni and Cu (coordination numbers 4 and 6)	
21.	VBT for outer orbital complexes of Cr, Fe, (coordination numbers 4 and 6).	
22.	VBT for outer orbital complexes of Co, Ni and Cu (coordination numbers 4 and 6).	
23.	Drawbacks of VBT	
24.	IUPAC (2005) system of nomenclature of coordination compound	
25.	IUPAC (2005) system of nomenclature of coordination compound	
26.	Unit III: Crystal Field Theory Crystal Field Theory (CFT): An introduction	
27.	Crystal field effect in octahedral symmetry	
28.	Crystal field stabilization energy (CFSE)	
29.	Crystal field effects for weak and strong fields.	
30.	Crystal field effect in Tetrahedral symmetry.	
31.	Factors affecting the magnitude of D.	
32.	Spectrochemical series.	
33.	Comparison of CFSE for Oh and Td complexes	
34.	Tetragonal distortion of octahedral geometry.	
35.	Jahn-Teller distortion	
36.	Square planar coordination	

DIGBOI COLLEGE, DIGBOI
Course Plan(2022-2022)
SESSION JAN- MAY, 2022

Name of the Teacher- NEELAKSHI HAZARIKA
Course – 6TH SEM HONOURS
Class/Semester- 6TH SEM Honours, CBCS
Name of the Paper- C- 13
Units Assigned- II.III, IV
Marks Assigned-53

Class	Topic/ Unit	Remarks
1.	Unit II: Organometallic compounds Definition and classification of organometallic compounds on the basis of bond type.	
2.	Conceptof hapticity of organic ligands.	
3.	Metal carbonyls: 18 electron rule, electron count of mononuclear, polynuclear and substituted	

	metal carbonyls of 3d series.	
4.	General methods of preparation (direct combination, reductivecarbonylation, thermal and photochemical decomposition) of mono and binuclear carbonyls of 3d series.	
5.	Structures of mononuclear and binuclear carbonyls of Cr, Mn, Fe,Co and Ni usingVBT	
6.	π-acceptor behavior of CO(MO diagram of CO to be discussed), synergic effect and use of IR data to eplain extent of back bonding.	
7.	Zeise's salt: preparation and structure, evidences of synergic effect and comparison of synergic effect with that in carbonyls.	
8.	Metal Alkyls: Important structural features of methyl lithium (tetramer) and trialkyl aluminium(dimer), concept of multicentre bonding in these compounds.	
9.	Role of triethylaluminium in polymerization of ethane (Ziegler-Natta Catalyst).	
10.	Species present in ether solution of Grignard reagent and their structures,	
11.	Schlenk equilibrium.	
12.	Ferrocene: Preparation and reactions (acetylation, alkylation, metallation	
13.	Structure and aromaticity.	
14.	Comparison of aromaticity and reactivity with that of benzene.	
15.	Unit III: Reaction Kinetics and Mechanism Introduction to inorganic reaction mechanisms.	
16	Substitution reactions in square planar complexes	
17	Trans-effect, theories of trans-effect,	
18	mechanism of nucleophilic substitution in square planar complexes	
19	Thermodynamic and kinetic stability, kinetics of octahedral substitution	
20	ligand field effects and reaction rates	
21	Mechanism of substitution in octahedral complexes.	
22	Unit IV: Catalysis by Organometallic Compounds Study of the following industrial processes and their mechanism 1. Alkene hydrogenation (Wilkinson's Catalyst)	
23	2. Hydroformylation (Co salts)	
24	3. Wacker Process	
25	4. Synthetic Gasoline (Fisher Tropsch reaction)	
26	5. Synthesis gas by metal carbonyl complexes	

Name of the Teacher- NEELAKSHI HAZARIKA
Course — Honours (CBCS)
Class/Semester-6th sem
Name of the Paper-DSE-603
Dissertation (Project work)
Marks Assigned- 100

Class	Topic/ Unit	Remarks
1.	Objective	
2.	Objective	
3.	Objective	
4.	Review of literature	
5.	Review of literature	
6.	Review of literature	
7.	Review of literature	
8.	Review of literature	
9	Dissertation writing	
10	Dissertation writing	
11	Dissertation writing	
12	Dissertation writing	
13	Dissertation writing	
14	Dissertation writing	

DIGBOI COLLEGE, DIGBOI

Course Plan
SESSION JUN-DEC, 2022

Name of the Teacher- NEELAKSHI HAZARIKA
Course –Honours / Generic – 1S HONOURS
Class/Semester- 1st Sem Honours, CBCS
Name of the Paper- C- 101
Units Assigned- All
Marks Assigned-53

Class	Topic/ Unit	Remarks
1.	**Unit I: Atomic Structure** Wave mechanics: Bohr's Theory de Broglie equation	
2.	Heisenberg's Uncertainty Principle and its significance	
3.	Schrödinger's wave equation	
4.	Normalized and orthogonal wave functions. Sign of wave functions.	
5.	Radial and angular wave functions for hydrogen atom.	
6.	Radial and angular distributioncurves.	
7.	Shapes of s, p, d and f- orbitals.	

8.	Contour boundary and probability diagrams.	
9.	Pauli's Exclusion Principle, Hund's rule of maximum multiplicity	
10.	Aufbau's principle and its limitations.	
11.	Variation of orbital energy with atomic number	
12.	Numericals	
13.	significance of Ψ and Ψ^2 .	
14.	Quantum numbers andtheir significance.	
15.	**Unit II: Periodicity of Elements:** Effective nuclear charge, shielding or screening effect	
16.	Variation of effective nuclear charge in periodic table.	
17.	Slater rules, It's applications	
18.	Atomic radii (van der Waals) and it's periodic variation	
19.	Ionic and crystal radii. Covalent radii (octahedral and tetrahedral)	
20.	Ionization enthalpy. Applications of ionization enthalpy.	
21.	Successive ionization enthalpies and factors affecting ionization energy.	
22.	Electron gain enthalpy, trends of electron gain enthalpy.	
23.	Electroneagativity and its periodic trend	
24.	Pauling's electronegativity scales, Numericals	
25.	Mulliken's electronegativity scales, Numericals	
26.	Allred Rachow's electronegativity scales, Numericals	
27.	Mulliken-Jaffé's electronegativity scales	
28.	Factors affecting Electronegativity	
29.	Applications of Electronegativity	
30.	**Unit III: Chemical Bonding** i) *Ionic bond*: General characteristics, types of ions, size effects	
31.	radius ratio rule and its limitations.	
32.	Packing of ions in crystals.	
33.	Lattice energy, Born-Lande's equation with derivation, Madelung constant	
34.	Born-Haber cycle and its application, Solvation energy.	
35.	*Covalent bond*: Lewis structure, Valence Bond theory (Heitler-London approach).	
36.	Energetics of hybridization, equivalent and non-equivalent hybrid orbitals.	
37.	Resonance and resonance energy,	
38.	Molecular orbital theory. Molecular orbital diagrams of diatomic molecules N_2	
39.	Molecular orbital diagrams of O_2, C_2, B_2, F_2, CO, NO, and their ions; HCl, BeF_2	
40.	Molecular orbital diagrams of simple polyatomic molecules CO_2, (idea of s-p mixing and orbital interaction to be given).	
41.	Formal charge, Valence shell electron pair repulsion theory (VSEPR)	

42.	Shapes of simple molecules and ions containing lone pairs and bond pairs of electrons.	
43.	Multiple bonding ($\sigma-$ and $\pi-$ bond approach) and bond lengths.	
44.	Covalent character in ionic compounds, polarizing power and polarizability	
45.	Fajan's rules and consequences of polarization.	
46.	Ionic character in covalent compounds: Bond moment and dipole moment.	
47.	Percentage ionic character from dipole moment and electronegativity difference.	
48.	*Metallic Bond*: Qualitative idea of valence bond	
49.	Band theories.	
50.	Semiconductors and insulators,	
51.	Defects in solids.	
52.	*Weak Chemical Forces*: van der Waals forces, ion-dipole forces, dipole-dipole interactions	
53.	Induced dipole interactions, Instantaneous dipole-induced dipole interactions	
54.	Hydrogen bonding (theories of hydrogen bonding, valence bond treatment).	
55.	**Unit IV: Oxidation-Reduction:** Redox equations	
56.	Standard Electrode Potential and its application to inorganic reactions.	
57.	Principles involved in volumetric analysis	

DIGBOI COLLEGE, DIGBOI

Course Plan

SESSION JUN-DEC, 2022

Name of the Teacher-Neelakshi Hazarika
Course –Honours / Generic – Generic
Class/Semester- 1s Semester CBCS
Name of the Paper-Atomic Structure, Bonding,General Organic Chemistry and Aliphatic Hydrocarbons
Units Assigned- Section A: Inorganic Chemistry (Unit :I, II)
Marks Assigned- 26

Class	Topic/ Unit	Remarks
1.	Unit I: Atomic Structure Review of: Bohr's theory and its limitations	
2.	Dual behaviour of matter and radiation:de-Broglie's relation, Heisenberg Uncertainty principle.	
3.	Hydrogen atom spectra. Need of a new approach to Atomic structure	
4.	Quantum mechanics, Time independent Schrodinger equation and meaning of	

	various terms in it.	
5.	Significance of Ψ and Ψ^2 .	
6.	Schrödinger equation for hydrogen atom	
7.	Radialand angular parts of the hydogenic wave functions (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p and 3d orbitals (Only graphical representation).	
8.	Radial and angular nodes and their significance.	
9.	Radial distribution functions and the concept of the most probable distancewith special reference to 1s and 2s atomic orbitals.	
10.	Significance of quantum numbers	
11.	Orbitalangular momentum and quantum numbers ml and ms.	
12.	Shapes of s, p and d atomicorbitals, nodal planes	
13.	Discovery of spin, spin quantum number (s) and magnetic spinquantum number (ms).	
14.	Rules for filling electrons in various orbitals, Electronic configurations of the atoms.	
15.	Stabilityof half-filled and completely filled orbitals, concept of exchange energy.	
16.	Relative energies of atomic orbitals, Anomalous electronic configurations	
17.	Unit II: Chemical Bonding and Molecular Structure Ionic Bonding: General characteristics of ionic bonding.	
18.	Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds.	
19.	Statement of Born-Landé equation for calculation of lattice energy,	
20.	Born-Haber cycle and its applications,	
21.	Polarizing power and polarizability	
22.	Fajan'srules, ionic character in covalent compounds,	
23.	Bond moment, dipole moment and percentage ionic character.	
24.	Covalent bonding: VB Approach	
25.	Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.	
26.	Concept of resonance and resonating structures in various inorganic and organic compounds.	
27.	MO Approach: Rules for the LCAO method, bonding and antibonding MOs and theircharacteristics for s-s, s-p and p-p combinations of atomic orbitals, nonbondingcombination of orbitals	
28.	MO treatment of homonuclear diatomic molecules of 1st and 2^{nd}periods (including idea of s-p mixing) and heteronuclear diatomic molecules such as CO, NO and NO+	
29.	Comparison of VB and MO approaches.	

DIGBOI COLLEGE, DIGBOI

Course Plan

SESSION JUN-DEC, 2022

Name of the Teacher- NEELAKSHI HAZARIKA
Course –Honours / Generic – HONOURS
Class/Semester- 3rd Semester, CBCS
Name of the Paper- Inorganic Chemistry
Units Assigned- All
Marks Assigned- 53

Class	Topic/ Unit	Remarks
1.	**Unit I: General Principles of Metallurgy :** Chief modes of occurrence of metals based on standard electrode potentials.	
2.	Ellingham diagrams for reduction of metal oxides using carbon and carbon monoxide as reducing agent.	
3.	Electrolytic Reduction,	
4.	Hydrometallurgy.	
5.	Methods of purification of metals: Electrolytic Kroll process,	
6.	Parting process, van Arkel-de Boer process	
7.	Mond's process, Zone refining	
8.	**Unit II: Acids and Bases:** Brönsted-Lowry concept of acid-base reactions, solvated proton.	
9.	relative strength of acids, types of acid-base reactions,	
10.	levelling solvents	
11.	Lewis acid-base concept,	
12.	Classification of Lewis acids,	
13.	Hard and Soft Acids and Bases (HSAB) Application of HSAB principle	
14.	**Unit III: Chemistry of *s* and *p* Block Elements:** Inert pair effect, Relative stability of different oxidation states	
15.	Diagonal relationship and anomalous behaviour of first member of each group. Allotropy and catenation.	
16.	Complex formation tendency of *s* and *p* block elements.	
17.	Study of the following compounds with emphasis on structure, bonding, preparation, properties and uses of Boric acid and borates	
18.	boron nitrides,	
19.	borohydrides (diborane),	
20.	Silanes	
21.	carboranes and graphitic compounds	

22.	Oxides and oxoacids of nitrogen, Phosphorus and chlorine.	
23.	Peroxoacids of sulphur, interhalogen compounds,	
24.	Polyhalide ions, pseudohalogens and basic properties of halogens.	
25.	**Unit IV: Noble gases :**Occurrence and uses	
26.	rationalization of inertness of noble gases	
27.	Clathrates; preparation and properties of XeF_2, XeF_4 and XeF_6;	
28.	Nature of bonding in noble gas compounds (Valence bond treatment and MO treatment for XeF2).	
29.	Molecular shapes of noble gas compounds (VSEPR theory).	
30.	**Unit V: Inorganic Polymers:** Types of inorganic polymers, comparison with organic polymers	
31.	Synthesis, structural aspects and applications of silicones	
32.	Siloxanes.	
33.	Borazines	
34.	Silicates.	
35.	Phosphazenes	
36.	Polysulphates	

DIGBOI COLLEGE, DIGBOI

Course Plan

SESSION JUN-DEC, 2022

Name of the Teacher-NEELAKSHI HAZARIKA
Course –Honours / Generic – Honours
Class/Semester- 5th Semester, CBCS
Name of the Paper- Physical Chemistry, C-501
Units Assigned- II
Marks Assigned- 11

Class	Topic/ Unit	Remarks
1.	Unit II: Molecular Spectroscopy Interaction of electromagnetic radiation with molecules and various types of spectra	
2.	Vibrational spectroscopy: Classical equation of vibration	
3.	computation of force constant	
4.	amplitude of diatomic molecular vibrations,	
5.	Numericals	
6.	anharmonicity	
7.	Morse potential, dissociation energies,	
8.	fundamental frequencies	
9.	overtones	
10.	hot bands	

11.	Numericals	
12.	degrees of freedom for polyatomic molecules	
13.	modes of vibration of various molecules	
14.	Concept of group frequencies.	
15.	Vibration-rotation spectroscopy: diatomic vibrating rotator,	
16.	P, Q, R branches.	
17.	cContour diagram for HCl for various selection rules	
18.	Nuclear Magnetic Resonance (NMR) spectroscopy: Principles of NMR spectroscopy	
19.	Larmor precession, chemical shift	
20.	low resolution spectra,	
21.	different scales of nmr spectra	
22.	spin-spin coupling	
23.	Spectra of different organic molecules	

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Course Plan

SESSION JUN-DEC, 2022

Name of the Teacher-NEELAKSHI HAZARIKA
Course –Honours / Generic – Honours
Class/Semester- 5th Semester, CBCS
Name of the Paper- DSE-501, Analytical Methods in Chemistry
Units Assigned- I, II,III, V
Marks Assigned- 23

Class	Topic/ Unit	Remarks
1.	Unit I: Qualitative and quantitative aspects of analysis Sampling, evaluation of analytical data	
2.	Different types of errors,Mathematical expressions.	
3.	Minimizations of errors, Numericals	
4.	accuracy and precision,	
5.	Mean deviations, Standard deviations, Coefficient of variation	
6.	Numericals	
7.	normal law of distribution if indeterminate errors,	
8.	statistical test of data; F test,	
9.	statistical test of data; Q test, rejection of data, and confidence intervals	
10.	statistical test of data; t test,	
11.	rejection of data,	
12.	confidence intervals, confidence limit	
13.	Unit II: UV-Visible and IR Spectrometry Infrared Spectrometry: Basic principles of instrumentation	
14.	choice of source in IR instrument	
15.	Monochromator & detector for single beam instrument;	
16.	Monochromator & detector for double beam instrument;	
17.	sampling techniquesin IR	
18.	Structural illustration through interpretation of data,	

19.	Structural illustration through interpretation of data,	
20.	effect and importance of isotope substitution.	
21.	Unit III: Thermal Methods of analysis: Theory of thermo-gravimetry (TG),	
22.	Basic principle of instrumentation	
23.	Techniques for quantitative estimation of Ca and Mg from their mixture.	
24.	Applications of TGA	
25.	Unit V: Separation techniques Chromatography: Classification, principle and efficiency of the technique.	
26.	Adsorption chromatography	
27.	partition chromatography	
28.	Ion exchange chromatography.	
29.	Different types of paper chromatography	
30.	Development of chromatograms: frontal, elution and displacement methods.	
31.	Qualitative and quantitative aspects of TLC	
32.	HPLC.	

DIGBOI COLLEGE, DIGBOI

Course Plan (Jan22-May22)

Dr Nayan Jyoti Khound

Name of the Teacher: Dr Nayan Jyoti Khound
Course –Honours
Class/Semester-II
Name of the Paper- C4
Units Assigned-I
Marks Assigned-26

Class	Topic/ Unit	Remarks
UNIT:I: Chemical Thermodynamics	Marks Assigned-26	
1.	Extensive and intensive properties of a system,	
2.	thermodynamic processes: cyclic, reversible, irreversible processes,	
3.	Thermodynamic function, complete differential, Zeroth law of thermodynamics.	
4.	First law of thermodynamics-internal energy, enthalpy, molar heat capacities,	
5.	relation between Cp and Cv, work of expansion in reversible and irreversible process, adiabatic	
6.	Joule Thomson effect, calculation of Joule Thomson co-efficient for ideal and Vander Waal's gas.	

7.	Thermo chemistry- Hess's law,	
8.	Kirchhoff's law relation of reaction enthalpy with internal energy,	
9.	Bond energy and Bond dissociation energy	
10.	Bond energy Calculation from thermo chemical data.	
11.	Free Energy Functions: Gibbs and Helmholtz energy	
12.	Free energy change and spontaneity	
13.	Relation between Joule-Thomson effect and S, G, A	
14.	Inversion temperature and Gibbs-Helmholtz equation	
15.	Numericals Discussion	
16.	Previous year Question paper discussion	

DIGBOI COLLEGE, DIGBOI

Course Plan (Jan22-May22)

Name of the Teacher- Dr Nayan Jyoti Khound
Course –Generic
Class/Semester-II
Name of the Paper-Ge-201
Units Assigned-I,
Marks Assigned- 10

Unit I: Chemical Energetic		Marks Assigned- 10
Class	Topic	Remarks
1.	Review of thermodynamics	
2.	System and Functions of thermodynamics	
3.	Laws of Thermodynamics.	
4.	Important principles and definitions of thermo chemistry.	
5.	Concept of standard state	
6.	standard enthalpies of formations, integral and differential enthalpies of solution and dilution.	
7.	bond energy, bond dissociation energy and resonance energy	
8.	Calculation of bond energy, bond dissociation energy and resonance energy from thermo chemical data.	
9.	Variation of enthalpy of a reaction with temperature– Kirchhoff's Equation.	
10.	Question paper discussion	

DIGBOI COLLEGE, DIGBOI

Course Plan (Jan22-May22)

Name of the Teacher: Dr Nayan Jyoti Khound
Course –Honours / Generic –Honours
Class/Semester-IV
Name of the Paper- C7 (physical chemistry)
Units Assigned- I
Marks Assigned- 22

Unit I: Conductance		Marks Assigned- 22
Class	Topic	Remarks
1.	Arrhenius theory of electrolytic dissociation.	
2.	Conductivity, equivalent and molar conductivity	
3.	Their variation with dilution for weak and strong electrolytes.	
4.	Molar conductivity at infinite dilution.	
5.	Kohlrausch law of independent migration of ions.	
6.	Debye-Huckel-Onsager equation,	
7.	Wien effect, Debye-Falkenhagen effect,	
8.	Walden's rules.	
9.	Ionic velocities, mobilities and their determinations,	
10.	Transference numbers and their relation to ionic mobilities,	
11.	Determination of transference numbers using Hittorf method	
12.	Determination of transference numbers using Moving Boundary methods.	
13.	Applications of conductance measurement: (i) degree of dissociation of weak electrolytes,	
14.	(ii) ionic product of water	
15.	(iii) solubility and solubility product of sparingly soluble salts,	
16.	(iv) conductometric titrations,	
17.	(iv) conductometric titrations,	
18.	& (v) hydrolysis constants of salts.	
19.	Numerical	
20.	Question paper discussion	

DIGBOI COLLEGE, DIGBOI
Course Plan (Jan22-May22)

Name of the Teacher- Dr Nayan Jyoti Khound

Course –Honours / Generic –Generic
Class/Semester-IV
Name of the Paper-GE 401
Units Assigned-4, 7
Marks Assigned- 8+8

Unit I: Kinetic Theory of Gases Marks Assigned- 08		
Class	Topic	Remarks
1.	Kinetic Theory of Gases: Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation.	
2.	Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation.	
3.	Van der Waals equation of state for real gases. Boyle temperature	
4.	Critical phenomena, critical constants and their calculation from Van der Waals equation.	
5.	Andrews isotherms of CO_2.	
6.	Maxwell Boltzmann distribution laws of molecular velocities and molecular energies and their importance.	
7.	Temperature dependence of these distributions. Most probable, average and root mean square velocities.	
8.	Collision number and mean free path of molecules.	
9.	Viscosity of gases, effect of temperature & pressure on coefficient of viscosity	
10.	Questions discussion	
11.	Questions discussion	
Unit 7: Chemical Kinetics Marks Assigned- 08 Marks Assigned- 08		
1	Rate and Unit of a chemical Reaction	
2	Order and Molecularity of a reaction	
3	Differential and integrated form of first order reaction	
4	Differential and integrated form of zero order reaction	
5	Differential and integrated form of second order reaction	
6	Experimental determination of rate laws	
7	Experimental determination of rate laws	
8	Experimental determination of half lives	
9	Numerical solving	
10	Kinetics of Opposing reaction	
11	Kinetics of Parallel reaction	
12	Kinetics of Consecutive reaction	
13	Steady state approximation and Chain Reactions	
14	Previous year question paper solved	
15	Discussion and problem/ question of the studied topic	

DIGBOI COLLEGE, DIGBOI

Course Plan (JAN 22to MAY22)

Name of the Teacher- Dr Nayan Jyoti Khound

Course –Honours / Generic –HONOURS
Class/Semester-VI
Name of the Paper- DSE 602
Units Assigned: 3
Marks Assigned- 30

Class	Topic/ Unit	Remarks
UNIT-3 Environment and its Segments		Marks Assigned- 30
1	Ecosystem and its types	
2.	Biogeochemical Cycles of Carbon	
3	Biogeochemical Cycles of Nitrogen	
4	Biogeochemical Cycles of Sulphur	
5	Air Pollution: Introduction	
6	Air Pollution: Major regions of atmosphere.	
6	Chemical and photochemical reactions in atmosphere.	
8	Chemical and photochemical reactions in atmosphere.	
9	Air pollutants: types, sources,	
10	Air pollutants: types, sources,	
11	Particle size and chemical nature. Photochemical smog: its constituents and photochemistry	
12	Environmental effects of ozone	
13	Pollution by SO2, CO2, CO, NOx, H2S and other foul smeling gases,	
14	Methods of estimation of CO, NOx, SOx and control procedures.	
15	Major sources of air pollution	
16	Pollution by SO2, CO2, CO, NOx, H2S and other foul smeling gases,	
17	Ozone depletion by oxides of nitrogen,	
18	chlorofluorocarbons and halogens, removal of sulphur from coal. Control of particulates	
19	Water pollution: Hydrological cycle,	
20	water resources, aquatic ecosystems,	
21	Sources and nature of water pollutants,	
22	Techniques for measuring water pollution,	
23	Techniques for measuring water pollution,	
24	Impacts of water pollution on hydrological and ecosystems	
25	Water purification methods.	
26	Effluent treatment plants (primary, secondary and tertiary treatment).	
27	Industrial effluents from the following industries and their treatment: electroplating, textile.	
28	Tannery, diary, petroleum and petrochemicals, agro, fertilizers etc. Sludge disposal	
29	Industrial waste management, incineration of waste.	
30	Water treatment and purification (Reverse osmosis, electro dialysis, ion-exchange).	

31	Water quality parameters for waste water, industrial water and domestic water.	
32	Question discussion	

DIGBOI COLLEGE, DIGBOI

Course Plan (JAN 22to MAY22)

Name of the Teacher- Dr Nayan Jyoti Khound
Course — Honours (CBCS)
Class/Semester-6th sem
Name of the Paper-DSE-603
Dissertation (Project work)
Marks Assigned- 100

Class	Topic/ Unit	Remarks
1.	Objective	
2.	Objective	
3.	Objective	
4.	Review of literature	
5.	Review of literature	
6.	Review of literature	
7.	Review of literature	
8.	Review of literature	
9	Dissertation writing	
10	Dissertation writing	
11	Dissertation writing	
12	Dissertation writing	
13	Dissertation writing	
14	Dissertation writing	

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Course Plan (June 22 to Dec 22)

Name of the Teacher- Dr NAYAN JYOTI KHOUND
Course – Honours (CBCS)
Class/Semester- First Semester
Name of the Paper- C-102 (Physical Chemistry)
Units Assigned- I + II
Marks Assigned- 18 + 08

Unit I: Gaseous State		Marks Assigned- 18
Class	Topic	Remarks
1.	Kinetic Theory of gases	
2.	Collision frequency, collision number, mean free path	
3.	Viscosity of gases and its pressure and temperature dependence	
4.	Maxwell distribution of velocities	
5.	Most probable velocity, average velocity, RMS velocity	
6.	Degree of freedom	
7.	Law of equipartition of energy	
8.	Deviation from ideal behaviour Cause of deviation	
9.	Numerical and questions	
10.	Compressibility of factor Z	
11.	Vander Waal equation & Other equation of real gases	
12.	Boyle's temperature	
13.	Isotherm of real gases	
14.	Continuity of states	
15.	Critical state and Vander Waal constants	
16.	Reduced equation of states	
17.	Law of corresponding states	
18.	Viscosity of gases and effect of Pressure & Temperature on it	
19.	Previous year question paper solved	
20.	Previous year question paper solved	

Unit II: Liquid State		Marks Assigned- 08
Class	Topic	Remarks
1.	Qualitative treatment of structure of liquid	
2.	Vapour pressure and surface tension of liquid	
3.	Coefficient of viscosity and effect of various solutes on it	
4.	Units and significance of physical properties of liquid	
5.	Viscosity of liquid and comparison with gases	
6.	Cleaning action of detergents	
7.	Qualitative discussion of structure of water	
8.	Previous year question paper solved	

DIGBOI COLLEGE, DIGBOI

Course Plan (June 22 to Dec 22)

Name of the Teacher- Dr NAYAN JYOTI KHOUND
Course – Honours (CBCS)
Class/Semester- 3rd Semester

Name of the Paper- C-303 (Physical Chemistry)
Units Assigned- I +II + III
Marks Assigned- 15 + 12 +12

Unit I: Phase Equilibria		Marks Assigned- 15
Class	Topic	Remarks
1.	Phase Rule & Concept of phases, components & degree of freedom	
2.	Application of Phase rule	
3.	Application of Phase rule	
4.	Derivation of Gibbs Phase rule	
5.	Derivation of Gibbs Phase rule	
6.	Phase diagram of Water system	
7.	Phase diagram of Sulphur system	
8.	Phase diagram of Eutectic system	
9.	Phase diagram of Lead Silver system	
10.	Phase diagram of Congruent system	
11.	Phase diagram of Zinc Magnesium system	
12.	Phase diagram of Zinc Magnesium system	
13.	Phase diagram of Incongruent system	
14.	Phase diagram of Sodium Sulphate Water system	
15.	Phase diagram of Sodium Sulphate Water system	
16.	Clausius Clayperon Rule	
17.	Application of Clausius Clayperon Rule	
18.	Application of Clausius Clayperon Rule	
19.	Numerical solved	
20.	Previous year question paper solved	
Unit – II	Chemical Kinetics	Marks Assigned- 12
1	Rate and Unit of a chemical Reaction	
2	Order and Molecularity of a reaction	
3	Differential and integrated form of first order reaction	
4	Differential and integrated form of zero order reaction	
5	Differential and integrated form of second order reaction	
6	Experimental determination of rate laws	
7	Experimental determination of rate laws	
8	Experimental determination of half lives	
9	Numerical solving	
10	Kinetics of Opposing reaction	
11	Kinetics of Parallel reaction	
12	Kinetics of Consecutive reaction	
13	Steady state approximation and Chain Reactions	
14	Previous year question paper solved	
15	Discussion and problem/ question of the studied topic	
Unit II: Catalysis		Marks Assigned- 12
Class	Topic	Remarks
1.	Definition and types of catalysts	

2.	Specificity and selectivity of catalysts	
3.	Mechanism of catalyzed reaction on solid surface	
4.	Effect of particle size and efficiency of nano particles as catalysts	
5.	Enzyme catalysis	
6.	Michaelis Menten catalysis	
7.	Acid base catalysis	
8	Question paper solved	

DIGBOI COLLEGE, DIGBOI

Course Plan (June 22 to Dec 22)

Name of the Teacher- Dr NAYAN JYOTI KHOUND
Course – Generic (CBCS)
Class/Semester- 3rd Semester
Name of the Paper- C-303 (Physical Chemistry)
Units Assigned- II + III
Marks Assigned- 06 + 06

Unit II: Phase Equilibria		Marks Assigned- 6
Class	Topic	Remarks
1.	Phases, components and degrees of freedom of a system,	
2.	Application of phase rule	
3.	Gibbs Phase Rule and its thermodynamic deviation.	
4.	Phase diagrams of water and sulphur syatem	
5.	Phase diagram of lead –silver, system	
6.	Phase diagram of $FeCl_3$-H_2O system	
7.	Phase diagram of Na-K only system	
8.	Question paper discussion	
Unit III: Conductance		Marks Assigned- 6
1	Conductivity, equivalent and molar conductivity	
2	Their variation with dilution for weak and strong electrolytes.	
3	Kohlrausch's law of independent migration of ions.	
4	Transference number and its experimental determination using Hittorf and Moving boundary methods.	
5	Ionic mobility.	
6	Applications of conductance measurements: determination of degree of ionization of weak electrolyte, solubility and solubility products of sparingly soluble salts,	
7	Applications of conductance measurements: determination of degree of ionic product of water, hydrolysis constant of a salt.	
8	Conductometric titrations of acid - base	

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Course Plan (June 22 to Dec 22)

Name of the Teacher- Dr NAYAN JYOTI KHOUND
Course – Honours (CBCS)
Class/Semester- 5th Semester
Name of the Paper- C-502 (Physical Chemistry)
Units Assigned- III
Marks Assigned- 12

Unit III: Photochemistry		Marks Assigned- 12
Class	Topic	Remarks
1.	Characteristics of electromagnetic radiation	
2.	Lambert – Beer's law and its limitations	
3.	Physical significance of absorption coefficients	
4.	Laws of photochemistry, low and high quantum yield	
5.	Actinometry	
6.	Photochemical equilibrium	
7.	Differential rate of photochemical reaction	
8.	Photosensitized reaction	
9.	Quenching	
10.	Photochemical reaction in biochemical processes	
11.	Photo stationary states	
12.	Chemiluminescence	

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Course Plan

Name of the Teacher- Dr NAYAN JYOTI KHOUND
Course – Honours (CBCS)
Class/Semester- 5th Semester
Name of the Paper- C-DSE 501 (Analytical Methods in Chemistry)
Units Assigned- I +II + III
Marks Assigned- 20 + 08 +10

Unit I: UV Visible and IR spectrometry		Marks Assigned- 20
Class	Topic	Remarks
1.	Origin of spectra, interaction of radiation with matter,	
2.	Fundamental laws of spectroscopy and selection rules,	
3.	Beer-Lambert's law and its validity	
4.	UV-Visible Spectrometry: Basic principles of instrumentation	
5.	Choice of source, monochromator and detector for single and double beam instrument	

6.	Basic principles of quantitative analysis:	
7.	Estimation of metal ions from aqueous solution,	
8.	Geometrical isomers,	
9.	Keto-enol tautomers.	
10.	Determination of composition of metal complexes using Job's method of continuous variation and mole ratio method.	
11.	Determination of composition of metal complexes using Job's method of continuous variation and mole ratio method.	
12.	Question discussion and solve	
13.	Flame Atomic Absorption and Emission Spectrometry	
14.	Basic principles of instrumentation	
15.	Choice of source, monochromator, detector, choice of flame and Burner designs.	
16.	Techniques of atomization and sample introduction;	
17.	Method of background correction,	
18.	Sources of chemical interferences and their method of removal.	
19.	Techniques for the quantitative estimation of trace level of metal ions from water samples.	
20.	Question discussion	
Unit – 4 Electro-analytical methods		Marks Assigned- 08
1	Electro-analytical methods,	
2	Classification of electro-analytical methods,	
3	basic principle of pH metric titration	
4	basic principle of potentiometric titration.	
5	basic principle of conductometric titrations.	
6	Techniques used for the determination of equivalence points.	
7	Techniques used for the determination of equivalence points.	
8	Techniques used for the determination of pKa values.	
9	Techniques used for the determination of pKa values.	
10	Question paper discussion	
Unit II: Separation Techniques		Marks Assigned- 10
Class	Topic	Remarks
1.	Solvent extraction & Classification,	
2.	Solvent extraction: principle and efficiency of the technique.	
3.	Mechanism of extraction: extraction by solvation and chelation.	
4.	Technique of extraction: batch, continuous and counter current extractions.	
5.	Technique of extraction: continuous extractions.	
6.	Technique of extraction: counter current extractions.	
7.	Qualitative and quantitative aspects of solvent extraction	
8	Extraction of metal ions from aqueous solution,	
9	Extraction of organic species from the aqueous and non-aqueous media.	
10	Question discussion	

Course Plan

DIGBOI COLLEGE, DIGBOI

Jan – May (Even Semester) 2022

Dr. Bishwajit Saikia

Name of the Teacher: **Dr. Bishwajit Saikia**
Course: **Honours**
Class/Semester: **2nd Semester**
Name of the Paper: **C-201**
Units Assigned: **I + II**
Marks Assigned: **8 + 12**

Class	Topic	Remarks
Unit I: Basic Organic Chemistry		
1.	Classification and Nomenclature, Hybridization	
2.	Inductive effect, electromeric effect and their applications	
3.	Resonance, hyperconjugation and their applications	
4.	Dipole moment, Organic acids and bases	
5.	Hard acids/bases soft acid/base	
6.	Homolytic and heterolytic fission, curly arrow rule, formal charge	
7.	Electrophiles and nucleophiles	
8.	Nucleophilicity and basicity	
9.	Carbocation, Carbanion	
10.	Free radicals, carbene	
11.	Energy profile diagram of single, two and three step reactions	
12.	Activation energy, thermodynamically and kinetically controlled reactions	
Unit II: Stereochemistry		
1.	Fischer and sawhorse projection formula and their interconversions	
2.	Newmann and sawhorse projection formula and their interconversions	
3.	Geometrical isomerism and their properties	
4.	Cis/trans and syn/anti isomerism	
5.	CIP rule for E/Z notation	
6.	Optical activity, specific rotation, chirality/asymmetry	
7.	Enantiomers with examples and their properties	
8.	Diastereosomers with examples and their properties	
9.	Meso compounds and Epimers	
10.	Racemic mixture and resolution	
11.	Threo and Erythro forms	
12.	Relative and absolute configuratios	
13.	D/L designation	
14.	R/S designation	

DIGBOI COLLEGE, DIGBOI

Course Plan

Jan – May (Even Semester) 2022

Name of the Teacher: **Dr. Bishwajit Saikia**
Course: **Generic**
Class/Semester: **2nd Semester (Section B: Organic Chemistry)**
Name of the Paper: **GE-201**
Units Assigned: **IV + V**
Marks Assigned: **8 + 8**

Class	Topic	Remarks
Unit IV: Aromatic Hydrocarbons		
1.	Preparation of benzene from phenol	
2.	Preparation of benzeneby decarboxylation, from acetylene	
3.	Preparation of benzene from benzene sulphonic acid.	
4.	Nitration	
5.	Halogenation	
6.	Sulphonation	
7.	Friedel-Craft's reaction (alkylation and acylation)	
8.	Side chain oxidation of alkyl benzenes	
Unit V: Alkyl and Aryl Halides		
1.	SN1, SN2 and SNi	
2.	Preparation: from alkenes and alcohols	
3.	Hydrolysis reaction	
4.	Nitrite & nitro formation	
5.	Nitrile &isonitrile formation	
6.	Williamson's ether synthesis	
7.	Elimination vs substitution	
8.	Preparation of aryl halide from benzene	
9.	Sandmeyer&Gattermann reactions, Aromatic nucleophilic substitution (replacement by –OH group) and effect of nitro substituent	
10.	Benzyne Mechanism: KNH_2/NH_3 (or $NaNH_2/NH_3$). Reactivity and Relative strength of C-Halogen bond in alkyl, allyl, benzyl, vinyl and aryl halides.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Jan – May (Even Semester) 2022

Name of the Teacher: **Dr. Bishwajit Saikia**

Course: **Honours**
Class/Semester: **4thSemester**
Name of the Paper: **C-402**
Units Assigned: **I + II +V**
Marks Assigned: **14 + 12 + 6**

Class	Topic	Remarks
Unit I: Nitrogen Containing Functional Groups		
1.	Preparation and important reactions of nitro and compounds	
2.	Nitriles and isonitriles	
3.	Effect of substituent and solvent on basicity of amines	
4.	Gabriel phthalimide synthesis	
5.	Carbylamine reaction, Mannich reaction	
6.	Hoffmann's exhaustive methylation	
7.	Hofmann-elimination reaction	
8.	Distinction between 1°, 2° and 3° amines with Hinsberg reagent	
9.	Distinction between 1°, 2° and 3° amines with nitrous acid	
10.	Preparation of diazonium salt	
11.	Synthetic applications of diazonium salt	
12.	Diazomethane	
13.	Diazoacetic Ester	
Unit II: Polynuclear Aromatic Hydrocarbons		
1.	Preparation and structure elucidation of naphthalene	
2.	Reactions of naphthalene	
3.	Preparation and structure elucidation ofphenanthrene	
4.	Reactions of phenanthrene	
5.	Preparation and structure elucidation of anthracene	
6.	Reactions of anthracene	
7.	Important derivatives of naphthalene	
8.	Important derivatives of anthracene	
Unit V: Terpenes		
1.	Occurrence of terpenes	
2.	Classification of terpenes	
3.	Isoprene rule	
4.	Elucidation of stucture and synthesis of Citral	
5.	Elucidation of stucture and synthesis of Neral	
6.	Elucidation of stucture and synthesis of □-terpeneol	

DIGBOI COLLEGE, DIGBOI

Course Plan

Jan – May (Even Semester) 2022

Name of the Teacher: **Dr. Bishwajit Saikia**
Course: **Honours**
Class/Semester: **6thSemester**

Name of the Paper: **C-602**
Units Assigned: **I + III + IV**
Marks Assigned: **10 + 10 + 10**

Class	Topic	Remarks
Unit IV: Organic Spectroscopy		
1.	Basic principles of Proton Magnetic Resonance, chemical shiftand factors influencing	
2.	Spin – Spin coupling and coupling constant;	
3.	Anisotropic effects inalkene, alkyne, aldehydes and aromatics	
4.	Applications of IR, UV, NMR and Mass for identification of simple organicmolecules.	
Unit III Dyes		
1.	Classification, Colour and constitution	
2.	Mordant and Vat Dyes	
3.	Azo dyes, Triphenyl Methane Dyes	
4.	Phthalein Dyes, Natural dyes	
Unit IV Polymers		
1.	Addition and condensation -Mechanism of cationic, anionicand free radical addition polymerization	
2.	Ziegler-Natta polymerisation of alkenes;Preparation and applications of plastics	
3.	thermosetting (phenol-formaldehyde,Polyurethanes) and thermosoftening (PVC, polythene);	
4.	Fabrics – natural and synthetic (acrylic, polyamido, polyester);	
5.	Rubbers – natural andsynthetic: Buna-S, Chloroprene and Neoprene;	
6.	Vulcanization; Polymer additives;Biodegradable polymers with examples.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Jan – May (Even Semester) 2022

Name of the Teacher- **Dr. Bishwajit Saikia**
Course — Honours (CBCS)
Class/Semester-6th sem
Name of the Paper-DSE-603
Dissertation (Project work)
Marks Assigned- 100

Class	Topic/ Unit	Remarks
1.	Objective	
2.	Objective	

3.	Objective	
4.	Review of literature	
5.	Review of literature	
6.	Review of literature	
7.	Review of literature	
8.	Review of literature	
9	Dissertation writing	
10	Dissertation writing	
11	Dissertation writing	
12	Dissertation writing	
13	Dissertation writing	
14	Dissertation writing	

DIGBOI COLLEGE, DIGBOI

Course Plan

June – December (Odd Semester) 2022

Name of the Teacher: **Dr. Bishwajit Saikia**

Course: **Generic**

Class/Semester: **1st Semester**

Name of the Paper: **GE-101 (Section B)**

Units Assigned: **IV**

Marks Assigned: **10**

Class	Topic	Remarks
Unit IV: Stereochemistry		
1.	Conformation of ethane	
2.	Conformation of butane	
3.	Conformation of cyclohexane	
4.	Interconversion of wedge to Newmann projection	
5.	Interconversion of Newmannto Sawhorse and Fischer projection	
6.	Geometrical and optical isomerism	
7.	Enantiomerism and diastereoisomerism	
8.	Threo and Erythro and Cis and Trans isomerism	
9.	CIP rule for R/S nomenclature	
10.	CIP rule for E/Z nomenclature	

DIGBOI COLLEGE, DIGBOI

Course Plan

Jan – May (Even Semester) 2022

Name of the Teacher: **Dr. Bishwajit Saikia**

Course: **Honours**
Class/Semester: **3rdSemester**
Name of the Paper: **C-302**
Units Assigned: **I + III + V**
Marks Assigned: **14 + 14 + 4**

Class	Topic	Remarks
Unit I: Chemistry of Halogenated hydrocarbons		
1.	Hunsdiecker reaction	
2.	SN1 reactions and their mechanisms	
3.	SN2 reactions and their mechanisms	
4.	SNi reactions and their mechanism	
5.	Nucleophilic substitution vs elimination reaction	
6.	Preparation of alkyl halide from diazonium salt	
7.	Nucleophilic aromatic substitution	
8.	Benzyne mechanism	
9.	Relative reactivity of alkyl, aryl, benzyl and vinyl halides towards nucleophilic substitution reaction	
10.	Organometallic compounds of Mg	
11.	Organometallic compounds of Li	
Unit III: Carbonyl compounds		
1.	Nucleophilic addition and elimination reactions	
2.	Mechanisms of aldol and benzoin condensation	
3.	Mechanisms of Knoevenagel condensation,Claisen-Schmidt and Perkin reactions	
4.	Mechanism of Cannizaro, Wittig and Beckmann reactions	
5.	Mechanism of Benzil-Benzilic acid rearrangements, haloform reaction and Baeyer Villiger oxidation	
6.	α-substitution reactions	
7.	Oxidations and reductions (Clemmensen, Wolff-Kishner	
8.	$LiAlH_4$, $NaBH_4$, MPV	
9.	PDC , PCC , SeO_2	
10.	$Pb(OAc)_4$ & HIO_4	
11.	Addition reactions of unsaturated carbonyl compounds: Michael addition	
12.	Unsaturated Aldehydes (Acrolein, Crotonaldehyde, Cinnamaldehyde)	
13.	Unsaturated Ketone (MVK)	
14.	Active methylene compounds: Keto-enoltautomerism	
15.	Preparation and synthetic applications of diethyl malonate	
16.	Preparation and synthetic applications of ethyl acetoacetate	
Unit III: Sulphur containing compounds		
1.	Preparation and reactions of thiols	
2.	Preparation and reactions of thioethers	
3.	Preparation and reactions of sulphonic acids	

DIGBOI COLLEGE, DIGBOI

Course Plan

Jan – May (Even Semester) 2022

Name of the Teacher: **Dr. Bishwajit Saikia**
Course: **Generic**
Class/Semester: **3rdSemester**
Name of the Paper: **GE-301 (Section B: Organic Chemistry)**
Units Assigned: **V + VI**
Marks Assigned: **6 + 6**

Class	Topic	Remarks
Unit V: Carboxylic acids and their derivatives		
1.	Preparation of carboxylic acids (aliphatic and aromatic)	
2.	Acidic and Alkaline hydrolysis of esters	
3.	Hell – Vohlard - Zelinsky Reaction	
4.	Preparation of Carboxylic acid derivatives (aliphatic)	
5.	Acid chlorides, anhydrides, Estersand their interconversion	
6.	Amides from acids and their interconversion	
7.	Comparative study of nucleophilicity of acyl derivatives	
8.	Reformatsky Reaction, Perkin Condensation	
Unit VI: Amines and Diazonium Salts		
1.	Gabriel's Phthalimide synthesis	
2.	Hofmann Bromamide reaction, Schotten – Baumann Reaction	
3.	Hofmann vs. Saytzeff elimination, Carbylamine test, Hinsberg test, with HNO_2	
4.	Electrophilic substitution (case aniline): nitration, bromination, sulphonation	
5.	Diazonium salts: Preparation: from aromatic amines	
6.	Reactions: conversion to benzene, phenol, dyes	

DIGBOI COLLEGE, DIGBOI

Course Plan

Jan – May (Even Semester) 2022

Name of the Teacher: **Dr. Bishwajit Saikia**
Course: **Honours**
Class/Semester: **5thSemester**
Name of the Paper: **C-501**
Units Assigned: **I + V + VI**
Marks Assigned: **8 + 10 + 10**

Class	Topic	Remarks
Unit I: Nucleic Acids		
1.	Components of nucleic acids, Nucleosides and nucleotides	
2.	Structure, synthesis and reactions of: Adenine, Guanine	
3.	Structure, synthesis and reactions of: Cytosine, Uracil and Thymine	
4.	Structure of polynucleotides	
5.	Structure of DNA (Watson & Model) and RNA	
6.	Genetic Code Biological role of DNA and RNA	
7.	Replication,Transcription	
8.	Translation	
Unit V: Disconnection approach in Organic Synthesis		
1.	Elementary idea about disconnection,	
2.	Synthon and Synthetic equivalent	
3.	Functionall group interconversion (FGI)	
4.	Functional group addition (FGA)	
5.	Simple examples of retrosynthesis of C-C bond formation by using Corey House reaction	
6.	Simple examples of retrosynthesis of C-C bond formation by using Grignard reaction	
7.	Simple examples of retrosynthesis of C-C bond formation by using aldol condensation	
8.	Retrosynthesis of monofunctionalised compounds	
	Retrosynthesis of Bi-functionalized compounds	
Unit VI: Pharmaceutical Compounds: Structure and Importance		
1.	Classification, structure and therapeutic uses of antipyretics: Paracetamol and its synthesis	
2.	Analgesics: Ibuprofen (with synthesis), Antimalarials	
3.	Ranitidine, Providone-Iodine Solution	
4.	Synthesis and mode of action of Suphanilamides and other Sulphadrugs (sulphapyridine, sulphathiazole)	
5.	Chloroquine (with synthesis)	
6.	An elementary treatment of Antibiotics and detailed study of chloramphenicol	
7.	Medicinal values of curcumin (haldi)	
8.	Medicinal values of azadirachtin (neem) and vitamin C	

DIGBOI COLLEGE, DIGBOI

Course Plan

Jan – May (Even Semester) 2022

Name of the Teacher: **Dr. Bishwajit Saikia**

Course: **Honours**

Class/Semester: **5thSemester**

Name of the Paper: **DSE-502**

Units Assigned: **I + II**

Marks Assigned: **4 + 27**

Class	Topic	Remarks

Unit I: Introduction to Green Chemistry		
1.	What is Green Chemistry	
2.	Need for Green Chemistry	
3.	Goals of Green Chemistry	
4.	Limitations	
5.	Obstacles in the persuit of the goals of Green Chemistry	
Unit II: Principles of Green Chemistry and Designing a Chemical synthesis		
1.	Twelve principles of Green Chemistry	
2.	Explanations and examples and specialemphasis of principles of Green chemistry	
3.	Prevention of Waste/ byproducts	
4.	Maximum incorporation of the materials used in the process into the final products	
5.	Atom Economy	
6.	Calculation of atom economy of the rearrangement	
7.	Calculation of atom economy of the addition reaction	
8.	Calculation of atom economy of the substitution reaction	
9.	Calculation of atom economy of theelimination reactions	
10.	Prevention/ minimization of hazardous/ toxic products reducing toxicity	
11.	Green solvents- supercritical fluids	
12.	Water as a solvent for organic reactions	
13.	Ionic liquids	
14.	Fluorous biphasic solvent	
15.	PEG, solventless processes	
16.	Immobilized solvents	
17.	How to compare greenness of solvents	
18.	Energy reuirements for reactions- alternative sources of energy	
19.	Use of microwaves and ultrasonic energy	
20.	Selection of starting materials	
21.	Avoidance of unnecessary derivatization	
22.	Careful use of blocking/ protecting groups	
23.	Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents	
24.	Catalysis and green chemistry	
25.	Comparison of heterogeneous and homogeneous catalysis	
26.	Prevention of chemical accidents designing greener processes	
27.	Inherent safer design	
28.	Principle of ISD " What you don't have cannot harm you	
29.	Greener alternative to Bhopal Gas Tragedy (safer route to carcarbaryl) and Flixiborough accident (safer route to cyclohexanol)	
30.	Subdivision of ISD	
31.	Minimization, simplification, substitution, moderation and limitation of ISD	
32.	Strengthening/ development of analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes	

DIGBOI COLLEGE, DIGBOI

Course Plan

CBCS COURSE

Session-Jan 2022 to May 2022

Dr Abhijit Mahanta

Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Honours
Class/Semester-2nd sem
Name of the Paper-Chemistry C-201
Units Assigned- Unit III, IV, V
Marks Assigned- 30

Class	Topic/ Unit	Remarks
1.	Unit III-Chemistry of aliphatic hydrocarbon-introduction	
2.	Unit III-Chemistry of alkane, preparation of alkane	
3.	Unit III-Chemistry of alkane, preparation of alkane	
4.	Unit III-Chemistry of alkane, preparation of alkane	
5.	Unit III-Chemistry of alkene, preparation of alkene	
6.	Unit III-Chemistry of alkane, preparation of alkane	
7.	Unit III-Chemistry of alkane, reaction of alkene	
8.	Unit III-1,2 and 1,4 addition reaction in conjugated dienes, Diels Alder reactions, Alllylic and benzylic bromination	
9	Unit III Reaction of alkyne: Acidity, Electrophilic and Nucleophilic reaction, hydration of alkyne	
10	Unit V-Aromaticity, Hucke's rule, aromatic character of arenes	
11	Unit V- Cyclic carbocation, carbanions and heterocyclic copounds with suitable examples	
12	Unit V- Electrophilic aromatic substitution: halogenation , nitration, sulphonation	
13	Unit V-Fridel Craft alkylation, directing groups	
14	Unit V -Cycloalkanes preparation and their stability	
15	Unit V -Bayer strain theory	

2. Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Generic
Class/Semester-2nd sem
Name of the Paper-Chemistry GE-201
Units Assigned- Unit 4
Marks Assigned- 12

Class	Topic/ Unit	Remarks
1.	Unit 4- Alcohols, phenols and ethers-Preparation of alcohol	
2.	Unit 4- Alcohols, phenols and ethers -Preparation of alcohol	
3.	Unit 4- Alcohols, phenols and ethers -Preparation of alcohol	
4.	Unit 4- Alcohols, phenols and ethers- Reactions of alcohol	
5.	Unit 4- Alcohols, phenols and ethers Pinacol-Pinacolone rearrangement, Lucas test, oxidation diols	
6.	Unit 4- Alcohols, phenols and ethers- Preparation of phenols	
7.	Unit 4- Alcohols, phenols and ethers- Reactions of phenols	
8.	Unit 4- Alcohols, phenols and ethers- Preparation of aldehyde	
9	Unit 4- Alcohols, phenols and ethers- Reactions of aldehyde	
10	Unit 4- Alcohols, phenols and ethers -Aldol condensation, Cannizzaro reaction, Wittig reaction, MPV reduction	
11	Unit 4- Alcohols, phenols and ethers -Clemensen reduction, Benzoin, Wolff Krishner	

3. Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Honours
Class/Semester-4 th sem
Name of the Paper-Chemistry C-402
Units Assigned- Unit III, IV, V
Marks Assigned- 30

Class	Topic/ Unit	Remarks
1.	Unit III-Classification and nomenclature of heterocyclic compound	
2.	Unit III-Classification and nomenclature of heterocyclic compound	
3.	Unit III-Synthesis of pyrrol, furan, thiophene	
4.	Unit III-Synthesis of pyrrol, furan, thiophene	
5.	Unit III-Reaction of pyrrol, furan, thiophene	
6.	Unit III-Synthesis of pyridine, pyrimidine, Indole	
7.	Unit III-Synthesis of quinoline, isoquinoline	
8.	Unit III-Synthesis of quinoline, isoquinoline	
9	Unit IV: Occurrence of alkaloids, structural features	
10	Unit IV: Isolation of alkaloid, physiological acxtion	

11	Unit IV: Hoffman exhaustive methylation, Emedes modification	
12	Unit IV: Structure elucidation and synthesis of hygrine, nicotin	
13	Unit IV: Medicinal importance of alkaloids	
14	Unit V: Occurrence and classification of terpenoids	
15	Unit V: Elucidation of structure	
16	Unit V: synthesis of citral, neral, terpinol	

4. Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Honours(CBCS)
Class/Semester-6th sem
Name of the Paper-C-602 Organic Chemistry
Units Assigned- Unit I, II
Marks Assigned- 14

Class	Topic/ Unit	Remarks
1.	Unit I-Mass spectrometry Principle, application	
2.	Unit I-Mass spectrometry Problems	
3.	Unit I- Mass spectrometry Problems	
4.	Unit II-Carbohydrates Occurrence, classification, biological importnce	
5.	Unit II- Carbohydrates Monosaccharides, constitution and absolute configuration of glucose aand fructose	
6.	Unit II- Carbohydrates Monosaccharides, constitution and absolute configuration of glucose aand fructose	
7.	Unit II- Carbohydrates Monosaccharides, constitution and absolute configuration of glucose aand fructose	
8.	Unit II- Carbohydrates Monosaccharides, epimers, anomers, mutarotation	
9	Unit II- Carbohydrate Determination of ring size of glucose and frucose	
10	Unit II- Carbohydrate Determination of ring size of glucose and frucose	
11	Unit II- Carbohydrate Haworth projection formula	
12	Unit II- Carbohydrates Intrconversion of aldoses to ktoses and vice versa	
13	Unit II- Carbohydrates	

	Intrconversion of aldoses to ktoses and vice versa	
14	Unit II- Carbohydrates Ascending and dscending orders	

4. Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Honours (CBCS)
Class/Semester-6th sem
Name of the Paper-DSE-602Industrial chemicals and enviornment
Units Assigned- Unit I
Marks Assigned- 10

Class	Topic/ Unit	Remarks
1.	Unit I-Industrial gases and inorganic chemicals Industrial gases production, storage, uses, hazards	
2.	Unit I-Industrial gases and inorganic chemicals Industrial gases production, storage, uses, hazards	
3.	Unit I-Industrial gases and inorganic chemicals Industrial gases production, storage, uses, hazards	
4.	Unit I-Industrial gases and inorganic chemicals Inorganic materials: manufacture, application, analysisand hazards	
5.	Unit I-Industrial gases and inorganic chemicals Inorganic materials: manufacture, application, analysisand hazards	
6.	Unit I-Industrial gases and inorganic chemicals Inorganic materials: manufacture, application, analysisand hazards	
7.	Unit I-Industrial gases and inorganic chemicals Inorganic materials: manufacture, application, analysisand hazards	
8.	Unit I-Industrial gases and inorganic chemicals Inorganic materials: manufacture, application, analysisand hazards	
9	Unit I-Industrial gases and inorganic chemicals Inorganic materials: manufacture, application, analysisand hazards	
10	Unit I-Industrial gases and inorganic chemicals Inorganic materials: manufacture, application, analysisand hazards	

4. Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Honours (CBCS)
Class/Semester-6th sem
Name of the Paper-DSE-603
Dissertation (Project work)
Marks Assigned- 100

Class	Topic/ Unit	Remarks
1.	Objective	
2.	Objective	
3.	Objective	
4.	Review of literature	
5.	Review of literature	
6.	Review of literature	
7.	Review of literature	
8.	Review of literature	
9	Dissertation writing	
10	Dissertation writing	
11	Dissertation writing	
12	Dissertation writing	
13	Dissertation writing	
14	Dissertation writing	

DIGBOI COLLEGE, DIGBOI

Course Plan

CBCS COURSE

Session-June 2022 to December 2022

1. Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Generic
Class/Semester-1st sem
Name of the Paper-Chemistry GE 101
Units Assigned- Unit 3 and 5
Marks Assigned- 18

Class	Topic/ Unit	Remarks
1.	Unit 3-Fundamental of Organic Chemistry-Electronic Displacement Effect-Inductive effect, electromeric effect	
2.	Unit 3- Fundamental of Organic Chemistry-Electronic Displacement effect -Resonance, hyperconjugation	
3.	Unit 3- Fundamental of Organic Chemistry-Cleavage of bond	
4.	Unit 3- Fundamental of Organic Chemistry-Nucleophile and electrophile	

5.	Unit 3- Fundamental of Organic Chemistry-Carbocation, carbanions, free radical	
6.	Unit 3- Fundamental of Organic Chemistry-Carbocation, carbanions, free radical	
7.	Unit 3- Fundamental of Organic Chemistry-Strength of acid and base	
8.	Unit 3- Fundamental of Organic Chemistry-Aromaticity, Huckels rule	
9.	Unit 5—Aliphatic Hydrocarbons-Alkanes-Preparation	
10.	Unit 5- Aliphatic Hydrocarbons -Reaction of alkanes	
11.	Unit 5- Aliphatic Hydrocarbons -Preparation of alkene	
12.	Unit 5- Aliphatic Hydrocarbons -Reaction of alkene	
13.	Unit 5- Aliphatic Hydrocarbons -Reaction of alkene	
14.	Unit 5- Aliphatic Hydrocarbons -Preparation of alkyne	
15.	Unit 5- Aliphatic Hydrocarbons -Reaction of alkyne	

2. Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Honours
Class/Semester-3rd sem
Name of the Paper-Chemistry C-302
Units Assigned- Unit II, IV
Marks Assigned- 24

Class	Topic/ Unit	Remarks
1.	Unit II-Preparation of alcohol	
2.	Unit II-Bouvaelt Blanc reduction, preparation of gycols	
3.	Unit II-Preparation of glycerol and properties	
4.	Unit II-Preparation of phenol, acidity and factor affecting it	
5.	Unit II- Ring substitution reaction	
6.	Unit II-Reimer Tiemann and Kolbes Schmidt reaction	
7.	Unit II-Fries and Claisen rearrangment	
8.	Unit II-Preparation of epoxide	
9	Unit II-Reaction of epoxide with alcohol, ammonia, and LiAlH4	
10	Unit IV: Preparation, properties of monocarboxylic acid	
11	Unit IV: Preparation, properties of dicarboxylic acid	
12	Unit IV: Preparation, properties of dicarboxylic acid	
13	Unit IV: Preparation, properties of dicarboxylic acid	
14	Unit IV: Preparation, reaction of acid chlorides, amides, anhydrides	
15	Unit IV: Preparation, properties of dicarboxylic acid	
16	Unit IV: Claisen, Diekmann and Reformatsky reaction	
17	Unit IV: Hoffmann and Curtius rearrangment	

3. Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Generic
Class/Semester-3rd sem
Name of the Paper-Chemistry GE-301
Units Assigned- Unit 7,8
Marks Assigned- 16

Class	Topic/ Unit	Remarks
1.	Unit 7- Carbohydrates -classification and properties	
2.	Unit 7-Structures of glucose, reactions, configuration	
3.	Unit 7-Structures of glucose, reactions, configuration	
4.	Unit 7-Structures of fructose, reactions, configuration	
5	Unit 7-Structures of fructose, reactions, configuration	
6	Unit 7-Structures of fructose, reactions, configuration	
7.	Unit 7-Mutarotation, ascending and descending of monosaccharides	
8.	Unit 8- Preparation of amino acid	
9.	Unit 8-Properties of amino acid	
10.	Unit 8- Reaction of amino acid	
11.	Unit 8-Primary, Secondar, tertiary structure of protein	
12.	Unit 8-Primary, Secondar, tertiary structure of protein	
13.	Unit 8-Primary, Secondar, tertiary structure of protein	
14.	Unit 8-Primary, Secondar, tertiary structure of protein	

4. Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Honours
Class/Semester-5 th sem
Name of the Paper-Chemistry C-501
Units Assigned- Unit II, III, IV
Marks Assigned- 28

Class	Topic/ Unit	Remarks
1.	Unit II-Amino acids, peptide and classification	
2.	Unit II-Synthesis of Amino acids, peptide and classification	
3.	Unit II-Study of peptides	
4.	Unit II-Study of peptides	
5.	Unit II-Study of peptides	
6.	Unit II-Synthesis of peptides	
7.	Unit II-Synthesis of peptides	
8.	Unit II-Synthesis of peptides	
9	Unit II-Protecting group	
10	Unit II-Protecting group	
11	Unit III: Introduction of enzyme, classification	
12	Unit III: Features of enzyme	
13	Unit III: Mechanism of enzyme action	
14	Unit III: Factors affecting enzyme action	

15	Unit III: Roll of coenzyme and cofactor in biology	
16	Unit III: Enzyme inhibitor	
17	Unit III: Enzyme inhibitor	
18	Unit III: Enzyme inhibitor	
19	Unit III: Enzyme inhibitor	
20	Unit IV: Introduction to oil and fat	
21	Unit IV: Fatty acids and properties	
22	Unit IV: Hydrogenation, saponification of oil and fat	
23	Unit IV: Rancidity of oil and fat	
24	Unit IV: Iodine no, acid value of oil and fat	

5. Name of the Teacher-Dr Abhijit Mahanta
Course –Honours / Generic – Honours
Class/Semester-5 th sem
Name of the Paper-Chemistry DSE-502 (Green Chemistry)
Units Assigned- Unit 3, 4
Marks Assigned- 25

Class	Topic/ Unit	Remarks
1.	Unit 3-Green synthesis of organic compounds	
2.	Unit 3-Green synthesis of organic compounds	
3.	Unit 3-Green synthesis of organic compounds	
4.	Unit 3-Microwave assisted green reactions of organic compounds	
5.	Unit 3-Microwave assisted green reactions of organic compounds	
6.	Unit 3-Ultrasound assisted green reactions of organic Compounds	
7.	Unit 3-CO2 as surfactant	
8.	Unit 3-Healthier fats and oils, C2C carpeting	
9	Unit 3-Rightfit pigment, bioplastic	
10	Unit 3--Green technologies	
11	Unit 4-Future trends in green chemistry	
12	Unit 4-Future trends in green chemistry	
13	Unit 4-Future trends in green chemistry	
14	Unit 4-Solventless green reaction	
15	Unit 4-Combinatorial green chemistry	

Course Plan

2nd Semester (Jan-May,2022)

Economics Major(CBCS)

Course Code: ECNHC201

Course Title: Introductory Macroeconomics

No of Class	Unit No and Title	Name of the teachers
12	Unit 1: Introduction to Macroeconomics:	Subhashish Gogoi
12	Unit 2: Measurement of GDP:	Subhashish Gogoi
12	Unit III: Demand for and Supply of Money:	Suraj Hajong
10	Unit IV: Inflation:	Suraj Hajong
12	Unit V: Theory of Determination of Income and Employment:	Suraj Hajong

2nd Semester

Economics Major(CBCS)

Course Code: ECNHC202

Course Title: Mathematical Methods for Economics - II

No of Class	Unit No and Title	Name of the teachers
12	Unit 1: Difference equation:	Dr. Mamoni Sharma
12	Unit 2: Linear Algebra (Matrices and Determinants):	Dr. Mamoni Sharma
12	Unit III: Derivatives of Functions of several variables:	Dr. Mamoni Sharma
10	Unit IV: Unconstrained optimization :	Dr. Mamoni Sharma
12	Unit V: Constrained optimization with equality constraints:	Dr. Mamoni Sharma

4th Semester

Economics Major(CBCS)

Course Code: ECNHC401

Course Title: Advanced Microeconomics

No of Class	Unit No and Title	Name of the teachers
12	Unit 1: General Equilibrium, Efficiency and Welfare	Subhashish Gogoi
12	Unit 2: Monopoly	Subhashish Gogoi
12	Unit III: Oligopoly	Subhashish Gogoi
10	Unit IV: Game theory and Competitive Strategy	Subhashish Gogoi
12	Unit V: Market Failure	Subhashish Gogoi

4th Semester

Economics Major(CBCS)

Course Code: ECNHC402

Course Title: Advanced Macroeconomics

No of Class	Unit No and Title	Name of the teachers
12	Unit 1: Microeconomic Foundations of Macroeconomics	Suraj Hajong
12	Unit 2: Economic Growth – I:	MM Gogoi
12	Unit III: Economic Growth – II:	MM Gogoi
10	Unit IV: Fiscal and Monetary Policy	MM Gogoi
12	Unit V: Schools of Macroeconomic Thoughts	Suraj Hajong

4th Semester

Economics Major(CBCS)

Course Code: ECNHC403

Course Title: Introductory Econometrics

No of Class	Unit No and Title	Name of the teachers
12	Unit 1: Nature and Scope of Econometrics and Basic Statistical Prerequisite	Karuan Phukan
12	Unit 2: Simple Linear Regression Model:	Karuan Phukan
12	Unit III: Violations of Classical Assumptions: Consequences, Detection and Remedies	Karuan Phukan
10	Unit IV: Multicollinearity:	Karuan Phukan
12	Unit V: Specification Analysis	Karuan Phukan

2022(JAN - JUNE)

6th Semester

Economics Major

PAPER 6.01 (DEVELOPMENT ECONOMICS WITH INDIAN PERSPECTIVE – II)

No of Class	Unit No and Title	Name of the teachers
8	Unit 1: Planning: Concept and Justification	**Shubhashish Gogoi**
10	Unit 2: Role of Agriculture in Economic Development	**Shubhashish Gogoi**
8	Unit III: Role of Industries in the Development Process	**Shubhashish Gogoi**
11	Unit IV: India in the Global Economy:	Suraj Hajong
7	Unit V: Economic Problems of North-East India	Suraj Hajong

2022(JAN - JUNE)

6th Semester

Economics Major

PAPER 6.02 (ENVIRONMENTAL ECONOMICS)

No of Class	Unit No and Title	Name of the teachers
9	Unit 1: Basic Concepts: Ecology, Environment and Economy	Karuna Phukan
12	Unit 2: Market Failure: Concept and Common Sources of Market Failure	Karuna Phukan
11	Unit III: Solution to the Environmental problems	Karuna Phukan
10	Unit IV: Sustainable development	Karuna Phukan
8	Unit V: Global and Local Environmental Concerns	Karuna Phukan

2022(JAN - JUNE)

6th Semester

Economics Major

PAPER 6.03 (INTERNATIONAL ECONOMICS)

No of Class	Unit No and Title	Name of the teachers
10	Unit 1: International Economics and Trade Theories	Suraj Hajong
8	Unit 2: Terms of Trade and Gains From Trade	Suraj Hajong
9	Unit III: International Trade Policy:	MM Gogoi
10	Unit IV: Foreign Exchange Markets and Exchange Rates	MM Gogoi
7	Unit V: Evolution of International Monetary System:	MM Gogoi

2022(JAN - JUNE)

6th Semester

Economics Major

PAPER 6.04 (ECONOMIC ISSUES OF ASSAM)

No of Class	Unit No and Title	Name of the teachers
12	Unit 1: Economic Characteristics of Assam	MM Gogoi
10	Unit 2: Agriculture: Trends and Pattern of Production	MM Gogoi
9	Unit III: Industry: Problems and prospects of Industrial development of Assam	MM Gogoi
7	Unit IV: Infrastructure: Economic Infrastructure of the State	MM Gogoi
10	Unit V: Economic Problems of Assam	MM Gogoi

2nd Semester

Economics Generic

Course Code: ECNGE2

Course Title: Introductory Macroeconomics

No of Class	Unit No and Title	Name of the teachers
12	Unit 1: Introduction to Macroeconomics	Subhashish Gogoi
12	Unit 2: Rules and approaches of Measurement of GDP	MM Gogoi
12	Unit III: Demand for and Supply of Money	MM Gogoi
10	Unit IV: Inflation	Subhashish Gogoi
12	Unit V: Theory of Income Determination	Subhashish Gogoi

4th Semester

Economics Generic

Course Code: ECNGE4.1

Course Title: Indian Economy-II

No of Class	Unit No and Title	Name of the teachers
12	Unit 1: Macroeconomic Policies and Their Impact	Dr. Mamoni Sharma
12	Unit 2: Policies and Performance in Agriculture	Dr. Mamoni Sharma
12	Unit III: Policies and Performance in Industry	Dr. Mamoni Sharma
10	Unit IV: Trends and Performance in Services	Dr. Mamoni Sharma

COURSE PLAN

EVEN SEMESTER, JANUARY-JUNE, 2022

EDUCATION

Name of the Teacher: **POBAN GOGOI**
Course - Honours/Generic : Honours
Class/Semester: II
Name of the Paper: **PSYCHOLOGICAL FOUNDATIONS OF EDUCATION**
Units Assigned: I & III
Marks Assigned: 16

Sl. No. of classes	Topic/ Unit		Remarks
1	**Unit:I**	Meaning and nature of psychology	
2		Schools of Psychology: Behaviourism	
3		Structuralism	
4		Functionalism	
5		Gestalt Psychology	
6		Psycho-analysis	
7		Constructivism	
8		Meaning of Educational Psychology	
9		Nature Educational Psychology	
10		Scope of Educational Psychology	
11		Importance of Educational Psychology in classroom teaching	
13	**Unit:III**	Meaning and nature of intelligence	
14		Factors of Intelligence: Heredity and Environment	
15		Theories of intelligence: Monarchic theory	
16		Spearman's two factors theory	
17		Multifactor theory & Group factor theory	
18		Guilford's Structure of Intellect (SoI)	
19		Concept of Emotional Intelligence	
20		Creativity: Meaning and nature	
21		Process and Product of creativity	
22		Stages of Creativity: Preparation, Incubation, inspiration, revision and verification	
23		Nurturing Creativity in Classrooms	
24		Meaning and nature of gifted children, difference between creativity and giftedness	
25		Education of Exceptional children: Gifted learner	
26		Education of Exceptional children: Slow learner	
27		Education of Exceptional children: Educable, trainable, mentally challenged	

COURSE PLAN

Name of the Teacher: **POBAN GOGOI**
Course - Honours/Generic : Honours
Class/Semester: II
Name of the Paper: **EDUCATIONAL MANAGEMENT AND ADMINISTRATION**
Units Assigned: I & V
Marks Assigned: 32

Sl. No. of classes	Topic/ Unit		Remarks
1	**Unit: I**	Meaning of Educational Management	
2		Nature & Scope of Educational Management	
3		Functions of Educational Management	
4		Types of Educational Management	
5		Types of Educational Management	
6		Difference between Management and Administration	
7		Management of Resources in Educational Institutions	
8		Management of Resources in Educational Institutions	
9		Management of Resources in Educational Institutions	
10		Management of Resources in Educational Institutions	
11		Management by Objectives	
12		Total Quality management	
13		SWOT analysis	
14	**Unit: V**	Meaning of educational finance	
15		Nature of educational finance	
16		Scope of educational finance	
17		Principles of managing educational finance	
18		Role of finance committee	
19		Maintenance of records in educational finance	
20		Use of computer in management of finance	
21		Budget	
22		Budget	
23		Sources of Educational Finance	
24		Public Private Partnership in financing Education	

COURSE PLAN

Name of the Teacher: **POBAN GOGOI**
Course - Honours/Generic: Honours
Class/Semester: IV
Name of the Paper: **TECHNIQUES OF TEACHING**
Units Assigned: **II**
Marks Assigned: 16

Sl. No. of classes	Topic/ Unit		Remarks
1	**Unit: II**	Planning Teaching**:** Lesson Plan- Meaning and importance	
2		Herbartian steps of planning a lesson	
3		Teaching Skills: Concept	
4		a) Introducing a lesson	
5		b) Blackboard writing	
6		c) Questioning (Fluency in questioning and Probing questioning)	
7		d) Stimulus variation	
8		e) Reinforcement	
9		f) Explaining	
10		g) Achieving closure	
11		Microteaching: Concept, importance and Microteaching cycle	
12		Objectives of teaching Language	
13		Objectives of teaching Social Science	
14		Objectives of teaching Science	
15		Objectives of Mathematics	

COURSE PLAN

Name of the Teacher: **POBAN GOGOI**
Course - Honours/Generic: Honours
Class/Semester: IV
Name of the Paper: **EDUCATION IN PRE-INDEPENDENT INDIA**
Units Assigned: **All**
Marks Assigned: 80

Sl. No. of classes	Topic/ Unit		Remarks
1	**Unit: I**	Education in Ancient India	
2		Education in Vedic and Buddhist Period with special reference to its salient features	
3		Aims and Objectives System of Administration and Finance	
4		Method of Teaching Types of Organisation of Educational Institution	
5		Curriculum Teacher-Pupil Relationship	
6		Women's Education during Vedic and Buddhist Period	
7		Education in Medieval India (Islamic System of Education)	
8		Islamic System of Education with special reference to its Salient Features	
9		Islamic System of Education with special reference to its Aims and Objectives	
10		Islamic System of Education with special reference to its System of Administration and Finance	
11		Islamic System of Education with special reference to its Types of Organisation of Educational Institution	
12		Islamic System of Education with special reference to its Curriculum	
13		Islamic System of Education with special reference to its Women Education during Islamic Period	
14		Comparison among the Vedic, Buddhist and Islamic education system.	
15	**Unit: II**	Education during British Period & Indigenous System of Education during British rule	
16		Meaning of indigenous education Types of indigenous educational institution Causes of downfall of Indigenous education	
17		Educational activities of Missionaries in India - The Portuguese	
18		Educational activities of Missionaries in India - The Danish	
19		Educational activities of Missionaries in India - The Dutch	
20		Educational activities of Missionaries in India - The French - The British	
21		Centres of Missionary Education in India	
22		Educational activities of Missionaries in Assam	
23		Educational activities of East India Company - Charter Act, 1813	
24		Orientalist and Anglicist Controversy	
25		Macaulay's Minute, 1835	

26		Bentinck's declaration of educational policy	
27	**Unit: III**	Wood's Despatch 1854	
28		Wood's Despatch 1854	
29		Hunter's Commission, 1882	
30		Hunter's Commission, 1882	
31		Lord Curzon's Educational Policy	
32		Do	
33		Do	
34		The Indian University Commission, 1902	
35		University Act, 1904	
36		National Movement / Rise of Nationalism	
37		Gokhale's Bill on Primary Education (1910-12)	
38		Government resolution on Educational policy, 1913	
39		Calcutta University Commission, 1917	
40	**Unit: IV**	Education under Dyarchy - Primary Education	
41		Education under Dyarchy - Secondary Education	
42		Education under Dyarchy -Expansion of education	
43		Simon Commission	
44		Government of India Act of 1921	
45		Hartog Committee Report 1929	
46		Do	
47		Wardha Scheme of Basic Education, 1937 - Wardha Education Conference 1937	
48		Salient features of Basic Education	
49		Causes of failure of this education in India	
50		Wood Abbot Report 1937	
51		Sargent Committee Report, 1944	
52		Do	

COURSE PLAN

Name of the Teacher: **POBAN GOGOI**
Course - Honours/Generic: Honours
Class/Semester: IV
Name of the Paper: **TEACHING PRACTICE**
Units Assigned: **I**
Marks Assigned: 11

Sl. No. of classes	**Topic/ Unit**		**Remarks**
1	**Unit: I**	Teaching Skill: Concept	
2		Writing of Micro Lesson plan	
3		Introducing a lesson	
4		Introducing a lesson	
5		Introducing a lesson	
6		Blackboard writing	
7		Blackboard writing	
8		Blackboard writing	
9		Questioning (Fluency in questioning)	
10		Questioning (Fluency in questioning)	
11		Questioning (Fluency in questioning)	
12		Questioning (Probing questioning)	
13		Questioning (Probing questioning)	
14		Questioning (Probing questioning)	

COURSE PLAN

Name of the Teacher: **POBAN GOGOI**
Course - Honours/Generic: Honours
Class/Semester: VI
Name of the Paper: **EMERGING TRENDS IN INDIAN EDUCATION**
Units Assigned: **All**
Marks Assigned: 80

Sl. No. of classes	Topic/ Unit		Remarks
1	**Unit: I**	The Indian Constitution (especially the Preamble, Fundamental Rights and Duties of Citizens and the Directive Principles of State Policies)	
2		Education in Indian Constitution: Need for including education in constitution Central, State and Concurrent lists	
3		Articles in the Constitution related to Education	
4		Do	
5		Constitution as a source of aims of education.	
6		Role of Constitution in equalizing the Educational opportunities	
7	**Unit: II**	Early Childhood Care & Education (ECCE) in India	
8		Do	
9		Elementary Education (EE) in India	
10		Do	
11		Secondary Education (SE) in India	
12		Do	
13		Higher Education (HE) in India	
14		Do	
15		Teacher Education in India	
16		**Technical and Vocational Education in India**	
17		Do	
18		Professional Education in India	
19	**Unit: III**	Environmental Education	
20		Do	
21		Women Education	
22		Do	
23		Inclusive Education	
24		Do	
25		Alternative Education	
26		Adult Education	
27		Population Education	
28		Do	

29		Human Rights Education	
30		Do	
31		Value and Peace Education	
32	**Unit: IV**	ICT based teaching learning	
33		Do	
34		Continuous and Comprehensive Evaluation	
35		Do	
36		Education and National development	
37		Issues of Curriculum	
38		Do	
39		Privatization and Commercialization in Indian Education	
40		Do	
41	**Unit: V**	Role of education in addressing youth unrest	
42		Role of education in addressing AIDS	
43		Role of education in addressing substance abuse	
44		Role of education in addressing Health and Hygiene	
45		Student politics	
46		Concepts of Millennium Development Goals (MDGs)	
47		Concept and importance of Education for All (EFA)	
48		Education in the context of Liberalization, Privatization & Globalization (LPG)	
49		Role of UNESCO and UNICEF in educating the world community	
50		Do	

COURSE PLAN

Name of the Teacher: **POBAN GOGOI**
Course - Honours/Generic: Honours
Class/Semester: VI
Name of the Paper: **PROJECT REPORT**
Units Assigned: **II**
Marks Assigned: 40

Sl. No. of classes	Topic/ Unit		Remarks
1	**Unit: II**	**Preparation of Project report:** Title of the Project	
2		**Preparation of Project report:** Title of the Project	
3		**Preparation of Project report:** Introduction	
4		**Preparation of Project report:** Introduction	
5		**Preparation of Project report:** Rationale of the study	
6		**Preparation of Project report:** Rationale of the study	
7		**Preparation of Project report:** Objectives of the Study	
8		**Preparation of Project report:** Method and procedures followed (Description of the tools and techniques used, procedure of Collection of Data and procedure of analysis of data)	
9		**Preparation of Project report:** Method and procedures followed (Description of the tools and techniques used, procedure of Collection of Data and procedure of analysis of data)	
10		**Preparation of Project report:** Method and procedures followed (Description of the tools and techniques used, procedure of Collection of Data and procedure of analysis of data)	
11		**Preparation of Project report:** Analysis and Interpretation of data with illustrations	
12		**Preparation of Project report:** Analysis and Interpretation of data with illustrations	
13		**Preparation of Project report:**Findings of the study	

1. **Course plan (teacher/faculty wise)**

a) Course plan of pradip Dutta

Course plan –January 2022 to Jun2022

Name of the Teacher-PRADIP DUTTA

Course –Honors'

Class/Semester-II

Name of the paper-PSYCHOLOGICAL FOUNDATION OF EDUCATION

Units Assigned- II-LEARNING AND MOTIVATION

Marks Assigned- 20 per unit

Serial number of classes	Topic/ Unit	Remarks
1	1.Meaning And Nature Of Learning	
2	2.Factors Of Learning	
3	-Home & School	
4	-Mass Media Andintelligence	
5	Variables Of Learning –Meaning	
6	Personal Variable	
7	Subject And Method Variable	
8	Types Of Learning – Cognitive	
9	Affective and psychomotor	
10	Types of Learning –thorndikes theory of learning	
11	classical conditioning	
12	Operent conditioning	
13	Thorndikes Laws of learning	
14	Motivation ,meaning and nature , role in learning	
15	Maturation meaning and role in learning	
16	Tranfer of learning –intra and inter	
	Positive negative , Zero, Biliteral	
17	Horizontal and vertical	
18	Attention and interest , Meaning and Role in Learning	
19	Memory , meaning , nature	

20	Role of Memory in learning	
Unit IV-Marks assigned 10	**PERSONALITY AND MENTAL HEALTH**	
Serial number of classes	Topic/ Unit	Remarks
1	Meaning And Charateristics	
2	**Factors of personality**	
3	-Physical, mental	
4	-Social and emotional	
5	Theories of personality	
6	Hipppocrates , Sheldon	
7	Kretchmer, spranger and jung	
8	Trait theories of personality – meaning and nature	
9	**Cattle and Eysenck**	
10	Concept of balanced matured personality	

Course **–Honors**' / Generic –

Class/Semester-II

Name of the paper-EDUCATIONAL MANAGEMENT AND ADMINSTRATION

Units Assigned-III –Educational leadership

Marks Assigned- 16

Serial number of classes	Topic/ Unit	Remarks
1	Leadership - concept , definition	
2	Nature of educational leadership	
3	Functions of educational leadership	
5	Functions educational leadership	
6	Principles of educational leadership	
7	Styles of educational leadership- Democratic	
8	Styles of educational leadership	
9	educational leadership - Autocratic	

10	Laissez faire style of educational leadership	
11	Factors influence in educational leadership	
12	Essential qualities of educational leadership	
13	Leadership development programme in educational leadership	
14	DO	
15	Role of educational leadership in ensuring quality of education	
16	Role of educational leadership in ensuring quality of education	

Class/Semester-IV

Name of the paper –**Educational Technology**

Units Assigned- –**All**

Marks Assigned-80

Serial number of classes	Topic/ Unit	Remarks
1	**Educational technology** Concept of educational technology	
2	nature of educational technology	
3	development of educational technology ,	
4	development of educational technology in India	
5	components of educational	
6	Source and chenel	
7	Massage & recever	
8	Feedback and setting	
9	technology :hardware	
10	soft and	
11	systems approach	
12	instructional technology	

13	Difference between educational technology and instructional technology	
14	Difference between educational technology and instructional technology	
15	discussion	
16	discussion	
	ICT IN EDUCATION	
1	**Concept of ICT**	
2	Development of information and communication technology	
3	Development of ICT	
4	computer and its role in education	
5	computer and its role in education	
6	Application of ICT-smart learning	
7	Smart classes	
8	, virtual classes	
9	ICT in Evaluation	
10	. E- Learning	
11	Internet and its application	
Unit II	**Communication and teaching**	
1	concept of communication	
2	nature of communication	
3	components of	
4	Communication-source	
5	channel	
6	massage	
7	receiver	
8	Feedback and setting	
9	classroom communication	
10	significance of communication in learning	
11	significance of communication in learning	
12	barriers of effective classroom communication	
13	steps for making communication effective	
14	qualities of a good classroom communication	
Unit-III	**Instructional techniques**	
1	models of teaching (concept	

2	characteristics	
3	inquiry training model	
4	classroom meeting model	
5	personalized system of instruction	
6	computer assisted instruction meaning	
7	Nature of computer assisted instruction	
8	forms of computer assisted instruction	
9	merits and demerits computer assisted instruction	
10	programmed learning (meaning	
11	characteristics	
12	Types of programmed learning	
13	Liner programmed learning	
14	Branching programmed learning	
15	open and distance education : concept	
16	Usefulness of open and distance learning	
17	application of technology in open and distance learning	
18	team teaching	
19	Group discussion	
20	Seminar and symposium	
	Discussion	

Class/Semester-IV

Name of the paper-**Teaching Practice**

Units Assigned- –**II preparing lesson plan and practice teaching**

Marks Assigned- 28

Serial number of classes	Topic/ Unit	Remarks
1	Meaning and Nature of lesson plan	
2	Types of lesson	
3	Knowledge lesson plan	
5	Appreciation lesson plan	
6	Skill lesson plan	
7	Demonstration of lesson plan	
8	Demonstration of lesson plan	
9	Practice teaching on Knowledge lesson in classroom	
10	Practice teaching on Knowledge lesson in classroom	
11	Practice teaching on appreciation lesson in classroom	
12	Practice teaching on appreciation lesson in classroom	
13	Practice teaching on skill lesson in classroom	
14	Practice teaching on skill lesson in classroom	

Class/Semester-VI-DSEED-603

Name of the paper –**GENDER AND EDUCATION**

Units Assigned- –**All**

Marks Assigned-80

Serial number of classes	Topic/ Unit	Remarks
1	**Sex and Gender : Meaning and concept**	
2	Difference between sex and Gender	
3	Gender role: concept and nature Types of Gender Role	
4	Types of Gender Role	
5	Patriarchal and Matriarchal :concept and nature Gender role in Patriarchal society	

6	Gender role in matriarchal society	
7	Social construct of Gender	
8	Social construct of Gender	
9	Gender segregation : concept and nature Types of gender segregation: horizontal and vertical	
10	Types of gender segregation: horizontal and vertical	
11	Gender segregation and education	
12	Gender marginalization in education Meaning ,concept and nature Causes of gender marginalization in education	
13	,concept and nature of gender marginalization	
14	Causes of gender marginalization in education	
15	Measures for inclusion in education	
16	Gender stereotyping : meaning and concept Issues and concern related to gender stereotyping in Indian society	
18	Gender stereotyping and education	
19	Self silence: concept and nature	
20	Discussion	
Unit II	**Gender and society**	
1	Gender biases : meaning and concept Gender biases in –society ,family and environment	
2	Gender biases in –Family and environment	
3	Gender socialization –meaning and concept Role of family, school, society	
4	Gender socialization- Role of family, school	
5	Role of media and popular culture –film & advertisement	
6	Gender inequality in education in terms of -cast	
7	Gender inequality in education in terms of –religion	

8	Gender inequality in education in terms of –region	
9	Discussion	
10	Issues related to women and Girl child	
11	Femal foeticide and infacticide	
12	Sex ratio	
13	Honour killing	
14	Dowry	
15	Child marriage	
Unit III	**Gender inequality in school**	
1	Gender discrimination in the construction of knowledge	
2	Gender discrimination in the dissemination of knowledge	
3	Gender discrimination in the Textbook	
4	Gender discrimination in the hidden curriculam	
5	Gender inequality and school	
6	Gender inequality and infrastructure	
7	Gender inequality curricular and co-curricular activities	
8	Gender issues in school education	
9	Problem of Access , retention,	
10	Stagnation and drop out	
11	Gender and inequality	
12	Role of school ,peer	
13	Role of teacher, curriculum	
14	Role of textbook in reinforcing equality	
15	Gender inclusive approach	
16	Single sex school	
17	Child friendly school	
18	Girl friendly school	
19	Significance of inclusive education	
20	Discussion	
Unit Iv	**Laws , Articles and policies to bring gender equality**	
1	Introduction to laws related to Women and social justice	
2	Dowry	

3	Remarriage	
4	Divorce	
5	Property rights	
6	Trafficking	
7	Discussion	
8	Women reservation Bill , History ,current status	
9	Women reservation Bill , current status	
10	Articles of Indian constitution related to education from gender inequality perspective	
11	Education policies and programmes from gender equality perspective	
12	Discussion	

Semester-VI

Name of the paper-**DSEED604 –PROJECT REPORT**

Units Assigned- –**II PREPARATION OF PROJRCT REPORT**

Marks Assigned- 25

Serial number of classes	Topic/ Unit	Remarks
1	Meaning and Nature of project	
2	Title of the project	
3	Introduction , rational of the study	
5	Objective of the study	
6	Methodology	
7	Data collection procedure	
8	Analysis and interpretation	
9	Illustration	
10	Findings of the study	
11	Practice	
12	Practice	
13	Practice	
14	Practice	

COURSE PLAN

EVEN SEMESTER, JANUARY-JUNE, 2022

EDUCATION

Name of the Teacher: **SNEHA GOGOI**
Course - Honours/Generic : Honours
Class/Semester: II
Name of the Paper: **PSYCHOLOGICAL FOUNDATIONS OF EDUCATION**
Units Assigned: IV
Marks Assigned: 20

Sl. No. of classes	Topic/ Unit		Remarks
1	**Unit:IV**	Meaning and characteristics of personality	
2		Factors of personality	
3		Type theories of personality- Sheldon, Jung	
4		Type theories- Hippocrates, Kretchmer, Spranger	
5		Trait Theories- Cattel	
6		Trait Theories- Eysenck	
7		Concept of balanced nature personality, concept of mental hygiene	
8		Adjustment mechanism- fantasy, compensation, identification	
9		Adjustment mechanism- rationalization and sublimation	
10		Concept of instinct and emotion	
11		Educationally significant instincts- curiosity, acquisition	
12		Educationally significant instincts- self-assertiveness, herd instincts, sex instincts	
13		Relation between instincts and emotion	
14		Importance of emotional training in the classroom	

COURSE PLAN

Name of the Teacher: **SNEHA GOGOI**
Course - Honours/Generic : Honours
Class/Semester: II
Name of the Paper: **EDUCATIONAL MANAGEMENT AND ADMINISTRATION**
Units Assigned: IV
Marks Assigned: 16

Sl. No. of classes	Topic/ Unit		Remarks
1	Unit: IV	Concept and characteristics of educational supervision	
2		Objectives of educational supervision	
3		Scope of educational supervision	
4		Functions of educational supervision	
5		Difference between supervision and inspection	
6		Factors influencing effectiveness of supervision	
7		Qualities of a good educational supervisor	
8		Problems of conducting educational supervision	

COURSE PLAN

Name of the Teacher: **SNEHA GOGOI**
Course - Honours/Generic: Honours
Class/Semester: IV
Name of the Paper: **TECHNIQUES OF TEACHING**
Units Assigned: **III**
Marks Assigned: 16

Sl. No. of classes	**Topic/ Unit**		**Remarks**
1	Unit: III	Teacher centred and learner centred methods	
2		Play way method, activity method	
3		Discussion method	
4		Inductive-deductive method	
5		Heuristic method	
6		Problem solving method, Project method	
7		Methods of teaching language: Grammar translation method	
8		Methods of teaching language: direct method	
9		Teaching approaches- structural approach	
10		Structural approaches- communicative approach	

COURSE PLAN

Name of the Teacher: **SNEHA GOGOI**
Course - Honours/Generic: Honours
Class/Semester: IV
Name of the Paper: **TEACHING PRACTICE**
Units Assigned: **II**
Marks Assigned: 16

Sl. No. of classes	Topic/ Unit		Remarks
1	Unit: II	Lesson plan: knowledge lesson	
2		Lesson plan: skill lesson	
3		Lesson plan: appreciation lesson	
4		Teaching Practice	
5		Teaching Practice	

COURSE PLAN

Name of the Teacher: **SNEHA GOGOI**
Course - Honours/Generic: Honours
Class/Semester: VI
Name of the Paper: **CHILD AND ADOLESCENT PSYCHOLOGY**
Units Assigned: **All**
Marks Assigned: 80

Sl. No. of classes	Topic/ Unit		Remarks
1	**Unit: I**	Development patterns during childhood- physical, mental, emotional, social and language	
2		Common childhood problems- problems of discipline, adjustment problem, anger	
3		Adjustment problems- aggression, truancy	
4		Deficiency and deprivations during childhood- Natural, Physiological	
5		Deficiency and deprivations during childhood- Socio-economic	
6		Social Adjustment problems – Shyness, hesitation	
7		Social adjustment problems- jealousy	
8		Prevention and correction of these problems	
9		Role of education	
10	Unit: II	Meaning and significance of child psychology	
11		Historical perspectives of development of child psychology	
12		Factors affecting child development(positive and negative factors)- home, school and society	
13		Do	
14		Methods used in child psychology	
15	**Unit: III**	Meaning and need for a study of adolescence psychology	
16		Theories of adolescence psychology- recapitulation	
17		Theories- youth culture	
18		Theories- social anxiety theory	
19		Development patterns during adolescence – physical, mental, social, emotional, moral	
20		Do	
21		Risk and resilience in adolescence	
22		Risk factors in adolescence	
23		Strategies to enhance resilience in adolescents	

24		Needs of adolescents today	
25		Problems of adolescents- emotional, adjustment	
26		Deviance and delinquency problems	
27		Common adolescent problems in educational institutions today- violence and vandalism, hetero-sexual attractions	
28	**Unit: IV**	Substance abuse problems	
29		Role of society in caring for the adolescents- parents, educational institutions, society	
30		Do	

COURSE PLAN

Name of the Teacher: **SNEHA GOGOI**
Course - Honours/Generic: Honours
Class/Semester: VI
Name of the Paper: **PROJECT REPORT**
Units Assigned: **I**
Marks Assigned: 40

Sl. No. of classes	Topic/ Unit		Remarks
1	Unit: I	Concept of project	
2		Characteristic of a good project	
3		Steps of conducting a project- identification of problem, formulation of objective	
4		**Preparation of tools:** questionnaire, rating scale	
5		**Preparation of tools:** interview schedule, checklist etc.	
6		**Selection of sample**	
7		**Collection of data**	
8		**Analysis and interpretation of data**	
9		**Report writing**	
10		**Challenges of conducting a project**	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher – Dr. Jayanta Handique

Course –Honours

Class/Semester- 1st

Name of the Paper- C1- **BASIC CIRCUIT THEORY AND NETWORK ANALYSIS**

Units Assigned-Unit- All

Marks Assigned - 60

Class	Topic/ Unit	Remarks
	Unit – 1	
1	Voltage and Current Sources	
2	Resistors: Fixed and Variable resistors	
3	Construction and Characteristics, Colour coding of resistors	
4	resistors in series and parallel	
5	Inductors: Fixed and Variable inductors	
6	Self and mutual inductance, Faraday's law and Lenz's law of electromagnetic induction	
7	Energy stored in an inductor, Inductance in series and parallel,	
8	Testing of resistance and inductance using multimeter.	
9	Capacitors: Principles of capacitance, Parallel plate capacitor, Permittivity	
10	Definition of Dielectric Constant, Dielectric strength, Energy stored in a capacitor	
11	Paper, Mica, Teflon, Ceramic, Plastic and Electrolytic capacitor, Construction and application	
12	Paper, Mica, Teflon, Ceramic, Plastic and Electrolytic capacitor, Construction and application	
13	capacitors in series and paralle	
14	factors governing the value of capacitors, testing of capacitors using multimeter**.**	
Class	Topic/ Unit	Remarks
	Unit – 2	
15	Kirchhoff's Current Law (KCL)	
16	Kirchhoff's Current Law (KCL)	
17	Kirchhoff's Voltage Law (KVL),	
18	Kirchhoff's Voltage Law (KVL),	
19	Node Analysis	
20	Node Analysis	
21	Mesh Analysis,	
22	Mesh Analysis,	
23	Star-Delta Conversion	

24	Star-Delta Conversion	
25	RC Circuit- Charging and discharging with initial charge,	
26	RL Circuit with InitialCurrent, Time Constant,	
27	RL and RC Circuits with Sources, DC Response of Series RLC Circuits.	
28	RL and RC Circuits with Sources, DC Response of Series RLC Circuits.	
Class	Topic/ Unit	Remarks
	Unit – 3	
29	Sinusoidal Voltage and Current, Definition of Instantaneous	
30	Definition of Instantaneous, Peak, Peak to Peak, Root Mean Square and Average Values	
31	Voltage-Current relationship in Resistor	
32	Voltage-Current relationship in Inductor	
33	Voltage-Current relationship in Capacitor	
34	Phasor, Complex Impedance	
35	Power in AC Circuits: Instantaneous Power,	
36	Average Power, Reactive Power, Power Factor	
37	Sinusoidal Circuit Analysis for RL circuit	
38	Sinusoidal Circuit Analysis for RC circuit	
39	Sinusoidal Circuit Analysis for RLC circuit	
40	Resonance in Series RLC Circuits	
41	Resonance in Parallel RLC Circuits	
42	Frequency Response of Series and Parallel RLC Circuits, Quality (Q) Factor and Bandwidth	
43	Passive Filters: Low Pass, High Pass, Band Pass and Band Stop.	
44	Passive Filters: Low Pass, High Pass, Band Pass and Band Stop.	
Class	Topic/ Unit	Remarks
	Unit – 4	
45	**Network Theorems**: Principal of Duality,	
46	Superposition Theorem	
47	Thevenin's Theorem,	
48	Norton's Theorem,	
49	Reciprocity Theorem	
50	Millman's Theorem,	
51	Maximum Power Transfer Theorem.	
52	circuit analysis using Network theorems.	
53	circuit analysis using Network theorems.	
54	Two Port Networks: Impedance (Z) Parameters	
55	Two Port Networks: Impedance (Z) Parameters	
56	Admittance (Y) Parameters	
57	Admittance (Y) Parameters	
48	Transmission (ABCD) Parameters.	
59	Transmission (ABCD) Parameters.	
60	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher – Dr. Jayanta Handique

Course –Honours

Class/Semester- 3rd

Name of the Paper- C-5 - **ELECTRONICS CIRCUITS**

Units Assigned- ALL

Marks Assigned- 60

Class	Topic/ Unit	Remarks
	Unit – 1	
1	Ideal diode, piecewise linear equivalent circuit,	
2	dc load line analysis, Quiescent (Q) point	
3	Clipping and clamping circuits.	
4	Rectifiers: HWR, Circuit diagrams, working and waveforms, ripple factor & efficiency, comparison	
5	Rectifiers: FWR (center tapped). Circuit diagrams, working and waveforms, ripple factor & efficiency, comparison	
6	Rectifiers: FWR (bridge). Circuit diagrams, working and waveforms, ripple factor & efficiency, comparison	
7	Filters: types, circuit diagram and explanation of shunt capacitor filter with waveforms	
8	Filters: types, circuit diagram and explanation of shunt capacitor filter with waveforms	
9	Filters: types, circuit diagram and explanation of shunt capacitor filter with waveforms	
10	Zener diode regulator circuit	
11	Zener diode regulator circuit diagram and explanation for load and line regulation	
12	Zener diode regulator circuit diagram and explanation for load and line regulation	
13	disadvantages of Zener diode regulator.	
14	Revision	
	Unit – 2	
15	Review of CE, CB Characteristics and regions of operation	
16	Review of CE, CB Characteristics and regions of operation	
17	Hybrid parameters	
18	Transistor biasing, DC load line	
19	DC load line, operating point, thermal runaway, stability and stability factor,	
20	Fixed bias without and with RE, collector to base bias	
21	voltage divider bias and emitter bias (+VCC and –VEE bias), circuit	

	diagrams and their working.	
22	Transistor as a switch, circuit and working**,**	
23	Darlington pair and its applications.	
24	BJT amplifier (CE), dc and ac load line analysis	
25	hybrid model of CE configuration	
26	Quantitative study of the frequency response of a CE amplifier	
27	Effect on gain and bandwidth for Cascaded CE amplifiers (RC coupled).	
28	Revision	
	Unit – 3	
29	Concept of feedback, negative and positive feedback	
30	Negative and positive feedback, advantages and disadvantages of negative feedback,	
31	voltage (series and shunt) feedback amplifiers,	
32	gain, input and output impedances	
33	current (series and shunt) feedback amplifiers	
34	gain, input and output impedances	
35	Barkhausen criteria for oscillations	
36	Study of phase shift oscillator	
37	Study of phase shift oscillator	
38	Study of Colpitts oscillator	
39	Study of Colpitts oscillator, Study of Hartley oscillator	
40	Study of Hartley oscillator	
	Unit – 4	
41	Review of Depletion and Enhancement MOSFET	
42	Biasing of MOSFETs,	
43	Small Signal Parameters, Common Source amplifier circuit analysis	
44	CMOS circuits	
45	Difference between voltage and power amplifier, classification of power amplifiers	
46	Class A and its operation	
47	Class B and its operation	
48	Class C and its operation	
49	Comparison between Class A, Class B and Class C amplifier	
50	Operation of a Class A single ended power amplifier	
51	Operation of a Class A single ended power amplifier	
52	Operation of Transformer coupled Class A power amplifier	
53	Operation of Transformer coupled Class A power amplifier	
54	Circuit operation of complementary symmetry Class B push pull power amplifier	
55	Circuit operation of complementary symmetry Class B push pull power amplifier	
56	crossover distortion, heat sinks.	
57	Circuit diagram, Working and Frequency Response for each, Limitations of single tuned amplifier,	
58	Circuit diagram, Working and Frequency Response for each, Limitations of single tuned amplifier,	
59	Applications of tuned amplifiers in communication circuits	
60	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher – Dr. Jayanta Handique

Course –Honours

Class/Semester- 5th

Name of the Paper- C12 - **ELECTROMAGNETICS**

Units Assigned- ALL

Marks Assigned- 60

Class	Topic/ Unit	Remarks
	Unit – 1	
1	Scalars and Vectors, Vector Algebra	
2	Rectangular (Cartesian) Coordinate System, Vector Components and Unit Vector	
3	Vector Field, Products, Cylindrical Coordinates	
4	Spherical Coordinates, Differential Length, Area and Volume,	
5	Line Surface and Volume integrals, Del Operator	
6	Gradient of a Scalar, Divergence and Curl of a Vector, the Laplacian	
7	Coulomb's Law and Electric Field, Field due to Discrete and Continuous Charge Distributions	
8	Electric Flux Density, Gauss's Law and Applications	
9	Divergence Theorem and Maxwell's First Equation. Electric Potential	
10	Potential due to a Charge and Charge distribution	
11	Electric dipole. Electric Fields in Conductors,	
12	Current and Current Density, Continuity of Current, Metallic Conductor Properties and Boundary Conditions	
13	Method of Images. Dielectric materials, Polarization,	
14	Dielectric Constant, Isotropic and Anisotropic dielectrics, Boundary conditions,	
15	Capacitance and Capacitors. Electrostatic Energy and Forces.	
	Unit – 2	
16	Derivation of Poisson's and Laplace's equation,	
17	Derivation of Poisson's and Laplace's equation,	
18	Uniqueness Theorem, Examples of Solution of Laplace's Equation:	
19	Cartesian, Cylindrical and Spherical Coordinates.	
20	Biot Savert's law and Applications,	
21	Magnetic dipole, Ampere's Circuital Law	
22	Curl and Stoke's Theorem,	
23	Maxwell's Equation,	
24	Maxwell's Equation	
25	Magnetic Flux and Magnetic Flux Density	
26	Scalar and Vector Magnetic Potential	

27	Magnetization in Materials and Permeability, Anisotropic materials	
28	Magnetic Boundary Conditions, Inductors and Inductances,	
29	Magnetic Energy, Magnetic Circuits. Inductances and Inductors,	
30	Inductances and Inductors, Magnetic Energy, Forces and Torques.	
	Unit – 3	
31	Faraday's Law of Electromagnetic Induction	
32	Stationary Circuit in Time-Varying Magnetic Field	
33	Transformer and Motional EMF	
34	Transformer and Motional EMF,	
35	Displacement Current, Maxwell's Equations in differential and integral form and Constitutive Relations	
36	Displacement Current, Maxwell's Equations in differential and integral form and Constitutive Relations	
37	Potential Functions	
38	Lorentz gauge and the Wave Equation for Potentials	
39	Lorentz gauge and the Wave Equation for Potentials	
40	Concept of Retarded Potentials	
41	Electromagnetic Boundary Conditions	
42	Electromagnetic Boundary Conditions	
43	Time-Harmonic Electromagnetic Fields and use of Phasors	
44	Time-Harmonic Electromagnetic Fields and use of Phasors	
45	Revision	
	Unit – 4	
46	Time- Harmonic Electromagnetic Fields and use of Phasors	
47	Time- Harmonic Electromagnetic Fields and use of Phasors,	
48	the Electromagnetic Spectrum	
49	Wave Equation in a source free isotropic homogeneous media	
50	Wave Equation in a source free isotropic homogeneous media	
51	Uniform Plane Waves in Lossless and Lossy unbounded homogeneous media,	
52	Wave Polarization, Phase and Group velocity,	
53	Flow of Electromagnetic Power and Poynting Vector	
54	Uniform Plane wave incident on a Plane conductor boundary	
55	concept of reflection and standing wave. Waves along Uniform Guiding Structures	
56	TEM, TE	
57	TE, TM	
58	TM, Electromagnetic Wave Propagation in Parallel Plate	
59	Electromagnetic Wave Propagation in Rectangular Metallic Waveguides.	
60	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan(2022-23)

Name of the Teacher- Dr. Nabadweep Chamuah

Course –Honours

Class/Semester- 1st

Name of the Paper- C2-**MATHEMATICS FOUNDATION FOR ELECTRONICS**

Units Assigned-Unit- I, II, IV

Marks Assigned-46

Class	Topic/ Unit	Remarks
1	First Order Ordinary Differential Equations	
2	First Order Ordinary Differential Equations	
3	Separable Ordinary Differential Equations	
4	Exact Ordinary Differential Equations	
5	Exact Ordinary Differential Equations and Linear Ordinary Differential equations	
6	Linear Ordinary Differential equations	
7	Second Order Homogeneous and Non-Homogeneous Differential Equations	
8	Second Order Homogeneous and Non-Homogeneous Differential Equations	
9	Power series method	
10	Power series method	
11	Legendre polynomials	
12	Frobenius Method	
13	Bessel's functions of first and second kind	
14	Bessel's functions of first and second kind	
15	Error functions and gamma function.	
16	Error functions and gamma function	
17	Introduction to Matrices	
18	System of Linear Algebraic Equations	
19	Gaussian Elimination Method, Gauss -Seidel Method	
20	LU decomposition	
21	Solution of Linear System by LU decomposition	
22	Eigen Values and Eigen Vectors, Linear Transformation	
23	Properties of Eigen Values and Eigen Vectors, Cayley-Hamilton Theorem	
24	Diagonalization, Powers of a Matrix.	
25	Real and Complex Matrices	
26	Real and Complex Matrices	
27	Symmetric, Skew Symmetric, Orthogonal Quadratic Form	
28	Symmetric, Skew Symmetric, Orthogonal Quadratic Form	
29	Hermitian, Skew Hermitian	

30	Hermitian, Skew Hermitian, Unitary Matrices**.**	
31	Complex Variable, Complex Function,	
32	Continuity, Differentiability, Analyticity	
33	Cauchy-Riemann (C- R) Equations	
34	Harmonic and Conjugate Harmonic Functions	
35	Exponential Function, Trigonometric Functions, Hyperbolic Functions.	
36	Exponential Function, Trigonometric Functions, Hyperbolic Functions.	
37	Line Integral in Complex Plane, Cauchy's Integral Theorem	
38	Cauchy's Integral Formula, Derivative of Analytic Functions.	
39	Cauchy's Integral Formula, Derivative of Analytic Functions.	
40	Sequences, Series and Power Series	
41	Sequences, Series and Power Series	
42	Taylor's Series, Laurent Series	
43	Taylor's Series, Laurent Series	
44	Zeroes and Pole	
45	Residue integration method, Residue integration of real Integrals.	
46	Residue integration method, Residue integration of real Integrals.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Nabadweep Chamuah

Course –Honours

Class/Semester- 3rd

Name of the Paper- C-6-**DIGITAL ELECTRONICS AND VERILOG/VHDL**

Units Assigned- ALL

Marks Assigned- 60

Class	Topic/ Unit	Remarks
1	Decimal, Binary, Hexadecimal and Octal number systems, base conversions,	
2	Binary, Octal and Hexadecimal arithmetic (addition, subtraction by complement method, multiplication),	
3	representation of signed and unsigned numbers, Binary Coded Decimal code.	
4	Introduction to Boolean Algebra and Boolean operators	
5	Basic postulates and fundamental theorems of Boolean algebra	
6	Truth Tables of OR, AND, NOT, XOR, XNOR	
7	Universal (NOR and NAND) gates	
8	Fan-in, Fan out, Noise Margin, Power Dissipation, Figure of merit, Speed power product	

9	TTL and CMOS families and their comparison.	
10	TTL and CMOS families and their comparison.	
11	TTL and CMOS families and their comparison.	
12	Revision	
13	Standard representation of logic functions (SOP and POS)	
14	Karnaugh map minimization	
15	Encoder	
16	ecoder	
17	Multiplexers	
18	Implementing logic functions with multiplexer	
19	Demultiplexers	
20	binary Adder	
21	binary subtractor	
22	parallel adder/subtractor	
23	parallel adder/subtractor	
24	Revision	
25	Latches and Flip flops	
26	S-R Flip flop	
27	J-K Flip flop	
28	T and D type Flip flop	
29	Clocked and edge triggered Flip flops	
30	master slave flip flop	
31	Registers	
32	Registers	
33	Counters (synchronous and asynchronous and modulo-N)	
34	Counters (synchronous and asynchronous and modulo-N)	
35	State Table, State Diagrams	
36	counter design using excitation table and equations	
37	Ring counter and Johnson counter	
38	Ring counter and Johnson counter	
39	Basic concepts- ROM, PLA, PAL, CPLD, FPGA	
40	Basic concepts- ROM, PLA, PAL, CPLD, FPGA	
41	Basic concepts- ROM, PLA, PAL, CPLD, FPGA	
42	Revision	
43	A Brief History of HDL, Structure of HDL Module	
44	Comparison of VHDL and Verilog	
45	Introduction to Simulation and Synthesis Tools, Test Benches. VHDL Modules	
46	Delays, data flow style, behavioural style, structural style	
47	mixed design style, simulating design	
48	Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format.	
49	VHDL terms, describing hardware in VHDL, entity, architectures, concurrent signal assignment, event scheduling, statement concurrency, structural designs, sequential behaviour, process statements, process declarative region, process statement region, process execution, sequential statements, architecture selection, configuration statements, power of configurations.	

50	VHDL terms, describing hardware in VHDL, entity, architectures, concurrent signal assignment, event scheduling, statement concurrency, structural designs, sequential behaviour, process statements, process declarative region, process statement region, process execution, sequential statements, architecture selection, configuration statements, power of configurations.	
51	Introduction to behavioural modelling, inertial delay, transport delay , inertial delay model, transport delay model, transport vs inertial delay,	
52	Introduction to behavioural modelling, inertial delay, transport delay , inertial delay model, transport delay model, transport vs inertial delay,	
53	simulation delta drivers, driver creation, generics, block statements, guarded blocks.	
54	Process statement, sensitivity list, signal assignment vs variable assignment, sequential statements, IF, CASE, LOOP, NEXT, EXIT and ASSERT statements	
55	Process statement, sensitivity list, signal assignment vs variable assignment, sequential statements, IF, CASE, LOOP, NEXT, EXIT and ASSERT statements	
56	assertion BNF, WAIT ON signal, WAIT UNTIL expression, WAIT FOR time expression, multiple wait conditions, WAIT Time-Out, Sensitivity List vs WAIT Statement Concurrent Assignment, Passive Processes.	
57	assertion BNF, WAIT ON signal, WAIT UNTIL expression, WAIT FOR time expression, multiple wait conditions, WAIT Time-Out, Sensitivity List vs WAIT Statement Concurrent Assignment, Passive Processes.	
58	Object types-signal, variable, constant, Data types– scalar types, composite types, incomplete types, File Type caveats, subtypes, Subprograms and functions	
59	Object types-signal, variable, constant, Data types– scalar types, composite types, incomplete types, File Type caveats, subtypes, Subprograms and functions	
60	Revision	

Name of the Teacher- Dr. Nabadweep Chamuah

Course –Honours

Class/Semester- 5th

Name of the Paper- C-11-**MICRO PROCESSOR AND MICROCONTROLLER**

Units Assigned- ALL

Marks Assigned- 60

Class	Topic/ Unit	Remarks
1	Introduction, Applications, Basic block diagram of microprocessors	
2	Speed, Word size, Memory capacity, Classification of microprocessors	
3	Features, Architecture of 8085	
4	General purpose registers, register pairs, flags	
5	stack pointer, program counter, types of buses	
6	Multiplexed address and data bus, generation of control signals, pin description of microprocessor 8085	
7	Basic interfacing concepts, Memory mapped I/O and I/O mapped I/O	
8	Basic interfacing concepts, Memory mapped I/O and I/O mapped I/O	
9	Operation code, Operand & Mnemonics	
10	Instruction set of 8085	
11	instruction classification, addressing modes, instruction format	
12	instruction classification, addressing modes, instruction format	
13	Assembly language programming examples.	
14	Assembly language programming examples.	
15	Assembly language programming examples.	
16	Revision	
17	Stack operations, subroutine, call and return instructions	
18	Stack operations, subroutine, call and return instructions	
19	Delay loops, use of counters, timing diagrams-instruction cycle, machine cycle	
20	Delay loops, use of counters, timing diagrams-instruction cycle, machine cycle	
21	T- states, time delay	
22	Interrupt structure of 8085A microprocessor, processing of vectored and non-vectored interrupts	
23	latency time and response time; Handling multiple interrupts	
24	Introduction, Different types of microcontroller and architecture	
25	Harvard vs. Princeton, CISC vs. RISC	
26	microcontroller memory types, microcontroller features, clocking, I/O pins,	
27	interrupts, timers, peripherals	

28	Revision	
29	Introduction to 8051, 8051 family microcontroller, Core features	**8051**
30	Architecture, pin diagram	
31	memory organization- Program and data memory organization	
32	I/O Ports	
33	oscillator module	
34	Timer modules (Timer 0, Timer 1 and Timer 2)	
35	Timer modules (Timer 0, Timer 1 and Timer 2)	
36	Revision	
37	Core features, Architecture	**PIC16F887**
38	pin diagram, memory organization	
39	Program and data memory organization, I/O Ports	
40	oscillator module,	
41	Timer modules	
42	comparator module	
43	analog-to-digital converter (ADC) module	
44	data EEPROM	
45	Enhanced capture/compare/PWM module	
46	EUSART	
47	master synchronous serial port (MSSP) module	
48	special features of the CPU	
49	Interrupts, addressing modes	
50	instruction set	
51	instruction set	
52	Revision	
53	LED, Switches, Solid State Relay	**Interfacing**
54	Seven Segment Display, 16x2 LCD display	
55	4x4 Matrix Keyboard	
56	Digital to Analog Converter	
57	Stepper Motor and DC Motor	
58	Interfacing program examples using C language.	
59	Interfacing program examples using C language.	
60	Revision	

Name of the Teacher- Dr. Nabadweep Chamuah

Course –Honours

Class/Semester- 5th

Name of the Paper- DSE-2-**MODERN COMMUNICATION SYSTEMS**

Units Assigned- UNIT: 2, 4

Marks Assigned- 30

Class	Topic/ Unit	Remarks
1	Introduction of Optical Fiber, Types of Fiber	
2	Guidance in Optical Fiber, Attenuation and Dispersion in Fiber	
3	Attenuation and Dispersion in Fiber	
4	Optical Sources	
5	Optical Sources	
6	Optical Detectors,	
7	Block Diagram of optical communication system	
8	optical power budgeting	
9	optical power budgeting	
10	Revidion	
11	Introduction, need, satellite orbits	**Satellite communication**
12	advantages and disadvantages of geostationary satellites	
13	Satellite visibility, satellite system – space segment	
14	Satellite visibility, satellite system – space segment	
15	block diagrams of satellite sub systems	
16	block diagrams of satellite sub systems	
17	effect of solar eclipse, path loss, ground station, simplified block diagram of earth station.	
18	effect of solar eclipse, path loss, ground station, simplified block diagram of earth station.	
19	Satellite access, TDMA, FDMA	
20	comparison of TDMA and FDMA,	
21	CDMA concepts	
22	GPS- (SPS & PPS)	
23	Primary characteristics of Ethernet-mobile IP	**Local area networks (LAN)**
24	OSI model	
25	OSI model	
26	wireless LAN requirements	
27	Bluetooth	
28	Wi-Fi	
29	WiMAX	
30	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Ankit Chhetri

Course –Honours

Class/Semester- 1st

Name of the Paper- C2- **COMPLEX VARIABLES AND FUNCTIONS**

Units Assigned-Unit- IV

Marks Assigned - 16

Class	Topic/ Unit	Remarks
	Unit – 4	
1	Complex Variable, Complex Function,	
2	Continuity, Differentiability, Analyticity	
3	Cauchy-Riemann (C- R) Equations	
4	Harmonic and Conjugate Harmonic Functions	
5	Exponential Function, Trigonometric Functions, Hyperbolic Functions.	
6	Exponential Function, Trigonometric Functions, Hyperbolic Functions.	
7	Line Integral in Complex Plane, Cauchy's Integral Theorem	
8	Cauchy's Integral Formula, Derivative of Analytic Functions.	
9	Cauchy's Integral Formula, Derivative of Analytic Functions.	
10	Sequences, Series and Power Series	
11	Sequences, Series and Power Series	
12	Taylor's Series, Laurent Series	
13	Taylor's Series, Laurent Series	
14	Zeroes and Pole	
15	Residue integration method, Residue integration of real Integrals.	
16	Residue integration method, Residue integration of real Integrals.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Ankit Chhetri

Course –Honours

Class/Semester- 3rd

Name of the Paper- C-7- **C PROGRAMMING AND DATA STRUCTURES (THEORY)**

Units Assigned- ALL

Marks Assigned- 60

Class	Topic/ Unit	Remarks
	Unit – 1	
1	Introduction, Importance of C, Character set	
2	Tokens, Keywords, Identifier, Constants	
3	Basic data types, Variables: declaration and assigning values.	
4	Stucture of C program, Arithmetic operators	
5	Relational operators, logical operators, Assignment operators	
6	Increment and decrement operators, Conditional operators, bitwise operators	
7	Expressions and evaluation of expressions	
8	Type cast operator, implicit conversions, precedence of operators.	
9	Arrays-concepts, declaration, accessing elements,	
10	Storing elements, two-dimensional and multi-dimensional arrays.	
11	Input output statement and library functions (math and string related functions).	
12	Input output statement and library functions (math and string related functions).	
	Unit – 2	
13	Decision making, branching and looping: if, if-else, else-if,	
14	if, if-else, else-if	
15	switch statement, break	
16	switch statement, break, for loop	
17	For loop	
18	For loop, While loop	
19	While loop, do while loop	
20	Do while loop, functions	
21	Defining functions, function arguments and passing,	
22	Defining functions, function arguments and passing, returning values from functions.	
23	Defining and declaring a structure variables, accessing structure members	

24	Defining and declaring a structure variables, accessing structure members	
25	initializing a structure, copying and comparing structure variables,	
26	initializing a structure, copying and comparing structure variables,	
27	array of structures,	
28	Arrays within structures, structure within structure	
39	structure within structure, structures and functions	
30	Pointers	
31	Pointers	
32	Object oriented programming, characteristics of an object-oriented language.	
	Unit – 3	
33	Definition of stack, array implementation of stack	
34	Definition of stack, array implementation of stack	
35	conversion of infix expression to prefix,	
36	postfix expressions, evaluation of postfix expression.	
37	evaluation of postfix expression.	
38	Definition of Queue, Circular queues	
39	Circular queues	
40	Array implementation of queues	
41	Linked List and its implementation,	
42	Linked List and its implementation,	
43	Link list implementation of stack and queue,	
44	Link list implementation of stack and queue,	
45	Circular and doubly linked list.	
46	Circular and doubly linked list.	
	Unit – 4	
47	Insertion sort	
48	Insertion sort,	
49	Selection sort	
50	Selection sort	
51	bubble sort	
52	Merge sort	
53	Linear search	
54	Binary search	
55	Introduction to trees, Binary search tree,	
56	Binary search tree, Insertion and search in BST	
57	Insertion and search in BST	
58	pre order, post order and in order traversal (recursive)	
59	pre order, post order and in order traversal (recursive)	
60	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Ankit Chhetri

Course –Honours

Class/Semester- 5th

Name of the Paper- DSE – I - **POWER ELECTRONICS**

Units Assigned- ALL

Marks Assigned- 60

Class	Topic/ Unit	Remarks
	Unit – 1	
1	Need for semiconductor power devices, Power diodes	
2	Power diodes,	
3	Enhancement of reverse blocking capacity,	
4	Introduction to Thyristor family	
5	SCR(Silicon Controlled Rectifier), Structure of SCR	
6	Structure and V-I characteristics	
7	Turn-On and Turn-Off characteristics of SCR	
8	ratings, Factors affecting the characteristics/ratings of SCR,	
9	Gate-triggering circuits, Control circuits design	
10	Gate-triggering circuits, Control circuits design	
11	Protection circuits	
12	Protection circuits, Snubber circuit.	
	Unit – 2	
13	Basic structure, working and V-I characteristic of DIAC	
14	Basic structure, working and V-I characteristic of TRIAC	
15	Basic structure, working and V-I characteristic of TRIAC, application of a DIAC as a triggering device for a TRIAC.	
16	Basic structure, I-V Characteristics of IGBT	
17	Switching characteristics, device limitations and safe operating area (SOA) etc	
18	SCR as a static switch, phase controlled rectification	
19	Single phase half wavewith inductive & non-inductive loads,	
20	Single Phase full wave rectifier with inductive & non-inductive loads,	
21	bridge rectifiers with inductive & non-inductive loads	
22	AC voltage control using SCR and Triac as a switch.	
23	Operation modes, switching characteristics of Power MOSFETs	
24	Power BJT, second breakdown, saturation and quasi-saturation state.	
25	Power BJT, second breakdown, saturation and quasi-saturation state.	

26	Revision	
	Unit – 3	
27	Need for commutating circuits and their various types	
28	Need for commutating circuits and their various types	
29	d.c. link invertors	
30	Parallel capacitor commutated invertors with and without reactive feedback and its analysis,	
31	Parallel capacitor commutated invertors with and without reactive feedback and its analysis,	
32	Series Invertor, limitations and its improved versions	
33	Series Invertor, limitations and its improved versions	
34	bridge invertors	
35	basic chopper circuit, types of choppers(Type A-D),	
36	basic chopper circuit, types of choppers(Type A-D),	
37	basic chopper circuit, types of choppers(Type A-D),	
38	step-down chopper, step-up chopper	
39	operation of d.c. chopper circuits using self commutation (A & B-type commutating circuit),	
40	operation of d.c. chopper circuits using self commutation (A & B-type commutating circuit),	
41	cathode pulse turn-off chopper(using class D commutation)	
42	cathode pulse turn-off chopper(using class D commutation), load sensitive cathode pulse turnoff chopper (Jones Chopper),	
43	load sensitive cathode pulse turnoff chopper (Jones Chopper),Morgan's chopper	
	Unit – 4	
44	DC Motors	
45	Basic understanding of field and armature,	
46	Principle of operation of DC Motor	
47	EMF equation, Back EMF	
48	EMF equation, Back EMF, Factors controlling motor speed	
49	Factors controlling motor speed	
50	Thyristor based speed control of dc motors	
51	AC motor (Induction Motor only),	
52	AC motor (Induction Motor only),	
53	Rotor and stator	
54	Rotor and stator	
55	torque & speed of induction motor	
56	torque & speed of induction motor	
57	Thyristor control of ac motors (block diagrams only).	
58	Revision	
59	Revision	
60	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Ankit Chhetri

Course –Honours

Class/Semester- 5th

Name of the Paper- DSE – II -**MODERN COMMUNICATION SYSTEMS (THEORY)**

Units Assigned- Unit- I, III

Marks Assigned- 30

Class	Topic/ Unit	Remarks
	Unit - 1	
1	DPCM (Differential Pulse Code Modulation)	
2	DPCM (Differential Pulse Code Modulation)	
3	DM (Delta Modulation)	
4	DM (Delta Modulation)	
5	ADM (Adaptive Delta Modulation)	
6	ADM (Adaptive Delta Modulation)	
7	Binary Line Coding Technique	
8	Multi level coding	
9	QAM (Modulation and Demodulation)	
10	QAM (Modulation and Demodulation)	
	Unit – 2	
11	Concept of cellular mobile communication – cell and cell splitting	
12	Concept of cellular mobile communication – cell and cell splitting, frequency bands used in cellular communication	
13	absolute RF channel numbers (ARFCN)	
14	frequency reuse, roaming and hand off	
15	frequency reuse, roaming and hand off	
16	authentication of the SIM card of the subscribers	
17	IMEI number, concept of data encryption	
18	concept of data encryption, architecture (block diagram) of cellular mobile communication network	
19	architecture (block diagram) of cellular mobile communication network	
20	CDMA technology, CDMA overview	
21	CDMA technology, CDMA overview	
22	CDMA technology, CDMA overview	
23	simplified block diagram of cellular phone handset	
24	Comparative study of GSM and CDMA, 2G, 3G and 4G concepts.	
25	Comparative study of GSM and CDMA, 2G, 3G and 4G concepts.	
26	Comparative study of GSM and CDMA, 2G, 3G and 4G concepts.	
27	Comparative study of GSM and CDMA, 2G, 3G and 4G concepts.	

28	Comparative study of GSM and CDMA, 2G, 3G and 4G concepts.	
29	Revision	
30	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher – Dr. Jayanta Handique

Course –Honours

Class/Semester- 2nd

Name of the Paper- C3 - **SEMICONDUCTOR DEVICES**

Units Assigned- Unit- All

Marks Assigned- 60

Class	Topic/ Unit	Remarks
	Unit - 1	
1	Introduction to Semiconductor Materials, Crystal Structure	
2	Crystal Structure, Planes and Miller Indices	
3	Energy Band in Solids, Concept of Effective Mass, Density of States	
4	Carrier Concentration at NormaEquilibrium in Intrinsic Semiconductor	
5	Derivation of Fermi Level for Intrinsic & Extrinsic Semiconductors	
6	Derivation of Fermi Level for Intrinsic & Extrinsic Semiconductors Donors, Acceptor	
7	Dependence of Fermi Level on Temperature and Doping Concentration	
8	Temperature Dependence of Carrier Concentrations.	
9	Carrier Transport Phenomena: Carrier Drift, Mobility, Resistivit	
10	Hall Effect, Diffusion Proces , Einstein Relation	
11	Current Density Equation, Carrier Injection	
12	Generation And Recombination Processes, Continuity Equation	
	Unit – 2	
13	Formation of Depletion Layer, Space Charge at a Junction	
14	Derivation of Electrostatic Potential Difference at Thermal Equilibrium,	
15	Depletion Width and Depletion Capacitance of an Abrupt Junction	
16	Depletion Width and Depletion Capacitance of an Abrupt Junction	
17	Concept of Linearly Graded Junction	
18	Derivation of Diode Equation and I-V Characteristics	
19	Derivation of Diode Equation and I-V Characteristics	
20	Zener and Avalanche Junction Breakdown Mechanism.	
21	Zener and Avalanche Junction Breakdown Mechanism.	
22	Tunnel diode circuit symbol, characteristics, applications.	
23	Tunnel diode circuit symbol, characteristics, applications, Varactor diode circuit symbol, characteristics, applications.	
24	Varactor diode circuit symbol, characteristics, applications.	

25	Solar cell circuit symbol, characteristics, applications.	
26	Solar cell circuit symbol, characteristics, applications, Revision	
27	Revision	
	Unit - 3	
28	PNP Transistors	
29	NPN Transistors	
30	Basic Transistor Action, Emitter Efficiency,	
31	Base Transport Factor, Current Gain	
32	Energy Band Diagram of Transistor in Thermal Equilibrium,	
33	Energy Band Diagram of Transistor in Thermal Equilibrium,	
34	Quantitative Analysis of Static Characteristics (Minority Carrier Distribution and Terminal Currents),	
35	Quantitative Analysis of Static Characteristics (Minority Carrier Distribution and Terminal Currents),	
36	Base - Width Modulation,	
37	Modes of operation, Input and Output Characteristics of CB Configurations.	
38	Modes of operation, Input and Output Characteristics of CE Configurations.	
39	Modes of operation, Input and Output Characteristics of CC Configurations.	
40	Metal Semiconductor Junctions: Ohmic and Rectifying Contact	
41	Metal Semiconductor Junctions: Ohmic and Rectifying Contact	
42	Revision	
	Unit - 4	
43	JFET, Construction	
44	JFET, Construction, Idea of Channel Formation, Pinch-Off and Saturation Voltage, Current - Voltage Output Characteristics	
45	Idea of Channel Formation, Pinch-Off and Saturation Voltage, Current - Voltage Output Characteristics	
46	MOSFET, types of MOSFETs,	
47	MOSFET Circuit symbols, Working	
48	Characteristic curves of Depletion type MOSFET (both N channel and P Channel)	
49	Characteristic curves of Depletion type MOSFET (both N channel and P Channel)	
50	Enhancement type MOSFET (both N channel and P channel	
51	Enhancement type MOSFET (both N channel and P channel	
52	Complimentary MOS (CMOS).	
53	UJT, Basic construction and working, Equivalent circuit,	
54	UJT, Basic construction and working, Equivalent circuit,	
55	Intrinsic Standoff Ratio, Characteristics and relaxation oscillator-expression	
56	SCR, Construction, Working	
57	SCR Characteristics	
58	Triac, Diac asic constructional features, Operation and Applications.	
59	MOSFET, Circuit symbols, Basic constructional features, Operation and Applications.	
60	Revision	

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Course Plan

Name of the Teacher – Dr. Jayanta Handique

Course –Honours

Class/Semester- 4th

Name of the Paper- C8 - **OPERATIONAL AMPLIFIERS AND APPLICATIONS**

Units Assigned- Unit- All

Marks Assigned- 60

Class	Topic/ Unit	Remarks
	Unit – 1`	
1	Concept of differential amplifiers (Dual input balanced and unbalanced output)	
2	Concept of differential amplifiers (Dual input balanced and unbalanced output)	
3	Concept of differential amplifiers (Dual input balanced and unbalanced output)	
4	Constant current bias, current mirror	
5	cascaded differential amplifier stages with concept of level translator	
6	cascaded differential amplifier stages with concept of level translator	
7	block diagram of an operational amplifier (IC 741)	
8	block diagram of an operational amplifier (IC 741)	
9	Input offset voltage, input offset current	
10	Input offset voltage, input offset current	
11	Input bias current, differential input resistance,	
12	Input bias current, differential input resistance,	
13	Input capacitanc	
14	Offset voltage adjustment range	
15	Input voltage range, common mode rejection ratio,	
16	Slew rate	
17	supply voltage rejection ratio	
18	Revision	
	Unit – 2	
19	Open and closed loop configuration	
20	Frequency response of an op-amp in open loop Configuration	
21	Frequency response of an op-amp in Close loop Configuration	
22	Inverting summing and difference amplifier	
23	Inverting summing and difference amplifier	
24	Non - Inverting summing and difference amplifier	
25	Non - Inverting summing and difference amplifier	
26	Inverting Integrator and differentiator amplifier	

27	Inverting Integrator and differentiator amplifier	
28	Non - Inverting Integrator and differentiator amplifier	
29	Non - Inverting Integrator and differentiator amplifier	
30	Voltage to current converter, Current to voltage converter	
31	Voltage to current converter, Current to voltage converter	
32	Basic comparator, Level detector, Voltage limiters, Schmitt Trigger	
33	Basic comparator, Level detector, Voltage limiters, Schmitt Trigger	
34	Phase shift oscillator, Wein bridge oscillator, Square wave generato	
35	triangle wave generator, saw tooth wave generator, and Voltage controlled oscillator(IC 566)	
36	triangle wave generator, saw tooth wave generator, and Voltage controlled oscillator(IC 566)	
	Unit – 3	
37	About IC 555	
38	Block diagram of Astable multivibrator circuit	
39	Block diagram of monostable multivibrator circuit	
40	Applications of Monostable and Astable multivibrators.	
41	Phase locked loops (PLL): Block diagram, phase detectors, IC565	
42	Phase locked loops (PLL): Block diagram, phase detectors, IC565	
43	IC 78xx and IC 79xx -concepts only	
44	IC LM317- output voltage equation.	
45	IC LM317- output voltage equation.	
46	Revision	
47	Revision	
48	Revision	
	Unit – 4	
49	Sample and hold system	
50	Sample and hold system	
51	Active filters: First order low pass butterworth filter	
52	Active filters: First order high pass butterworth filter	
53	Second order filter	
54	Band pass filter,	
55	Band reject filter	
56	Band reject filter, All pass filter	
57	All pass filter	
58	Log and antilog amplifiers	
59	Log and antilog amplifiers	
60	Revision	

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Course Plan

Name of the Teacher – Dr. Jayanta Handique

Course –Honours

Class/Semester- 6th

Name of the Paper- **C13 – COMMUNICATION ELECTRONICS**

Units Assigned- Unit- 3 and 4

Marks Assigned- 30

	Unit – 3	
1	Channel capacity, Sampling theorem	
2	Channel capacity, Sampling theorem	
3	PAM modulation and detection techniques	
4	PDM modulation and detection techniques	
5	PPM modulation and detection techniques	
6	Multiplexing, TDM	
7	Multiplexing, TDM	
8	TDM and FDM	
9	Need for digital transmission	
10	Quantizing, Uniform and Non-uniform Quantization	
11	Quantizing, Uniform and Non-uniform Quantization	
12	Quantization Noise, Companding	
13	Quantization Noise, Companding	
14	Coding, Decoding, Regeneration.	
15	Coding, Decoding, Regeneration.	
	Unit – 4	
16	Block diagram of digital transmission and reception	
17	Block diagram of digital transmission and reception	
18	Information capacity, Bit Rate, Baud Rate and M-ary coding.	
19	Information capacity, Bit Rate, Baud Rate and M-ary coding.	
20	Amplitude Shift Keying (ASK),	
21	Amplitude Shift Keying (ASK),	
22	Frequency Shift Keying (FSK),	
23	Frequency Shift Keying (FSK),	
24	Phase Shift Keying (PSK),	
25	Phase Shift Keying (PSK),	
26	Binary Phase Shift Keying (BPSK)	
27	Binary Phase Shift Keying (BPSK)	
28	Quadrature Phase Shift Keying (QPSK)	
29	Quadrature Phase Shift Keying (QPSK)	
30	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Nabadweep Chamuah

Course –Honours

Class/Semester- 2nd

Name of the Paper- C-4-**APPLIED PHYSICS**

Units Assigned- 1,2

Marks Assigned- 30

Class	Topic/ Unit	Remarks
1	Inadequacies of Classical physics, Compton's effect	
2	Photo-electric Effect	
3	Wave-particle duality, de Broglie waves	
4	Wave-particle duality, de Broglie waves	
5	Basic postulates and formalism of quantum mechanics	
6	probabilistic interpretation of waves	
7	conditions for physical acceptability of wave functions.	
8	Schrodinger wave equation for a free particle and in a force field (1 dimension)	
9	Boundary and continuity conditions, Operators in Quantum Mechanics.	
10	Conservation of probability, Time-dependent form	
11	Conservation of probability, Time-dependent form	
12	Linearity and superposition of Operators, Time-independent one-dimensional Schrodinger wave equation	
13	Stationary states, Eigen-values and Eigen functions	
14	Particle in a one-dimensional box, Extension to a three-dimensional box	
15	Potential barrier problems, phenomenon of tunneling	
16	Kronig Penney Model and development of band structure	
17	Kronig Penney Model and development of band structure	
18	Spherically symmetric potentials	
19	Hydrogen-like atom problem	
20	Revision	
21	Elastic and Plastic Deformations	
22	Hooke's Law	
23	Elastic Moduli	
24	Brittle and Ductile Materials	
25	Tensile Strength, Theoretical and Critical Shear Stress of Crystals	
26	Tensile Strength, Theoretical and Critical Shear Stress of Crystals	
27	Strengthening Mechanisms	
28	Strengthening Mechanisms, Hardness, Creep, Fatigue, Fracture	
29	Hardness, Creep, Fatigue, Fracture.	
30	Revision	

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Course Plan

Name of the Teacher- Dr. Nabadweep Chamuah

Course –Honours

Class/Semester- 4th

Name of the Paper- C-9-**SIGNALS AND SYSTEMS**

Units Assigned- ALL

Marks Assigned- 60

Class	Topic/ Unit	Remarks
1	Continuous and discrete time signals	
2	Continuous and discrete time signals	
3	Continuous and discrete time signals	
4	Transformation of the independent variable	
5	Transformation of the independent variable	
6	Transformation of the independent variable	
7	Exponential signals	
8	sinusoidal signals	
9	Impulse functions	
10	unit step functions	
11	Continuous-Time and Discrete-Time Systems	
12	Continuous-Time and Discrete-Time Systems	
13	Continuous-Time and Discrete-Time Systems	
14	Basic System Properties	
15	Basic System Properties	
16	Basic System Properties	
17	Basic System Properties	
18	Revision	
19	Discrete time LTI systems	
20	Discrete time LTI systems	
21	Convolution Sum	
22	Continuous time LTI systems	
23	Continuous time LTI systems	
24	Convolution integral	
25	Properties of LTI systems	
26	LTI systems with and without memory	
27	Causality, Stability, Unit Step response	
28	Differential and Difference equation formulation	
29	Block diagram representation of first order systems	
30	Revision	
31	Continuous-Time periodic signals	
32	Convergence of the Fourier series	

33	Properties of continuous-Time Fourier series	
34	Properties of continuous-Time Fourier series	
35	Discrete-Time periodic signals	
36	Properties of Discrete-Time Fourier series	
37	Properties of Discrete-Time Fourier series	
38	Frequency-Selective filters	
39	Simple RC highpass and lowpass filters	
40	Simple RC highpass and lowpass filters	
41	Aperiodic signals, Periodic signals,	
42	Properties of Continuous-time Fourier transform	
43	Convolution and Multiplication Properties	
44	Convolution and Multiplication Properties	
45	Properties of Fourier transform	
46	Properties of Fourier transform	
47	Fourier transform Pairs	
48	Revision	
49	Laplace Transform	
50	Laplace Transform	
51	Inverse Laplace Transform	
52	Properties of the Laplace Transform,	
53	Properties of the Laplace Transform,	
54	Laplace Transform Pairs	
55	Laplace Transform for signals,	
56	Laplace Transform Methods in Circuit Analysis	
57	Impulse and Step response of RL circuit	
58	Impulse and Step response of RC circuit	
59	Impulse and Step response of RLC circuit	
60	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Nabadweep Chamuah

Course –Honours

Class/Semester- 6th

Name of the Paper- C13- COMMUNICATION ELECTRONICS

Units Assigned- UNIT-1,2

Marks Assigned- 30

Class	Topic/ Unit	Remarks
	Unit – 1	
1	Block diagram of an electronic communication system	
2	electromagnetic spectrum-band designations and applications	
3	electromagnetic spectrum-band designations and applications	

4	Constant current bias, current mirror	
5	need for modulation, concept of channels and base-band signals	
6	need for modulation, concept of channels and base-band signals	
7	Concept of Noise, Types of Noise, Signal to noise ratio	
8	Concept of Noise, Types of Noise, Signal to noise ratio	
9	Noise Figure, Noise Temperature, Friss formula.	
10	Noise Figure, Noise Temperature, Friss formula.	
	Unit – 2	
11	Amplitude Modulation	
12	Amplitude Modulation, modulation index and frequency spectrum.	
13	Generation of AM, Amplitude Demodulation (diode detector)	
14	Concept of Double side band suppressed carrier	
15	Concept of Double side band suppressed carrier	
16	Single side band suppressed carrier	
17	Single side band suppressed carrier	
18	Other forms of AM (Pilot Carrier Modulation, Vestigial Side Band modulation, Independent Side Band Modulation)	
19	Other forms of AM (Pilot Carrier Modulation, Vestigial Side Band modulation, Independent Side Band Modulation)	
20	Block diagram of AM Transmitter and Receiver	
21	Frequency and Phase modulation, modulation index and frequency spectrum	
22	Frequency and Phase modulation, modulation index and frequency spectrum	
23	Equivalence between FM and PM	
24	Generation of FM (direct and indirect methods),	
25	Generation of FM (direct and indirect methods),	
26	FM detector (PLL)	
27	FM detector (PLL)	
28	Block diagram of FM Transmitter and Receiver	
29	Block diagram of FM Transmitter and Receiver	
30	Comparison between AM, FM and PM.	

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Course Plan

Name of the Teacher- Dr. Nabadweep Chamuah

Course –Honours

Class/Semester- 6th

Name of the Paper- C14- PHOTONICS

Units Assigned- UNIT-3, 4

Marks Assigned- 30

Class	Topic/ Unit	Remarks
	Unit – 3	
1	**Light Emitting Diodes**: Construction, materials and operation.	
2	**Light Emitting Diodes**: Construction, materials and operation.	
3	**Lasers:** Interaction of radiation and matter	
4	Einstein coefficients, Condition for amplification	
5	Laser cavity, threshold for laser oscillation	
6	threshold for laser oscillation, Line shape function	
7	Examples of common lasers. The semiconductor injection laser diode.	
8	**Photodetectors:** Bolometer, Photomultiplier tube	
9	Charge Coupled Device. Photo transistors and Photodiodes	
10	Charge Coupled Device. Photo transistors and Photodiodes	
11	Quantum efficiency and responsivity	
12	**LCD Displays:** Types of liquid crystals, Principle of Liquid Crystal Displays	
13	**LCD Displays:** Types of liquid crystals, Principle of Liquid Crystal Displays	
14	Applications, advantages over LED displays.	
15	Revision	
	Unit – 4	
16	TE and TM modes in symmetric slab waveguides	
17	TE and TM modes in symmetric slab waveguides	
18	TE and TM modes in symmetric slab waveguides	
19	effective index, field distributions	
20	effective index, field distributions	
21	Dispersion relation and Group Velocity	
22	Dispersion relation and Group Velocity	
23	Step index optical fiber, total internal reflection,	
24	Step index optical fiber, total internal reflection,	
25	Concept of linearly polarized waves in the step index circular dielectric waveguides	
26	Concept of linearly polarized waves in the step index circular dielectric waveguides	
27	Single mode and multimode fibers	
28	Single mode and multimode fibers	
29	Attenuation and dispersion in optical fiber.	
30	Attenuation and dispersion in optical fiber.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Nabadweep Chamuah

Course –Honours

Class/Semester- 6th

Name of the Paper- DSE-3 - NANOELECTRONICS

Units Assigned- All

Marks Assigned- 60

Class	Topic/ Unit	Remarks
	Unit – 1	
1	Definition of Nano-Science and Nano Technology, Applications of Nano-Technology	
2	Size dependence of properties, bonding in atoms and giant molecular solids	
3	Electronic conduction, Systems confined to one, two or three dimension and their effect on property	
4	Time dependent and time independent Schrodinger wave equations	
5	Time dependent and time independent Schrodinger wave equations	
6	Particle in a box, Potential step: Reflection and 6unnelling (Quantum leak).	
7	Penetration of Barrier, Electron trapped in 2D plane (Nano sheet)	
8	Quantum confinement effect in nano materials.	
9	Preparation of Quantum Nanostructure; Size and Dimensionality effect, Fermi gas; Potential wells	
10	Preparation of Quantum Nanostructure; Size and Dimensionality effect, Fermi gas; Potential wells	
11	Partial confinement; Excitons; Single electron Tunneling	
12	Partial confinement; Excitons; Single electron Tunneling	
13	Infrared detectors; Quantum dot laser Superconductivity	
14	Infrared detectors; Quantum dot laser Superconductivity	
	Unit – 2	
15	Synthetic aspects: bottom up and top down approaches	
16	Synthetic aspects: bottom up and top down approaches	
17	Lithograpahic and Nonlithograpahic techniques	
18	Lithograpahic and Nonlithograpahic techniques	
19	Sputtering and film deposition in glow discharge	
20	Sputtering and film deposition in glow discharge	
21	DC sputtering technique (p-CuAlO2 deposition)	
22	Thermal evaporation technique	
23	E-beam evaporation, Chemical Vapour deposition(CVD)	
24	Synthesis of carbon nano-fibres and multi-walled carbon nanotubes	
25	Synthesis of carbon nano-fibres and multi-walled carbon nanotubes	
26	Pulsed Laser Deposition,	

27	Molecular beam Epitaxy, Sol-Gel Technique (No chemistry required),	
28	Synthesis of nanowires/rods	
29	Electro deposition	
30	Chemical bath deposition, Ion beam deposition system,	
31	Vapor-Liquid –Solid (VLS) method of nanowire	
32	Vapor-Liquid –Solid (VLS) method of nanowire	
	Unit – 3	
33	Scanning Probe Microscopy (SPM),	
34	Atomic Force Microscopy (AFM),	
35	Field Ion Microscopy	
36	Scanning Electron Microscopy (SEM),	
37	Transmission Electron Microscopy (TEM) including energy dispersive X-ray (EDX) analysis	
38	low energy electron diffraction (LEED),	
39	reflection high energy electron diffraction (RHEED)	
40	Infra-red and Raman Spectroscopy	
41	Infra-red and Raman Spectroscopy	
42	X-ray Spectroscopy	
43	X-ray Spectroscopy	
44	Magnetic resonance	
45	Optical and Vibrational Spectroscopy	
46	Optical and Vibrational Spectroscopy	
47	Optical and Vibrational Spectroscopy	
48	Characterization and application like biopolymer tagging and light emitting semiconductor quantum dots	
49	Characterization and application like biopolymer tagging and light emitting semiconductor quantum dots	
50	Revision	
	Unit – 4	
51	Carbon nanotubes, nano cuboids	
52	nano cuboids, graphene	
53	Carbon quantum dots: Fabrication, structure. electrical, mechanical, and vibrational properties and applications	
54	Carbon quantum dots: Fabrication, structure. electrical, mechanical, and vibrational properties and applications	
55	Use of nano particles for biological application,	
56	Drug delivery and bio-imaging	
57	Drug delivery and bio-imaging	
58	Impact of nanotechnology on the environment.	
59	Impact of nanotechnology on the environment.	
60	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Ankit Chhetri

Course –Honours

Class/Semester- 2nd

Name of the Paper- C-4- **APPLIED PHYSICS**

Units Assigned- Unit-3, 4

Marks Assigned- 30

Class	Topic/ Unit	Remarks
	Unit – 3	
1	Brief Introduction to Laws of Thermodynamics	
2	Concept of Entropy	
3	Concept of Phonons	
4	Heat Capacity, Debye's Law	
5	Heat Capacity, Debye's Law	
6	Lattice Specific Heat, Electronic Specific Heat	
7	Lattice Specific Heat, Electronic Specific Heat	
8	Specific Heat Capacity for Si and GaAs	
9	Specific Heat Capacity for Si and GaAs	
10	Thermal Conductivity	
11	Thermoelectricity	
12	Seebeck Effect	
13	Thomson Effect	
14	Peltier Effect	
15	Revision	
	Unit – 4	
16	Conductivity of metals, Ohm's Law,	
17	relaxation time, collision time and mean free path	
18	electron scattering and resistivity of metals	
19	heat developed in current carrying conductor	
20	Superconductivity	
21	Classification of Magnetic Materials	
22	Origin of Magnetic moment, Origin of dia, para, ferro and anti-ferro magnetism and their comparison	
23	Origin of Magnetic moment, Origin of dia, para, ferro and anti-ferro magnetism and their comparison	
24	Ferrimagnetic materials, Saturation Magnetisation and Curie temperature	
25	Ferrimagnetic materials, Saturation Magnetisation and Curie temperature	
26	Magnetic domains, Concepts of Giant Magnetic Resistance (GMR)	

27	Magnetic domains, Concepts of Giant Magnetic Resistance (GMR)	
28	Magnetic recording	
29	Magnetic recording	
30	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Ankit Chhetri

Course –Honours

Class/Semester- 4th

Name of the Paper- C-10-**ELECTRONIC INSTRUMENTATION**

Units Assigned- All

Marks Assigned- 60

Class	Topic/ Unit	Remarks
	Unit – 1	
1	Specifications of instruments, their static and dynamic characteristics,	
2	Error (Gross error, systematic error, absolute error and relative error)	
3	Uncertainty analysis, Statistical analysis of data and curve fitting	
4	PMMC instrument	
5	Galvanometer, DC Measurements	
6	DC measurement - ammeter, voltmeter, **o**hm meter	
7	DC measurement - ammeter, voltmeter, **o**hm meter	
8	AC measurement, Digital voltmeter systems (integrating and non-integrating types),	
9	AC measurement, Digital voltmeter systems (integrating and non-integrating types),	
10	Digital multimeters, digital frequency meter system (different modes and universal counter).	
11	Digital multimeters, digital frequency meter system (different modes and universal counter).	
12	Digital multimeters, digital frequency meter system (different modes and universal counter).	
13	Low capacitance probes, high voltage probes, current probes	
14	Current probes, identifying electronic connectors – audio and video, RF/Coaxial, USB etc	
15	Current probes, identifying electronic connectors – audio and video, RF/Coaxial, USB etc	

	Unit – 2	
16	Low Resistance: Kelvin's double bridge method	
17	Medium Resistance by Voltmeter Ammeter method	
18	Wheatstone bridge method,	
19	High Resistance by Megger. A.C. bridges	
20	Measurement of Self Inductance, Maxwell's bridge	
21	Hay's bridge,	
22	Anderson's bridge	
23	Measurement of Capacitance, Schering's bridge	
24	DeSauty's bridge, Measurement of frequency	
25	Wien's bridge.	
26	4 bit binary weighted resistor type D-A conversion, circuit and working	
27	Circuitof R-2R ladder.A-D conversion characteristics	
28	Circuitof R-2R ladder.A-D conversion characteristics	
29	Successive approximation ADC. (Mention of relevant ICs for all).	
30	Successive approximation ADC. (Mention of relevant ICs for all).	
	Unit – 3	
31	CRT	
32	wave form display and electrostatic focusing, time base and sweep synchronization	
33	measurement of voltage, frequency and phase by CRO	
34	Oscilloscope probes, Dual trace oscilloscope	
35	Oscilloscope probes, Dual trace oscilloscope	
36	Sampling Oscilloscope	
37	DSO	
38	Powerscope	
39	Powerscope	
40	CRO specifications	
41	Audio oscillator	
42	Audio oscillator, Pulse Generator	
43	Pulse Generator	
44	Function generator	
45	Revision	
	Unit – 4	
46	Classification of transducers	
47	Basic requirement/characteristics of transducers, active & passive transducers	
48	Resistivetransducers	
49	Resistivetransducers	
50	Capacitivetransducers	
51	Capacitivetransducers	
52	Inductivetransducers	
53	piezoelectric transducers	
54	Measurement of displacement, velocity and acceleration	
55	Measurement of pressure	
56	Measurement of temperature	
57	Measurement of temperature	
58	Light transducers	

59	Light transducers	
60	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Ankit Chhetri

Course –Honours

Class/Semester- 6th

Name of the Paper- C-14 – **PHOTONICS**

Units Assigned- Unit- 1, 2

Marks Assigned- 30

Class	Topic/ Unit	Remarks
	Unit – 1	
1	Plane waves in homogeneous media, concept of spherical waves	
2	Reflection and transmission at an interface,	
3	total internal reflection, Brewster's Law	
4	Interaction of electromagnetic waves with dielectrics: origin of refractive index, dispersion.	
5	Interaction of electromagnetic waves with dielectrics: origin of refractive index, dispersion.	
6	Superposition of waves of same frequency	
7	Superposition of waves of same frequency	
8	Concept of coherence, Interference by division of wavefront,	
9	Concept of coherence, Interference by division of wavefront,	
10	Young's double slit, Division of Amplitude	
11	thin film interference, anti-reflecting films, Newton's rings	
12	Michelson interferometer. Holography.	
13	Huygen Fresnel Principle	
14	Diffraction Integral, Fresnel and Fraunhoffer approximations.	
15	Diffraction Integral, Fresnel and Fraunhoffer approximations.	
16	Fraunhoffer Diffraction by a single slit	
17	Fraunhoffer Diffraction by a single slit, rectangular aperture	
18	Double slit, Resolving power of microscopes and telescopes;	
19	Diffraction grating: Resolving power and Dispersive power	
20	Diffraction grating: Resolving power and Dispersive power	
	Unit – 2	
21	Linear, circular and elliptical polarization	
22	Linear, circular and elliptical polarization	
23	polarizer-analyzer and Malus' law;Double refraction by crystals,	
24	polarizer-analyzer and Malus' law;Double refraction by crystals,	
25	Interference of polarized light	

26	Wave propagation in uniaxial media	
27	Wave propagation in uniaxial media	
28	Half wave and quarter wave plates.	
29	Half wave and quarter wave plates.	
30	Faraday rotation and electro-optic effect	

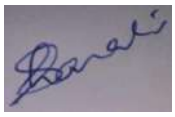
Digboi College: Department of English

Course Plan

(Mar-Jun 2022)

Name of the Teacher: **Dr. Pabitra Bharali**
Programme: **English Honours**
Class/Semester-: **SECOND**
Name of the Course/Paper: **C3: Indian writing in English**
Units Assigned: **III (Part) & IV**
Marks Assigned: **30** **Class per week: 02**

Class	Topic/ Unit	Remarks
1.	a. Introduction to Indian English writings b. Introduction to North-east Indian poetry in English	Objective is to familiarize the learners with the concerns of Indian English writers and inspire in them a critical insight.
2.	Mulk Raj Anand: The Two Lady Rams	Groundwork for the play
3.	Mulk Raj Anand: The Two Lady Rams	Analysis and appreciation
4.	Mulk Raj Anand: The Two Lady Rams	Analysis and appreciation
5.	Salman Rushdie: The Free Radio	Analysis and appreciation
6.	Salman Rushdie: The Free Radio	Analysis and appreciation
7.	Salman Rushdie: The Free Radio	Analysis and appreciation
8.	Shashi Despande: The Intrusion	Analysis and appreciation
9.	Shashi Despande: The Intrusion	Analysis and appreciation
10.	Shashi Despande: The Intrusion	Analysis and appreciation
11.	Arup kr Dutta: The Wilted Flower	Analysis and appreciation
12.	Arup kr Dutta: The Wilted Flower	Analysis and appreciation
13.	Arup kr Dutta: The Wilted Flower	Analysis and appreciation
14.	Nissim Ezekiel: Night of the Scorpion	Analysis and appreciation
15.	Nissim Ezekiel: Enterprise	Analysis and appreciation
16.	Nissim Ezekiel: as a poet	Analysis and appreciation
17.	Robin s. Ngangom: A Poem for Mother	Analysis and appreciation
18.	Robin s. Ngangom: The Strange affair of Robin s. Ngangom	Analysis and appreciation
19.	Robin s. Ngangom: The Strange affair of Robin s. Ngangom	Analysis and appreciation
20.	Robin s. Ngangom: The Strange affair of Robin s. Ngangom	Analysis and appreciation
21	Interactions	Problem solving
22	Interactions	Problem solving
23	Presentations	Problem solving
24	Presentations	Problem solving



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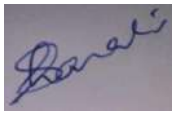
Digboi College: Department of English

Course Plan

(Mar-Jun 2022)

Name of the Teacher: **Dr. Pabitra Bharali**
Programme: **English Honours**
Class/Semester-: **Fourth**
Name of the Course/Paper: **C9: British Romantic Literature**
Units Assigned: **I: Pre-Romantic Literature**
Marks Assigned: **20** **Class per week: 02**

Class	Topic/ Unit	Remarks
1.	a. Introduction to Pre-Romantic Literature	Objective is to familiarize the learners with the characteristics of English Pre-Romantic literature and inspire in them a critical insight.
2.	William Blake: as a poet	Analysis and appreciation
3.	William Blake: Introduction to Songs of Innocence	Analysis and appreciation
4.	William Blake: The Lamb	Analysis and appreciation
5.	William Blake: The Lamb	Analysis and appreciation
6.	William Blake: The Tyger	Analysis and appreciation
7.	William Blake: The Tyger	Analysis and appreciation
8.	William Blake: The Lamb and The Tyger: Comparison	Analysis and appreciation
9.	William Blake: The Chimney Sweeper (Innocence)	Analysis and appreciation
10.	William Blake: The Chimney Sweeper (Innocence)	Analysis and appreciation
11.	William Blake: The Chimney Sweeper (Experience)	Analysis and appreciation
12.	William Blake: The Chimney Sweeper (Experience)	Analysis and appreciation
13.	William Blake: The Chimney Sweeper: Innocence and Experience (Comparative study)	Analysis and appreciation
14.	Robert Burns: A Bard's Epitaph	Analysis and appreciation
15.	Robert Burns: A Bard's Epitaph	Analysis and appreciation
16.	Robert Burns: Scots Wha Hae	Analysis and appreciation
17.	Robert Burns: Scots Wha Hae	Analysis and appreciation
18.	Interactions	Problem solving
19.	Presentations	Problem solving
20.	Presentations	Problem solving



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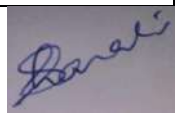
Digboi College: Department of English

Course Plan

(Mar-Jun 2022)

Name of the Teacher: **Dr. Pabitra Bharali**
Programme: **English Honours**
Class/Semester-: **Fourth**
Name of the Course/Paper: **C10: British Literature: 19th Century**
Units Assigned: **III: Charles Dickens: Hard Times**
Marks Assigned: **20** **Class per week: 02**

Class	Topic/ Unit	Remarks
1.	a. Introduction to Victorian Literature/Novel/Dickens	Objective is to familiarize the learners with the characteristics of English Victorian literature and inspire in them a critical insight.
2.	Hard Times: Part I: Sowing	Analysis and appreciation
3.	Hard Times: Part I: Sowing	Analysis and appreciation
4.	Hard Times: Part I: Sowing	Analysis and appreciation
5.	Hard Times: Part I: Sowing	Analysis and appreciation
6.	Hard Times: Part I: Sowing	Analysis and appreciation
7.	Hard Times: Part II: Reaping	Analysis and appreciation
8.	Hard Times: Part II: Reaping	Analysis and appreciation
9.	Hard Times: Part II: Reaping	Analysis and appreciation
10.	Hard Times: Part II: Reaping	Analysis and appreciation
11.	Hard Times: Part II: Reaping	Analysis and appreciation
12.	Hard Times: Part III: Garnering	Analysis and appreciation
13.	Hard Times: Part III: Garnering	Analysis and appreciation
14.	Hard Times: Part III: Garnering	Analysis and appreciation
15.	Hard Times: Part III: Garnering	Analysis and appreciation
16.	Hard Times: Part III: Garnering	Analysis and appreciation
17.	Hard Times: Plot and Characterization	Analysis and appreciation
18.	Hard Times: Depiction of Victorian society	Analysis and appreciation
19.	Presentations	Problem solving
20.	Presentations	Problem solving
21	Presentations	Problem solving
22	Presentations	Problem solving



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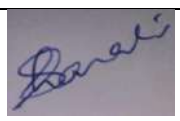
Digboi College: Department of English

Course Plan

(Mar-Jun 2022)

Name of the Teacher: **Dr. Pabitra Bharali**
Programme: **English Honours**
Class/Semester-: **Sixth**
Name of the Course/Paper: **C13: Modern European Drama**
Units Assigned: **IV: Avant-Garde Drama**
Marks Assigned: **20** **Class per week: 02**

Class	Topic/ Unit	Remarks
1.	a. Introduction to New drama & Avant-Garde Drama	Objective is to familiarize the learners with aspects of new drama & avant-garde drama and inspire in them a critical insight.
2.	Eugene Ionesco: Rhinoceros	Analysis and appreciation
3.	Eugene Ionesco: Rhinoceros	Analysis and appreciation
4.	Eugene Ionesco: Rhinoceros	Analysis and appreciation
5.	Eugene Ionesco: Rhinoceros	Analysis and appreciation
6.	Eugene Ionesco: Rhinoceros	Analysis and appreciation
7.	Eugene Ionesco: Rhinoceros	Analysis and appreciation
8.	Eugene Ionesco: Rhinoceros	Analysis and appreciation
9.	Eugene Ionesco: Rhinoceros	Analysis and appreciation
10.	Eugene Ionesco: Rhinoceros	Analysis and appreciation
11.	Eugene Ionesco: Rhinoceros	Analysis and appreciation
12.	Eugene Ionesco: Rhinoceros – Avant-garde aspects	Analysis and appreciation
13.	Eugene Ionesco: Rhinoceros- Symbols	Analysis and appreciation
14.	Eugene Ionesco: Rhinoceros-Characterization	Analysis and appreciation
15.	Interactions/Presentations	Problem solving
16.	Interactions/Presentations	Problem solving



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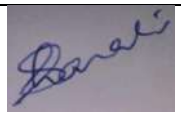
Digboi College: Department of English

Course Plan

(Mar-Jun 2022)

Name of the Teacher: **Dr. Pabitra Bharali**
Programme: **English Honours**
Class/Semester-: **Sixth**
Name of the Course/Paper: **DSE 5: Literary Theory**
Units Assigned: **III: Post-structuralism**
Marks Assigned: **20** **Class per week: 02**

Class	Topic/ Unit	Remarks
1.	a. Introduction to Literary theory	Objective is to familiarize the learners with literary theories and inspire in them a critical insight.
2.	Jacques Derrida: Structure, Sign and Play in the Discourse of Human Science	Analysis and appreciation
3.	Jacques Derrida: Structure, Sign and Play in the Discourse of Human Science	Analysis and appreciation
4.	Jacques Derrida: Structure, Sign and Play in the Discourse of Human Science	Analysis and appreciation
5.	Jacques Derrida: Structure, Sign and Play in the Discourse of Human Science	Analysis and appreciation
6.	Jacques Derrida: Structure, Sign and Play in the Discourse of Human Science	Analysis and appreciation
7.	Jacques Derrida: Structure, Sign and Play in the Discourse of Human Science	Analysis and appreciation
8.	Jacques Derrida: Structure, Sign and Play in the Discourse of Human Science	Analysis and appreciation
9.	Michel Foucault: Truth and Power	Analysis and appreciation
10.	Michel Foucault: Truth and Power	Analysis and appreciation
11.	Michel Foucault: Truth and Power	Analysis and appreciation
12.	Michel Foucault: Truth and Power	Analysis and appreciation
13.	Michel Foucault: Truth and Power	Analysis and appreciation
14.	Michel Foucault: Truth and Power	Analysis and appreciation
15.	Michel Foucault: Truth and Power	Analysis and appreciation
16.	Interactions	Problem solving



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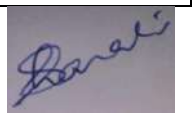
Digboi College: Department of English

Course Plan

(Mar-Jun 2022)

Name of the Teacher: **Dr. Pabitra Bharali**
Programme: **English Honours**
Class/Semester-: **Sixth**
Name of the Course/Paper: **DSE 7: Partition Literature**
Units Assigned: **III (part) & IV (part)**
Marks Assigned: **15** **Class per week: 01**

Class	Topic/ Unit	Remarks
1.	a. Introduction to partition literature	Objective is to familiarize the learners with partition literature, context of Indian partition and its literature and inspire in them a critical insight.
2.	Manik Bandhopadhya: The Final Solution	Analysis and appreciation
3.	Manik Bandhopadhya: The Final Solution	Analysis and appreciation
4.	Manik Bandhopadhya: The Final Solution	Analysis and appreciation
5.	Manik Bandhopadhya: The Final Solution	Analysis and appreciation
6.	Jibananda Das: I shall Return to this Bengal	Analysis and appreciation
7.	Jibananda Das: I shall Return to this Bengal	Analysis and appreciation
8.	Interactions	Problem solving



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DIGBOI COLLEGE, DIGBOI

Department of English

Course Plan (March - June, 2022)

Name of the Teacher- Sanjoy Das

Class/Semester- 2nd Semester (English Honours) CBCS

Name of the Paper: C 4- British Poetry and Drama: 14th to 17th Centuries (c)

Units Assigned- IV

Marks Assigned- 20

Class	Topic/ Unit	Remarks
1.	Unit IV- Shakespeare's Comedy	Introduction
2.	Features of comedy defined	Appreciation
3.	Shakespearean comedy characteristics highlighted	Appreciation
4.	Twelfth Night – Text	Analysis & interpretation
5.	Act I scene I	Analysis & interpretation
6.	Act I scene I	Analysis & interpretation
7.	Act I scene II, III	Analysis & interpretation
8.	Act I scene IV, V	Analysis & interpretation
9.	Act II scene I, II	Analysis & interpretation
10.	ActII scene II, II ,III	Analysis & interpretation
11.	ActII scene III, IV	Analysis & interpretation
12.	Act IIscene IV	Analysis & interpretation
13.	Act IIscene IV, V	Analysis &

		interpretation
14.	ActIII scene I, II	Analysis & interpretation
15.	ActIII scene II,III	Analysis & interpretation
16.	Act III scene III, IV	Analysis & interpretation
17.	Act III scene IV, V	Analysis & interpretation
18.	Act III scene V	Analysis & interpretation
19.	Act Iv scene I,II	Analysis & interpretation
20.	Act IV scene III,IV	Analysis & interpretation
21	Act IV scene IV, V	Analysis & interpretation
22	Act V scene V,	Analysis & interpretation
23	TN as a romantic comedy	Analysis & interpretation
24	Character analysis	Analysis & interpretation
25	Contd..	Analysis & interpretation
25	Various other themes and perspectives undertaken	Analysis & interpretation
26	Discussion / Tutorial	Discussion
27	Discussion	Discussion

28	Discussion	Discussion
29	Interaction	Discussion

DIGBOI COLLEGE, DIGBOI

Session: (March- June, 2022)

Name of the Teacher- Sanjoy Das

Class/Semester- 4th Semester

Course- 10 : British Literature: 19th century

Unit's Assigned-Unit II & IV

Marks Assigned- 40

Class	Topic/ Unit	Remarks
1.	Unit I- The socio-political contexts of the English novel – An overview	Introduction
2.	Contd…	Appreciation
3.	Contd…	
4.	Charlotte Bronte– introduction to the author	Background information
5.	Chapterwise discussion of the text 'Jane Eyre'	Analysis & interpretation
6.	Contd…	Analysis & interpretation
7.	Contd…	Analysis & interpretation
8.	Contd…	Analysis & interpretation
9.	Contd…	Analysis & interpretation
9.	Contd…	Analysis & interpretation
10.	Important issues discussed	Discussion

11.	Discussed the text as feminist reading	Discussion
12.	Art of characterization, thematic structure etc	Discussion
12.	Socio-cultural aspects discussed	Discussion
13.	Other aspects related to novel discussed	Discussion
13.	Contd…	Discussion
14.	Interaction	Interaction
15.	Interaction	Interaction
16	Victorian poetry- background	Analysis & interpretaion
17	Alfred Tennyson's Ulysses	Analysis & interpretation
18	Contd….	Analysis & interpretation
19	Critical interpretation of the poem	Interpretation
20	Robert Browning's My Last Duchess	Analysis & interpretation
21	Contd…	Analysis & interpretation
22	Contd…	Analysis & interpretation
23	Critical interpretation of the poem	Analysis & interpretation
24	Stylistics devices discussed	Discussion and interaction

DIGBOI COLLEGE, DIGBOI

Session: (March- June, 2022)

Name of the Teacher- Sanjoy Das

Class/Semester- 6th Semester

Course- 10: British Literature: 19th century

Unit's Assigned-Unit II

Marks Assigned- 20

Class	Topic/ Unit	Remarks
1.	Epic theatre and its characteristics	Introduction
2.	Bertold Brecht – brief biography	Introduction
3.	Brechtian philosophy discussion	interpretation
4.	The Good Woman of Szechuan –text started	Analysis & interpretation
5.	Contd…	Analysis & interpretation
6.	Contd…	Analysis & interpretation
7.	Contd…	Analysis & interpretation
8	Contd…	Analysis & interpretation
9.	Good Woman of Szechuan as an epic theatre	Analysis & interpretation
10.	Historical materialism in the play	Analysis & interpretation
11.	Symbolism in the play	Analysis & interpretation

DIGBOI COLLEGE, DIGBOI

Session: (March- June, 2022)

Name of the Teacher- Sanjoy Das

Class/Semester- 6th Semester

Course- 14: Postcolonial Literatures

Unit's Assigned-Unit II

Marks Assigned- 20

Class	Topic/ Unit	Remarks
1.	Post-colonial literature at a nutshell	Introduction
2.	Latin American novel and its features	Introduction
3.	Contd…	interpretation
4.	Gabriel Garcia Marquez 'Chronicle of a Death Foretold'- text	Background interpretation
5.	Text started	Analysis & interpretation
6.	Contd…	Analysis & interpretation
7.	Contd…	Analysis & interpretation
8.	Contd…	Analysis & interpretation
9.	Contd…	Analysis & interpretation
10.	The text as a love story	Analysis & interpretation
11.	Concept of belief and honour in the text	Analysis & interpretation
12.	Other features- symbols, structure discussion	Discussion and interaction

DIGBOI COLLEGE, DIGBOI

Course Plan Even Semester (2022 January-May)

Name of the Teacher-Dr. Sangeeta Boruah Saikia

Course –Honours / Generic – GE-4

Class/Semester-4th Semester (CBCS)

Name of the Paper-Industrial Geography

Units Assigned- 1 and 2

Marks Assigned- 40

Class	Topic/ Unit	Remarks
1.	Concept and Nature of Industrial Geography	
2.	Scope of Industrial Geography	
3.	Types and Classification of Industries	
4.	Geographical Characteristics of Industries	
5.	Locational factors of Industries	
6.	Weber's Theory of Industrial Location	
7.	Small Scale Industry	
8.	Medium Scale Industry	
9.	Heavy Industry	
10.	Manufacturing Industries	
11.	Iron and Steel Industry	
12.	Processes of Iron and Steel Production	
13.	Location of Iron and Steel Industry	
14.	Early Localization and Early Growth	
15.	Distribution of Iron and Steel Industry	
16.	Iron and Steel Industry in India	
17.	Rural Based Industries	
18.	Locational factors of Rural based Industries	
19.	Characteristics of Rural Based Industries	
20.	Footloose Industry	
21.	Characteristics of Footloose Industries	
22.	Locational Factors of Footloose Industries	
23.	Problem of Footloose Industries	
24.	Some Examples of Footloose Industry in India	
25.		

DIGBOI COLLEGE: DIGBOI

Course Plan 2022(Even Semester June to December)

Name of the teacher- Narendra Kumar Das
Course- Honours/Generic- Generic
Class/Semester- 2nd Semester (CBCS)
Name of the paper- Regional Development (GE-02)
Units Assigned- 3,4,5
Marks Assigned- 40

CLASS	UNITS/TOPIC	REMARKS
1	Concept of Region	
2	Choice of a region for planning	
3	Concept and Characteristics of Ideal Planning Region	
4	Concept and Characteristics of Ideal Planning Region	
5	Delineation of Planning Region	
6	Delineation of Planning Region	
7	Concept of Regionalization	
8	Regionalization of India for Planning	
9	Agro-Ecological Zones	
10	Agro-Ecological Zones	
11	Concept of Strategies and Models in Regional Planning	
12	Growth Pole Model of Perroux	
13	Growth Pole Model of Perroux	
14	Growth Center Model in Indian Context	
15	Growth Center Model in Indian Context	
16	Village Cluster Model in Indian Context	
17	Concept of Problem Regions in Regional Planning	
18	Tribal Area Development Programme	
19	Hill Area Development Programme	
20	DVC The Success story and Failure	
21	DVC The Success story and Failure	

DIGBOI COLLEGE, DIGBOI

Course Plan (Session Jan.- May 2022)

Department Of Hindi

Name of the Teacher- Dr. Anuradha Kumari Sahu

Course –Honours / Generic – Honours

Class/Semester- B.A. 2nd Semester

Name of the Paper-AadikaleenewamMadhyakaleen Hindi Kavita, C-3

Units Assigned- Unit – 3 & Unit - 4

Marks Assigned - 20+20

Class	Topic/ Unit	Remarks
1.	Introduction	
2.	Soordas Ka SahityikParichaya,	
3.	Soordas ka Vatsalya Varnan	
4.	Merau Man Anat Kahan Sukh Pawai – Vyaakhya.	
5.	Kilkat Kaanha ghuturuwaniAawat - Vyaakhya.	
6.	Hamarai Hari Haril Ki Lakari - Vyaakhya.	
7.	Ati Maleen Vrishabhaanu-Kumari - Vyaakhya.	
8.	Tutorial/Discussion.	
9.	Tulasidas Ka SahityikParichaya,	
10.	TulasidasKe Kavya Men Bhakti-Bhavana	
11.	Kavitawali Ka Samanya Parichaya,	
12.	Ehi GhaatateThorikDooriAhai Kati Lau Jalu ThaahDekhaaihau Joo - Vyaakhya.	
13.	Kheti N Kisaan Ko Bhikhaari Ko N Bheekh, Bali, - Vyaakhya.	
14.	VinayPatrika- Parichaya,	
15.	Ramko Gulam, Naam RambolaRaakhyon Ram – Vyaakhya	
16.	Esi Moodhataa Yaa Manki – Vyaakhaya,	
17.	Question & Answer	
18.	Tutorial / Discussion	
19.	Ghananand jeewanParichaya	
20.	Ghananand Prem KePeer..	
21.	Ghananand Ke Kavya Men Premanubhooti	
22.	Parkaajhi Deh Kau Dhaari Firau ParajanyaJathaaratha- Vyaakhyaa	
23.	AtiSoodho Saneh ko Maaraghai Jahan SayaanapBaank Nahin – Vyaakhya,	
24.	Rahim –Parichaya	
25.	Rahim keDohon Ki Vyaakhya - 6,7,11,12.	
26.	Rahim keDohon Ki Vyaakhya – 14,15,16,20.	
27.	Rahim keDohon Ki Vyaakhya – 24,25.	
28.	Bihari Ka Parichaya	
29.	Bihari keDhohenDekhane men Chhote Par Bhaav Gambhir hotehai- Alochana	
30.	Bihari keDohon ki Vyaakhaya - 1,2, 3,6,9,	
31	Bihari keDohon ki Vyaakhaya -10, 13, 20,22,26	
32	Tutorial/ Discussion	

Name of the Teacher- Dr. Anuradha Kumari Sahu

Course –Honours / Generic – Honours

Class/Semester- B.A. 2nd Semester

Name of the Paper- Aadhunik Hindi Kavita (ChhayaavadTak), C-4

Units Assigned- Unit – 3 & Unit - 4

Marks Assigned - 20+20

Class	Topic/ Unit	Remarks
1.	Introduction	
2.	JayShankar Prasad Ka Sahityik Parichay	
3.	'Aansoon' Kavita Men Varnit Peeda…	
4.	'Aanoon' –Vyaakhyaa	
5.	'Aanoon' –Vyaakhyaa	
6.	'Aanoon' –Vyaakhyaa	
7.	'Aanoon' –Vyaakhyaa	
8.	'He! Laaj Bhare Saundarya Bata do' –Vyaakhyaa	
9.	Le Chal VahaanBhulaawa Dekar –Vyaakhyaa	
10.	Tutorial / Discussion	
11.	Sooryakaant Tripathi 'Niraalaa' SahityikParichaya	
12.	Joohi Ki Kali–Vyaakhyaa	
13.	Sandhyaa Sundari –Vyaakhyaa	
14.	Bandho N Naaw–Vyaakhyaa	
15.	Question & Answer	
16.	Question & Answer	
17.	Tutorial / Discussion	
18.	Sumitranandan Pant -SahityikParichaya	
19.	Pratham Rashmi –Vyaakhyaa	
20.	Vaani –Vyaakhyaa	
21.	Vaani -& Pratham Rashmi – Saransh	
22.	Question & Answer	
23.	Tutorial / Discussion	
24.	Mahadevi Verma - SahityikParichaya	
25.	Mahadevi Verma : Aadhunik Meera	
26	Kaun PahunchaaDegaa Us Paar-Vyaakhyaa	
27.	Yah Mandir ka Deep Ise NeerawJalaane Do –Vyaakhyaa	
28.	Question & Answer	
29.	Question & Answer	
30.	Tutorial / Discussion	

Name of the Teacher- Dr. Anuradha Kumari Sahu

Course –Honours / Generic – Honours

Class/Semester- B.A. 4th Semester

Name of the Paper- Bhasha Vigyan Aur Hindi Bhasha, C-8

Units Assigned- Unit – 1 & Unit - 2

Marks Assigned - 20+20

Class	Topic/ Unit	Remarks
1.	Introduction	
2.	Bhaha- Swaroop	
3.	Bhasha ki Paribhasha	
4.	Bhasha aur Boli Men Antar	
5.	Bhasha Vigyan - Swaroop	
6.	Bhasha Vigyan ki Paribhasha	
7.	Bhasha Vigyan ke Ang	
8.	Bhasha Vigyan ke Ang	
9.	Bhasha Vigyan ki Shakhaen	
10.	Bhasha Vigyan ki Shakhaen	
11.	Bhasha ki Pravritiyan	
12.	Bhasha ki Visheshatayen	
13.	Bhasha Vigyan ke Adhyayan se Labha	
14.	Tutorial/ Discussion	
15.	Dhwani Vigyan	
16.	Dhwani Vigyan- Swaroop	
17.	Dhwani Vigyan- Paribhasha	
18.	Dhwaniyon ka Vargikaran	
19.	Dhwaniyon ka Vargikaran	
20.	Dhwaniyon ka Vargikaran	
21.	Tutorial/ Discussion	
22.	Roopim Vigyan- Tatparya,	
23.	Roopim Vigyan – Swaroop,	
24.	Roopim ki Awadharana	
25.	Roopim Vigyan – Paribhasha	
26.	Roopim Vigyan- Prakar	
27.	Roopim Vigyan- (Naam, Aakhyaat, Upasarg aur Nipaat,)	
28.	Tutorial / Discussion	

Name of the Teacher- Dr. Anuradha Kumari Sahu

Course –Honours / Generic – Honours

Class/Semester- B.A. 4th Semester

Name of the Paper- HindiUpanyas , C-9

Units Assigned- Unit – 1 & Unit - 3

Marks Assigned - 20+20

Class	Topic/ Unit	Remarks
1.	Introduction	
2.	Premchand Ki Upanyas Kala	
3.	Gaban – Upanyas Explanation	
4.	Gaban – Upanyas Explanation	
5.	Gaban – Upanyas Explanation	
6.	Gaban – Upanyas Explanation	
7.	Gaban – Upanyas Explanation	
8.	Gaban – Upanyas Explanation	
9.	Gaban – Upanyas Explanation	
10.	Gaban – Upanyas Kala ketatwake Samiksha	
11.	Gaban – Upanyas Kala ketatwake Samiksha	
12	Gaban – Upanyaske Patron ka Charitra - Chitran	
13.	Jalapa ka Charitra – Chitran	
14.	Important Paragraph Ka Vyaakhya.	
15. .	Important Paragraph Ka Vyaakhya.	
16.	Tutorial / Discussion	
17.	AmritlaalNaagar- Krititwa	
18.	Manas ka Hans - Upanyas Explanation	
19.	Manas ka Hans - Upanyas Explanation	
20.	Manas ka Hans - Upanyas Explanation	
21.	Manas ka Hans - Upanyas Explanation	
22.	Manas ka Hans - Upanyas Explanation	
23.	Manas ka Hans - Upanyas Explanation	
24.	Manas ka Hans - Upanyas Explanation	
25.	Manas ka Hans - Upanyas Explanation	
26.	Manas ka Hans - Upanyas Explanation	
27.	Manas ka Hans - Upanyas - Kalaa	
28.	Manas ka Hans – Naamkaran ki Sarthakata	
29.	Manas ka Hans – Uddeshya	
30.	Manas ka Hans: Patra-Yojana	
31.	Ratnaawali ka Charitra – Chitran	
32.	Manas ka Hans keaadharPar spashtkijiye ki ‘GoswaamiTulasidas : MaanaveeyaAasthaaonke Amar Gayak’ hai ?	
33.	Manas ka Hans -Vyakhya	
34.	Manas ka Hans –Vyakhya	
35.	Tutorial / Discussion.	

Name of the Teacher- Dr. Anuradha Kumari Sahu

Course –Honours / Generic – Honours

Class/Semester- B.A. 4th Semester

Name of the Paper- Hindi Kahani, C-10

Units Assigned- Unit –3 & Unit -4

Marks Assigned - 20+20

Class	Topic/ Unit	Remarks
1.	Introduction	
2.	Phaniswar Nath Renu- Parichaya,	
3.	'Teesari Kasam' Kahani,	
4.	'Teesari Kasam' Kahani,	
5.	'Teesari Kasam' Kahani,	
6.	'Teesari Kasam' Kahani,	
7.	'Teesari Kasam' Kahani Patra Yojana,	
8.	'Teesari Kasam' Kahani- Kala keTatwa ki Samiksha,	
9.	'Teesari Kasam' Kahani ki Vyaakhyaa	
10.	Mohan Rakesh EkParichaya	
11.	'Malabe ka Malik'- Kahani	
12.	'Malabe ka Malik'- Kahani	
13.	'Malabe ka Malik'- Kahani	
14.	'Malabe ka Malik'- Kahani ki Samiksha	
15.	'Malabe ka Malik'- Kahani ki Patra Yojana	
16.	Gini miya ka Charitra-Chitran	
17.	'Malabe ka Malik'- Kahani ki Important Lines Ki Vyaakhyaa.	
18.	'Malabe ka Malik'- Kahani ki Important Lines Ki Vyaakhyaa.	
19.	Tutorial / Discussion	
20.	Amarkant ka Parichaya	
21.	Dopahar ka Bhojan - Kahani	
22.	Dopahar ka Bhojan - Kahani	
23.	Dopahar ka Bhojan – Kahani	
24.	Dopahar ka Bhojan – Kahani- Patra Yojana	
25.	Dopahar ka Bhojan – Kahani – Kala ke Aadhar Par Samiksha	
26.	Dopahar ka Bhojan – Kahani ki Vyaakhyaa	
27.	Dopahar ka Bhojan – Kahani ki Vyaakhyaa	
28.	Tutorial / Discussion	
29.	Krishna Shobati – Parichaya	
30.	Sikka Badal Gaya – Kahani	
31.	Sikka Badal Gaya – Kahani	
32.	Sikka Badal Gaya – Kahani	
33.	Sikka Badal Gaya – Kahani ki Samiksha	
34	Sikka Badal Gaya – Kahani ki Vyaakhyaa	
35.	Tutorial / Discussion	

Name of the Teacher- Dr. Anuradha Kumari Sahu

Course –Honours / Generic – Honours

Class/Semester-B.A. 6th Semester

Name of the Paper- Hindi ki Sahityik Patrakarita (C-13)

Units Assigned- Unit – 3 & Unit- 4

Marks Assigned- 20+20

Sl. No.	Topic/ Unit	Remarks
1.	Introduction- Swatantrottar Patrakarita	
2.	Swatantrottar Patrakarita ki Visheshta	
3.	Swatantrottar Patrakarita- Parichay	
4.	Swatantrottar Patrakarita- Parichay	
5.	Swatantrottar Patrakarita - Pravritiyan	
6.	Swatantrottar Patrakarita - Pravritiyan	
7.	Swatantrottar Patrakarita - Pravritiyan	
8.	Tutorial / Discussion	
9.	Samkaleen Saahityik Patrakarita - Parichay	
10.	Samkaleen Saahityik Patrakarita - Parichay	
11.	Samkaleen Saahityik Patrakarita- Pravritiyan	
12.	Samkaleen Saahityik Patrakarita -	
13.	Tutorial / Discussion	
14.	Hindi Ki Vividh Patra-Patrika : Sankshep Parichay	
15.	Hindi Ki Vividh Patra-Patrika- Banaras Akhabar	
16.	Hindi Ki Vividh Patra-Patrika- Bharat Mitra	
17.	Hindi Ki Vividh Patra-Patrika- Hindi Pradip	
18.	Hindi Ki Vividh Patra-Patrika- Swadesh	
19.	Hindi Ki Vividh Patra-Patrika-Pratap	
20.	Hindi Ki Vividh Patra-Patrika- Jansatta	
21.	Tutorial / Discussion	
22.	Question & Answer	
23.	Question & Answer	
24.	Question & Answer	
25.		

Name of the Teacher- Dr. Anuradha Kumari Sahu

Course –Honours / Generic – Honours

Class/Semester-B.A. 6th Semester

Name of the Paper- Prayojanmoolak Hindi (C-14)

Units Assigned- Unit – 1& Unit - 2

Marks Assigned- 20+20

Sl.No.	Topic/ Unit	Remarks
1.	Introduction – Syllabus	
2.	Prayojanmoolak Hindi ka Swaroop aur Paribhasha	
3.	Prayojanmoolak Hindi ke Prakar	
4.	Prayojanmoolak Hindi ke Prakar/ Roop, Mahatw, Simaaen aur Sambhawanae	
5.	Hindi ki Smvaidhanik Sthiti	
6.	Hindi ki Smvaidhanik Sthiti- Ashtam anusoochi me Shamil Bhasha	
7.	Hindi ki Smvaidhanik Sthiti	
8.	Hindi Bhasha ke Vividh Roop	
9.	Hindi Bhasha ke Vividh Roop	
10.	Hindi Bhasha ke Vividh Roop	
11.	Tutorial	
12.	Hindi Ka Manakikaran	
13.	Hindi Ka Manakikaran	
14.	Hindi Ka Manakikaran : Vartani ke Star Par	
15.	Hindi Ka Manakikaran : Vartani ke Star Par	
16.	Hindi Ka Manakikaran : Vartani ke Star Par	
17.	Prayojanmoolak Hindi ki Shailiya	
18.	Prayojanmoolak Hindi ki Shailiya	
19.	Prayojanmoolak Hindi ki Shailiya	
20.	Prayojanmoolak Hindi ki Shailiya	
21.	Prayojanmoolak Hindi ki Shailiya	
22.	Tutorial	
23.	Prayojanmoolak Hindi ki Shailiya	
24.	Prayojanmoolak Hindi ki Shailiya	
25.	Prayojanmoolak Hindi ki Shailiya	
26.	Revision	
27.	Discussion	
28.	Revison	
29.	Revison	
30.	Revison	
31.	Revison	
32.	Revison	
33.	Revison	
34.	Revison	
35	Discussion	

Name of the Teacher- Dr. Anuradha Kumari Sahu

Course –Honours / Generic – Honours

Class/Semester-B.A. 6th Semester

Name of the Paper- Tulasidas(DSE-3)

Units Assigned- Unit –1& Unit - 2

Marks Assigned- 20+20

Sl. No.	Topic/ Unit	Remarks
1.	Introduction	
2.	Goswami Tulasi ka Vyaktitw	
3.	Tulasidas Ka Krititwa	
4.	Tulasidas Ka Krititwa	
5.	Tulasidas Ka SahityikParichaya	
6.	TulasidasKe Kavya Men Bhakti-Bhavana	
7.	Tutorial	
8.	TulasidasKe Kavya Men Bhakti-Bhavana	
9.	Ayodhyakaand Parichay	
10.	Ayodhyakaand: Doha – chupai 67-76 Parichay	
11.	Ayodhyakaand: 69&70 Vyakhya	
12.	Ayodhyakaand: : 71&72 Vyakhya	
13.	Ayodhyakaand: : 73 Vyakhya	
14.	Ayodhyakaand: 74 Vyakhya	
15.	Ayodhyakaand: 75 Vyakhya	
16.	Ayodhyakaand: 76 Vyakhya	
17.	Ayodhyakaand : Katha	
18.	Discussion	
19.	Tutorial	
20.	Revison	
21.	Revison	
22.	Revison	
23.	Revison	
24.	Revison	
25.	Discussion	

Name of the Teacher- Dr. Anuradha Kumari Sahu

Course –Honours / Generic – Honours

Class/Semester-B.A. 6th Semester

Name of the Paper- Premchand (DSE-4)

Units Assigned- Unit – 1 & Unit - 2

Marks Assigned- 20+20

Sl. No.	Topic/ Unit	Remarks
1.	Sevasadan – Novel (Saaransh)	
2.	Premchand Ka Parichay	
3.	Sevasadan Upanyas Men Samajikata	
4.	Sevasadan Upanyas Men Paatra Yojana	
5.	Sevasadan Upanyas Men Nihit Samasya	
6.	Sevasadan Upanyas Men Nihit Samasya	
7.	Sevasadan Upanyas	
8.	Sevasadan Upanyas	
9.	Sevasadan Upanyas	
10.	Sevasadan Upanyas	
11.	Discussion	
12.	Karbala Natak Ka Saransh	
13.		
14.		
15.		
16.		
17.	Discussion	
18.	Discussion	
19.	Discussion	
20.	Discussion	

DIGBOI COLLEGE, DIGBOI

Course Plan January, 2022

Name of the Teacher- Partha Kr Narah
Course –Honours / Generic – HISGE2
Class/Semester- II
Name of the Paper- History of India From the earliest times to 1526 AD.
Marks Assigned- 80

Class	Topic/ Unit	Remarks
1.	Sources –A survey. Archaeological sources.	Text Books: English: Thapar, Romila- Early India Chandra, S- History of Medieval India Singh, Upindar- A History of Ancient and Early Medieval India
2.	Literary sources	
3	Foreign accounts	
4	Harappan Civilization.Origin and extent	
5	Salient features, of Harrapans	
6	Town planning.	
7	Socials and economic condition s of Harrapans	
8	Religions and decline and the end of Civilization.	
9	Vedic Civilization society, economy, polity and culture of the Rig-Vedic	
10	Later Vedic periods	
11	Raise of the Territorial States –Mahajanapadas.Ascedancy of Magadha	
12	Alexander s invasion of India	
13	Rise of the Mauryan Empire under Asoka-his inscription	
14	Dhamma ofAsoka.	
15	Mauryan system of Administration.	
16	Political developments in the Post-Mauryan The period (200BC-3000BC) The Sungas	
17	The Satavahanas	
18	The Khushanas.	
19	Sangam literature	

DIGBOI COLLEGE, DIGBOI

Course Plan, January, 2022

Name of the Teacher-Partha K Narah

Course –Honours / Generic – HISGE 4

Class/Semester- IV

Name of the Paper-History of Modern Assam

Marks Assigned- 80

Class	Topic/ Unit	Remarks
1.	Political Condition in Assam on the Eve of the British rule.	Text Books:
2.	Establishment and Consolidation of the British rule – Reforms and Reorganizations David Scott Measures.	English: Baruah, S.L. –A Comprehensive History of Assam Barpujari.H.K.-(ed) The Comprehensive History of Assam.Vol.IV&V
3.	David Scott. Administrative Reforms	
4.	David Scott, Revenue and judicial Reforms.	
5.	Robertson's–Administrative Reorganization and Revenue Measures	
6.	Francis Jenkins	
7.	Annexation of Lower Assam, Administrative Reorganization and Revenue Measuress.	
8.	Early phase of Revolts and Resistance to British	
9.	Gomdhar Konwar, Piyali Phukan,	
10	Restoration of Purondar Singha and Treaty of 1833.	
11	U.Tirut Singh .The Khamti and the Singpho Rebellion	
12	Annexation of Cachar	
13	The 1857 Revolt in Assam and its Aftermath	
14	Maniram Dewan	
15	Establishment of Chief commissionership of Assam	
16	Land Revenue Measures and Peasant Uprisings in 19th century Assam	
17	Peasant Uprisings of Lower Assam	
18	Patharughat Uprising	

DIGBOI COLLEGE, DIGBOI

Course Plan January,2022

Name of the Teacher-Dr. Anamika Neog

Course – Generic – HISGE2

Class/Semester- II

Name of the Paper- History of India From the earliest times to 1526

Units Assigned- Unit III (3.04) – Unit V

Marks Assigned- 80

Class	Topic/ Unit	Remarks
1.	Gupta Age- Political history	Text Books:
2.	Gupta Age- society,economy and culture	English: Thapar, Romila- Early India Chandra, S- History of Medieval India Singh, Upindar- A History of Ancient and Early Medieval India
3.	Post-Gupta period(upto 640 A.D.)- polity, society,economy and culture	Assamese: Barua, P.K.- Bharat Buranji Nath, D.- BharatarRajnoitikaruSanskritikBuranji(Revised)
4.	Political developments in the South- the Pallavas	
5.	The Imperial Cholas	
6.	The Rashtrakutas	
7.	The Chalukyas	
8.	The Arabs in Indian politics	
9.	The Turks in Indian politics- Ghaznivides	
10.	The Ghorid invasions	
11.	Indian Society during 650-1200 A.D.-literature & language, temple architecture and sculpture	

12.	The Delhi Sultanate- the Slave dynasty	
13.	The Khaljis- AlauddinKhalji's administration	
14.	The Tughluqs dynasty	
15.	Disintegration of the Delhi Sultanate and rise of Provincial Kingdoms	
16.	Vijayanagar Kingdom	
17.	Bahmani Kingdom	
18.	Polity, society of the Sultanate period	
19.	Economy,religion and culture of the Sultanate period,	
20.	Bhakti Movement and Sufism	

DIGBOI COLLEGE, DIGBOI

Course Plan , January, 2022

Name of the Teacher- Dr. Anamika Neog

Course –Honours / Generic – HISGE 4.1

Class/Semester- IV

Name of the Paper-History of Modern Assam

Units Assigned- Unit III (3.04) – Unit V

Marks Assigned- 80

Class	Topic/ Unit	Remarks
1.	Growth of national consciousness	Text Books:
2.	Assam association	English: Baruah, S.L. –A Comprehensive History of Assam Barpujari,H.K.-(ed) The Comprehensive History of Assam,Vol.IV&V
3.	Sarbajaniksabhas	Assamese: Nath,D. – AsamBuranji, Revised and enlarged edition
4.	Rayatsabhas.	
5.	Impact of Partition of Bengal in Assam.	
6.	Impact of Swadeshi Movement in Assam	
7.	Government of India Act, 1919	
8.	Dyarchy on Trial in Assam	
9.	Non-Co-operation Movement in Assam	
10.	Swarajist Politics in Assam	
11.	The Civil Disobedience Movement	
12.	Student Movement in Assam	
13.	Trade Union and Allied Movements	
14	Tribal League and Politics in Assam.	
15.	Migration	
16.	Line System and its Impact on Politics in Assam	
17.	Quit India Movement in Assam	
18.	Cabinet Mission plan and the Grouping Controversy.	
20.	The Sylhet Referendum	

Department of Mathematics

Digboi College

Course Plan

Session January To May, 2022

Teachers':

1. Dr. Jatindra Lahkar
2. Mr. Mukul Buragohain
3. Dr. Binod Chetri
4. Dr. Arjun Singh Chetri

DIGBOI COLLEGE, DIGBOI

Department of Mathematics

Course Plan (Session January-May, 2022 to be commence from March, 2022)

Name of the Teacher: Dr. Jatindra Lahkar

Course –Honours / Generic: Honours

Class/Semester: Second Semester

Name of the Paper: Differential Equations(P) Paper Code:C4

Units Assigned: Complete Paper

Marks Assigned: Theory – 60 and Practical – 20.

Class	Topic/ Unit	Remarks
1	**Unit-1:** Differential equation and Classification.	
2	Formation of differential equations and examples	
3	General, Particular, implicit and explicit solution of DE.	
4	Revision of HS Differential equations.	
5	Exact Differential Equations and examples, Class-1	
6	Exact Differential Equation and examples, Class-2	
7	Different rules of Integrating Factor.	
8	Method of separation of variable and Homogeneous DE	
9	Homogeneous DE and example	
10	Equation reducible to homogeneous and LDE	
11	Linear DE and examples	
12	Bernoulli's Equation, DE reducible to LDE	
13	Bernoulli's equation and examples, Class-1	
14	Bernoulli's equation and examples, Class-1	
15	Special integrating factors and transformations, Class-1	
16	Special integrating factors and transformations, Class-2	
17	**Unit-2:** Application of DE and Model Formulation	
18	Application of first order DE	
19	General Compartmental Model, Balance law	
20	Formulation of the differential equation for exponential decay model.	
21	Lake pollution model,	
22	Lake pollution model, problem of salt dissolved in a tank	
23	Lake Burley Griffin Case Study	
24	Drug assimilation model case of a single cold pill.	
25	Drug assimilation into the blood (case of a course of cold pills)	
26	Examples of Drug assimilation model	
27	Exponential growth of population.	
28	Population growth model	
29	Limited growth with harvesting	
30	Examples Limited growth with harvesting	
31	Epidemic model of influenza, formulation of DE	
32	Epidemic model of influenza, solution	

33	Predators and prey Model	
34	Model of battle	
35	**Unit-3:** Solution of homogeneous equation of second order	
36	Linear combinations of the solution.	
37	Solution of homogeneous equation of second order, Principle of super position-1	
38	Solution of homogeneous equation of second order, Principle of super position-1	
39	Wronskian, definition for two and n-functions.	
40	Wronskian: its properties and applications with examples-1	
41	Wronskian: its properties and applications with examples-2	
42	Examples and Theorems of linearly dependent and independent solution of HLDE, Class-1	
43	Examples and Theorems of linearly dependent and independent solution of HLDE, Class-2	
44	Linear second order HLDE (reduction of order), Class-1	
45	Linear second order HLDE (reduction of order), Class-2	
46	Homogeneous Linear equation with constant coefficients.	
47	Solution of non-homogeneous DE using method of undetermined coefficients-Class-1	
48	Solution of non-homogeneous DE using method of undetermined coefficients -Class-2.	
49	Euler equations.	
50	Method of variation of parameters-Class-1	
51	Method of variation of parameters-Class-2	
52	**Unit-4:** Equilibrium solutions and Equilibrium points	
53	Interpretation of Phase plane.	
54	Phase Plane analysis -1 compartmental model	
55	Phase Plane analysis -2: Predator and Prey Model	
56	Phase Plane analysis -3: Lotka-Voltera Predator and Prey Model.	
57	Phase Plane analysis -4: Battle model.	
58	Phase Plane analysis -4: Epidemic model of influenza.	
59	Revision of Unit-4	
60	**Practical: MatLab Programming, Basic data types.**	Practical Class 2 hours.
61	Plotting of second order solution family of differential equation	
62	Plotting of third order solution family of differential equation.	
63	Growth model (exponential case only).	
64	Decay model (exponential case only).	
65	Lake pollution model (with constant/seasonal flow and pollution concentration).	
66	Case of single cold pill and a course of cold pills.	
67	Limited growth of population (with and without harvesting).	
68	Predatory-prey model (basic Volterra model, with density dependence)	
69	Predatory-prey model (effect of DDT, two prey one predator).	
70	Epidemic model of influenza (basic epidemic model)	
71	Epidemic model of influenza (contagious for life, disease with carriers	

72	Battle model (basic battle model, jungle warfare, long range weapons)	
73	Battle model (long range weapons)	
74	Plotting of recursive sequences	
75	Study the convergence of sequences through plotting	
76	Verify Bolzano-Weierstrass theorem through plotting of sequences and hence identify convergent sub-sequences from the plot	
77	Study the convergence/divergence of infinite series by plotting their sequences of partial sum	
78	Cauchy's root test by plotting nth roots	
79	Ratio test by plotting the ratio of nth and (n+1)th term	
80	Tutorial	

DIGBOI COLLEGE, DIGBOI

Department of Mathematics

Course Plan (Session January-May, 2022)

Name of the Teacher: Dr. Jatindra Lahkar

Course –Honours / Generic: Honours

Class/Semester: Fourth Semester

Name of the Paper: Numerical Methods (P) Paper Code:C8

Units Assigned: Complete Paper

Marks Assigned: Theory – 60 and Practical – 20.

Class	Topic/ Unit	Remarks
1	**Unit-1:** Introduction to Numerical Methods.	
2	Classification of DE	
3	Algorithm: Definition with examples	
4	Frow charts: Definition, symbols for flow charts with examples	
5	Convergence of numerical methods.	
6	Relative and absolute errors.	
7	Truncation Errors.	
8	**Unit-2:** Transcendental and polynomial equations: Definition and examples	
9	Bisection method: Derivation	
10	Bisection method: Examples	
11	Bisection method: Examples	
12	Bisection method: convergence	
13	Newton Raphson Method: Derivation	
14	Newton Raphson Method: Examples	
15	Newton Raphson Method: Examples	
16	Newton Raphson Method: convergence	
17	Secant and Regula falsi Method: Derivation	
18	Secant and Regula falsi Method: Examples	
19	Secant and Regula falsi Method: Examples	
20	Secant and Regula falsi Method: convergence	
21	**Unit-3:** Solution of simultaneous linear equation:	
22	Gauss Elimination Method: Derivation	
23	Gauss Elimination Method: examples	
24	Gauss Elimination Method: Convergence	
25	Gauss Jordan Method: Derivation	
26	Gauss Jordan Method: Examples	
27	Gauss Jordan Method: Convergence	
28	Gauss Jacobi Method: Derivation	
29	Gauss Jacobi Method: Examples	
30	Gauss Jacobi Method: Convergence	
31	Gauss Seidel Method: Derivation	
32	Gauss Seidel Method: Examples	

33	Gauss Seidel Method: Convergence	
34	**Unit-4:** Interpolation	
35	Lagrange's Interpolation formula: Derivation	
36	Lagrange's Interpolation formula: Examples	
37	Lagrange's Interpolation formula: Error calculation	
38	Finite difference operator, definition and examples	
39	Newton Gregory forward interpolation formula: Derivation	
40	Newton Gregory forward interpolation formula: Examples	
41	Newton Gregory forward interpolation formula: Error Calculation	
42	Newton Gregory backward interpolation formula: Derivation	
43	Newton Gregory backward interpolation formula: Examples	
44	Newton Gregory backward interpolation formula: Error Calculation	
45	**Unit-5**: Numerical Integration: Definition and examples	
46	Trapezoidal Rule: Derivation	
47	Trapezoidal Rule: Examples	
48	Simpson's $1/3^{rd}$ Rule: Derivation	
49	Simpson's $1/3^{rd}$ Rule: Examples	
50	Simpson's $3/8^{th}$ Rule: Derivation	
51	Simpson's $3/8^{th}$ Rule: Examples	
52	Boole's Rule : Derivation	
53	Boole's Rule: Examples	
54	Midpoint Rule: Derivation	
55	Midpoint Rule: Examples	
56	Midpoint Rule: Derivation	
57	Midpoint Rule: Examples	
58	Composite Trapezoidal Rule: Derivation and Examples	
59	Composite Simpson's Rule: Derivation and examples	
60	**Unit-6: ODE: Euler's Method: Derivation**	
61	Euler's method: Examples	
62	Euler's modified method: Derivation	
63	Euler's modified method: Examples	
64	Derivation of R.K. method of order two and four.	
65	Examples of R.K. method of order two and four.	
66	**Practical: MatLab programming, basic Data types**	Practical Class 2 hours.
67	Data types-simple data types, floating data types, character data types	
68	arithmetic operators and operator precedence, variables and constant declarations, expressions,	
69	input/output statement, relational operators, logical operators and logical expressions,	
70	control statements and loop statements, Arrays should be introduced to the students.	
71	MatLab programme for Calculate the sum 1/1 + 1/2 + 1/3 + 1/4 + ---------+ 1/N	
72	MatLab programme for To find the absolute value of an integer and Enter 100 integers into an array and sort them in an ascending order	
73	MatLab programme for Bisection Method	

74	MatLab programme for Newton Raphson Method	
75	MatLab programme for Secant Method	
76	MatLab programme for Regula Falsi Method	
77	MatLab programme for LU decomposition Method	
78	MatLab programme for Gauss-Jacobi Method	
79	MatLab programme for Gauss-Siedel Method	
80	MatLab programme for Newton Interpolation	
81	MatLab programme for Simpson's $1/3^{rd}$ Rule	
82	MatLab programme for Simpson's $3/8^{th}$ Rule	

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Department of Mathematics

Course Plan (Session January-May, 2022)

Name of the Teacher: Dr. Jatindra Lahkar

Course –Honours / Generic: Honours

Class/Semester: Six Semester

Name of the Paper: Hydro Mechanics: Paper DSE-3.1

Units Assigned: Complete Paper

Marks Assigned: Theory – 80.

Class	Topic/ Unit	Remarks
1	**Unit-1:** Kinematics introduction.	
2	Types of fluids and their properties.	
3	Velocity of a fluid at a point and examples.	
4	Eulerian and Lagrangian method, stream lines and path lines and examples.	
5	Steady and unsteady flows, velocity potential.	
6	Tutorial	
7	Rotational and irrotational motions, local and particle rate of change.	
8	Equation of continuity in cartesian form.	
9	Equation of continuity in vector form.	
10	Equation of continuity examples.	
11	Equation of continuity examples.	
12	Tutorial	
13	Acceleration of a fluid at a point and examples.	
14	General analysis of fluid motion	
15	**Unit-2: Equation of motion introduction**	
16	Euler's equation of motion in cartesian form	
17	Euler's equation of motion in vector form	
18	Tutorial	
19	Bernoullis equation and examples	
20	Steady motion under conservative forces,	
21	Impulsive motion.	
22	Circulation, Kelvin's circulation theorem.	
23	Examples on Circulation.	
24	Tutorial	
25	**Unit-3: General theory of irrotational motion introduction**	
26	Potential flow, deductions from Green's theorem.	
27	Kinetic energy of a liquid,	
28	Uniqueness theorems, Kelvin's minimum energy theorem,	
29	Mean value of velocity potential.	
30	Tutorial	

31	**Unit-4: Fluid pressure**. Introduction	
32	Definition and examples of Density and specific gravity.	
33	Theorems on fluid pressure under gravity.	
34	Rate of variation of pressure.	
35	Differential equation of pressure.	
36	Tutorial	
37	Condition of equilibrium of floating body.	
38	Equi-pressure surfaces and lines of force.	
39	Curves of equi-pressure.	
40	Curves of equi-density.	
41	Examples	
42	Tutorial	
43	**Unit-5: Resultant Pressure and Centre of Pressure**	
44	Definition of Resultant Pressure and Centre of Pressure.	
45	Determination of centre of pressure of parallelogram.	
46	Determination of centre of pressure of triangle.	
47	Determination of centre of pressure of circle.	
48	Tutorial	
49	Determination of centre of pressure of different examples.	
50	Thrust on curved surface.	
51	Example on thrust on curved surface.	
52	**Unit-6**: Equilibrium and Stability of Floating Bodies.	
53	Condition of equilibrium of floating bodies.	
54	Examples	
55	Stable, Unstable and Neutral equilibrium.	
56	Determination of Meta centre.	
57	Examples	
58	Tutorial	

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Course Plan (January 2022 to June 2022)

Name of the Teacher: Mukul Buragohain

Course-Honours/ Generic- Honours

Class/Semester- Sem-IV

Name of the Paper- C10 (Ring Theory & Linear Algebra-I)

Units Assigned- Unit-1 &2

Marks Assigned-35

Class	Topic/Unit	Remarks
1	**Unit-1:** Definition and examples of rings	
2	Solved Examples	
3	properties of rings	
4	subrings	
5	Subrings related theorem	
6	Subrings related theorem	
7	integral domain and theorems	
8	Fields and related theorems	
9	characteristic of a ring	
10	Ideal	
11	Ideal and its properties.	
12	ideal generated by a subset of a ring	
13	operations on ideals	
14	operations on ideals	
15	factor rings	
16	Theorems on factor rings	
17	prime and maximal ideals	
18	Theorems on prime ideals	
19	Theorems on maximal ideals	
20	Theorems on prime and maximal ideals	
21	**Unit-2:** Ring homomorphisms	
22	Examples of Ring homomorphisms	
23	Examples of Ring homomorphisms	
24	properties of ring homomorphisms	
25	properties of ring homomorphisms	
26	Solved problems on ring homomorphism	
27	Solved problems on ring homomorphism	
28	Solved problems on ring homomorphism	
29	Solved problems on ring homomorphism	
30	Isomorphism theorems I	
31	Isomorphism theorems I	
32	Isomorphism theorems II	
33	Isomorphism theorems II	
34	Isomorphism theorems III	

35	Isomorphism theorems III	
36	Solved Examples	
37	field of quotients	
38	Theorems on field of quotients	
39	Theorems on field of quotients	
40	Over all discussion on unit-2	

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Course Plan(January 2022 to June 2022)

Name of the Teacher: Mukul Buragohain

Course-Honours/ Generic- Generic

Class/Semester- Sem-IV

Name of the Paper- Algebra(GE4)

Units Assigned- Unit-1 &2

Marks Assigned- 56

Class	Topic/Unit	Remarks
1	**Unit-1:** Definition and examples of groups	
2	Basic Properties of groups	
3	Basic Properties of groups	
4	Order of an element and order of a group	
5	examples of abelian and non-abelian groups	
6	examples of abelian and non-abelian groups	
7	examples of abelian and non-abelian groups	
8	Theorems on abelian and non-abelian groups	
9	The group Zn of integers under addition modulo n	
10	Solved Examples related with addition modulo n	
11	Solved Examples related with addition modulo n	
12	the group U(n) of units under multiplication modulo n	
13	Solved Examples related with multiplication modulo n	
14	Solved Examples related with multiplication modulo n	
15	Cyclic groups from number systems	
16	Cyclic groups from number systems	
17	complex roots of unity	
18	complex roots of unity	
19	circle group	
20	the general linear group GLn(n,R)	
21	groups of symmetries of an isosceles triangle,	
22	groups of symmetries of an equilateral triangle,	
23	groups of symmetries of a rectangle	

24	groups of symmetries of a square	
25	the permutation group Sym (n)	
26	Solved examples	
27	Solved examples	
28	Solved examples	
29	Group of quaternions	
30	Group of quaternions	
31	**Unit-2:** Subgroups and examples	
32	examples of subgroups	
33	examples of subgroups including the center of a group.	
34	Theorems on subgroups	
35	Theorems on subgroups	
36	Theorems on subgroups	
37	cyclic subgroups	
38	Theorem on cyclic subgroups	
39	Theorem on cyclic subgroups	
40	Theorem on cyclic subgroups	
41	the concept of a subgroup generated by a subset	
42	the commutator subgroup of group	
43	Properties of the commutator subgroup of group	
44	Properties of the commutator subgroup of group	
45	Theorems on commutator subgroup of group	
46	Theorems on commutator subgroup of group	
47	Cosets	
48	Theorems on Cosets	
49	Theorems on Cosets	
50	Index of subgroup	
51	Lagrange's theorem	
52	order of an element of a group	
53	Theorems on order of an element of a group	
54	Theorems on order of an element of a group	
55	Normal subgroups and its examples and characterizations	
56	Theorems on Normal subgroups	
57	Theorems on Normal subgroups	
58	Quotient groups	
59	Theorems on Quotient groups	
60	Theorems on Quotient groups	

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Course Plan (January 2022 to June 2022)

Name of the Teacher: Mukul Buragohain

Course-Honours/ Generic- Honours

Class/Semester-B.Com 4th Sem

Name of the Paper- Business Mathematics

Units Assigned- Unit-1

Marks Assigned- Marks not Assigned in the syllabus

Class	Topic/Unit	Remarks
1	**Unit-1:** Introduction to Matrix	
2	Algebra of Matrices	
3	Inverse of a Matrix	
4	Solved examples	
5	Matrix operations- Business application	
6	Tutorial	
7	Solution of system of linear equations by matrix inversion method having unique solution , involving two variables	
8	Solution of system of linear equations by matrix inversion method having unique solution , involving three variables	
9	Solution of system of linear equations by Cramer's Rule having unique solution , involving two variables	
10	Solution of system of linear equations by Cramer's Rule having unique solution , involving three variables	

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Course Plan(January 2022 to June 2022)

Name of the Teacher: Mukul Buragohain
Course-Honours
Class/Semester- VI
Name of the Paper- Ring theory and Linear Algebra-II
Units Assigned- Unit :1,2,3
Marks Assigned-80

Class	Topic/Unit	Remarks
1	**Unit-1** Polynomial rings	
2	Polynomial rings over commutative rings	
3	division algorithm and consequences	
4	principal ideal domains	
5	principal ideal domains	
6	Tutorial	
7	factorization of polynomials	
8	factorization of polynomials	
9	reducibility tests	
10	reducibility tests	
11	Solved problems on reducibility tests	
12	Tutorial	
13	irreducibility tests	
14	irreducibility tests,	
15	Problems on irreducibility tests	
16	Problems on irreducibility tests	
17	Problems on irreducibility tests	
18	Tutorial	
19	Eisenstein criterion	
20	unique factorization in Z[x].	
21	unique factorization in Z[x].	
22	Divisibility in integral domains	
23	Divisibility in integral domains	
24	Tutorial	
25	irreducibles	
26	primes	
27	unique factorization domains	
28	unique factorization domains	
29	Euclidean domains	
30	Tutorial	
31	**Unit-2:** Dual spaces	
32	dual basis	
33	Examples of dual basis and dual space	
34	double dual	
35	Problems on double dual	
36	Tutorial	
37	transpose of a linear transformation	

38	transpose of a linear transformation and its matrix in the dual basis,	
39	Tutorial	
40	Problems on transpose of a linear transformation and its matrix in the dual basis	
41	annihilators	
42	Tutorial	
43	Problems on annihilators	
44	Eigen spaces of a linear operator	
45	diagonalizability	
46	Problems on diagonalizability	
47	Tutorial	
48	invariant subspaces	
49	Cayley-Hamilton theorem	
50	Application of Cayley-Hamilton theorem	
51	the minimal polynomial for a linear operator	
52	Problems on the minimal polynomial for a linear operator	
53	Problems on the minimal polynomial for a linear operator	
54	Problems on the minimal polynomial for a linear operator	
55	Tutorial	
56	**Unit-3** Inner product spaces,	
57	Inner product spaces and norms,	
58	Theorems on Inner product spaces and norms	
59	Theorems on Inner product spaces and norms	
60	Tutorial	
61	Gram-Schmidt orthogonalisation process	
62	Gram-Schmidt orthogonalisation process	
63	Application of Gram-Schmidt orthogonalisation process	
64	Application of Gram-Schmidt orthogonalisation process	
65	Tutorial	
66	orthogonal complements	
67	Bessel’s inequality	
68	the adjoint of a linear operator	
69	Least Squares Approximation	
70	Least Squares Approximation	
71	Tutorial	
72	minimal solutions to systems of linear equations	
73	Problems on minimal solutions to systems of linear equations	
74	Normal and self-adjoint operators	
75	Normal and self-adjoint operators	
76	Orthogonal projections	
77	Tutorial	
78	Spectral theorem	

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Course Plan

Name of the Teacher- **Dr. Binod Chetry**

Course– B.Sc. Honours

Class/Semester- Semester II

Name of the Paper- GE-2.1 Differential Equation

Units Assigned- Unit 1, Unit 2 & Unit 3

Marks Assigned- 52

Class	Topic/ Unit	Remarks
1.	Introduction to exact differential equations	
2.	First order exact differential equations	
3.	Introduction to Integrating factors	
4.	Rules to find an integrating factor	
5.	Tutorial and discussion of problems	
6.	First order higher degree equations solvable for x	
7.	First order higher degree equations solvable for y	
8.	First order higher degree equations solvable for p	
9.	Tutorial and discussion of problems	
10.	Methods for solving higher-order differential equations	
11.	Basic theory of linear differential equations	
12.	Wronskian and its properties	
13.	Tutorial and discussion of problems	
14.	Solving a differential equation by reducing its order	
15.	Examples and problems on differential equation by reducing its order	
16.	Linear homogenous equations with constant coefficients	
17.	Linear non-homogenous equations	
18.	Tutorial and discussion of problems	
19.	The method of variation of parameters	
20.	The Cauchy-Euler equation	
21.	Tutorial and discussion of problems	
22.	Simultaneous differential equations	
23.	Total differential equations	
24.	Tutorial and discussion of problems	
25.	Revision	

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Course Plan

Name of the Teacher- Dr. Binod Chetry

Course– B.Com. Honours

Class/Semester- Semester IV

Name of the Paper- C-409 Business Mathematics

Units Assigned- Unit 3 & Unit 4(shared)

Marks Assigned- NA

Class	Topic/ Unit	Remarks
1.	Introduction to Partial differentiation	Unit 3
2.	Examples and problems on Partial differentiation	
3.	Partial derivatives up to second order	
4.	Examples and problems on second order partial derivative	
5.	Homogeneity of functions	
6.	Examples and problems on Homogeneity of functions	
7.	Euler's theorem	
8.	Examples and problems on Euler's theorem	
9.	Total differentials	
10.	Examples and problems on total differentials	
11.	Differentiation of implicit functions with the help of total differentials	
12.	Examples and problems on implicit functions	
13.	Introduction of maxima and minima	
14.	Examples and problems on maxima and minima	
15.	Maxima and minima of two variables involving not more than one constraints	
16.	Maxima and minima of two variables involving not more than one constraints using Lagrange multipliers	
17.	Tutorials and discussion	
18.	Rates of interest nominal	Unit 4
19.	Effective and their inter-relationships in different compounding situations	
20.	Examples and problems	
21.	Compounding and discounting of a sum using different types of rates	
22.	Examples and problems	
23.	Types of annuities like ordinary	
24.	Due, deferred, continuous, perpetual and their future	
25.	Due, deferred, continuous, perpetual and present values using different types of rates of interest	
26.	Depreciation of assets	
27.	Examples and problems	

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Course Plan

Name of the Teacher- Dr. Binod Chetry

Course– B.Sc. Honours
Class/Semester- Semester IV
Name of the Paper- C 9 Riemann Integration and Series of Functions
Units Assigned- Unit 1,2,3, 4 & 5 (all units)
Marks Assigned- 80

Class	Topic/ Unit	Remarks
1.	Introduction to Riemann integration	
2.	Examples and problems of Riemann integration	
3.	Inequalities of upper and lower sums	
4.	Examples and problems of inequalities of upper and lower sums	
5.	Riemann conditions of integrability	
6.	Riemann sum	
7.	Definition of Riemann integral through Riemann sums	
8.	Equivalence of two definitions	
9.	Tutorial and discussion	
10.	Riemann integrability of monotone and continuous functions	
11.	Examples and problems on Riemann integrability of monotone and continuous functions	
12.	Properties of the Riemann integral	
13.	Tutorial and discussion	
14.	Definition and integrability of piecewise continuous functions	
15.	Definition and integrability of piecewise continuous functions and monotone	
16.	Examples of piecewise continuous functions	
17.	Examples of piecewise continuous and monotone functions	
18.	Problems on piecewise continuous functions	
19.	Problems on piecewise continuous and monotone functions	
20.	Tutorial and discussion	
21.	Intermediate Value theorem for Integrals	
22.	Examples of Intermediate Value theorem for Integrals	
23.	Problems on Intermediate Value theorem for Integrals	
24.	Fundamental theorems of Calculus	
25.	Examples of Fundamental theorems of Calculus	
26.	Problems on Fundamental theorems of Calculus	
27.	Tutorial and discussion	
28.	Revision of Riemann condition of Integrability	
29.	Some more problem on Riemann sums	
30.	Tutorial and discussion	
31.	Introduction of Improper integrals	
32.	Properties and examples of Improper integrals	
33.	Introduction of Beta and Gamma functions	
34.	Convergence of Beta and Gamma functions	

35.	Tutorial and discussion	
36.	Introduction to Pointwise and uniform convergence of sequence of functions	
37.	Examples and properties of Pointwise and uniform convergence of sequence of functions	
38.	Problems on Pointwise and uniform convergence of sequence of functions	
39.	Theorems on continuity of the limit function of a sequence of functions	
40.	Examples and problems on continuity of the limit function of a sequence of functions	
41.	Theorems on derivability of the limit function of a sequence of functions	
42.	Examples and problems on derivability of the limit function of a sequence of functions	
43.	Theorems on integrability of the limit function of a sequence of functions	
44.	Examples and problems on integrability of the limit function of a sequence of functions	
45.	Tutorial and discussion	
46.	Series of functions	
47.	Theorems on the continuity of the sum function of a series of functions	
48.	Examples and problems on the continuity of the sum function of a series of functions	
49.	Theorems on the derivability of the sum function of a series of functions	
50.	Examples and problems on the derivability of the sum function of a series of functions	
51.	Cauchy criterion for uniform convergence	
52.	Examples and problems on Cauchy criterion for uniform convergence	
53.	Weierstrass M-Test	
54.	Examples and problems on Weierstrass M-Test	
55.	Tutorial and discussion	
56.	Introduction to Limit superior and Limit inferior	
57.	Examples and problems on Limit superior and Limit inferior	
58.	Power series	
59.	Properties of power series	
60.	Examples and problems on Power series	
61.	Radius of convergence	
62.	Examples and problems on radius of convergence	
63.	Tutorial and discussion	
64.	Cauchy Hadamard Theorem	
65.	Examples and problems on Cauchy Hadamard Theorem	
66.	Differentiation and integration of power series	
67.	Examples and problems on Differentiation and integration of power series	
68.	Abel's Theorem	
69.	Examples and problems on Abel's Theorem	
70.	Weierstrass Approximation Theorem	
71.	Examples and problems on Weierstrass Approximation Theorem	

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Course Plan

Name of the Teacher- Dr. Binod Chetry

Course– B.Sc. Honours

Class/Semester- Semester VI

Name of the Paper- DSE 4.1 Mathematical Methods

Units Assigned- Unit 1,2,3, 4 & 5(all units)

Marks Assigned- 80

Class	Topic/ Unit	Remarks
1.	Introduction to Fourier Series	
2.	Examples and properties of Fourier Series	
3.	Problems on Fourier Series	
4.	Dirichlet conditions	
5.	Examples and problems using Dirichlet conditions	
6.	Tutorial and discussion	
7.	Fourier series for even functions	
8.	Examples and problems on Fourier series for even functions	
9.	Fourier series for odd functions	
10.	Examples and problems on Fourier series for odd functions	
11.	Tutorial and discussion	
12.	Introduction to Half range Fourier series	
13.	Half range Fourier series for even and odd function	
14.	Examples and problems on Half range Fourier series	
15.	Tutorial and discussion	
16.	**Laplace Transform**: Definition of Laplace transform	
17.	Existence theorem for Laplace transform	
18.	Linearity property of Laplace transform	
19.	Laplace transform of some elementary functions. (algebraic functions, trigonometric functions, exponential functions, hyperbolic functions).	
20.	First Shifting theorem	
21.	Second shifting theorem	
22.	Change of scale property	
23.	Laplace transform of derivatives	
24.	Laplace transform of Integrals	
25.	Examples and Problem discussion	
26.	Introduction to Inverse Laplace Transform	
27.	Definition of Inverse Laplace Transform	
28.	Examples and problems on Inverse Laplace Transform	
29.	Properties of Inverse Laplace Transform	
30.	First shifting theorem	
31.	Examples and problems of first shifting theorem	
32.	Second shifting theorem	

33.	Examples and Problems on second shifting theorems	
34.	Tutorial and discussion	
35.	Some more problems on first and second shifting theorem	
36.	Convolution theorem	
37.	Examples and problems on Convolution theorem	
38.	Revision of Change of scale property, Linearity property etc	
39.	Problem discussion on Change of scale property, Linearity property etc	
40.	Tutorial and discussion	
41.	Introduction to Fourier Transform, and Inverse Fourier transform	
42.	Dirichlet conditions	
43.	Definition of Fourier transform	
44.	Tutorial and discussion	
45.	Inverse theorem for Fourier transform	
46.	Fourier Sine transform and inversion formula	
47.	Fourier cosine transform and inversion formula	
48.	Tutorial and discussion	
49.	Linearity property	
50.	Change of scale property	
51.	Shifting property	
52.	Modulation theorem	
53.	Convolution theorem	
54.	Tutorial and discussion	
55.	Applications of Fourier and Laplace transform	
56.	Solution of Boundary value problems and initial value problems in 1-D case	
57.	Solution of Boundary value problems and initial value problems in 2-D case	
58.	Solution of Laplace equation in 2-D case	
59.	Solution of Poisson equation in 2-D case	
60.	Tutorial and discussion	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Arjun Singh Chetry

Course– B.Sc. Honours

Class/Semester- Semester II

Name of the Paper- C3. Real Analysis

Units Assigned- Unit 1,2,3 (all units)

Marks Assigned- 80

Class	Topic/ Unit	Remarks
1.	Overview of the Course and the Paper (Real Analysis)	
2.	Review of Algebraic and Order Properties of $\mathbb{R}$	
3.	Order Properties of $\mathbb{R}$	
4.	ϵ-neighborhood of a point in $\mathbb{R}$	
5.	Idea of countable sets, uncountable sets	
6.	uncountability of $\mathbb{R}$	
7.	De Moivre's theorem for rational indices (with Proof)	
8.	Bounded above sets, Bounded below sets	
9.	Application of De Moivre's theorem (simplifying trigonometric identities)	
10.	Bounded Sets, Unbounded sets	
11.	Tutorial-I	
12.	Suprema and Infima	
13.	The Completeness Property of R,	
14.	Functions (in context with relations)	
15.	The Archimedean Property	
16.	Tutorial-II	
17.	Density of Rational (and Irrational) numbers in R	
18.	Intervals	
19.	Limit points of a set	
20.	Isolated points	
21.	One to one correspondence and cardinality of a set	
22.	Illustrations of Bolzano-Weierstrass theorem for sets	
23.	Tutorial III	
24.	Sequences and Bounded sequence	
25.	Convergent sequence	
26.	Limit of a sequence	
27.	Limit Theorems	
28.	Tutorial IV	
29.	Examples and Problems	
30.	Monotone Sequences	
31.	Monotone Convergence Theorem	

32.	Tutorial-V	
33.	Subsequences	
34.	Divergence Criteria	
35.	Monotone Subsequence Theorem (statement only)	
36.	Problems related to Monotone Subsequence Theorem	
37.	Bolzano Weierstrass Theorem for Sequences	
38.	Cauchy sequence	
39.	Cauchy's Convergence Criterion	
40.	Tutorial-VI	
41.	Infinite series	
42.	Convergence and divergence of infinite series-I	
43.	Convergence and divergence of infinite series-II	
44.	Cauchy Criterion-I	
45.	Cauchy Criterion-II(Problems)	
46.	Tests for convergence- Convergence Test	
47.	Comparison Test(contd.)	
48.	Limit Comparison test-I	
49.	Limit Comparison test-II	
50.	Ratio Test-I	
51.	Ratio Test-II	
52.	Cauchy's n^{th} root test-I	
53.	Cauchy's n^{th} root test-II	
54.	Integral test-I	
55.	Integral test-II	
56.	Alternating series-I	
57.	Alternating series-II	
58.	Leibniz test-I	
59.	Leibniz test-II	
60.	Absolute and Conditional convergence-I	
61.	Absolute and Conditional convergence-II	
62.	Revision (remaining classes)	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Arjun Singh Chetry

Course– B.Sc. Honours

Class/Semester- Semester II

Name of the Paper- GE-2.1 Differential Equation

Units Assigned- Unit 4 & Unit 5

Marks Assigned- 28

Class	Topic/ Unit	Remarks
1.	Order and degree of partial differential equations	
2.	Concept of linear and non-linear partial differential equations	
3.	Formation of first order partial differential equations	
4.	Linear partial differential equation of first order	
5.	Tutorial-I	
6.	Lagrange's method-I	
7.	Lagrange's method-II	
8.	Lagrange's method-III	
9.	Lagrange's method-IV	
10.	Tutorial-II	
11.	Charpit's method-I	
12.	Charpit's method-II	
13.	Charpit's method-III	
14.	Charpit's method-IV	
15.	Tutorial-III	
16.	Classification of second order partial differential equations into elliptic through illustrations only	
17.	Classification of second order partial differential equations into parabolic through illustrations only	
18.	Classification of second order partial differential equations into hyperbolic through illustrations only	
19.	Revision	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Arjun Singh Chetry

Course– B.Com. Honours

Class/Semester- Semester IV

Name of the Paper- C-409 Business Mathematics

Units Assigned- Unit 2 & Unit 5(shared)

Marks Assigned- NA

Class	Topic/ Unit	Remarks
1.	Introduction to Functions	Unit 2
2.	Types of Functions- Linear	
3.	Types of Functions- Quadratic	
4.	Types of Functions- Polynomial	
5.	Types of Functions- Exponential	
6.	Types of Functions- Logarithmic	
7.	Concepts of limits	
8.	Continuity of function	
9.	Concept of Differentiation	
10.	Rules of Differentiation	
11.	Maxima and Minima involving second order derivatives-I	
12.	Maxima and Minima involving second order derivatives-II	
13.	Maxima and Minima involving higher order derivatives-II	
14.	Maxima and Minima involving higher order derivatives-II	
15.	Tutorial-I	
16.	Concept of Marginal Analysis	
17.	Concept of Elasticity	
18.	Applied Maximum and Minimum Problems	
19.	Maximum and Minimum Problems's effect of Tax on Monopolist's optimum price and quantity	
20.	Economic Order Quantity	
21.	Tutorial-II	
22.	Formulation of LPP	Unit 5
23.	Graphical Solution to LPP	
24.	Cases of Unique optimal solutions	
25.	Cases of multiple solutions	
26.	Unbounded solutions	
27.	Infeasibility	
28.	Redundant Constraints	
29.	Tutorial-III	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Arjun Singh Chetry

Course– B.Sc. Honours

Class/Semester- Semester VI

Name of the Paper- C13 Metric Spaces and Complex Analysis

Units Assigned- Unit 1, 2, 3, 4, 5, 6(All units)

Marks Assigned- 80

Class	Topic/ Unit	Remarks
1.	Overview of the Course and the Paper	
2.	Metric spaces: definition and examples	
3.	Metric spaces (Problems)	
4.	Sequences in metric spaces-I	
5.	Sequences in metric spaces-II	
6.	Cauchy sequences	
7.	Tutorial-I	
8.	Complete Metric Spaces-I	
9.	Complete Metric Spaces-II	
10.	Open and closed balls-I	
11.	Open and closed balls-II	
12.	Neighbourhood	
13.	Open set	
14.	Interior of a set	
15.	Limit point of a set	
16.	Tutorial-II	
17.	Closed set	
18.	Diameter of a set	
19.	Cantor's theorem	
20.	Subspaces	
21.	Dense sets, separable spaces	
22.	Continuous mappings	
23.	Sequential criterion and other characterizations of continuity.	
24.	Uniform continuity	
25.	Tutorial-III	
26.	Homeomorphism	
27.	More examples of Homeomorphism	
28.	Contraction mappings-I	
29.	Contraction mappings-II	
30.	Compactness	
31.	Compactness-II	
32.	Tutorial-IV	
33.	Banach Fixed point Theorem	

34.	Connectedness	
35.	Connected subsets of R	
36.	Limits	
37.	Limits involving the point at infinity-I	
38.	Limits involving the point at infinity-II	
39.	Continuity	
40.	Tutorial-V	
41.	Properties of complex numbers	
42.	Regions in the complex plane	
43.	Functions of complex variable	
44.	Mappings	
45.	Tutorial-VI	
46.	Derivatives	
47.	Differentiation formulas	
48.	Differentiation formulas-II	
49.	Cauchy-Riemann equations, sufficient conditions for Differentiability	
50.	Tutorial-VII	
51.	Analytic functions	
52.	Examples of analytic functions	
53.	Exponential function	
54.	Logarithmic function	
55.	Trigonometric function	
56.	Tutorial-VIII	
57.	Derivatives of functions	
58.	Definite integrals of functions	
59.	Tutorial-IX	
59.	Contours	
60.	Contour integrals and its examples	
61.	Upper bounds for moduli of contour integrals	
62.	Tutorial-X	
62.	Cauchy- Goursat theorem	
63.	Cauchy integralformula	
64.	Tutorial-XI	
65.	Liouville's theorem	
66.	Liouville's theorem and the fundamental theorem of algebra	
67.	Tutorial-XII	
68.	Convergence of sequences	
69.	Convergence of series	
70.	Taylor series and its examples	
71.	Tutorial-XIII	
72.	Laurent series	
73.	Laurent series and its examples	
74.	Tutorial-XIV	
75.	Absolute convergence of power series	
76.	Uniform convergence of power series	
77.	Tutorial-XV	
78.	Revision	

DIGBOI COLLEGE, DIGBOI

COURSE PLAN

SESSION: 2022

Name of Teacher: Bisti Ram Narzary

Course : Honours/Generic – Honours

Class/Semester : 1st Semester (H)

Paper Code : C1, Name of the paper-- Indian Philosophy

Unit Assigned : Full Paper

Marks Assigned : 80

Class	Topic/Unit	Remarks
1	Introduction to Indian philosophy	Explanations
2	Introduction to Indian philosophy	Notes
3	Common Features of Indian philosophical Schools	Explanations & Notes
4	The Upanisads doctrine of Self	Explanations & Notes
5	The Upanisads Critique of Rituals	Explanations & Notes
6	Carvaka Metaphysics	Explanations & Notes
7	Carvaka Epistemology	Explanations & Notes
8	Carvaka Epistemology	Notes
9	Early Buddhism	Explanations & Notes
10	Four noble Truths	Explanations & Notes
11	Doctrine of Dependent Origination (Pratityasamudpada)	Explanations & Notes
12	Anekantavada of Jainism	Explanations & Notes
13	Syadvada of Jainism	Explanations & Notes
14	Nyaya theory of the nature of Knowledge	Explanations & Notes
15	Vaisesika theory of the nature of Knowledge	Explanations & Notes
16	Mimamsa theory of the nature of Knowledge	Explanations & Notes
17	Samkhya theory of Prakriti	Explanations & Notes
18	Samkhya theory of Purusa	Explanations & Notes
19	Samkhya theory of Evolution	Explanations & Notes
20	Asatkaryavada and asatkaryavada Debate	Explanations & Notes
21	Advaita Vedanta of Sankara	Explanations & Notes
22	Nature of Brahman (Sankara)	Explanations & Notes
23	Nature of Maya (Sankara)	Explanations & Notes
24	Visistadvaita of Ramanuja	Explanations & Notes
25	Nature of Brahman (Ramanuja)	Explanations & Notes
26	Refutation of Maya (Ramanuja)	Explanations & Notes
		Explanations & Notes

DIGBOI COLLEGE, DIGBOI
COURSE PLAN

Name of Teacher: Bisti Ram Narzary
Course : Honours/Generic – Honours
Class/Semester : 2nd Semester (H)
Paper Code : C 3, Name of the paper—Ancient Greek Philosophy
Unit Assigned : Full Paper
Marks Assigned : 80

Class	Topic/Unit	Remarks
1	Pre- Socratic Philosophy	Explanations & notes
2	Thales: First Principle	Explanations & Notes
3	Pythagoras: Number theory	Explanations & Notes
4	Democritus: Atomism	Explanations & Notes
5	Heraclitus: Doctrine of Flux and Logos	Explanations & Notes
6	Parmenides: Nature of Being	Explanations & Notes
7	Sophist: Protagoras (Man is the measure of all things)	Explanations & Notes
8	Socrates: Virtue is Knowledge	Explanations & Notes
9	Plato's theory of Knowledge	Explanations & Notes
10	Plato's theory of Ideas	Explanations
11	Plato's theory of the Immortality of the Soul	Explanations & Notes
12	Aristotle's Concept of Cause	Explanations & Notes
13	Form and Matter- Aristotle	Explanations
14	Aristotle's criticism of Plato's theory of Ideas	Explanations & Notes

DIGBOI COLLEGE, DIGBOI
COURSE PLAN

Name of Teacher: Bisti Ram Narzary
Course : Honours/Generic – Honours
Class/Semester : 3rd Semester (H)
Paper Code : C7, Name of the paper—Western Ethics
Unit Assigned : Full Paper
Marks Assigned : 80

Class	Topic/Unit	Remarks
1	Nature of Ethics	Explanations
2	Scope of Ethics	Notes
3	Utility of the study of Ethics	Explanations & Notes
4	Moral Concept of Good	Explanations & Notes
5	Moral Concept of Ought	Explanations & Notes
6	Moral Concept of Right	Explanations & Notes
7	Moral and Non-Moral Action	Explanations & Notes
8	Voluntary Action: its Stages	Explanations & Notes
9	Characteristics of Moral Consciousness	Explanations & Notes
10	Elements of Moral consciousness	Explanations & Notes
11	Nature of Moral Judgement	Explanations & Notes
12	Object of Moral Judgement	Explanations & Notes
13	Postulates of Morality	Explanations & Notes
14	Virtue Ethics of Aristotle	Explanations & Notes
15	Teleological Ethics: Egoism and Altruism	Explanations & Notes
16	Deontological Ethics of Kant	Explanations & Notes
17	Duty and Conflict of Duties	Explanations & Notes
18	Crime and Punishment	Explanations & Notes
19	Preventive theory of Punishment	Explanations & Notes
20	Reformative theory of Punishment	Explanations & Notes
21	Retributive theory of Punishment	Explanations & Notes
22	Capital Punishment	Explanations & Notes
23	Euthanasia	Explanations & Notes

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COURSE PLAN

Name of Teacher: Bisti Ram Narzary

Course : Honours/Generic – Honours

Class/Semester :4th Semester (H)

Paper Code : C10, Name of the paper—PHILOSOPHY OF RELIGION

Unit Assigned : Full Paper

Marks Assigned : 80

Class	Topic/Unit	Remarks
1	Nature of the Philosophy of Religion	Explanations
2	Scope of the Philosophy of Religion	Notes
3	Religion and Science	Explanations & Notes
4	Religious Faith	Explanations & Notes
5	religious Belief and Reason	Explanations & Notes
6	Mysticism	Explanations & Notes
7	Nature of Religious Consciousness	Explanations & Notes
8	Elements of Religious Consciousness	Explanations & Notes
9	Anthropological theory of the origin of Religion	Explanations & Notes
10	Psychological theories of the origin of Religion	Explanations & Notes
11	Devine Determinism	Explanations & Notes
12	Human Freedom	Explanations & Notes
13	Proofs for the existence of God--	Explanations & Notes
14	Cosmological Argument	Explanations & Notes
15	Ontological Argument	Explanations & Notes
16	Teleological Argument	Explanations & Notes
17	Moral Argument	Explanations & Notes
18	Problem of Evil	Explanations & Notes
19	Metaphysical arguments of the Immortality of Soul	Explanations & Notes
20	Religious Arguments of the Immortality of Soul	Explanations & Notes
21	Anti theistic Trends:----	Explanations & Notes
22	Positivism	Explanations & Notes
23	Materialism	Explanations & Notes
24	Marxism	Explanations & Notes

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COURSE PLAN

Name of Teacher: Bisti Ram Narzary

Course : Honours/Generic – Honours

Class/Semester : 4th Semester (Generic)

Paper Code : GE4, Name of the paper—Applied Ethics

Unit Assigned : Unit-IV & II

Marks Assigned : 25

Class	Topic/Unit	Remarks
1	Introduction to Professional Ethics	Explanations
2	Medical Ethics	Explanations& Notes
3	Euthanasia	Explanations & Notes
4	Abortion	Explanations & Notes
5	Doctor-Patient Relation	Explanations & Notes
6	Media Ethics: Privacy	Explanations & Notes
7	Problem of Yellow Journalism	Explanations & Notes
8	Ethical issues in Cyber Space	Explanations & Notes
9	Capital Punishment	Explanations & Notes
10		Explanations & Notes

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COURSE PLAN

Name of Teacher: Bisti Ram Narzary

Course : Honours/Generic – Honours

Class/Semester : 5th Semester (H)

Paper Code : C12, Name of the paper—Existentialism and Phenomenology

Unit Assigned : Unit-I & Unit IV

Marks Assigned : 28

Class	Topic/Unit	Remarks
1	Nature of Phenomenology	Explanations
2	Important features of Phenomenology	Explanations & Notes
3	Main approaches of Phenomenology	Explanations & Notes
4	Salient features of Existentialism	Explanations & Notes
5	Theistic and Atheistic Existentialism	Explanations & Notes
6	Existence and Essence (J.P Sartre)	Explanations & Notes
7	Human Freedom (Sartre)	Explanations & Notes
8	Humanism (Sartre)	Explanations & Notes
9		Explanations & Notes

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COURSE PLAN

Name of Teacher: Bisti Ram Narzary
Course : Honours/Generic – Honours
Class/Semester : 5th Semester (H)
Paper Code : DSE-2, Name of the paper: Meta-Ethics
Unit Assigned : Full Paper
Marks Assigned : 80

Class	Topic/Unit	Remarks
1	Introduction of Meta-Ethics	Explanations
2	Nature of Meta Ethics	Notes
3	Scope of Meta-Ethics	Explanations & Notes
4	G.E Moore's Concept of Good	Explanations & Notes
5	Naturalistic Fallacy	Explanations & Notes
6	Emotivism of A.J Ayer	Explanations & Notes
7	Emotivism of C.L Stevension	Explanations & Notes
8	Prescriptivism of R.M Hare	Explanations & Notes
9		Explanations & Notes
10		Explanations & Notes

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COURSE PLAN

Name of Teacher: Bisti Ram Narzary

Course : Honours/Generic – Honours

Class/Semester : 6th Semester (H)

Paper Code : C13, Name of the paper—Comparative Religion

Unit Assigned : Full Paper

Marks Assigned : 80

Class	Topic/Unit	Remarks
1	Nature of Comparative Religion	Explanations
2	Objective of Comparative Religion	Notes
3	Values of Comparative Religion	Explanations & Notes
4	Acquaintance with Hinduism	Explanations & Notes
5	Buddhism	Explanations & Notes
6	Jainism	Explanations & Notes
7	Christianity	Explanations & Notes
8	Islam	Explanations & Notes
9	Jainism	Explanations & Notes
10	Sikhism	Explanations & Notes
11	Zoroastrianism	Explanations & Notes
12	Principal sects of Hinduism; Saivism	Explanations & Notes
13	Saktism	Explanations & Notes
14	Vaisnavism	Explanations & Notes
15	Neo-Vaisnavism of Snkardeva and Madhabdeva	Explanations & Notes
16	Judaism, Christianity and Islam (Comparison on the basis of God, World, Self and Human Ddestiny)	Explanations & Notes
17	Secularism	Explanations & Notes
18	Religious understanding	Explanations & Notes
19	Fanaticism	Explanations & Notes
20	Possibility of Universal Religionn	Explanations & Notes

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COURSE PLAN

Name of Teacher: Bisti Ram Narzary

Course : Honours/Generic – Honours

Class/Semester : 6th Semester (H)

Paper Code : C14, Name of the paper—Analytic Philosophy

Unit Assigned : Unit-III & IV

Marks Assigned : 28

Class	Topic/Unit	Remarks
1	Refutation of Idealism (G.E Moore)	Explanations
2	Neo-Realism (G.E Moore)	Notes
3	Problem of sense data (G.E Moore)	Explanations & Notes
4	A.J Ayer's Elimination of Metaphysics	Explanations & Notes
5	Picture theory of Wittgenstein	Explanations & Notes
6	Language game of Wittgenstein	Explanations & Notes
7		Explanations & Notes

COURSE PLAN (2021-2022)

DIGBOI COLLEGE, DIGBOI

Name of the teacher- Dr. Reepa Sarmah

Course- Honours / Generic- Honours

Class/semester – 2nd semester

Name of the Paper – Indian Logic (C 4)

Units Assigned – Full (4 units)

Marks Assigned – 80

Class	Topic/Unit	Remarks
1	Nature of Indian Logic	Explain
2	Nature of Indian Logic	Explain
3	Nature of Indian Logic	Explain &Provided Notes
4	Development of Indian Logic	Explain &Provided Notes
5	Development of Indian Logic	Explain
6	Development of Indian Logic	Explain
7	Development of Indian Logic	Explain
8	Indian Logic and Epistemology	Explain
9	Indian Logic and Epistemology	Explain
10	Indian Logic and Epistemology	Explain &Provided Notes
11	Classification of Knowledge by Nyaya	Explain
12	Classification of Knowledge by Nyaya	Explain
13	Prama	Explain
14	Prama	Explain
15	Prama	Explain
16	Prama	Explain &Provided Notes
17	Aprama	Explain
18	Apram	Explain
19	Apram	Explain &Provided Notes
20	Pramanas as the Karana of Prama	Explain
21	Pramanas as the Karana of Prama	Explain
22	Pramanas as the Karana of Prama	Explain &Provided Notes
23	Characteristics of Pramanas	Explain
24	Characteristics of Pramanas	Explain
25	Characteristics of Pramanas	Explain &Provided Notes
26	Kinds of Pramanas	Explain
27	Kinds of Pramanas	Explain
28	Kinds of Pramanas	Explain &Provided Notes
29	Nyaya pratyaksa	Explain
30	Nyaya pratyaksa	Explain

31	Nyaya pratyaksa	Explain &Provided Notes
32	Mimamsa Pratyaksa	Explain
33	Mimamsa Pratyaksa	Explain
34	Mimamsa Pratyaksa	Explain &Provided Notes
35	Definition of Anumana	Explain
36	Definition of Anumana	Explain &Provided Notes
37	Constituents of Anumana	Explain
38	Constituents of Anumana	Explain
39	Constituents of Anumana	Explain
40	Constituents of Anumana	Explain &Provided Notes
41	Kinds of Anumana	Explain
42	Kinds of Anumana	Explain
43	Kinds of Anumana	Explain &Provided Notes
44	Paksata	Explain
45	Paksata	Explain
46	Paksata	Explain &Provided Notes
47	Vyapti	Explain
48	Vyapti	Explain &Provided Notes
49	Ascertainment of Vyapti	Explain
50	Ascertainment of Vyapti	Explain
51	Ascertainment of Vyapti	Explain &Provided Notes
52	Types of Vyapti	Explain
53	Types of Vyapti	Explain
54	Types of Vyapti	Explain &Provided Notes
55	Marks of Valid Reason	Explain
56	Nyaya Hetabhasa	Explain
57	Nyaya Hetabhasa	Explain &Provided Notes
58	Nyaya Hetabhasa	Explain
59	Nyaya Hetabhasa	Explain
60	Nyaya Hetabhasa	Explain
61	Nyaya Hetabhasa	Explain

COURSE PLAN (2021-2022)

DIGBOI COLLEGE, DIGBOI

Name of the teacher- Dr. Reepa Sarmah

Course- Honours / Generic- Honours

Class/semester – 4 th semester

Name of the Paper – SOCIAL AND POLITICAL PHILOSOPHY (C 9)

Units Assigned – Full (4 units)

Marks Assigned – 80

Class	Topic/Unit	Remarks
1	Nature of Social Philosophy	Explain
2	Nature of Social Philosophy	Explain &Provided Notes
3	Scope of Social Philosophy	Explain
4	Scope of Social Philosophy	Explain &Provided Notes
5	Concept of Individual	Explain
6	Concept of Individual	Explain &Provided Notes
7	Concept of Society	Explain &Provided Notes
8	Concept of Community	Explain &Provided Notes
9	Concept of Association	Explain &Provided Notes
10	Concept of I institution	Explain &Provided Notes
11	Theories of relation –Individual and Society	Explain
12	Theories of relation –Individual and Society	Explain
13	Theories of relation –Individual and Society	Explain &Provided Notes
14	Nature of Family	Explain
15	Kinds of Family	Explain &Provided Notes
16	Role of Family in the Society	Explain &Provided Notes
17	Social Evolution	Explain
18	Social Evolution	Explain &Provided Notes
19	Social Progress	Explain
20	Social evil	Explain
21	Nature of Political Philosophy	Explain
22	Nature of Political Philosophy	Explain
23	Scope of Political Philosophy	Explain
24	Scope of Political Philosophy	Explain &Provided Notes
25	Concept of State	Explain
26	Concept of State	Explain &Provided Notes
27	Concept of Nation	Explain
28	Concept of Liberty	Explain
29	Concept of Equality	Explain

30	Concept of Justice	Explain
31	Democracy and its forms	Explain
32	Democracy and its forms	Explain &Provided Notes
33	Gandhi's concept of Sarvodaya	Explain
34	Gandhi's concept of Sarvodaya	Explain &Provided Notes
35	Ambedkar's concept annihilation of Caste	Explain
36	Ambedkar's concept annihilation of Caste	Explain &Provided Notes
37	Marxist concept of Class	Explain
38	Marxist concept of Class	Explain
39	Marxist concept of Class	Explain &Provided Notes
40		

COURSE PLAN (2021-2022)

DIGBOI COLLEGE, DIGBOI

Name of the teacher- Dr. Reepa Sarmah

Course- Honours / Generic- Honours

Class/semester – 6 th semester

Name of the Paper – Applied Ethics (DSE-4)

Units Assigned – Full (4 units)

Marks Assigned – 80

Class	Topic/Unit	Remarks
1	Nature of Ethics	Explain
2	Nature of Ethics	Explain &Provided Notes
3	Scope of Ethics	Explain
4	Scope of Ethics	Explain &Provided Notes
5	Utility of Ethics	Explain
6	Utility of Ethics	Explain &Provided Notes
7	Moral and Non –moral Actions	Explain
8	Moral and Non –moral Actions	Explain &Provided Notes
9	Value of Human Life	Explain
10	Value of Human Life	Explain
11	Value of Human Life	Explain &Provided Notes
12	Suicide	Explain
13	Suicide	Explain &Provided Notes
14	Female Foeticide	Explain
15	Female Foeticide	Explain &Provided Notes

16	Capital Punishment	Explain
17	Capital Punishment	Explain
18	Capital Punishment	Explain &Provided Notes
19	Nature as Means or ends	Explain
20	Nature as Means or ends	Explain
21	Nature as Means or ends	Explain &Provided Notes
22	Importance of Environmental Ethics	Explain
23	Importance of Environmental Ethics	Explain &Provided Notes
24	Professional Ethics	Explain
25	Professional Ethics	Explain
26	Professional Ethics	Explain &Provided Notes
27	Medical Ethics	Explain
28	Medical Ethics	Explain
29	Medical Ethics	Explain &Provided Notes
30	Euthanasia	Explain
31	Euthanasia	Explain
32	Euthanasia	Explain &Provided Notes
33	Abortion	Explain
34	Abortion	Explain &Provided Notes
35	Doctor –Patient Relation	Explain
36	Doctor –Patient Relatio	Explain &Provided Notes
37	Media Ethics	Explain
38	Media Ethics	Explain
39	Media Ethics	Explain &Provided Notes
40	Privacy	Explain
41	Privacy	Explain &Provided Notes
42	Problem of Yellow Journalism	
43	Problem of Yellow Journalism	Expla Explain in
44	Problem of Yellow Journalism	Explain
45	Problem of Yellow Journalism	Explain &Provided Notes

COURSE PLAN (2021-2022)

DIGBOI COLLEGE, DIGBOI

Name of the teacher- Dr. Reepa Sarmah

Course- Honours / Generic- Honours

Class/semester – 6 th semester

Name of the Paper –Psychology

Units Assigned – Full (2 units)

Marks Assigned – 40

Class	Topic/Unit	Remarks
1	Memory	Explain
2	Memory	Explain & provided notes
3	Forgetting	Explain
4	Forgetting	Explain & provided notes
5	Immagination	Explain
6	Immagination	Explain & provided notes
7	Feeeling	Explain
8	Feeeling	Explain & provided notes
9	Emotion	Explain
10	Emotion	Explain & provided notes
11	Gestalt theory of Learning	Explain &Provided Notes
12	Gestalt theory of Learning	Explain &Provided Notes
13	Thorndike's theory of Learning	Explain
14	Thorndike's theory of Learning	Explain &Provided Notes
15	Personality	Explain
16	Personality Traits	Explain
17	Personality Traits	Explain &Provided Notes
18	Kinds of Personality	Explain
19	Kinds of Personality	Explain &Provided Notes
20	Factors in Personality	Explain
21	Factors in Personality	Explain &Provided Notes
22	Nature and Testing of I.Q.	Explain
23	Nature and Testing of I.Q.	Explain
24	Nature and Testing of I.Q.	Explain
25	Nature of Motivation	Explain
26	Nature of Motivation	Explain &Provided Notes
27	Types of Motivation	Explain
28	Types of Motivation	Explain
29	Types of Motivation	Explain &Provided Notes

COURSE PLAN (2021-2022)

DIGBOI COLLEGE, DIGBOI

Name of the teacher- Dr. Reepa Sarmah

Course- - Major/Non-Major: Major

Class/semester – 1 st semester

Name of the Paper – Logic (C2)

Units Assigned – Full (4 units)

Marks Assigned – 80

Class	Topic/Unit	Remarks
1	Nature of Logic	Explain
2	Nature of Logic	Explain
3	Nature of Logic	Explain &Provided Notes
4	Nature of Argument	Explain
5	Nature of Argument	Provide Notes
6	Argument and Argument form	Explain
7	Argument and Argument form	Explain
8	Argument and Argument form	Explain &Provided Notes
9	Truth and Validity	Explain
10	Truth and Validity	Provide Notes
11	Square of Opposition	Explain
12	Square of Opposition	Provide Notes
13	Mediate Inference	Explain
14	Mediate Inference	Provide Notes
15	Categorical Syllogism	Explain
16	Categorical Syllogism	Provide Notes
17	Figure	Explain
18	Figure	Provide Notes
19	Mood	Explain
20	Mood	Provide Notes
21	Venn-Diagram Techniques for testing Validity of Syllogism	Explain and Practice
22	Venn-Diagram Techniques for testing Validity of Syllogism	Explain and Practice
23	Venn-Diagram Techniques for testing Validity of Syllogism	Explain and Practice
24	Venn-Diagram Techniques for testing Validity of Syllogism	Explain and Practice
25	Venn-Diagram Techniques for testing Validity of Syllogism	Explain and Practice
26	Venn-Diagram Techniques for testing Validity of Syllogism	Explain and Practice
27	Truth Functions	Explain &Provided Notes
28	Kinds of Truth Functions	Explain
29	Kinds of Truth Functions	Provide Notes
30	Truth Table method	Explain &Provided Notes
31	Direct Truth Table method	Explain and Practice
32	Direct Truth Table method	Explain and Practice
33	Direct Truth Table method	Explain and Practice
34	Direct Truth Table method	Explain and Practice
35	Direct Truth Table method	Explain and Practice
36	Indirect truth table Method	Explain and Practice
37	Indirect truth table Method	Explain and Practice
38	Indirect truth table Method	Explain and Practice
39	Indirect truth table Method	Explain and Practice
40	Set theory	Explain
41	Set theory	Provide Notes
42	Null set	Explain &Provided Notes
43	Sub-set	Explain &Provided Notes

44	Proper set	Explain &Provided Notes
45	Union	Explain &Provided Notes
46	Intersection	Explain &Provided Notes
47	Difference	Explain &Provided Notes
48	Formal Proof of Validity	Explain &Provided Notes
49	Rules of Inference	Explain and Practice
50	Rules of Inference	Explain and Practice
51	Rules of Inference	Explain and Practice
52	Rules of Inference	Explain and Practice
53	Rules of Inference	Explain and Practice
54	Rules of Inference	Explain and Practice
55	Rules of Replacement	Explain and Practice
56	Rules of Replacement	Explain and Practice
57	Rules of Replacement	Explain and Practice
58	Rules of Replacement	Explain and Practice
59	Singular Proposition	Explain and Practice
60	Singular Proposition	Explain and Practice
61	General Proposition	Explain
62	Quantifiers	Explain
63	Rules of Quantification	Explain
64	Symbolization of Traditional Categorical Proposition	Explain
65	Symbolization of Traditional Categorical Proposition	Provide Notes

DIGBOI COLLEGE, DIGBOI

Course plan

Name of the teacher- Dr. Reepa Sarmah

Course- Honours / Generic- Honours

Class/semester – 3 rd semester

Name of the Paper – Indian Ethics (C6)

Units Assigned – Full (4 units)

Marks Assigned – 80

Class	Topic/Unit	Remarks
1	Ethics of Vedas	Explain
2	Ethics of Vedas	Explain
3	Rta	Explain &Provided Notes
4	Rta	Explain
5	Rna	Provide Notes

6	Rna	Explain
7	Ethics of Upanisads	Explain
8	Ethics of Upanisads	Explain &Provided Notes
9	Sreyas	Explain
10	Sreyas	Provide Notes
11	Preyas	Explain
12	Preyas	Provide Notes
13	Nisreyas	Explain
14	Nisreya	Provide Notes
15	Yajna	Explain
16	Yajna	Provide Notes
17	Yajna	Explain
18	Ethics of Bhagawat Gita	Provide Notes
19	Ethics of Bhagawat Gita	Explain
20	Ethics of Bhagawat Gita	Provide Notes
21	Svabhava	Explain and Practice
22	Svabhava	Explain and Practice
23	Svadharma	Explain and Practice
24	Svadharm	Explain and Practice
25	Jnana Marga	Explain and Practice
26	Jnana Marga	Explain and Practice
27	Bhakti Marga	Explain &Provided Notes
28	Bhakti Marga	Explain
29	Karma Marga	Provide Notes
30	Karma Marga	Explain &Provided Notes
31	Synthesis of Jnana,Karma and Bhakti marga	Explain and Practice
32	Synthesis of Jnana,Karma and Bhakti marga	Explain and Practice
33	Niskama Karma Yoga	Explain and Practice
34	Niskama Karma Yoga	Explain and Practice
35	Lokasamgraha	Explain and Practice
36	Lokasamgraha	Explain and Practice
37	Sthitaprajna	Explain and Practice
38	Dharma	Explain and Practice
39	Kinds of Dharma	Explain and Practice
40	Purusartha	Explain
41	Purusartha	Provide Notes
42	Varnasramadharma	Explain &Provided Notes
43	Varnasramadharma	Explain &Provided Notes
44	Law of Karma	Explain &Provided Notes
45	Law of Karma	Explain &Provided Notes
46	Carvaka Ethics	Explain &Provided Notes
47	Carvaka Ethics	Explain &Provided Notes
48	Buddhist Ethics	Explain &Provided Notes
49	Eight fold path	Explain and Practice
50	Eight fold path	Explain and Practice
51	Panchachila	Explain and Practice
52	Jaina Ethics	Explain and Practice
53	Triratna	Explain and Practice

54	Anubrata	Explain and Practice
55	Anubrata	Explain and Practice
56	Mahabrata	Explain and Practice
57	Mahabrat	Explain and Practice

DIGBOI COLLEGE, DIGBOI

Course plan

Name of the teacher- Dr. Reepa Sarmah

Course- Honours / Generic- Honours

Class/semester – 5 th semester

Name of the Paper – Philosophy of Vedas and Upanishads

Units Assigned – Full (4 units)

Marks Assigned – 80

Class	Topic/Unit	Remarks
1	Introduction to Vedic philosophy	Explain
2	Introduction to Vedic philosophy	Explain
3	Introduction to Vedic Philosophy	Explain &Provided Notes
4	Introduction to Upanisadic philosophy	Explain
5	Introduction to Upanisadic philosophy	Provide Notes
6	Introduction to Upanisadic philosophy	Explain
7	Significance of Vedas	Explain
8	Significance of Vedas	Explain &Provided Notes
9	Significance of Vedas	Explain
10	Significance of Upanisads	Provide Notes
11	Significance of Upanisads	Explain
12	Significance of Upanisads	Provide Notes
13	Vedic concept of Man	Explain
14	Vedic concept of Man	Provide Notes
15	Vedic concept of Man	Explain
16	Vedic concept of nature	Provide Notes
17	Vedic concept of nature	Explain
18	Vedic concept of nature	Provide Notes
19	Vedic concept of Deities	Explain
20	Vedic concept of Deities	Provide Notes
21	Vedic concept of Deities	Explain
22	Vedic concept of Deities	Explain
23	Upanisadic Brahman	Explain and provided Notes
24	Upanisadic Brahman	Explain
25	Upanisadic Brahman	Explain
26	Upanisadic Atman	Explain and provided Notes
27	Upanisadic Atman	Explain
28	Upanisadic Atman	Explain
29	Upanisadic Atman	Provide Notes
30	Upanisadic Jiva	Explain
31	Upanisadic Jiva	Explain
32	Upanisadic Jiva	Explain
33	Upanisadic Jiva	Provide Notes
34	Upanisadic Jagat	Explain
35	Upanisadic Jagat	Explain
36	Upanisadic Jagat	Explain
37	Upanisadic Jagat	Provide Notes
38	Upanisadic Mukti	Provide Notes
39	Upanisadic Mukti	Explain
40	Upanisadic Mukti	Explain
41	Rta	Provide Notes
42	Rta	Explain
43	Rta	Explain
44	Rna	Explain
45	Rna	Explain
46	Rna	Explain
47	Rna	Provide Notes

48	Yajna	Explain
49	Yajna	Explain
50	Yajna	Provide Notes
51	Purusarthas	Explain
52	Purusarthas	Explain
53	Purusarthas	Provide Notes
54	Sreyas	Provide Notes
55	Sreyas	Explain
56	Preyas	Explain
57	Preyas	Provide Notes

DIGBOI COLLEGE, DIGBOI

Course plan

Name of the teacher- Dr. Reepa Sarmah

Course- Honours / Generic- Honours

Class/semester – 5th semester

Name of the Paper – Existentialism and Phenomenolism

Units Assigned – 1 unit

Marks Assigned – 20

Class	Topic/Unit	Remarks
1	Keikegaard : an introduction	Explain
2	Three stages of Existence	Explain
3	Three stages of Existence	Explain &Provided Notes
4	Three stages of Existence	Explain
5	Three stages of Existence	Provide Notes

6	Subjectivity and Truth	Explain
7	Subjectivity and Truth	Explain
8	Subjectivity and Truth	Explain &Provided Notes
9	Subjectivity and Truth	Explain
10	Gabriel Marcel :an introduction	Provide Notes
11	Being and Others	Explain
12	Being and Others	Provide Notes
13	Being and Others	Explain
14	Being and Loving	Provide Notes
15	Being and Loving	Explain
16	Being and Loving	Provide Notes

COURSE PLAN FOR SESSION JUNE-DECEMBER 2022

INSTRUCTOR: GITALI DEKA (Contractual)

DEPARTMENT: PHILOSOPHY

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher-Miss Gitali Deka

Course– B.A Generic

Class/Semester- Semester I

Name of the Paper- Introduction to Philosophy

Units Assigned- Unit I

Marks Assigned-25

Class	Topic/ Unit	Remarks
1.	What is Philosophy	Explain
2.	Definitions of Philosophy	Explain and provided notes
3.	Nature of philosophy	Explain
4.	Scope of philosophy	Explain
5.	Relevance of philosophy	Explain and provided notes
6.	Relation between philosophy and science	Explain
7.	Similarities between philosophy and science	Explain and provided notes
8.	Differences between philosophy and science	Explain

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Miss Gitali Deka

Course– B.A. 3rd Sem

Class/Semester- Semester III

Name of the Paper- C5 , MODERN WESTERN PHILOSOPHY

Course Assigned – Unit I

Marks Assigned- 25

Class	Topic/ Unit	Remarks
1.	Introduction to philosophy	Explain
2.	Philosophy of Descartes	Explain
3.	Descarte's theory of mind body	Explain and provided notes
4.	Relation between mind and body	Explain
5.	Descartes theory of knowledge	Explain
6.	Philosophy of Spinoza	Explain and provided notes
7.	Spinoza's substance	Explain and provided notes
8.	Attributes and modes	Explain
9.	Relation between attributes and modes	Explain

Course Plan

Name of the Teacher- Miss Gitali Deka

Course– B.A. 5th sem (Honours)

Course assigned –unit 1

Name of the Paper- Contemporary Indian Philosophy-II

Marks Assigned- 25

Class	Topics/ Unit	Remarks
1.	Introduction to contemporary Indian philosophy	Explain
2.	Philosophy of K.C.Bhattacharya	Explain and provided notes
3.	Concept of philosophy	Explain
4.	Subjectivity	Explain
5.	Notion of Subjectivity	Explain and provided notes
6.	Concept of absolute	Explain and provided notes
7.	K.C.Bhattacharya and concept of absolute	Explain
8.	Question paper discuss	Discussion

NAME OF THE TEACHER: DR. RASHMI PATOWARY DETAILS OF COURSES ASSIGNED FOR THE SESSION: 2021-2022 (Even semester)					
UNDERGRADUATE					
Sl. No	**CLASS**	**PAPER CODE**	**PAPER TITLE**	**UNITS**	**Marks**
I	**SEM-II (HONOURS) (CBCS)**	**PHYSICS -C-IV**	**WAVES AND OPTICS (4 CREDITS)**	**IV to IX**	**33**
II	**SEM-II (GENERIC) (CBCS)**	**PHYSICS-GE-IV**	**WAVES AND OPTICS (4 CREDITS)**	**IV,V,VI,VII**	**37**
III	**SEM-IV (HONOURS) (CBCS)**	**PHYSICS -C-V**	**MATHEMATICAL PHYSICS-III (4 CREDITS)**	**FULL**	**60**
IV	**SEM-VI (HONOURS) (CBCS)**	**PHYSICS-DSE-3**	**NUCLEAR PHYSICS**	**FULL**	**60**
POST-GRADUATE					
VI	**SEM-II (CBCS)**	**PH-DSE-IIA**	**PLASMA PHYSICS (4 CREDITS)**	**FULL**	**60**
VII	**SEM-IV**	**PH-C-IX**	**NUCLEAR PHYSICS**	**FULL**	**60**

	(CBCS)		**(4 CREDITS)**		

(EVEN SEMESTER:2020-2021)

COURSE PLAN

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Course –Physics Honours **Semester- II** **Paper Code: PH-C-IV** **Name of the Paper-WAVES AND OPTICS** **Units Assigned-VII-XI** **Marks Assigned:33**			
Class	UNIT	Topic/ Unit	Marks
1.	**UNIT:VII** **Interference**	Division of amplitude and wavefront:	**9 Marks**
2.		Young's double slit experiment	
3.		Lloyd's Mirror and Fresnel's Biprism.	
4.		Phase change on reflection: Stokes' treatment	

5.		Interference in Thin Films: parallel and wedge-shaped films.	
6.		Fringes of equal inclination (Haidinger Fringes)	
7.		Fringes of equal thickness (Fizeau Fringes)	
8.		Newton's Rings,	
9.		Measurement of wavelength and refractive with the help of Newton's ring	
10.	UNIT:VIII **Interferometer**	Introduction to interferometry, Interferometers, Types of interferometer	4 marks
11.		Michelson Interferometer Idea of form of fringes	
12.		)Determination of Wavelength, Wavelength Difference	
13.		Refractive Index, and Visibility of Fringes.	
14.		Fabry-Perot interferometer	
15.	UNIT: IX **Diffraction**	Kirchhoff's Integral Theorem	**2 Marks)**
16.		Fresnel-Kirchhoff's Integral formula.	

17.	UNIT: IX **Fraunhofer diffraction**	Diffraction, Fresnel and Fraunhoffer,	**8 Marks**
		Composition of SHM by vector addition of amplitudes, Fraunhofer diffraction at a Single slit	
		Fraunhofer diffraction at a Circular aperture	
18.		Fraunhofer diffraction at Double slit.	
		Fraunhofer diffraction at Multiple slits.	
19.		Resolving Power of a telescope	
20.		Diffraction grating	
		Resolving power of grating	
	UNIT: X **Fresnel Diffraction**	Fresnel's Assumptions.	**7 Marks**
		Fresnel's Half-Period Zones for Plane Wave	
		Explanation of Rectilinear Propagation of Light.	
		Theory of a Zone Plate: Multiple Foci of a Zone Plate.	

		Fresnel's Integral,	
		Fresnel diffraction pattern at a straight edge	
		Fresnel diffraction pattern at a slit and at a wire	
	UNIT: XI **Holography** **3 Lectures**	Principle of Holography. Recording and Reconstruction Method.. **(,**	**3 Marks)**
		Theory of Holography as Interference between two Plane Waves .Point source holograms.	
		Summing up	

Course –Physics GENERIC
Semester- II
Paper Code: GE-4
Name of the Paper-WAVES AND OPTICS
Units Assigned-V,VI,VII

Marks Assigned			
Class	UNIT	Topic/ Unit	Marks
1	**Unit IV** 15 lectures **Interference, Michelson's Interferometer** **15 Lectures**	Interference: Division of amplitude and division of wavefront.	15 marks
2		Young's Double Slit experiment.	
3		Lloyd's Mirror and Fresnel's Biprism, principle and working	
4		Phase change on reflection: Stokes' treatment.	
5		Interference in Thin Films: parallel and wedge-shaped films.	
6		Fringes of equal thickness (Fizeau Fringes).	
7		Fringes of equal inclination (Haidinger Fringes);	
8		Newton's Rings:	
9		measurement of wavelength and refractive index by newton's ring method	
10		Interferometers, Michelson's interometer	
11		Idea of form of fringes, Visibility of fringes	

		Determination of wavelength, Wavelength difference	
12		Determination of Refractive index	
13.	**Unit VI Diffraction: 14 Lectures**	Recap: Diffraction : Fraunhofer and fresnel's and conditions under which these hold.	**14 Marks**
14		Fraunhofer diffraction at Single slit.	
15		Fraunhofer diffraction at Double Slit.	
16		Fraunhofer diffraction at Multiple slits.	
17		Diffraction grating	
18		Fresnel Diffraction	
19		Half-period zones	
20		Zone plate	
21		Fresnel Diffraction pattern at a straight edge	

22		Fresnel Diffraction pattern at a a slit using half-period zone analysis	
23		Fresnel Diffraction pattern at a wire using half-period zone analysis	
24		Numericals on the above	
25		Sum-Up of diffraction	
26	**Unit VII** **Polarization** **5 Lectures**	Transverse nature of light waves, polarization of light,.	**5 Marks**
		Plane polarized light : production of Plane polarized light	
		Brewsters law, Malus law	
		Analysis of Plane polarized light,	
		Sum-up of polarization of light	
		Sum-up of the whole syllabus.	

Course –Physics Honours
Semester- IV
Course Code: PHYSICS-C-VIII
Course Title: MATHEMATICAL PHYSICS-III
Nature of the Course: Core
Total Credits assigned: 06
Units Assigned- Full paper
Marks Assigned- 60

Class	UNIT		Topic/ Unit	marks
1.	**UNIT:I Complex Variables 23 classes**		Brief Revision of Complex Numbers and their Graphical Representation,...	**30 Marks**
2.			Euler's formula, De Moivre's theorem, Roots of Complex Numbers	
3.			Numericals on the above topics	
4.			Functions of Complex Variables	
5.			Analyticity of functions of complex variables, Examples of analytic functions	
6.			Cauchy-Riemann Conditions, harmonic functions	
7.			Proof of Cauchy-Riemann Conditions in Cartesian and polar co-ordinates	
8.			Miscellaneous numerical on Cauchy-Riemann Conditions	

9			Tutorial	
10			Singular functions: poles and branch points, order of singularity	
11			Branch cuts.	
12			Tutorial	
13			Integration of a function of a complex variable	
14			Cauchy's Inequality	
15			Cauchy’s Integral formula	
16			Tutorial	
17			Simply and multiply connected region	
18			Laurent and Taylor’s expansion	
19			Tutorial	
20			Residues and Residue Theorem	

21			Application in solving Definite Integrals	
22			Tutorial	
23			Sum-UP	
24	**UNIT:II** Fourier Transforms		Necessity and applications of Fourier Transforms Fourier Integral theorem..,	**15 Marks**
25			Fourier Transform. Examples.	
26			Tutorial	
27			Fourier transform of trigonometric, Gaussian, finite wave train & other functions.	
28			Tutorial	
29			Representation of Dirac delta function as a Fourier Integral	
30			Fourier transform of derivatives	
31			Inverse Fourier transform,	
32			Tutorial	

33			Properties of Fourier transforms (translation, change of scale, complex conjugation, etc.	
34			Three dimensional Fourier transforms and their examples.	
35			Convolution theorem.	
36			Application of Fourier Transforms to differential equations: One dimensional Wave equation.	
37			Application of Fourier Transforms to Diffusion/Heat Flow Equations	
38			SUM-UP	
39	UNIT: III **Laplace Transforms**		Laplace Transform (LT) of Elementary functions.	**15 Marks**
40			Properties of Laplace Transform	
41			Change of Scale Theorem, Shifting Theorem.	
42			Tutorial	
43			LTs of 1st and 2nd order Derivatives and Integrals of Functions,	
44			Derivatives and Integrals of LTs	

45			LT of Unit Step function, Dirac Delta function,	
46			LT of Periodic Functions. Convolution Theorem.	
47			Tutorial	
48			Application of Laplace Transforms to 2nd order Differential Equations:	
49			Damped Harmonic Oscillator, Simple Electrical Circuits	
50			Coupled differential equations of 1st order.	
51			Solution of heat flow along infinite bar using Laplace transform	
52			Tutorial	
53			Summing up	

Course –Physics MAJOR Semester-VI **Course Code: PHYSICS-DSE-3**

Course Title: NUCLEAR PHYSICS Nature of the Course: Core Units Assigned- Full paper Marks Assigned- 80			
Class	**UNIT**	**Topic/ Unit**	**marks**
1.	**UNIT:I** **General Properties of Nuclei**	Charge density (matter density), binding energy, average binding energy and its variation with mass number	**10 Marks**
2.		Main features of binding energy versus mass number curve, N/A plot,	
3.		Angular momentum, parity, magnetic moment	
4.		Electric moments, nuclear excites states.	
5.	**UNIT:II** **Nuclear Models**	Liquid drop model approach, semi empirical mass formula and significance of its various terms,	**13 Marks**
6.		condition of nuclear stability, two nucleon separation energies,	
7.		Fermi gas model (Degenerate fermion gas, nuclear symmetry potential in Fermi gas)	
8.		evidence for nuclear shell structure, nuclear magic numbers	
9.		basic assumption of shell model,	

10.		concept of mean field, residual interaction concept of nuclear force,	
11.	**UNIT:III** **Radioactivity decay**	Basics of radioactivity,laws of radioactivity	**10 Marks**
12.		Alpha decay: basics of α-decay processes,	
13.		Range , Geiger Nuttall law, α-decay spectroscopy	
14.		Theory of α-emission, Gamow factor ,	
15.		β-decay: energy kinematics for β-decay, positron emission, electron capture,	
16.		Neutrino hypothesis	
17.		Gamma decay: Gamma rays emission & kinematics, internal conversion	
18.	**UNIT:IV** **Nuclear Reactions**	Nuclear reactions and its different types.	**9 Marks**
19.		Conservation Laws, , Q-value	
20.		kinematics of reactions, reaction rate	
21.		Reaction cross section, Concept of compound and direct Reaction	
22.		Resonance reaction, Coulomb scattering(Rutherford scattering).	
23.	**UNIT:V** **Interaction of Nuclear Radiation with matter**	Idea of how nuclear radiation interact with matter	**9 Marks**
		Energy loss of electrons, Energy loss due to ionization (Bethe-Block formula),	

20		Cerenkov radiation	
21		Gamma ray interaction through matter,	
22		Photoelectric effect, Compton scattering, pair production,	
23		Neutron interaction with matter	
23	**UNIT:VI Detector for Nuclear Radiations**	Nuclear detectors and different types. Idea of gas detectors , regions of a gas filled counter.	9 marks
24		estimation of electric field, mobility of particle, for ionization chamber, proportional counter.	
25		GM Counter and its various aspects	
26		Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT).	
27		Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility),	
28		Neutron detector	

29	**UNIT:VII Particle Accelerators**	Linear accelerator,	5 marks
30		Cyclotron, Synchrotrons	
31		Van-de Graaff generator (Tandem accelerator), Accelerator facility available in India.	
32	**UNIT:VIII Particle Physics**	Fundamental interactions among elementary particles. Particle interactions; basic features,	15 marks
34		Classification of elementary particles, types of particles and its families	
35		Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm	
36		Continued.	
37		Standard model, quark s, color quantum number and gluons	

COURSE PLAN

Course – M.Sc. Physics

Semester: II

Paper Code: PH-DSE-IIA

Name of the Paper-PLASMA PHYSICS Units Assigned: FULL PAPER Marks Assigned:60				
Class	**UNIT**		**Topic/ Unit**	**marks**
1	**Unit I: (L 8, T 4,)**		Introduction to plasma , Definition of plasma, quasi-neutrality	**Marks 12**
2			Concept of temperature,	
3			Debye shielding	
4			plasma parameters,	
5			criterion for plasma	
6			Classification of Plasma	
7			Applications of Plasma Physics	
8				
	Unit II: (L 8, T 6)		**Single particle motion: motion of a charged particle in uniform magnetic field** diffusion across magnetic fields,	**Marks 14**

			Motion of a charged particle in uniform electric field	
			TUTORIAL	
			Motion of a charged particle in uniform electric and magnetic field	
			Motion of a charged particle in non-uniform electric field	
			TUTORIAL	
			Motion of a charged particle in non-uniform magnetic field,	
			TUTORIAL	
			Magnetic mirror and related concepts	
			Motion of a charged particle in time varying electric field magnetic field	
			Motion of a charged particle in time varying electric field magnetic field	
			Adiabatic invariants,	

			TUTORIAL	
	Unit III: (L 10, T 5)		Plasma as fluids: Introduction,	**Marks 17**
			relation of plasma physics to ordinary electromagnetics,	
			TUTORIAL	
			Fluid equation of motion	
			TUTORIAL	
			Convective derivative	
			Fluid drifts perpendicular to B	
			Fluid drifts perpendicular to B contd	
			TUTORIAL	
			Fluid drifts parallel to B	

			Fluid drifts parallel to B continued	
			TUTORIAL	
			Plasma approximation	
			TUTORIAL	
			Plasma confinement	
	Unit IV: (L 12, T 4,)		Wave phenomena in plasma	**Marks 17**
			phase and group velocities	
			plasma oscillation, electron plasma waves	
			TUTORIAL	
			ion-acoustic waves	
			Propagation parallel to the magnetic	

			Propagation parallel to the magnetic continued	
			TUTORIAL	
			Propagation perpendicular to the magnetic	
			Propagation perpendicular to the magnetic continued	
			TUTORIAL	
			propagation through ionosphere and magnetosphere	
			TUTORIAL	
			Space and Astrophysical Plasma, Van Allen Belts	
			Space and Astrophysical Plasma continued	
			Sum-Up	

COURSE PLAN

Course – M.Sc. Physics

Semester: IV

Paper Code: PH-C-X

Name of the Paper-NUCLEAR PHYSICS

Units Assigned: FULL PAPER

Marks Assigned:60

Class	UNIT		Topic/ Unit	marks
	Unit I: (L 10,)		Review of nuclear properties	**Marks 10**
			Review of quantum properties of the nucleus	
			Paulis Spin formalism	
			Isospin	
			Nuclear Forces and its properties.	
			Exchange forces: Four types	

			Isotopic spin formalism	
			Generalized Pauli's exclusion principle	
			meson theory of nuclear forces	
			Review	
	Unit II: (L 18,)		Two body problem as a study of nuclear force, bound state of two nucleons	**Marks 18**
			Deuteron and its experimentally observed properties.	
			Solution of schrodinger's equation for Deuteron, minimum depth of potential well	
			Deuteron Wave function, probability of the deuteron to be in a bound state, radius of the deuteron	
			Ground and excited states of deuteron	
			General form of nucleon-nucleon forces	
			Nucleon-nucleon scattering at low energies	
			Ground states and excited states	

			Central and tensor forces	
			Nuclear models: Review of liquid drop model and its applications,	
			Shell model and explanation of magic numbers.	
			L-S coupling	
			Magnetic moment and Schmidt lines,	
			limitations of the shell model	
	Unit III: (L 15,		Nuclear reactions: Reaction channels, , , , , , and general features of β-ray spectrum, ,.	**Marks 15**
			scattering cross-section	
			nuclear reaction mechanisms	
			compound nucleus	
			Partial wave analysis of nuclear reaction	
			-do-	

			Breit-Wigner single level formula, , resonance	
			-do-	
			B-W formula incorporating spin,	
			Nuclear fission	
			β-decay, β-spectrum, inability to explain spectrum.	
			neutrino hypothesis and explanation of β-ray spectrum	
			Fermi's theory of β-decay	
			-do-	
			Curie plot, selection rules	
	Unit IV: (L 12,		Elementary Particle Physics: The four Fundamental forces, , , and.	**Marks 12**
			Elementary particles and their classification	
			Characteristics of the elementary particles	

			Quantum numbers, behaviour under charge conjugation, time reversal and parity operation	
			Elementary particles allowed or forbidden on basis of conservation laws examples	
			Isotopic multiplet and Gellmann-Nishijima scheme	
			Quark model, Standard model	
			SU (3) classification	
	Unit V: (L 5,		Detection of radiations	**Marks 5**
			Gas filled counters	
			Continued	
			scintillation detectors,	
			semiconductor detectors	
			Numericals on	

DIGBOI COLLEGE, DIGBOI

Course Plan

Period: January-June 2022

Name of the Teacher - Dr Kanchan Konwar, Dept of Physics
Course – Honours
Class/Semester – 2nd Semester (CBCS)
Name of the Paper - PHYSICS-C III: ELECTRICITY AND MAGNETISM
Units Assigned – I, II, VI, VII, VIII
Marks Assigned – 41

Unit	Class	Topic/ Unit	Remarks
I	1	Electric field: Electric field lines.	
	2	Electric flux.	
	3	Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry.	
	4	Electrostatic Potential. Laplace's and Poisson equations.	
	5	The Uniqueness Theorem.	
	6	Potential and Electric Field of a dipole. Force and Torque on a dipole.	
	7	Electrostatic energy of system of charges.	
	8	Electrostatic energy of a charged sphere.	
	9	Conductors in an electrostatic Field	
	10	Surface charge and force on a conductor	
	11	Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor	
	12	Method of Images and its application to (1) Plane Infinite Sheet and (2) Sphere	
II	1	Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant.	
	2	Capacitor (parallel plate, spherical, cylindrical) filled with dielectric	
	3	Displacement vector D. Relations between E,P and D.	
	4	Gauss' Law in dielectrics	
VI	1	AC Circuits: Kirchhoff's laws for AC circuits.	
	2	Complex Reactance and Impedance.	
	3	Series LCR Circuit	
	4	Parallel LCR Circuit.	
VII	1	Ideal Constant-voltage and Constant-current Sources.	
	2	Network Theorems: Thevenin theorem, Norton Theorem,	
	3	Superposition theorem, Reciprocity theorem,	
	4	Maximum Power Transfer theorem.	
VIII	1	Torque on a current Loop.	
	2	Ballistic Galvanometer: Current and Charge Sensitivity.	
	3	Electromagnetic damping. Logarithmic damping. CDR.	

Course – Honours
Class/Semester – 4th Semester (CBCS)
Name of the Paper - PHYSICS-C-X : ANALOG SYSTEMS AND APPLICATIONS
Units Assigned – I to X
Marks Assigned – 60

Unit	Class	Topic/ Unit	Remarks
I	1	Semiconductor Diodes	
	2	P and N type semiconductors.	
	3	Energy Level Diagram.	
	4	Conductivity and Mobility, Concept of Drift velocity.	
	5	Barrier Formation in PN Junction Diode. Static and Dynamic Resistance.	
	6	Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity.	
	7	Derivation for Barrier Potential, Barrier Width and Current for Step Junction	
II	1	Rectifier Diode: Half-wave Rectifiers.	
	2	Centre-tapped Rectifiers	
	3	and Bridge Full-wave	
	4	Calculation of Ripple Factor and Rectification Efficiency, C-filter	
	5	Zener Diode and Voltage Regulation.	
	6	Principle and structure of (1) LEDs, (2) Photodiode and (3) Solar Cell	
III	1	n-p-n and p-n-p Transistors.	
	2	Characteristics of CB, CE and CC Configurations	
	3	Current gains α and β Relations between α and β.	
	4	Load Line analysis of Transistors. DC Load line and Q-point.	
	5	Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.	
IV	1	Transistor Biasing and Stabilization Circuits.	
	2	Fixed Bias	
	3	Voltage Divider Bias	
	4	Transistor as 2-port Network.	
	5	h-parameter Equivalent Circuit	
	6	Analysis of a single-stage CE amplifier using Hybrid Model.	
	7	Input and Output Impedance. Current, Voltage and Power Gains.	
	8	Classification of Class A, B & C Amplifiers	
V	1	RC coupled Amplifier	
	2	Two stage RC coupled Amplifier	
	3	frequency response	
VI	1	Effect of positive and negative feedback on Input impedence,	
	2	Effect of positive and negative feedback on Output impedence,	
	3	Effect of positive and negative feedback on Gain	
	4	Effect of positive and negative feedback on Stability, Distortion and noise.	
VII	1	Barkhausen's Criterion for self-sustained oscillations.	
	2	RC Phase shift oscillator	
	3	Hartley & Colpitts oscillators	
VIII	1	Characteristics of an Ideal and Practical Op-Amp. (IC 741)	
	2	Open-loop and Closed-loop Gain.	
	3	Frequency Response. CMRR.	
	4	Slew Rate and concept of Virtual ground	
IX	1	Applications of Op-Amps: Inverting and non-inverting amplifiers	
	2	Adder, Subtractor	
	3	Differentiator, Integrator	
	4	Log amplifier, Zero crossing detector	
	5	Wein bridge oscillator.	
X	1	Resistive network (Weighted and R-2R Ladder).	
	2	Accuracy and Resolution.	
	3	A/D Conversion (successive approximation)	

Course – Honours
Class/Semester – 6th Semester (CBCS)
Name of the Paper - PHYSICS DSE -4 (NANO MATERIALS AND APPLICATION)
Units Assigned – II and VI
Marks Assigned – 22

Unit	Class	Topic/ Unit	Remarks
II	1	Top down and Bottom up approach	
	2	Photolithography. Ball milling. Gas phase condensation.	
	3	Vacuum deposition.	
	4	Physical vapor deposition (PVD): Thermal evaporation,	
	5	E-beam evaporation, Pulsed Laser deposition.	
	6	Chemical vapor deposition (CVD). Sol-Gel. Electro deposition	
	7	Spray pyrolysis, Hydrothermal synthesis.	
	8	Preparation through colloidal methods. MBE growth of quantum dot.	
VI	1	Applications of nanoparticles, quantum dots	
	2	nanowires and thin films for photonic devices (LED, solar cells).	
	3	Single electron transfer devices, CNT based transistors.	
	4	Nanomaterial Devices: Quantum dots heterostructure lasers	
	5	optical switching and optical data storage.	
	6	Magnetic quantum well; magnetic dots	
	7	Magnetic quantum well; magnetic dots - magnetic data storage.	
	8	Micro Electromechanical Systems (MEMS),	
	9	Nano Electromechanical Systems (NEMS).	

Period: July-December 2022

Course – Honours
Class/Semester – 1st Semester (CBCS)
Name of the Paper - Physics-C- II (MECHANICS)
Units Assigned – from 6 to 10
Marks Assigned – 33

Unit	Class	Topic/ Unit	Remarks
VI	1	Fluid Motion:Kinematics of Moving Fluids:	
	2	Poiseuille's Equation	
	3	Poiseuille's Equation contd.	
VII	1	Gravitation and Central Force Motion: Law of gravitation.	
	2	Gravitational potential energy. Inertial and gravitational mass.	
	3	Potential and field due to spherical shell and solid sphere.	
	4	Motion of a particle under a central force field.	
	5	Two-body problem and its reduction to one-body problem and its solution.	
	6	The energy equation and energy diagram.	
	7	Kepler's Laws.	
	8	Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness.	
	9	Basic idea of global positioning system (GPS).	
VIII	1	Simple Harmonic Oscillations.	
	2	Differential equation of SHM and its solution.	
	3	Differential equation of SHM and its solution contd.	
	4	Kinetic energy, potential energy, total energy and their time-average values..	
	5	Damped oscillation	
	6	Forced oscillations: Transient and steady states;	
	7	Resonance, sharpness of resonance; power dissipation and Quality Factor	
IX	1	Non-inertial frames and fictitious forces. Uniformly rotating frame.	
	2	Laws of Physics in rotating coordinate systems.	
	3	Centrifugal force , Coriolis force and its applications	
	4	Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems	
X	1	Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity.	
	2	Lorentz Transformations. Simultaneity and order of events.	
	3	Lorentz contraction. Time dilation.	
	4	Relativistic transformation of velocity, frequency and wave number	
	5	Relativistic addition of velocities.	
	6	Variation of mass with velocity	
	7	Massless Particles. Mass-energy Equivalence	
	8	Relativistic Doppler effect.	
	9	Relativistic Kinematics. Transformation of Energy and Momentum .	

Course – Honours
Class/Semester – 3rd Semester (CBCS)
Name of the Paper - PHYSICS-C VII: DIGITAL SYSTEMS AND APPLICATIONS (THEORY)
Units Assigned – from 1 to 12
Marks Assigned – 60

Unit	Class	Topic/ Unit	Remarks
I	1	Block Diagram of CRO. Electron Gun, Deflection System and Time Base. Deflection Sensitivity	
	2	Applications of CRO: Study of Waveform	
	3	Measurement of Voltage,Current, Frequency, and Phase Difference.	
II	1	Integrated Circuits : Active & Passive components. Discrete components. Wafer. Chip.	
	2	Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI.	
	3	Classification of ICs. Examples of Linear and Digital ICs.	
III	1	Difference between Analog and Digital Circuits. Binary Numbers.	
	2	Decimal to Binary and Binary to Decimal Conversion.	
	3	BCD, Octal and Hexadecimal numbers.	
	4	AND, OR and NOT Gates (realization using Diodes and Transistor).	
	5	NAND and NOR Gates as Universal Gates.	
	6	XOR and XNOR Gates and application as Parity Checkers.	
IV	1	De Morgan's Theorems. Boolean Laws.	
	2	Simplification of Logic Circuit using Boolean Algebra.	
	3	Fundamental Products.	
	4	Idea of Minterms and Maxterms.	
	5	Conversion of a Truth table into Equivalent Logic Circuit by Sum of Products Method	
	6	Karnaugh Map.	
V	1	Basic idea of Multiplexers	
	2	De-multiplexers	
	3	Decoders	
	4	Encoders	
VI	1	Binary Addition	
	2	Binary Subtraction using 2's Complement	
	3	Half and Full Adders.	
	4	Half & FullSubtractors	
	5	4-bit binary Adder/Subtractor	
VII	1	SR, D Flip-Flops	
	2	JK Flip-Flops	
	3	Level and Edge Triggered Flip-Flops	
	4	Preset and Clear operations	
	5	Race-around conditions in JK Flip-Flop	
	6	M/S JK Flip-Flop	
VIII	1	IC 555: block diagram	
	2	Astable multivibrator	
	3	Monostable multivibrator.	
IX	1	Serial-in-Serial-out, Serial-in-Parallel-out Shift Registers	
	2	Parallel-in-Serial-out and Parallel-in-Parallel-out	
X	1	Ring Counter	
	2	Asynchronous counters	
	3	Decade Counter	
	4	Synchronous Counter	
XI	1	Input/Output Devices. Data storage (idea of RAM and ROM).	
	2	Computer memory	
	3	Memory organization & addressing	
	4	Memory Interfacing. Memory Map	

XII	1	Main features of 8085. Block diagram. Components. Pin-out diagram.	
	2	Buses. Registers. ALU. Memory. Stack memory	
	3	Timing & Control circuitry	
	4	Timing diagram of MOV and MVI.	
	5	Timing states. Instruction cycle	
XIII	1	Introduction to Assembly Language:	
	2	1 byte, 2 byte & 3 byte instruction	

Course – Honours

Class/Semester – 5th Semester (CBCS)

Name of the Paper -PHYSICS DSE -2 Course title: PHYSICS OF DEVICES AND INSTRUMENTS

Units Assigned – from 1 to 7

Marks Assigned – 60

Unit	Class	Topic/ Unit	Remarks
I	1	Devices: Characteristic and small signal equivalent circuits of UJT and JFET.	
	2	Metal-semiconductor Junction.	
	3	Metal oxide semiconductor (MOS) device. Ideal MOS and Flat Band voltage. SiO2-Si based MOS.	
	4	Enhancement and Depletion Mode MOSFETS, CMOS.	
	5	MOSFET– their frequency limits. Charge coupled devices.	
	6	Tunnel diode.	
II	1	Power supply and Filters: Block Diagram of a Power Supply,	
	2	Qualitative idea of C and L Filters.	
	3	IC Regulators, Line and load regulation, Short circuit protection.	
	4	Active and Passive Filters, Low Pass, High Pass, Band Pass and band Reject Filters.	
	5	Multivibrators: Astable and Monostable Multivibrators using transistors	
III	1	Phase Locked Loop(PLL): Basic Principles,	
	2	Phase detector(XOR & edge triggered	
	3	Voltage Controlled Oscillator (Basics, varactor)	
	4	Loop Filter– Function	
	5	Loop Filter Circuits, transient response, lock and capture.	
	6	Basic idea of PLL IC (565 or 4046)	
IV	1	Basic process flow for IC fabrication, Electronic grade silicon.	
	2	Crystal plane and orientation. Defects in the lattice. Oxide layer.	
	3	Oxidation Technique for Si. Metallization technique.	
	4	Positive and Negative Masks. Optical lithography. Electron lithography..	
	5	Feature size control and wet anisotropic etching	
	6	Lift off Technique. Diffusion and implantation.	
V	1	Serial Communications: RS232, Handshaking, Implementation of RS232 on PC.	
	2	Universal Serial Bus (USB): USB standards, Types and elements of USB transfers.	
	3	Basic idea of UART	
VI	1	Parallel Communications: General Purpose Interface Bus (GPIB),	
	2	GPIB signals and lines	
	3	Handshaking and interface management,	
	4	Implementation of a GPIB on a PC.	
	5	Basic idea of sending data through a COM port.	
VII	1	Block diagram of electronic communication system, Need for modulation.	
	2	Amplitude modulation. Analysis of Amplitude Modulated wave.	
	3	Sideband frequencies in AM wave. CE Amplitude Modulator.	
	4	Demodulation of AM wave using Diode Detector	
	5	Basic idea of Frequency, Phase Modulation	
	6	Pulse and Digital Modulation	
	7	ASK, PSK, FSK	

COURSE PLAN

Name of the Teacher: DR. DEEP KUMAR KURI

Department of Physics

Period: January-May 2022

1) Paper: Electricity and Magnetism (PHYSICS – C III) - B.Sc. 2nd Semester (H)

Unit	Class	Topic	Remarks
Unit 3 Magnetic Field	1	Magnetic force between current elements and definition of Magnetic Field **B**	
	2	Biot-Savart's Law and its simple applications: straight wire and circular loop	
	3	Current Loop as a Magnetic Dipole and its Dipole Moment	
	4	Ampere's Circuital Law and its application to (1) Solenoid and (2) Toroid.	
	5	Properties of **B**: curl and divergence.	
	6	Vector Potential	
	7	Magnetic Force on (1) point charge (2) current carrying wire	
	8	Magnetic Force between current elements	
	9	Torque on a current loop in a uniform Magnetic, Field	
Unit 4	1	Magnetization vector (**M**). Magnetic Intensity (**H**).	

Magnetic Properties of Matter	2	Magnetic Susceptibility and permeability	
	3	Relation between **B, H, M**	
	4	Ferromagnetism. B-H curve and hysteresis	
Unit 5 Electromagnetic Induction	1	Faraday's Law. Lenz's Law.	
	2	Self-Inductance and Mutual Inductance	
	3	Reciprocity Theorem	
	4	Energy stored in a Magnetic Field.	
	5	Introduction to Maxwell's Equations	
	6	Charge Conservation and Displacement current.	

2) Paper: Elements of Modern Physics (PHYSICS – C IX) - B.Sc. 4th Semester (H)

Unit	Class	Topic	Remarks
Unit 1	1	Planck's constant and light as a collection of photons	
	2	Blackbody Radiation: Quantum theory of Light	
	3	Photo-electric effect	
	4	Photo-electric effect (continued)	
	5	Compton scattering	
	6	Compton scattering (continued)	
	7	De Broglie wavelength and matter waves	
	8	Davisson-Germer experiment	
	9	Wave description of particles by wave packets	

	10	Wave description of particles by wave Packets (continued)	
	11	Group and Phase velocities and relation between them	
	12	Two-Slit experiment with electrons	
	13	Wave amplitude and wave functions	
	14	Probability	
Unit 2	1	Position measurement- gamma ray microscope thought experiment	
	2	Wave-particle duality, Heisenberg uncertainty principle	
	3	Derivation from Wave Packets impossibility of a particle following a trajectory	
	4	Estimating minimum energy of a confined particle using uncertainty principle	
	5	Energy-time uncertainty principle application to virtual particles and range of an interaction.	
Unit 3	1	Two slit interference experiment with photons, atoms and particles	
	2	linear superposition principle as a consequence	
	3	Matter waves and wave amplitude	
	4	Schrodinger equation for non-relativistic particles	
	5	Momentum and Energy operators	
	6	stationary states	
	7	physical interpretation of a wave	

		function	
	8	probabilities and normalization	
	9	Probability and probability current densities in one dimension	
	10	Probability and probability current densities in one dimension (continued)	
Unit 4	1	One dimensional infinitely rigid box	
	2	Energy eigen values and eigen functions	
	3	Normalization	
	4	Quantum dot	
	5	Quantum mechanical scattering in one dimension-across a step potential	
	6	Tunneling in one dimension-across a step potential	
	7	Quantum mechanical scattering in one dimension- across a rectangular potential barrier	
	8	Quantum mechanical scattering in one dimension- across a rectangular potential barrier (continued)	
	9	Tunneling in one dimension- across a rectangular potential barrier	
	10	Tunneling in one dimension- across a rectangular potential barrier (continued)	
Unit 5	1	Size and structure of atomic nucleus and its relation with atomic weight	
	2	Impossibility of an electron being in the nucleus as a consequence of the	

		uncertainty principle	
	3	Nature of nuclear force	
	4	NZ graph	
	5	Liquid Drop model: semi-empirical mass formula and binding energy	
	6	Nuclear Shell Model and magic numbers	
Unit 6	1	Radioactivity	
	2	stability of the nucleus	
	3	Law of radioactive decay	
	4	Mean life and half-life	
	5	Alpha decay, Beta decay- energy released	
	6	spectrum and Pauli's prediction of neutrino, Gamma ray emission	
	7	Energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus	
	8	Energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus (continued)	
Unit 7	1	Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons.	
	2	Nuclear reactor: slow neutrons interacting with Uranium 235	
	3	Fusion and thermonuclear reactions	

		driving stellar energy	
Unit 8	1	Einstein's A and B coefficients, Metastable states	
	2	Spontaneous and Stimulated emissions	
	3	Optical Pumping and Population Inversion	
	4	Three-Level and Four-Level Lasers, Ruby Laser and He-Ne Laser. Basic lasing.	

3) Paper: Electromagnetic Theory (PHYSICS – C XIII) – B.Sc. 6th Semester (M)

Unit	Class	Topic	Remarks
Unit – 1 Maxwell Equations	1	Review of Maxwell's equations	
	2	Displacement Current	
	3	Vector and Scalar Potentials	
	4	Gauge Transformations: Lorentz and Coulomb Gauge	
	5	Boundary Conditions at Interface between Different Media	
	6	Boundary Conditions at Interface between Different Media contd…	
	7	Wave Equations	
	8	Plane Waves in Dielectric Media	
	9	Poynting Theorem and Poynting Vector	
	10	Poynting Theorem and Poynting Vector contd…	
	11	Electromagnetic (EM) Energy Density	
	12	Physical Concept of Electromagnetic Field Energy Density, Momentum	

		Density and Angular Momentum Density	
Unit – 2 EM Wave Propagation in Unbounded Media	1	Plane EM waves through vacuum and isotropic dielectric medium	
	2	Plane EM waves through vacuum and isotropic dielectric medium contd…	
	3	Transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance	
	4	Transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance contd…	
	5	Propagation through conducting media, relaxation time, skin depth	
	6	Wave propagation through dilute plasma	
	7	electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth	
	8	electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth contd…	
	9	application to propagation through ionosphere	
	10	application to propagation through ionosphere contd…	
Unit 3 EM Wave in Bounded Media	1	Boundary conditions at a plane interface between two media	
	2	Reflection & Refraction of plane waves at plane interface between two	

		dielectric media-Laws of Reflection & Refraction	
	3	Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction contd…	
	4	Fresnel's Formulae for perpendicular & parallel polarization cases	
	5	Brewster's law	
	6	Reflection & Transmission coefficients	
	7	Reflection & Transmission coefficients contd…	
	8	Total internal reflection	
	9	evanescent waves	
	10	Metallic reflection (normal Incidence)	
Unit 4 Polarization of Electromagnetic Waves	1	Description of Linear	
	2	Circular and Elliptical Polarization	
	3	Propagation of E.M. Waves in Anisotropic Media	
	4	Symmetric Nature of Dielectric Tensor, Fresnel’s Formula	
	5	Uniaxial and Biaxial Crystals	
	6	Light Propagation in Uniaxial Crystal, Double Refraction	
	7	Polarization by Double Refraction	
	8	Nicol Prism, Ordinary & extraordinary refractive indices	
	9	Production & detection of Plane, Circularly and Elliptically Polarized Light	
	10	Phase Retardation Plates: Quarter-	

		Wave and Half-Wave Plates	
	11	Babinet Compensator and its Uses	
	12	Analysis of Polarized Light	
	13	Optical Rotation, Biot's Laws for Rotatory Polarization	
	14	Fresnel's Theory of optical rotation, Calculation of angle of rotation	
	15	Experimental verification of Fresnel's theory	
	16	Specific rotation	
	17	Laurent's half-shade polarimeter	
Unit 4 Wave Guides	1	Planar optical wave guides	
	2	Planar dielectric wave guide	
	3	Condition of continuity at interface	
	4	Phase shift on total reflection	
	5	Eigenvalue equations	
	6	Phase and group velocity of guided waves	
	7	Phase and group velocity of guided waves contd…	
	8	Field energy and power transmission	
Unit 5 Optical Fibres	1	Numerical aperture	
	2	Step and Graded Indices	
	3	Single and Multimode fibres	

4) Paper: Electricity and Magnetism (PHYSICS-GE-2) – B.Sc. 2nd Semester

Unit	Class	Topic	Remarks
Unit 3 Magnetism	1	Biot-Savart's law and its applications- straight conductor	
	2	circular coil	

	3	Solenoid carrying current	
	4	Divergence and curl of magnetic field	
	5	Magnetic vector potential	
	6	Ampere's circuital law	
	7	Magnetic properties of materials: Magnetic intensity	
	8	magnetic induction	
	9	permeability, magnetic susceptibility.	
	10	Brief introduction of dia-, para-and ferro-magnetic materials	
Unit 4 Electromagnetic Induction	1	Faraday's laws of electromagnetic induction	
	2	Lenz's law	
	3	self and mutual inductance	
	4	L of single coil	
	5	M of two coils	
	6	Energy stored in magnetic field	
Unit 5 Maxwell`s equations and Electromagnetic wave propagation	1	Equation of continuity of current	
	2	Displacement current	
	3	Maxwell's equations	
	4	Poynting vector	
	5	energy density in electromagnetic field	
	6	electromagnetic wave propagation through vacuum	
	7	electromagnetic wave propagation through isotropic dielectric medium	
	8	electromagnetic wave propagation through isotropic dielectric medium contd…	

	9	transverse nature of EM waves	
	10	polarization	

5) Paper: Classical Mechanics (PH-C-IV) – M.Sc. 2nd Semester

Unit	Class	Topic	Remarks
Unit 1	1	Review of Newtonian mechanics, Mechanics of a system of particles	
	2	Constraints of motion and their classification, Generalised co-ordinates	
	3	D' Alembert's principle, Lagrange's equations of motion	
	4	Hamilton's principle, Symmetries and conservation theorems	
	5	Cyclic coordinates. Flows in phase space	
	6	solvable vs integrable, equilibria and linear stability theory	
	7	Bifurcations in Hamiltonian systems	
	8	Bifurcations in Hamiltonian systems (continued)	
Unit 2	1	Motion in a central potential	
	2	Maps	
	3	winding numbers and orbital stability	
	4	Hidden symmetry in the Kepler problem	
	5	Small Oscillations	
	6	Solution of one-dimensional harmonic oscillator problem	
	7	Forced oscillations in one dimension	

	8	Damped harmonic motion in one dimension general solution of the problem	
	9	Displacement as a function of time	
	10	Systems with many degrees of freedom	
	11	Eigen value equation and normal co-ordinates	
	12	Integrable and chaotic oscillations	
	13	Return maps	
	14	Area preserving maps	
	15	Deterministic chaos	
Unit 5	1	Noncanonical flows, flows on spheres	
	2	Local vs complete integrability	
	3	Globally integrable noncanonical flows	
	4	Attractors	
	5	Damped driven Euler-Lagrange dynamics	
	6	Liapunov exponents, Geometry and integrability	
	7	Damped driven Newtonian systems, period doubling	
	8	Fractal and multifractal orbits in phase space	
	9	Strange attractors	
	10	The two frequency problem	

6) Paper: Atomic and Molecular Physics (PH-C-XII) - M.Sc. 4th Semester

Unit	Class	Topic	Remarks

Unit 1 Atomic Spectroscopy	1	Fine structure of hydrogen atom	
	2	relativistic correction	
	3	Lamb shift	
	4	Spectra of alkali atoms	
	5	spinorbit interaction and fine structure in alkali atoms	
	6	spinorbit interaction and fine structure in alkali atoms contd…	
	7	spinorbit interaction and fine structure in alkali atoms contd…	
	8	level scheme of two electron atoms-equivalent and nonequivalent electrons	
	9	ground and excited states of two electron atoms	
	10	interaction energy in L-S and j-j coupling for two electrons	
	11	interaction energy in L-S and j-j coupling for two electrons contd…	
	12	interaction energy in L-S and j-j coupling for two electrons contd…	
	13	Zeeman effect	
	14	Zeeman effect contd…	
	15	Paschen-Back effect	
	16	Stark effect	
	17	hyperfine structure of hydrogen and alkali atoms	
	18	hyperfine structure of hydrogen and alkali atoms contd…	
	19	hyperfine structure of hydrogen and alkali atoms contd…	

	20	spectra of multi electron atoms	
	21	X-ray spectra	
	22	width and shape of spectral lines	
	23	width and shape of spectral lines contd…	
Unit 2 Molecular Spectroscopy	1	Regions of the spectrum	
	2	types of molecules	
	3	Rotational Spectra for rigid and non rigid rotators	
	4	isotopic effect in rotational spectra	
	5	intensity of spectral lines	
	6	information derived from rotational spectra	
	7	microwave spectrometer	
	8	Vibrational spectra for anharmonic oscillator	
	9	vibration-rotation spectra	
	10	Infra-red spectrometer	
	11	Electronic spectra of molecules-BornOppenheimer approximation	
	12	vibrational analysis of electronic band spectra	
	13	vibrational analysis of electronic band spectra contd…	
	14	fine structure of electronic band spectra	
	15	fine structure of electronic band spectra contd…	
	16	Fortrat Diagram	
	17	Raman spectra	

	18	Raman spectrometer	
	19	Photoelectron spectroscopy	
	20	Spin resonance spectroscopy- NMR	
	21	ESR	
	22	Mössbauer spectroscopy	
	23	Mössbauer spectroscopy contd..	
	24	Fourier Transform Spectroscopy	
	25	Fourier Transform Spectroscopy contd..	
Unit 3 Laser Spectroscopy	1	Fundamentals of Lasers-properties	
	2	basic elements	
	3	threshold condition	
	4	rate equation	
	5	population inversion	
	6	Laser resonator and modes	
	7	types of laser- solid state laser	
	8	gas laser	
	9	Semi conductor laser	
	10	applications of laser spectroscopy	
	11	Laser Cooling	
	12	Ammonia Masers-two level and three level	

Period: June-December 2022

1) Paper: Thermal Physics (PHYSICS - C VI) - B.Sc. 3rd Semester (H)

Unit	Class	Topic	Remarks
Unit 1 Zeroth and First Law of Thermodynamics	1	Extensive and intensive Thermodynamic Variables, Thermodynamic Equilibrium	
	2	Zeroth Law of Thermodynamics & Concept of Temperature, Concept of Work & Heat	
	3	State Functions, First Law of Thermodynamics and its differential form	
	4	Internal Energy	
	5	First Law & various processes	
	6	General Relation between CP and CV	
	7	Work Done during Isothermal and Adiabatic Processes	
	8	Compressibility and Expansion Coefficient	
Unit 2 Second Law of Thermodynamics	1	Reversible and Irreversible process with examples	
	2	Conversion of Work into Heat and Heat into Work	
	3	Heat Engines	
	4	Carnot's Cycle	
	5	Carnot engine & efficiency	
	6	Refrigerator & coefficient of performance	
	7	2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and	

		their Equivalence	
	8	2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence (continued)	
	9	Carnot's Theorem	
	10	Applications of Second Law of Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale	
Unit 3 Entropy	1	Concept of Entropy, Clausius Theorem, Clausius Inequality	
	2	Second Law of Thermodynamics in terms of Entropy, Entropy of a perfect gas	
	3	Principle of Increase of Entropy	
	4	Entropy Changes in Reversible and Irreversible processes with examples, Entropy of the Universe	
	5	Principle of Increase of Entropy	
	6	Temperature–Entropy diagrams for Carnot's Cycle	
	7	Third Law of Thermodynamics. Unattainability of Absolute Zero	
Unit 4 Thermodynamic Potentials	1	Thermodynamic Potentials: Internal Energy, Enthalpy	
	2	Helmholtz Free Energy, Gibb's Free Energy	
	3	Surface Films and Variation of Surface Tension with Temperature	
	4	Magnetic Work	
	5	Cooling due to adiabatic demagnetization	
	6	First and second order Phase Transitions with examples	
	7	Clausius Clapeyron Equation and Ehrenfest equations	
Unit 5 Maxwell's	1	Derivations and applications of Maxwell's Relations	
	2	Clausius Clapeyron equation	
	3	Values of Cp-Cv	

Thermodynamic Relations	4	TdS Equations	
	5	Joule-Kelvin coefficient for Ideal and Van der Waal Gases	
	6	Energy equations	
	7	Change of Temperature during Adiabatic Process	
Unit 6 Kinetic Theory of Gases Distribution of Velocities	1	Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification	
	2	Doppler Broadening of Spectral Lines and Stern's Experiment	
	3	Mean Speed	
	4	RMS and Most Probable Speeds	
	5	Degrees of Freedom	
	6	Law of Equipartition of Energy	
	7	Specific heats of Gases	
Unit 7 Molecular Collisions	1	Mean Free Path, Collision Probability, Estimates of Mean Free Path	
	2	Viscosity, Thermal Conductivity	
	3	Diffusion	
	4	Brownian Motion and its Significance	
Unit 8 Real Gases	1	Behavior of Real Gases: Deviations from the Ideal Gas Equation	
	2	The Virial Equation. Andrew's Experiments on CO2 Gas.	
	3	Critical Constants	
	4	Continuity of Liquid and Gaseous State, Vapour and Gas	
	5	Boyle Temperature	
	6	Van der Waal's Equation of State for Real Gases	
	7	Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves	
	8	P-V Diagrams. Joule's Experiment. Free Adiabatic Expansion of a Perfect Gas.	
	9	Joule-Thomson Porous Plug Experiment. Joule- Thomson Effect for Real and Van der Waal Gases.	

	10	Temperature of Inversion. Joule- Thomson Cooling	

2) Paper: Quantum Mechanics & Applications (PHYSICS – C XI) - B.Sc. 5th Semester (H)

Unit	Class	Topic	Remarks
Unit 1 Time dependent Schrodinger equation	1	Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function.	
	2	Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions.	
	3	Normalization. Linearity and Superposition Principles.	
	4	Eigenvalues and Eigenfunctions. Position, momentum and Energy operators	
	5	commutator of position and momentum operators; Expectation values of position and momentum.	
	6	Wave Function of a Free Particle.	
Unit 2 Time independent Schrodinger equation	1	Hamiltonian, stationary states and energy eigenvalues	
	2	expansion of an arbitrary wavefunction as a linear combination of energy eigenfunctions	
	3	General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary	

		states	
	4	Application to spread of Gaussian wavepacket for a free particle in one dimension	
	5	Application to spread of Gaussian wavepacket for a free particle in one dimension (continued)	
	6	Wave packets	
	7	Fourier transforms and momentum space wavefunction	
	8	Fourier transforms and momentum space wavefunction (continued)	
	9	Position-momentum uncertainty principle	
	10	Position-momentum uncertainty principle (continued)	
Unit 3 General discussion of bound states in an arbitrary potential	1	Continuity of wave function	
	2	Boundary condition	
	3	Emergence of discrete energy levels	
	4	Application to one-dimensional problem-square well potential	
	5	Quantum mechanics of simple harmonic oscillator	
	6	Quantum mechanics of simple harmonic oscillator (continued)	
	7	Energy levels and energy eigen functions using Frobenius method	
	8	Energy levels and energy eigen functions using Frobenius method (continued)	

	9	Hermite polynomials	
	10	Hermite polynomials (continued)	
	11	ground state	
	12	zero point energy & uncertainty principle	
Unit 4 Quantum theory of hydrogen-like atoms	1	Time independent Schrodinger equation in spherical polar coordinates	
	2	Separation of variables for second order partial differential equation	
	3	Separation of variables for second order partial differential equation (continued)	
	4	Angular momentum operator & quantum numbers	
	5	Radial wave functions from Frobenius method	
	6	Radial wave functions from Frobenius method (continued)	
	7	Radial wave functions from Frobenius method (continued)	
	8	Shapes of the probability densities for ground & first excited states	
	9	Orbital angular momentum quantum numbers l and m	
	10	s, p, d... shells	
Unit 5 Atoms in Electric & Magnetic Fields	1	Electron angular momentum	
	2	Space quantization	
	3	Electron Spin and Spin Angular Momentum	
	4	Larmor's Theorem	
	5	Spin Magnetic Moment	

	6	Stern-Gerlach Experiment	
	7	Zeeman Effect: Electron Magnetic Moment and Magnetic Energy	
	8	Gyromagnetic Ratio and Bohr Magneton	
Unit 6 Atoms in External Magnetic Fields	1	Normal Zeeman Effect	
	2	Anomalous Zeeman Effect	
	3	Paschen Back Effect	
	4	Stark Effect	
Unit 7 Many electron atoms	1	Pauli's Exclusion Principle	
	2	Symmetric & Antisymmetric Wave Functions, Periodic table	
	3	Fine structure	
	4	Spin orbit coupling	
	5	Spectral Notations for Atomic States	
	6	Total angular momentum	
	7	Vector Model	
	8	Spin-orbit coupling in atoms-L-S and J-J couplings	
	9	Hund's Rule	
	10	Term symbols, Spectra of Hydrogen and Alkali atoms (Na etc.)	

3) Paper: Thermal Physics and Statistical Mechanics (PHYSICS – GE - 3) - B.Sc. 3rd Semester (G)

Unit	Class	Topic	Remarks
Unit 1 Laws of Thermnodynamics	1	Zeroth Law of thermodynamics and temperature	
	2	First law and internal energy	
	3	First law and internal energy	

		(continued)	
	4	Conversion of heat into work	
	5	Various Thermodynamical Processes	
	6	Various Thermodynamical Processes (continued)	
	7	Applications of First Law: General Relation between CP and CV	
	8	Applications of First Law: General Relation between CP and CV (continued)	
	9	Work Done during Isothermal and Adiabatic Processes	
	10	Work Done during Isothermal and Adiabatic Processes (continued)	
	11	Compressibility and Expansion Coefficient	
	12	Compressibility and Expansion Coefficient (continued)	
	13	Reversible and irreversible processes	
	14	Second law and Entropy	
	15	Second law and Entropy (continued)	
	16	Carnot's cycle & theorem	
	17	Carnot's cycle & theorem (continued)	
	18	Entropy changes in reversible processes	
	19	Entropy changes in irreversible processes	
	20	Entropy-temperature diagrams	
	21	Third law of thermodynamics	
	22	Unattainability of absolute zero	

Unit 3 Kinetic Theory of Gases	1	Derivation of Maxwell's law of distribution of velocities and its experimental verification	
	2	Mean free path (Zeroth Order)	
	3	Transport Phenomena: Viscosity	
	4	Transport Phenomena: Viscosity (continued)	
	5	Conduction	
	6	Diffusion (for vertical case)	
	7	Diffusion (for vertical case) (continued)	
	8	Law of equipartition of energy	
	9	Applications to specific heat of gases	
	10	Monoatomic and diatomic gases.	
Unit 5 Statistical Mechanics	1	Phase space	
	2	Macrostate and Microstate	
	3	Entropy and Thermodynamic probability	
	4	Maxwell Boltzmann law - distribution of velocity	
	5	Maxwell Boltzmann law - distribution of velocity (continued)	
	6	Quantum statistics	
	7	Fermi-Dirac distribution law	
	8	Fermi-Dirac distribution law (continued)	
	9	Electron gas	
	10	Bose-Einstein distribution law	
	11	Photon gas	
	12	Comparison of three statistics	

4) Paper: Quantum Mechanics-I (PH-C-III) - M.Sc. 1st Semester

Unit	Class	Topic	Remarks
Unit 1 Fundamental Concepts	1	Overview of wave mechanics	
	2	Schrödinger equation	
	3	application to some important physical problems: particle in a box	
	4	simple harmonic oscillator	
	5	simple harmonic oscillator contd…	
	6	delta function potential	
	7	delta function potential contd..	
	8	spherical well potential	
	9	spherical well potential contd…	
	10	hydrogen atom	
	11	hydrogen atom contd..	
	12	Kets, Bras and Operators	
	13	Kets, Bras and Operators contd…	
	14	Base Kets and Matrix Representations	
	15	Base Kets and Matrix Representations contd…	
	16	Base Kets and Matrix Representations contd…	
	17	Measurements	
	18	Observables and Uncertainty Relations	
	19	Observables and Uncertainty Relations contd…	
	20	Generalized uncertainty principle	
	21	Change of basis	
	22	Change of basis contd…	
	23	Wave functions in Position and	

		Momentum Space	
	24	Wave functions in Position and Momentum Space contd…	
	25	Wave functions in Position and Momentum Space contd…	
Unit 2 Quantum Dynamics	1	Schrödinger picture	
	2	Heisenberg picture	
	3	Time evolution and the Schrödinger equation	
	4	Heisenberg equation	
	5	time evolution of the simple harmonic oscillator	
	6	Symmetries	
	7	Conservation laws and Degeneracy	
	8	Conservation laws and Degeneracy contd…	
	9	Spatial and Time translation	
	10	Parity	
	11	Time reversal	
	12	Density operators	
	13	Density operators contd…	
	14	Pure versus Mixed Ensembles	
	15	Pure versus Mixed Ensembles contd…	
Unit 3 Angular Momentum	1	Rotation	
	2	Angular Momentum and Unitary groups	
	3	commutation relations	
	4	Eigenvalues and Eigenstates of Angular Momentum	
	5	Ladder operators and their matrix	

		representations	
	6	Ladder operators and their matrix representations contd…	
	7	the Stern Gerlach Experiment	
	8	Spin angular momentum and Pauli matrices	
	9	Addition of Angular momentum	
	10	Clebcsh Gordon Coefficients	
	11	Clebcsh Gordon Coefficients contd…	
	12	Clebcsh Gordon Coefficients contd…	
	13	Identical particles	
	14	Many particle systems	
	15	Symmetric and anti-symmetric wave functions	
	16	Slater's determinant	
	17	Pauli's exclusion principle	
	18	Wigner-Eckart theorem	
	19	Spherical tensors	
	20	Spherical tensors contd…	

5) Paper: Electrodynamics (PH-C-VIII) - M.Sc. 3rd Semester

Unit	Class	Topic	Remarks
Unit 1	1	Propagation of electromagnetic waves in different media	
	2	Dispersion	
	3	Frequency dependence of σ, μ and ε	
	4	Frequency dependence of σ, μ and ε (continued)	Tutorial
	5	Dispersion in non-conductors	
	6	Dispersion in non-conductors	Tutorial

		(continued)	
	7	Anomalous dispersion	Tutorial
	8	Free electrons in conductors and plasma	
	9	Wave Guides	
	10	TE waves in rectangular wave guide	
	11	TE waves in rectangular wave guide (continued)	Tutorial
	12	Coaxial transmission lines	
	13	Boundary value problems in spherical coordinate	
Unit 2	1	Electromagnetic radiation: Retarded potentials	
	2	Electromagnetic radiation: Retarded potentials (continued)	Tutorial
	3	Electric dipole radiation	
	4	Electric dipole radiation (continued)	Tutorial
	5	Radiation from an arbitrary distribution of charges and current	
	6	Radiation from an arbitrary distribution of charges and current (continued)	Tutorial
	7	Lienard-Wiechert potentials	
	8	Lienard-Wiechert potentials (continued)	Tutorial
	9	Fields due to uniformly moving charge	
	10	Fields due to uniformly moving charge (continued)	Tutorial
	11	Fields due to accelerated charge	

	12	Fields due to accelerated charge (continued)	Tutorial
	13	Linear and circular acceleration	
	14	Linear and circular acceleration (continued)	Tutorial
	15	Angular distribution of radiated power	
	16	Angular distribution of radiated power (continued)	Tutorial
	17	Bremhstrahlung and Synchrotron radiation	
	18	Bremhstrahlung and Synchrotron radiation (continued)	Tutorial
	19	Radiation reaction	
	20	Radiation reaction (continued)	
	21	Abraham-Lorentz formula	
	22	Abraham-Lorentz formula (continued)	Tutorial
Unit 3	1	Structure of space-time	
	2	Structure of space-time (continued)	
	3	Structure of space-time (continued)	Tutorial
	4	Four vectors and Lorentz transformation	
	5	Four vectors and Lorentz transformation (continued)	Tutorial
	6	Four vectors and Lorentz transformation (continued)	
	7	Proper time and velocity	
	8	Proper time and velocity (continued)	Tutorial
	9	Relativistic energy and momentum	
	10	Relativistic energy and momentum (continued)	

	11	Relativistic energy and momentum (continued)	Tutorial
	12	Magnetism as relativistic phenomena	
	13	Magnetism as relativistic phenomena (continued)	Tutorial
	14	Potential formulation of relativistic electrodynamics	
	15	Potential formulation of relativistic electrodynamics (continued)	Tutorial
	16	Potential formulation of relativistic electrodynamics (continued)	Tutorial
	17	Electromagnetic field tensor	
	18	Electromagnetic field tensor (continued)	Tutorial
	19	Electromagnetic field tensor (continued)	
	20	Dual tensor	
	21	Dual tensor (continued)	Tutorial
	22	Dual tensor (continued)	
	23	Covariant formulation of electrodynamics	
	24	Covariant formulation of electrodynamics (continued)	Tutorial
	25	Covariant formulation of electrodynamics (continued)	

COURSE PLAN

Name of the Teacher: DR. SUMI BHUYAN

Department of Physics

Period: March-June 2022

1) Paper: Waves and Optics (PHYSICS - C IV) – B.Sc. 1st Semester (H)

Unit	Class	Topic	Remarks
Unit 1 Superposition of Collinear Harmonic oscillations	1	Linearity and Superposition Principle.	
	2	Superposition of two collinear oscillations having (1) equal frequencies	
	3	Superposition of two collinear oscillations having (2) different frequencies (Beats)	
	4	Superposition of N collinear Harmonic oscillations with (1) Equal phase differences	
	5	Superposition of N collinear Harmonic oscillations with (2) Equal frequency differences	
Unit 2 Superposition of two perpendicular Harmonic Oscillations	1	Graphical and Analytical methods.	
	2	Lissajous Figures with equal and unequal frequency and their use	
	4	Work done by non-conservative forces. Law of conservation of Energy.	
Unit 3	1	Plane and Spherical waves	
	2	Longitudinal and Transverse Waves	

Wave motion	3	Plane Progressive (Travelling) waves	
	4	Wave equation	
	5	Particle and Wave velocities	
	6	Differential equation	
	7	Pressure of a longitudinal wave	
	8	Energy Transport	
	9	Intensity of Wave	
	10	Water waves: Ripple and gravity waves	
Unit 4 Velocity of Waves	1	Velocity of transverse vibrations of stretched strings	
	2	Velocity of Longitudinal waves in a fluid in a pipe	
	3	Newton's Formula for velocity of sound	
	4	Laplace's Correction.	
Unit 5 Superposition of Two Harmonic Waves	1	Standing (stationary) waves in a string: Fixed and Free ends. Analytic Treatment	
	2	Phase and Group Velocities. Changes with respect to position and Time.	
	3	Energy of Vibrating String. Transfer of Energy.	
Superposition of Two Harmonic Waves	4	Standing (stationary) waves in a string: Fixed and Free ends. Analytic Treatment	
	5	Phase and Group Velocities. Changes with respect to position and Time.	

	6	Energy of Vibrating String. Transfer of Energy.	
	7	Normal modes of stretched strings. Plucked and struck strings.	
	8	Melde's Experiment.	
	9	Longitudinal standing waves and normal modes	
	10	Open and Closed Pipes. Superposition of N Harmonic Waves	
Unit 6 Wave Optics	1	Electromagnetic nature of light	
	2	Definition and properties of wave front	
	3	Huygens principle. Temporal and Spatial coherence	

2) Paper: – Waves and Optics (PHYSICS- GE-4) B.Sc 4th semester (GENERIC)

Unit	**Class**	**Topic**	**Remarks**
Unit 1 Superposition of two collinear harmonic oscillations	1	Linearity and superposition principle	
	2	Oscillations having equal frequency	
	3	Oscillations having different frequencies (Beats)	
	4	Graphical and analytical Methods	
	5	Lissajous figures with equal an unequal frequency and their use	
Superposition of two perpendicular harmonic oscillations	6	Reflection and refraction of a plane wave at a plane interface at oblique incidence	
Unit II Waves Motion- General	1	Transverse waves on a string	
	2	Travelling and standing waves on a string	
	3	Normal modes of a string	

	4	Group velocity, phase velocity.	
	5	Plane waves, Spherical waves, Wave Intensity	
Unit III Sound	1	Simple Harmonic motion	
	2	Forced vibrations and resonance	
	3	Fourier's Theorem-Application to saw tooth wave and square wave	
	4	Intensity and loudness of sound-Decibels-Intensity levels- music notes- musical scale	
	5	Acoustics of buildings: Reverberation and time of reverberation	
	6	Absorption coefficient-Sabine's formula-measurement of reverberation time	
	7	Acoustic aspects of halls and auditoria	
Unit 3	1	Electromagnetic nature of light	
	2	Definition and Properties of wave front	
	3	Huygens Principle	

3) Paper: Waves and Optics (Lab) (PHY-GE-4) – CBCS - B.Sc. 4th Semester

Unit	Class	Topic	Remarks
Practical	1	Familiarization with Schuster's focusing; determination of angle of prism	
	2	To determine the Refractive Index of the material of a prism using Sodium Light	
	3	To determine wavelength of sodium light using Fresnel Biprism	
	4	To determine wavelength of sodium light using Newton's Rings	

1) Paper: Waves and Optics (Lab) (PHYSICS - C IV) – CBCS - B.Sc. 1st Semester (H)

Unit	Class	Topic	Remarks
Practical	1	Familiarization with Schuster's focusing; determination of angle of prism	
	2	To determine the Refractive Index of the material of a prism using Sodium Light	
	3	To determine wavelength of sodium light using Fresnel Biprism	
	4	To determine wavelength of sodium light using Newton's Rings	
	5	To determine wavelength of sodium source using Michelson's interferometer	

2) Paper: Condensed Matter Physics (PH-C-V) - M.Sc. 2nd Semester

Unit	Class	Topic	Remarks
Unit III Conduction electrons in crystalline solids	1	Periodic potential	
	2	Bloch theorem	
	3	Kronig Penny model	
	4	Electronic energy bands	
	5	E-K diagram	
	6	Brillouin zone, Effective mass	
	7	Metals, Insulators and semiconductors	
Unit IV Magnetic Properties of Materials	1	Introductory concepts	
	2	Langevin diamagnetism	
	3	Langevin diamagnetism	
	4	Paramagnetism due to free ions	
	5	Pauli Paramagnetism	
	6	Molecular field theory of Ferromagnetism	
	7	Domains, Hysteresis loop	
	8	Antiferromagnetism	
	9	Ferrimagnetism	
Unit V Superconductivity	1	Introductory concepts	
	2	Meissner Effect	
	3	Type I and Type II superconductors	
	4	London equations	
	5	Thermodynamics of superconducting transition, Isotope effect	

	6	Introduction to BCS theory, Cooper pair	
	7	Basic idea on High temperature superconductivity	

3) Paper: Condensed Matter Physics II (PH-DSE-IVB) - M.Sc. 4th Semester

Unit	Class	Topic	Remarks
Unit I Lattice vibrations	1	Harmonic approximation	
	2	Monoatomic linear lattice(continued)	
	5	Diatomic linear lattice(continued)	
	7	Dispersion relations, Normal modes, phonons	Tutorial
	8	Infrared absorption in ionic crystals	
	10	Lattice dynamics in three dimensions (harmonic and adiabatic approximation) (continued)	Tutorial
	12	Normal modes of a monoatomic 3-dimensional Bravais lattice	Tutorial
	13	Quantum theory of harmonic crystal, lattice specific heat(continued)	
	15	Anharmonic effects, thermal expansion(continued)	
	17	The Grueneisen parameter	
	18	Normal and Umklapp processes	Tutorial
Unit III Semiconductors	1	Intrinsic and extrinsic semiconductors(continued)	
	3	Mobility and electrical conductivity(continued)	Tutorial
	5	Fermj level, Hall Effect(continued)	

	7	Rectifying properties of barriers, Schottky theory of M.S contact (continued)	Tutorial
	9	Surface states, P-N junction rectifiers	
	10	Transistors, solar cells, equivalent circuit of solar cells(continued)	Tutorial
	11	Temperature effects, solar cell materials, devices and efficiencies(continued)	
	13	Optical and high frequency effects in semiconductors. (continued)	Tutorial
	14	Optical constants(continued)	
	17	Free carrier absorption, fundamental absorption(continued)	Tutorial
	20	Direct and indirect transitions(continued)	
	25	Lattice absorption	Tutorial

4) Paper: Condensed Matter Physics Lab (PH-DSE-VB) - M.Sc. 4th Semester

Unit	**Class**	**Topic**	**Remarks**
Lab	1	To determine the Boltzmann Constant	
	2	To determine the Stefan's Constant	
	3	To determine the Curie temperature of phase transition for a ferroelectric materials	
	4	To study the Hall Effect and determine the different parameters	

Period: August 2022-Dec 2022

1) **Paper: Mechanics (PHYSICS - C II) – B.Sc. 1st Semester (H)**

Unit	Class	Topic	Remarks
Unit 1 Fundamentals of Dynamics	1	Reference frames. Inertial frames	
	2	Review of Newton's Laws of Motion. Galilean transformations	
	3	Galilean invariance. Momentum of variable-mass system: motion of rocket	
	4	Motion of a projectile in Uniform gravitational field Dynamics of a system of particles	
	5	Centre of Mass	
	6	Principle of conservation of momentum. Impulse.	
s	1	Work and Kinetic Energy Theorem, Conservative and non-conservative forces. Potential Energy.	
	2	Energy diagram. Stable and unstable equilibrium, Elastic potential energy.	
	3	Force as gradient of potential energy. Work & Potential energy.	
	4	Work done by non-conservative forces. Law of conservation of Energy.	
Unit 3 Collisions	1	Elastic collisions between particles	
	2	Inelastic collisions between particles	
	3	Centre of Mass and laboratory frame	

Unit 4 Rotational Dynamics	1	Angular momentum of particles and system of particles	
	2	Torque	
	3	Principle of conservation of angular momentum	
	4	Rotation about a fixed axis	
	5	Moment of Inertia	
	6	Calculation of moment of inertia for rectangular bodies	
	7	Calculation of moment of inertia for cylindrical bodies	
	8	Calculation of moment of inertia for cylindrical bodies (continued)	
	9	Calculation of moment of inertia for spherical bodies	
	10	Calculation of moment of inertia for spherical bodies (continued)	
	11	Kinetic energy of rotation	
	12	Motion involving both translation and rotation	
Unit 5 Elasticity	1	Relation between Elastic constants	
	2	Twisting torque on a Cylinder or Wire	

1) Paper: Mechanics Generic (PHYSICS-GE1) – CBCS - B.Sc. 1st Semester (G)

Unit	**Class**	**Topic**	**Remarks**
Unit 6 Gravitation	1	Newton's Law of Gravitation	
	2	Motion of a particle in a central force field(motion is in a plane, angular momentum is conserved, areal velocity is constant)	

	3	Kepler's Law, Satellite in circular orbit and applications, Geosynchronous orbits	
	4	Basic idea of global positioning system (GPS), Weightlessness, Physiological effects on astronauts	
Unit 7 Oscillations	1	Simple Harmonic Motion	
	2	Differential equation of SHM and its solutions	
	5	Kinetic and Potential Energy	
	6	Total energy and their time averages	
	7	Damped Oscillations	
	8	Calculation of partition function for an ideal monatomic gas (continued)	
Unit 8 Elasticity	1	Hooke's Law- stress- strain diagram	
	3	Elastic moduli-Relation between elastic constants	
	5	Poisson's Ratio- Expression for Poisson's ratio in terms of elastic constants	
	6	Work done in stretching and work done in twisting a wire	
	5	Twisting couple on a cylinder	
	6	Determination of Rigidity modulus by static torsion- Torsional Pendulum	
	7	Determination of rigidity modulus and moment of inertia -$q, \eta \ and \ \sigma$ by Searle's method	

2) Paper: Classical Mechanics (PH-C-IV) - M.Sc. 3rd Semester

Unit	Class	Topic	Remarks
Unit 1 Electron Theory	1	Free electron theory	
	3	Energy Levels and density of states	
	5	Fermi Energy, Boltzmann equation	
	4	Relaxation time, electrical and thermal conductivity of metals	
	7	Weidmann Franz law	
	9	Nearly free electron method	
	11	Tight Binding method	
Unit 2 Dielectric and Ferroelectric Properties	1	Polarization	
	3	Langevin's theory	
	5	Clausius- Mossotti relation	
	7	Static dielectric constant of solids	
	9	Complex dielectric constant and dielectric loss	
	12	Dielectric relaxation, Debye equation	
	14	Dipole theory of ferroelectricity	
	17	Thermodynamics of ferroelectricity	
	19	First and second order transitions	
	20	Anti-ferroelectricity	
Unit 3 Magnetic Properties of a system	1	Hartree and Hartree -Fock approximation	
	5	Hartree exchange and Heisenberg Hamilitonian	
	9	The ground state and excited states in Hartree- Fock approximation	
	13	Heisenberg Ferromagnet and Spin waves	

Unit 4 Superconductivity	1	Isotope effect, electron-phonon interaction	
	4	BCS theory	
	7	Flux quantization in a superconducting ring	
	9	AC and DC Josephson effects	
	12	Ginsberg- Landau theory	
	13	SQUIDS	

3) Paper: Nanostructured materials (PH-AEC) - M.Sc. 1st Semester

Unit	**Class**	**Topic**	**Remarks**
Unit 1	1	Introduction to nano-science and technology	
	2	history and scope	
	3	interdisciplinary nature	
	4	surface to volume ratio, electronic structure.	
	5	Types of nanomaterials, semiconducting nanomaterials: quantum dot, quantum wire, quantum well	Tutorial
	8	idea of band structure, density of states, variation of density of state and band gap with crystal size	
	12	electron confinement in one, two and three dimensions, carbon nanomaterials: fullerene, carbon nanotube.	

Unit 2	1	Chemical and physical methods for synthesis of nanostructured materials	
	5	Applications of nanostructured materials.	
	8	Thermodynamic behaviour of an ideal Fermi gas (continued)	
	9	Pauli paramagnetism	
	10	Pauli paramagnetism (continued)	
	11	Landau diamagnetism	
	12	Landau diamagnetism (continued)	Tutorial
	13	Landau diamagnetism (continued)	
Unit 3	1	Nanomaterials characterization, instruments, principle of measurements, ,	
	5	,measurement techniques: X-ray diffraction,	
	6	scanning electron microscopy	
	7	transmission electron microscopy	Tutorial
	8	scanning tunneling microscopy	
	9	atomic force microscopy	
	10	optical and vibrational spectroscopy	

COURSE PLAN : APARAJITA GOGOI, DEPARTMENT OF ZOOLOGY : 2022

EVEN SEMESTER CLASSES

MONTH	WEEK	SEM II H	SEM IV H	SEM VI H	SEM II G	SEM IV G	Remark
MARCH	4TH	C3 UNIT 6 Echinodermata- General character		C 13- Unit 4 Metamorphosis changes; Hormonal regulation of Amphibian metamorphosis C 13- Hormonal regulation of Insect metamorphosis			
April	1st	C3-Unit -6 Echinoderm classifi. Water vascular system C4-Unit 8: Cell signalling overview	Introductory class C 10- Unit 5- Mitochondria str, Oxidation-Reduction	C 13- Regeneration and Aging C-14-Chemogeny & Biogeny*	GE-Unit II- Vectors Biological - mechanical		* Extra class
	2nd	C4- Unit 6- Chromatin- Euchromatin & Heterochromatin, Nucleosome	**C 10-Unit 5**- Oxidative Phosphorylation- Energy currency Unit5- Electron Transport system **C8-Unit 1**- Comparative anatomy- integumentary system in vertebrates	C 14-Unit 1: Evolution of Eukaryotes Origin of photosynthesis DSE- **IMMUNOLOGY** Unit 4: Antigen –antibody interaction		**GE-** **Environment & Public Health** Unit 2- Green house gases, Global warming	
	3rd		C-10: Unit 5 –ETS	C 14-Unit 1 Darwinism- Lamarckism			

Month	Week	SEM II H	SEM IV H	SEM VI H	SEM II G	SEM IV G	SEM VI G
	3rd	C4: Unit 8- GPCR- Second messenger	C 9: Unit 2- Respiration mechanism	**DSE-Fishery** Unit 4- Morphometry & Meristic counts	GE Unit II Carrier and vectors		
	4th	C4- Nucleus Structure and function	C 9: Unit 2- Physiology of Respiration	**DSE IMMUNOLOGY** Unit 4- Vaccine- vaccination, Immunodiffusion-ELISA & RIA **DSE – Fishery** Unit 4- Extensive- Intensive fish culture		Unit 2- Green house effect, Acid Rain	
May	1st Sessional exam		**C 9: Unit 2-** Dissociation Curves	**DSE – Fishery** Brood stock management			
	2nd	**C4- Nucleus** Structure and function Nucleolous		**DSE – Fishery** Induced breeding; Aquarium Maintenance		**Unit 2-** Ozone depletion	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – Honours

Class/Semester –1st Semester **(CBCS)**

Name of the Paper - Core Course I: Non-Chordates I: Protists to Pseudocoelomates

Units Assigned – Unit 1: Protista, Parazoa and Metazoa

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 1: General characteristics and Classification up to Classes	
2.	Unit 1: General characteristics and Classification up to Classes	
3.	Unit 1: Structural organization & nutrition of Euglena	
4.	Unit 1: Structural organization & nutrition of Euglena	
5.	Unit 1: Structural organization & nutrition of Amoeba	
6.	Unit 1: Structural organization & nutrition of Amoeba	
7.	Unit 1: Structural organization & nutrition of Paramoecium	
8.	Unit 1: Structural organization & nutrition of Paramoecium	
9.	Unit 1: Life cycle and pathogenicity of Plasmodium vivax	
10.	Unit 1: Life cycle and pathogenicity of Plasmodium vivax	
11.	Unit 1: Locomotion and Reproduction in Animal protista	

12.	Unit 1: Locomotion and Reproduction in Animal protista	
13.	Unit 1: Locomotion and Reproduction in Animal protista	
14.	Unit 1: Locomotion and Reproduction in Animal protista	
15.	Unit 1: Evolution of symmetry and segmentation of Metazoa	
16.	Unit 1: Evolution of symmetry and segmentation of Metazoa	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – Honours

Class/Semester –1st Semester **(CBCS)**

Name of the Paper - CORE COURSE II: PRINCIPLES OF ECOLOGY

Units Assigned – Unit 1 and Unit 2

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 1: Introduction to Ecology History of ecology, Autecology and synecology	
2.	Unit 1: Introduction to Ecology Levels of organization	
3.	Unit 1: Introduction to Ecology Laws of limiting factors,	
4.	Unit 1: Introduction to Ecology Study of abiotic factors	
5.	Unit 1: Introduction to Ecology Study of abiotic factors	
6.	Unit 2: Population Unitary and Modular populations	
7.	Unit 2: Population Unique and group attributes of population: Density, natality, mortality	
8.	Unit 2: Population life tables	
9.	Unit 2: Fecundity tables	
10.	Unit 2: Survivorship curves,	
11.	Unit 2: Population age ratio, sex ratio, dispersal and dispersion strategies	
12.	Unit 2: Population Exponential and logistic growth, equation and patterns, r and K	
13.	Unit 2: Population Exponential and logistic growth, equation and patterns, r and K	
14.	Unit 2: Population Exponential and logistic growth, equation and patterns, r and K	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – Generic

Class/Semester –1st Semester **(CBCS)**

Name of the Paper - GE II: ANIMAL DIVERSITY

Units Assigned – Unit 1, Unit 5, Unit 9 and Unit 10

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 1. Protista: General characters of Protozoa	
2.	Unit 1. Protista: Life cycle of Plasmodium.	
3.	Unit 5. Pseudocoelomates - General characters of Nemethehelminthes	
4.	Unit 5. Pseudocoelomates - Parasitic adaptations.	
5.	Unit 9. Coelomate Deuterostomes- General characters of Echinodermata	
6.	Unit 9. Coelomate Deuterostomes- Water Vascular system in Starfish.	
7.	Unit 9. Coelomate Deuterostomes- Water Vascular system in Starfish.	
8.	Unit 10. Protochordata- Salient features	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – Honours

Class/Semester –2nd Semester **(CBCS)**

Name of the Paper - **CCIII – Non-chordates II: Coelomates**

Units Assigned – Unit 1, Unit 2 and Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit -1 Introduction To Coelomates- Evolution of Coelom and Metamerism.	
2.	Unit -1 Introduction To Coelomates- Evolution of Coelom and Metamerism.	
3.	Unit- 2 General Characteristics And Classification up To Classes	
4.	Unit- 2 General Characteristics And Classification up To Classes	
5.	Unit – 2: Excretion In Annelida	
6.	Unit 4: Onychophora General Characteristics and Evolutionary Significance	
7.	Unit 4: Onychophora General Characteristics and Evolutionary Significance	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – Honours

Class/Semester –2nd Semester **(CBCS)**

Name of the Paper - **CCIV –: Cell Biology**

Units Assigned –Unit 4 and Unit 5

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit -4: Mitochondria And Peroxisomes: Mitochondria Structure,	
2.	Unit -4: Mitochondria And Peroxisomes: Semi-Autonomous Nature, Endosymbiotic Hypothesis,	
3.	Unit -4: Mitochondria And Peroxisomes: Semi-Autonomous Nature, Endosymbiotic Hypothesis,	
4.	Unit -4: Mitochondria And Peroxisomes: Mitochondrial Respiratory Chain,	
5.	Unit -4: Mitochondria And Peroxisomes: Mitochondrial Respiratory Chain,	
6.	Unit -4: Mitochondria And Peroxisomes: Chemi-Osmotic Hypothesis,	
7.	Unit -4: Mitochondria And Peroxisomes: Peroxisomes.	
8.	Unit -4: Mitochondria And Peroxisomes: Peroxisomes.	
9.	Unit –5: Cytoskeleton-Structure And Functions: Microtubules,	
10.	Unit –5: Cytoskeleton-Structure And Functions: Microfilaments And Intermediate Filaments.	
11.	Unit –5: Cytoskeleton-Structure And Functions: Intermediate Filaments.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – Generic

Class/Semester –2nd Semester **(CBCS)**

Name of the Paper - **CCII-GE- Viii Insect Vectors and Diseases**

Units Assigned –Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit IV: Dipteran as Disease Vectors:,	
2.	Unit IV: Dipterans as important insect vectors – Mosquitoes	
3.	Unit IV: Dipterans as important insect vectors –Sand fly,	
4.	Unit IV: Dipterans as important insect vectors – Houseflies;	
5.	Unit IV: Study of mosquito-borne diseases – Malaria	
6.	Unit IV: Study of mosquito-borne diseases –Dengue, Chikungunya, Viral	
7.	Unit IV:Study of mosquito-borne diseases –Dengue, Chikungunya, Viral encephalitis,	
8.	Unit IV: Control of mosquitoes.	
9.	Unit IV: Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; Control of Sand fly.	
10.	Unit IV: Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; Control of Sand fly.	
11.	Unit IV: Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; Control of Sand fly.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – Hnours

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper - CORE COURSE V: DIVERSITY OF CHORDATA
Units Assigned – Unit 1, Unit 2, and Unit 3

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 1: Introduction to Chordates- General characteristics and outline classification	
2.	Unit 1: Introduction to Chordates- General characteristics and outline classification	
3.	Unit 2: Protochordata - General characteristics of Hemichordata	
4.	Unit 2: Protochordata - General characteristics of Urochordata	
5.	Unit 2: Protochordata - General characteristics of Cephalochordata	
6.	Unit 2: Protochordata - Study of larval forms in protochordates	
7.	Unit 2: Protochordata - Study of larval forms in protochordates	
8.	Unit 10. Protochordata- Retrogressive metamorphosis in Urochordata	
9.	Unit 10. Protochordata- Retrogressive metamorphosis in Urochordata	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – Hnours

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper - Core Course VI: Animal Physiology: Controlling and Coordinating Systems
Units Assigned – Unit 1 and Unit 5

Class	Topic/ Unit	Remarks
1.	Unit 1: Tissues- Structure, location, classification and functions of epithelial tissue	
2.	Unit 1: Tissues- Structure, location, classification and functions of epithelial tissue	
3.	Unit 1: Tissues - Structure, location, classification and functions of connective tissue	
4.	Unit 1: Tissues - Structure, location, classification and functions of connective tissue	
5.	Unit 1: Tissues - Structure, location, classification and functions of nervous tissue	
6.	Unit 1: Tissues - Structure, location, classification and functions of nervous tissue	
7.	Unit 5: Reproductive System - Histology of testis and ovary	
8.	Unit 5: Reproductive System - Histology of testis and ovary	
9.	Unit 5: Reproductive System - Physiology of male and female reproduction	
10.	Unit 5: Reproductive System - Physiology of male and female reproduction	
11.	Unit 5: Reproductive System - Physiology of male and female reproduction	
13.	Unit 5: Reproductive System – Puberty	
14.	Unit 5: Reproductive System - Methods of contraception in male and female	
15.	Unit 5: Reproductive System - Methods of contraception in male and female	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – Honours

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper – **Core Course VII: Fundamentals of Biochemistry**

Units Assigned – Unit 5

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 5: Enzymes- Nomenclature and classification	
2.	Unit 5: Enzymes- Nomenclature and classification	
3.	Unit 5: Enzymes - Cofactors	
4.	Unit 5: Enzymes - Specificity of enzyme action	
5.	Unit 5: Enzymes - Isozymes	
6.	Unit 5: Enzymes - Mechanism of enzyme action	
7.	Unit 5: Enzymes - Mechanism of enzyme action	
8.	Unit 5: Enzymes - Enzyme kinetics	
9.	Unit 5: Enzymes - Enzyme kinetics	
10.	Unit 5: Enzymes - Factors affecting rate of enzyme-catalyzed reactions	
11.	Unit 5: Enzymes - Factors affecting rate of enzyme-catalyzed reactions	
13.	Unit 5: Enzymes- Derivation of MichaelisMenten equation	
14.	Unit 5: Enzymes- Concept of Km and Vmax, Lineweaver-Burk plot	
15.	Unit 5: Enzymes - Multisubstrate reactions	
16.	Unit 5: Enzymes - Enzyme inhibition	
17.	Unit 5: Enzymes - Enzyme inhibition	
18.	Unit 5: Enzymes- Allosteric enzymes and their kinetics	
19.	Unit 5: Enzymes- Regulation of enzyme action.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – **Generic**

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper – **GE VII: HUMAN PHYSIOLOGY**

Units Assigned – Unit 3 and Unit 6

Class	Topic/ Unit	Remarks
1.	Unit 3: Respiratory Physiology Ventilation, External and internal Respiration,	
2.	Unit 3:Transport of oxygen and carbon dioxide in blood,	
3.	Unit 3:Transport of oxygen and carbon dioxide in blood	
4.	Unit 3: Factors affecting transport of gases	
5.	Unit 6: Endocrine and Reproductive Physiology Structure and function of endocrine glands (ovaries, and testes),	
6.	Unit 6: Endocrine and Reproductive Physiology Structure and function of endocrine glands (ovaries, and testes),	
7.	Unit 6: Endocrine and Reproductive Physiology Structure and function of endocrine glands (ovaries, and testes),	
8.	Unit 6: Brief account of spermatogenesis and oogenesis	
9.	Unit 6: Brief account of spermatogenesis and oogenesis	
10.	Unit 6: Menstrual cycle.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- **Dr. Kishor Haloi**

Course –Honours / Generic – Honours

Class/Semester –4th Semester **(CBCS)**

Name of the Paper - **Core Course VIII: Comparative Anatomy of Vertebrate**

Units Assigned – Unit 7 and Unit 8

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 7: Nervous System Comparative account of brain	
2.	Unit 7: Nervous System Comparative account of brain	
3.	Unit 7: Autonomic nervous system	
4.	Unit 7: Autonomic nervous system	
5.	Unit 7: Spinal cord, Cranial nerves in mammals	
6.	Unit 7: Spinal cord, Cranial nerves in mammals	
7.	Unit 7: Cranial nerves in mammals	
8.	Unit 7: Cranial nerves in mammals	
9.	Unit 8: Sense Organs Classification of receptors	
10.	Unit 8: Sense Organs Classification of receptors	
11.	Unit 8: Brief account of visual receptors in man	
12.	Unit 8: Brief account of visual receptors in man	
13.	Unit 8: Brief account of auditory receptors in man	
14.	Unit 8: Brief account of auditory receptors in man	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – Honours

Class/Semester –4th Semester **(CBCS)**

Name of the Paper - **Core Course IX: Animal Physiology: Life Sustaining Systems**

Units Assigned – Unit 5

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 5: Physiology of Heart Structure of mammalian heart	
2.	Unit 5: Physiology of Heart Coronary circulation	
3.	Unit 5: Physiology of Heart Structure and working of conducting myocardial fibers	
4.	Unit 5: Physiology of Heart Structure and working of conducting myocardial fibers	
5.	Unit 5: Physiology of Heart Origin and conduction of cardiac impulses Cardiac cycle	
6.	Unit 5: Physiology of Heart Origin and conduction of cardiac impulses Cardiac cycle	
7.	Unit 5: Physiology of Heart Cardiac output and its regulation	
8.	Unit 5: Physiology of Heart Frank-Starling Law of the heart	
9.	Unit 5: Physiology of Heart nervous and chemical regulation of heart rate	
10.	Unit 5: Physiology of Heart Electrocardiogram	
11.	Unit 5: Physiology of Heart Blood pressure and its regulation	
12.	Unit 5: Physiology of Heart Blood pressure and its regulation	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Kishor Haloi

Course –Honours / Generic – Honours

Class/Semester –4th Semester **(CBCS)**

Name of the Paper – **CORE COURSE X: Biochemistry of Metabolic Processes**

Units Assigned – Unit 1 and Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 1: Overview of Metabolism Use of reducing equivalents and cofactors;	
2.	Unit 1: Overview of Metabolism basics of intermediary metabolism and overview of regulatory strategies.	
3.	Cofactors; Specificity of enzyme action; Isozymes; Mechanism of enzyme action; Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions; Derivation of MichaelisMenten equation, Concept of Km and Vmax, Lineweaver-Burk plot; Multisubstrate reactions; Enzyme inhibition; Allosteric enzymes and their kinetics; Regulation of enzyme action	
4.	Unit 4: Protein Metabolism Catabolism of amino acids	
5.	Unit 4: Protein Metabolism Transamination	
6.	Unit 4: Protein Metabolism Deamination	
7.	Unit 4: Protein Metabolism Urea cycle	
8.	Unit 4: Protein Metabolism Urea cycle	
9.	Unit 4: Protein Metabolism Fate of C-skeleton of Glucogenic and Ketogenic amino acids.	
10.	Unit 4: Protein Metabolism Fate of C-skeleton of Glucogenic and Ketogenic amino acids.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Kishor Haloi

Course –Honours / Generic – **Generic**

Class/Semester –4th Semester **(CBCS)**

Name of the Paper – **GE IV: ENVIRONMENT AND PUBLIC HEALTH**

Units Assigned – Unit 1 and Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	UNIT I: Introduction: Sources of Environmental hazards, hazard identification and accounting.	
2.	UNIT I: Introduction: Sources of Environmental hazards, hazard identification and accounting	
3.	UNIT I: Introduction: Fate of toxic and persistent substances in the environment	
4.	UNIT I: Introduction: Dose Response Evaluation	
5.	UNIT I: Introduction: Exposure Assessment	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Kishor Haloi

Course –Honours / Generic – **Honours**

Class/Semester –5th Semester **(CBCS)**

Name of the Paper – **Core Course XI: Molecular Biology**

Units Assigned – Unit 4, Unit 7 and Unit 8

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 4 : Genetic code	
2.	Unit 4 :Degeneracy of the genetic code and Wobble Hypothesis and assembly in prokaryotes	
3.	Unit 4 :Process of protein synthesis in prokaryotes: Ribosome structure	
4.	Unit 4 : Fidelity of protein synthesis,	
5.	Unit 4 : Aminoacyl tRNA synthetases and charging of tRNA	
6.	Unit 4 : Proteins involved in initiation, elongation and termination of polypeptide chain	
7.	Unit 4 : Proteins involved in initiation, elongation and termination of polypeptide chain	
8.	Unit 4 :Inhibitors of protein synthesis	
9.	Unit 4 :Difference between prokaryotic and eukaryotic translation	
10.	Unit 7: DNA Repair Mechanisms Pyrimidine dimerization and mismatch repair	
11.	Unit 7: DNA Repair Mechanisms Pyrimidine dimerization and mismatch repair	
12.	Unit 8: Regulatory RNAs Concept of Ribo-switches	
13.	Unit 8: RNA interference, miRNA, siRNA	
14.	Unit 8: RNA interference, miRNA, siRNA	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Kishor Haloi

Course –Honours / Generic – **Honours**

Class/Semester –5th Semester **(CBCS)**

Name of the Paper – **Core Course XII: Principles of Genetics**

Units Assigned – Unit 6, Unit 7 and Unit 8

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 6: Polygenic Inheritance Polygenic inheritance with suitable examples; simple numericals based on it	
2.	Unit 6: Polygenic Inheritance Polygenic inheritance with suitable examples; simple numericals based on it	
3.	Unit 7: Recombination in Bacteria and Viruses Conjugation, Transformation, Transduction	
4.	Unit 7: Recombination in Bacteria and Viruses Conjugation, Transformation, Transduction,	
5.	Unit 7: Complementation test in Bacteriophage	
6.	Unit 8: Transposable Genetic Elements Transposons in bacteria	
7.	Unit 8: Transposable Genetic Elements Ac-Ds elements in maize and P elements in *Drosophila*	
8.	Unit 8: Transposable Genetic Elements Ac-Ds elements in maize and P elements in *Drosophila*	
9.	Unit 8: Transposable Genetic Elements Transposons in humans	
10.	Unit 8: Transposable Genetic Elements Transposons in humans	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Kishor Haloi

Course –Honours / Generic – **Honours**

Class/Semester –5th Semester **(CBCS)**

Name of the Paper –

Units Assigned – Unit 6, Unit 7 and Unit 8

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems - Integumentary	
2.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems - Integumentary	
3.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems - excretory	
4.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems - excretory	
5.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems -circulatory	
6.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems -circulatory	
7.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems - respiratory	
8.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems - respiratory	
9.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems -endocrine	
10.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems –endocrine	
11.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems – reproductive	
12.	Unit IV: Physiology of Insects Structure and physiology of Insect body systems – reproductive	
13.	Unit IV: Physiology of Insects - Sensory receptors and nervous system	

14.	Unit IV: Physiology of Insects - Sensory receptors and nervous system	
15.	Unit IV: Physiology of Insects - Growth and metamorphosis	
16.	Unit IV: Physiology of Insects - Growth and metamorphosis	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Kishor Haloi
Course –Honours / Generic – **Honours**
Class/Semester –5th Semester **(CBCS)**
Name of the Paper – **DSE Course III: Endocrinology**
Units Assigned – Unit 1, and Unit 2
Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 1: Introduction to Endocrinology History of endocrinology, Classification	
2.	Unit 1: Introduction to Endocrinology History of endocrinology, Classification	
3.	Unit 1: Characteristic and Transport of Hormones	
4.	Unit 1: Characteristic and Transport of Hormones	
5.	Unit 1: Neurosecretions and Neurohormones	
6.	Unit 1: Neurosecretions and Neurohormones	
7.	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis Structure of pineal gland,	
8.	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis Secretions and their functions in biological rhythms and reproduction.	
9.	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis - Structure of hypothalamus,	
10.	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis - Hypothalamic nuclei and their functions,	
11.	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis - Regulation of Neuroendocrine glands	
12.	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis - Feedback Mechanisms	
13.	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis - Hormones and their Functions,	
14.	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis - Hypothalamo- hypophysial portal system	
15.	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis - Disorders of pituitary gland.	
16.	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis - Disorders of pituitary gland.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – Honours

Class/Semester –1st Semester **(CBCS)**

Name of the Paper - **Course Code: Zc101t Core Course I: Non-Chordates I: Protists to Pseudocoelomates**

Units Assigned – Unit 3 and Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 3: Cnidaria- General characteristics and Classification up to classes	
2.	Unit 3: Cnidaria- General characteristics and Classification up to classes	
3.	Unit 3: Cnidaria- Metagenesis in Obelia	
4.	Unit 3: Cnidaria- Polymorphism in Cnidaria	
5.	Unit 3: Cnidaria- Polymorphism in Cnidaria	
6.	Unit 4: Ctenophora General characteristics	
7.	Unit 4: Ctenophora- Evolutionary significance of Ctenophora	

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Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – Honours

Class/Semester –1st Semester **(CBCS)**

Name of the Paper - **Core Course Ii: Principles of Ecology**

Units Assigned – Unit 2 and Unit 3

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 2: Population Population regulation - density-dependent and independent factors Population interactions,	
2.	Unit 2: Population Population regulation - density-dependent and independent factors Population interactions,	
3.	Unit 2: Population Population regulation - density-dependent and independent factors Population interactions,	
4.	Unit 2: Gause's Principle with laboratory and field examples	
5.	Unit 2: Gause's Principle with laboratory and field examples,	
6.	Unit 2: Lotka-Volterra equation for competition and Predation, functional and numerical responses.	
7.	Unit 2: Lotka-Volterra equation for competition and Predation, functional and numerical responses.	
8.	Unit 4: Ecosystem - Nutrient and biogeochemical cycle with Nitrogen cycle as an example Human modified ecosystem	
9.	Unit 4: Ecosystem - Nutrient and biogeochemical cycle with Nitrogen cycle as an example Human modified ecosystem	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Generic**

Class/Semester –1st Semester **(CBCS)**

Name of the Paper - **GE II: Animal Diversity**

Units Assigned – Unit 3, Unit 6, Unit 11 and Unit 13

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 3. Radiata - General characters of Cnidarians and polymorphism	
2.	Unit 3. Radiata - Polymorphism	
3.	Unit 3. Radiata - Polymorphism	
4.	Unit 6. Coelomate - Protostomes General Characters of Annelida	
5.	Unit 6. Coelomate - Metamerism	
6.	Unit 11. Pisces - Osmoregulation	
7.	Unit 11. Pisces -Migration of Fishes	
8.	Unit 13. Reptiles - Amniotes	
9.	Unit 13. Reptiles - Origin of reptiles.	
10.	Unit 13. Reptiles - Terrestrial adaptations in Reptiles	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – Honours

Class/Semester –2nd Semester **(CBCS)**

Name of the Paper - **CCIII – Non-chordates II: Coelomates**

Units Assigned – Unit 5

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit: 5 - General Characters of Mollusca	
2.	Unit: 5 - Classification of Mollusca	
3.	Unit: 5 - Classification of Mollusca	
4.	Unit: 5 - Pearl formation in Mollusca	
5.	Unit: 5 - Pearl formation in Mollusca	
6.	Unit: 5 - Respiration in Mollusca	
7.	Unit: 5 - Respiration in Mollusca	
8.	Unit: 5 - Evolutionary significance of Trocophore larva	
9.		

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Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – Honours

Class/Semester –2nd Semester **(CBCS)**

Name of the Paper - **CCIV – Cell Biology**

Units Assigned – Unit 1, Unit 2 and Unit 3 and Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 1: Prokayotic and Eukaryotic cells	
2.	Unit 1: Virus	
3.	Unit 1: Viroids	
4.	Unit 1: Mycoplasma	
5.	Unit 1: Prions	
6.	Unit 2: Mitosis	
7.	Unit 2: Mitosis	
8.	Unit 2: Cell Cycle and its regulation.	
9.	Unit 2: Cell Cycle and its regulation.	
10.	Unit 3: Structure & functions: Golgi Bodies	
11.	Unit 3: Structure & functions: Golgi Bodies	
12.	Unit 3: Structure & functions: Lysosomes	
13.	Unit 3: Structure & functions: Lysosomes	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Generic**

Class/Semester –**2nd Semester (CBCS)**

Name of the Paper - **CCII-GE- VIII Insect Vectors and Diseases**

Units Assigned – Unit 4 and Unit 5

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit IV: Dipteran as Disease Vectors: Study of house fly as important mechanical vector,	
2.	Unit IV: Myiasis and Control of house fly.	
3.	Unit V: Siphunculata as Disease Vectors: Human louse (Head, Body and Pubic louse) as important insect vectors;	
4.	Unit V: Siphunculata as Disease Vectors: Human louse (Head, Body and Pubic louse) as important insect vectors;	
5.	Unit V: Study of louse-borne diseases –Typhus fever	
6.	Unit V: Study of louse-borne diseases – Relapsing fever	
7.	Unit V: Study of louse-borne diseases - Trench fever	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Honours**

Class/Semester –**3rd Semester (CBCS)**

Name of the Paper - **Core Course V: Diversity of Chordata**

Units Assigned – Unit 8 and Unit 10

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 8: Aves- General characteristics and classification	
2.	Unit 8: Aves- General characteristics and classification	
3.	Unit 8: Aves- Archaeopteryx-- a connecting link	
4.	Unit 8: Aves- Principles and aerodynamics of flight	
5.	Unit 8: Aves- Principles and aerodynamics of flight	
6.	Unit 8: Aves-Flight adaptations	
7.	Unit 8: Aves-Flight adaptations	
8.	Unit 8: Aves-Migration in birds	
9.	Unit 8: Aves-Migration in birds	
10.	Unit 10: Zoogeography - Zoogeographical realms	
11.	Unit 10: Zoogeography - Theories pertaining to distribution of animals	
12.	Unit 10: Zoogeography - Plate tectonic and Continental drift theory	
13.	Unit 10: Zoogeography - Distribution of vertebrates in different realms	
13.	Unit 10: Zoogeography - Distribution of vertebrates in different realms	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Honours**

Class/Semester –**3rd Semester (CBCS)**

Name of the Paper - **Core Course Vi: Animal Physiology: Controlling And Coordinating Systems**
Units Assigned – Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 4: Muscle - Histology of different types of muscle	
	Unit 4: Muscle - Histology of different types of muscle	
2.	Unit 4: Muscle - Ultra structure of skeletal muscle	
3.	Unit 4: Muscle - Molecular and chemical basis of muscle contraction	
4.	Unit 4: Muscle - Molecular and chemical basis of muscle contraction	
5.	Unit 4: Muscle - Characteristics of muscle twitch	
6.	Unit 4: Muscle - Summation and tetanus.	
7.	Unit 4: Muscle - Motor unit	

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Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Honours**

Class/Semester –**3rd Semester (CBCS)**

Name of the Paper - **Core Course Vi: Animal Physiology: Controlling And Coordinating Systems**
Units Assigned – Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 1: Carbohydrates - Structure and Biological importance: Monosaccharides	
2.	Unit 1: Carbohydrates - Structure and Biological importance: Monosaccharides	
3.	Unit 1: Carbohydrates - Structure and Biological importance: Disaccharides	
4.	Unit 1: Carbohydrates - Structure and Biological importance: Disaccharides	
5.	Unit 1: Carbohydrates - Structure and Biological importance: Polysaccharides	
6.	Unit 1: Carbohydrates - Structure and Biological importance: Polysaccharides	
7.	Unit 1: Carbohydrates - Structure and Biological importance: Glycoconjugates	
8.	Unit 1: Carbohydrates – Structure and Biological importance: Glycoconjugates	
9.	Unit 2: Lipids - Structure and Significance	
10.	Unit 2: Lipids - Physiologically important saturated and unsaturated fatty acids	
11.	Unit 2: Lipids - Tri-acylglycerols, Phospholipids, Glycolipids, Steroids.	
12.	Unit 2: Lipids - Tri-acylglycerols, Phospholipids, Glycolipids, Steroids.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Generic**

Class/Semester –**3rd Semester (CBCS)**

Name of the Paper – **GE VII: Human Physiology**

Units Assigned – Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 4: Renal Physiology - Functional anatomy of kidney	
2.	Unit 4: Renal Physiology - Mechanism and regulation of urine formation	
3.	Unit 4: Renal Physiology - Mechanism and regulation of urine formation	
4.	Unit 5: Cardiovascular Physiology - Structure of heart, Coordination of heartbeat, Cardiac cycle, ECG	
5.	Unit 5: Cardiovascular Physiology - Structure of heart,	
6.	Unit 5: Cardiovascular Physiology -Coordination of heartbeat,	
7.	Unit 5: Cardiovascular Physiology - Cardiac cycle	
8.	Unit 5: Cardiovascular Physiology - ECG	

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Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – Honours

Class/Semester –4th Semester **(CBCS)**

Name of the Paper - **Core Course VIII: Comparative Anatomy Of Vertebrate**

Units Assigned – Unit 5 and Unit 6

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 5: Circulatory System General plan of circulation	
2.	Unit 5: Evolution of heart	
3.	Unit 5: Evolution of heart	
4.	Unit 5: Evolution of aortic arches	
5.	Unit 5: Evolution of aortic arches	
6.	Unit 6: Urinogenital System	
7.	Unit 6: Succession of kidney	
8.	Unit 6: Succession of kidney	
9.	Unit 6: Evolution of urinogenital ducts	
10.	Unit 6: Evolution of urinogenital ducts	
11.	Unit 6: Types of mammalian uteri	
12.	Unit 6: Types of mammalian uteri	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – Honours

Class/Semester –4th Semester **(CBCS)**

Name of the Paper - **Core Course IX: Animal Physiology: Life Sustaining Systems**

Units Assigned – Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 4: Blood Components of blood and their functions	
2.	Unit 4: Blood Components of blood and their functions	
3.	Unit 4: Blood Structure and functions of haemoglobin	
4.	Unit 4: Blood Haemostasis	
5.	Unit 4: Blood Blood clotting system,	
6.	Unit 4: Blood Blood clotting system,	
7.	Unit 4: Blood Kallikrein-Kinninogen system,	
8.	Unit 4: Blood Complement system & Fibrinolytic system	
9.	Unit 4: Blood Complement system& Fibrinolytic system	
10.	Unit 4: Blood Haemopoiesis	
11.	Unit 4: Blood Blood groups: Rh factor, ABO and MN.	
12.	Unit 4: Blood Blood groups: Rh factor, ABO and MN.	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – Honours

Class/Semester –4th Semester **(CBCS)**

Name of the Paper – **CORE COURSE X: Biochemistry of Metabolic Processes**

Units Assigned – Unit 1 and Unit 3

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 1: Overview of Metabolism Catabolism vs Anabolism, Stages of catabolism	
2.	Unit 1: Overview of Metabolism Compartmentalization of metabolic pathways	
3.	Unit 3: Lipid Metabolism β-oxidation and omega -oxidation of saturated fatty acids with even and odd number of carbon atoms	
4.	Unit 3: Lipid Metabolism β-oxidation and omega -oxidation of saturated fatty acids with even and odd number of carbon atoms	
5.	Unit 3: Lipid Metabolism β-oxidation and omega -oxidation of saturated fatty acids with even and odd number of carbon atoms	
6.	Unit 3: Lipid Metabolism β-oxidation and omega -oxidation of saturated fatty acids with even and odd number of carbon atoms	
7.	Unit 3: Lipid Metabolism Biosynthesis of palmitic acid	
8.	Unit 3: Lipid Metabolism Biosynthesis of palmitic acid	
9.	Unit 3: Lipid Metabolism Ketogenesis	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Generic**

Class/Semester –4th Semester **(CBCS)**

Name of the Paper – **GE IV: Environment and Public Health**

Units Assigned – Unit 1 and Unit 5

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 3: Pollution- Air pollution sources and effects	
2.	Unit 3: Pollution -Water pollution sources and effects	
3.	Unit 3: Pollution Noise - pollution sources and effects	
4.	Unit 5 Diseases - Causes, symptoms and control of tuberculosis	
5.	Unit 5 Diseases - Causes, symptoms and control of tuberculosis	
6.	Unit 5 Diseases - Causes, symptoms and control of Asthma	
7.	Unit 5 Diseases - Causes, symptoms and control of Asthma s	
8.	Unit 5 Diseases - Causes, symptoms and control of Cholera	
9.	Unit 5 Diseases - Causes, symptoms and control of Cholera	
10.	Unit 5 Diseases - Causes, symptoms and control of Minamata Disease	
11.	Unit 5 Diseases - Causes, symptoms and control of Minamata Disease	
12.	Unit 5 Diseases - Causes, symptoms and control of typhoid	
13.	Unit 5 Diseases - Causes, symptoms and control of typhoid	

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Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Honours**

Class/Semester –5th Semester **(CBCS)**

Name of the Paper – **CORE COURSE XI**: **Molecular Biology**

Units Assigned – Unit 6

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 6: Gene Regulation - Transcription regulation in prokaryotes: Principles of transcriptional regulation	
2.	Unit 6: Gene Regulation - Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from *lac* operon	
3.	Unit 6: Gene Regulation - Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from *trp* operon;	
4.	Unit 6: Gene Regulation - Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencer elements; Gene silencing, Genetic imprinting	
5.	Unit 6: Gene Regulation - Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencer elements; Gene silencing, Genetic imprinting	
6.	Unit 6: Gene Regulation - Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencer elements; Gene silencing, Genetic imprinting	
7.	Unit 6: Gene Regulation - Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencer elements; Gene silencing, Genetic imprinting	
8.	Unit 6: Gene Regulation - Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencer elements; Gene silencing, Genetic imprinting	

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Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Honours**

Class/Semester –5th Semester **(CBCS)**

Name of the Paper – **CORE COURSE XII: PRINCIPLES OF GENETICS**

Units Assigned – Unit 2 and Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 2: Linkage, Crossing Over and Chromosomal Mapping Linkage and crossing over	
2.	Unit 2: Linkage, Crossing Over and Chromosomal Mapping Cytological basis of crossing over	
3.	Unit 2: Linkage, Crossing Over and Chromosomal Mapping Cytological basis of crossing over	
4.	Unit 2: Linkage, Crossing Over and Chromosomal Mapping Molecular mechanisms of crossing over including models of recombination	
5.	Unit 2: Linkage, Crossing Over and Chromosomal Mapping Molecular mechanisms of crossing over including models of recombination	
6.	Unit 2: Linkage, Crossing Over and Chromosomal Mapping Recombination frequency as a measure of linkage intensity, Two factor and three factor crosses, Interference and coincidence, Somatic cell hybridization.	
7.	Unit 2: Linkage, Crossing Over and Chromosomal Mapping Two factor and three factor crosses, Interference and coincidence, Somatic cell hybridization.	
8.	Unit 2: Linkage, Crossing Over and Chromosomal Mapping Two factor and three factor crosses, Interference and coincidence, Somatic cell hybridization.	
9.	Unit 2: Linkage, Crossing Over and Chromosomal Mapping Two factor and three factor crosses, Interference and coincidence, Somatic cell hybridization.	
11.	Unit 4: Sex Determination Chromosomal mechanisms of sex determination in Drosophila and Man	
12.	Unit 4: Sex Determination Chromosomal mechanisms of sex determination in Drosophila and Man	

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Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Honours**

Class/Semester –5th Semester **(CBCS)**

Name of the Paper – **DSE Course III: ENDOCRINOLOGY**
Units Assigned –Unit 4
Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit 4: Regulation of Hormone Action Hormone action at Cellular level and molecular level	
2.	Unit 4: Regulation of Hormone Action Hormone action at Cellular level and molecular level	
3.	Unit 4: Regulation of Hormone Action - Hormone receptor : signal transducer, second messenger	
4.	Unit 4: Regulation of Hormone Action - Hormone receptor : signal transducer, second messenger	
5.	Unit 4: Regulation of Hormone Action - Hormones in homeostasis	
6.	Unit 4: Regulation of Hormone Action - Hormones in homeostasis	
7.	Unit 4: Regulation of Hormone Action - Disorders of endocrine glands	
8.	Unit 4: Regulation of Hormone Action - Disorders of endocrine glands	
9.	Unit 4: Regulation of Hormone Action - Disorders of endocrine glands	

DIGBOI COLLEGE, DIGBOI

Course Plan

Name of the Teacher- Dr. Moni Kankana Kalita

Course –Honours / Generic – **Honours**

Class/Semester –5th Semester **(CBCS)**

Name of the Paper – **DSE Course IV: BIOLOGY OF INSECTA**

Units Assigned –Unit 4

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	Unit I: Introduction - General Features of Insects	
2.	Unit I: Introduction - Distribution and Success of Insects on the Earth	
3.	Unit VI: Insects as Vectors Insects as mechanical and Biological vectors,	
4.	Unit VI: Insects as Vectors Brief discussion on houseflies and mosquitoes as important insect vectors	
5.	Unit VI: Insects as Vectors Brief discussion on houseflies and mosquitoes as important insect vectors	
6.	Unit VI: Insects as Vectors Brief discussion on houseflies and mosquitoes as important insect vectors	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2021

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 101: Biological Chemistry and Molecular Biology**

Units Assigned – Unit 1 & 3

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	Unit 1: Structure and functions of carbohydrates	
2.	Unit 1 Structure and functions of carbohydrates	
3.	Unit 1: Structure and functions of lipids	
4.	Unit 1 Structure and functions of proteins	
5.	Unit 1: Structure and functions of amino acid	
6.	Unit 1: Structure and functions of amino acid	
7.	Unit 1: Levels and structural organization of proteins	
8.	Unit 1: Levels and structural organization of proteins.	
9.	Unit 3: Enzymes: classification	
10.	Unit 3: Enzymes: properties	
11.	Unit 3: Mechanism of enzyme action	
12.	Unit 3: Factors affecting enzyme activity	
13.	Unit 3: Michaelis-Menten equation	
14.	Unit 3: Line-weaver & Burk plot	
15.	Unit 3: significance of Km; Enzyme inhibition;	
16.	Unit 3: Cofactors and coenzymes; Biosensors	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2021

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 102: CELL BIOLOGY & GENETICS**

Units Assigned – Unit 2

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	Unit 2: Cell-cycle: phases of cell cycle	
2.	Unit 2: Cell-cycle: checkpoints and regulators of cell cycle progression	
3.	Unit 2: Cell-cycle: checkpoints and regulators of cell cycle progression	
4.	Unit 2: Cell-cycle: Programmed cell death	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2021

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper **- LSD106: A. BIOCHEMISTRY-I INTERMEDIARY METABOLISM**

Units Assigned – Unit 5, Unit 6

Marks Assigned – 20 out of 60

Class	Topic/ Unit	Remarks
1.	Unit 5: Metabolism of Purines and Pyrimidines, its regulation	
2.	Unit 5: Metabolism of Purines and Pyrimidines, its regulation	
3.	Unit 6: Interrelationship of carbohydrate, lipid and protein metabolism, Inborn errors of metabolism	
4.	Unit 6: Interrelationship of carbohydrate, lipid and protein metabolism, Inborn errors of metabolism	
5.	Unit 6: Interrelationship of carbohydrate, lipid and protein metabolism, Inborn errors of metabolism	
6.	Unit 6: Interrelationship of carbohydrate, lipid and protein metabolism, Inborn errors of metabolism	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –2nd Semester **(CBCS)**

Name of the Paper - **LSC202: TOXICOLOGY, PEST MANAGEMENT, BIOETHICS & IPR**

Units Assigned – Unit 4

Marks Assigned – 10 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 4:** Bioethics and IKS: Historical perspectives of bioethics	
2.	**Unit 4:** Bioethics and IKS: Conflicting issues (GMO, GMP, Cloning, Environmental hazards)	
3.	**Unit 4:** Bioethics and IKS: Conflicting issues (GMO, GMP, Cloning, Environmental hazards)	
4.	**Unit 4:** Bioethics and IKS: Principles and guidelines for research in animals and human	
5.	**Unit 4:** Bioethics and IKS: Intellectual Property Rights and their types	
6.	**Unit 4:** Bioethics and IKS: Indigenous knowledge system, biopiracy.	
7.	**Unit 4:** Bioethics and IKS: Indigenous knowledge system, biopiracy.	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –2nd Semester **(CBCS)**

Name of the Paper - **LSC203: TAXONOMY, EVOLUTION & BIODIVERSITY**

Units Assigned –Unit 4

Marks Assigned – 05 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 4:** Phylogenetic tree: reading and using, the tree of life.	
2.	**Unit 4:** Phylogenetic tree: reading and using, the tree of life.	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –2nd Semester **(CBCS)**

Name of the Paper - **LSD206: A. BIOCHEMISTRY –II (PROTEIN CHEMISTRY & ENZYMOLOGY)**

Units Assigned –Unit 3 & 4

Marks Assigned – 20 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 3:** Enzymes: Energetics of enzyme catalyzed reaction single and bisubstrate reactions	
2.	**Unit 3:** Enzymes: mechanism of action	
3.	**Unit 3:** Enzymes: Allosteric enzymes	
4.	**Unit 3:** Enzymes: Enzyme induction and inhibition (competitive, non-competitive and uncompetitive)	
5.	**Unit 3:** Enzymes: Enzyme induction and inhibition (competitive, non-competitive and uncompetitive)	
6.	**Unit 3:** Enzymes: Enzyme induction and inhibition (competitive, non-competitive and uncompetitive)	
7.	**Unit 3:** Enzymes: Purification of Enzyme	
8.	**Unit 4:** Enzyme kinetics; Michalis-Menten plot	
9.	**Unit 4:** Line weaver Bulk plot, Hill plot	
10.	**Unit 4:** Regulation of enzyme activity	
11.	**Unit 4:** Restriction enzymes, RNA as an enzyme	
12.	**Unit 4:** Isoenzyme and their significance. Regulation of metabolism by enzyme.	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper - **LSC 301: ANIMAL PHYSIOLOGY**

Units Assigned – Unit 2

Marks Assigned – 8 out of 45

Class	Topic/ Unit	Remarks
1.	**Unit 2:** Types and comparative anatomy of heart in vertebrate	
2.	**Unit 2:** Cardiac cycle and its regulation	
3.	**Unit 2:** Blood pressure and heart diseases	
4.	**Unit 2:** Blood pressure and heart diseases	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper - **LSC 302: IMMUNOLOGY**

Units Assigned – Unit 3

Marks: 08 out of 45

Class	Topic/ Unit	Remarks
1.	**Unit 3:** Complement system: characteristic features	
2.	**Unit 3: A**ctivation pathways and its biological consequences	
3.	**Unit 3: S**tructure and function of MHC I and MHC II molecules	
4.	**Unit 3: S**tructure and function of MHC I and MHC II molecules	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper – **LSC 303: DEVELOPMENTAL BIOLOGY**

Units Assigned – Unit 1

Marks: 08 out of 45

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	**Unit 1:** Gamatogenesis: Cells in the seminiferous tubules; formation of spermatids	
2.	**Unit 1:** Gamatogenesis: differentiation of the spermatozoa; Oogenesis - growth of the oocytes	
3.	**Unit 1:** Gamatogenesis: Nuclear activity during the growth of the oocyte; accumulation of food reserves in the cytoplasm of the oocytes	
4.	**Unit 1:** Gamatogenesis: In vitro oocyte maturation; hormonal control of gametogenesis	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 101: Biological Chemistry and Molecular Biology**

Units Assigned – Unit 1 & 3

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	Unit 1: Structure and functions of carbohydrates	
2.	Unit 1 Structure and functions of carbohydrates	
3.	Unit 1: Structure and functions of lipids	
4.	Unit 1 Structure and functions of proteins	
5.	Unit 1: Structure and functions of amino acid	
6.	Unit 1: Structure and functions of amino acid	
7.	Unit 1: Levels and structural organization of proteins	
8.	Unit 1: Levels and structural organization of proteins.	
9.	Unit 3: Enzymes: classification	
10.	Unit 3: Enzymes: properties	
11.	Unit 3: Mechanism of enzyme action	
12.	Unit 3: Factors affecting enzyme activity	
13.	Unit 3: Michaelis-Menten equation	
14.	Unit 3: Line-weaver & Burk plot	
15.	Unit 3: significance of Km; Enzyme inhibition;	
16.	Unit 3: Cofactors and coenzymes; Biosensors	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 102: CELL BIOLOGY & GENETICS**

Units Assigned – Unit 2

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	Unit 2: Cell-cycle: phases of cell cycle	
2.	Unit 2: Cell-cycle: checkpoints and regulators of cell cycle progression	
3.	Unit 2: Cell-cycle: checkpoints and regulators of cell cycle progression	
4.	Unit 2: Cell-cycle: Programmed cell death	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper - **LSD106: A. BIOCHEMISTRY-I INTERMEDIARY METABOLISM**

Units Assigned – Unit 5, Unit 6

Class	Topic/ Unit	Remarks
1.	Unit 5: Metabolism of Purines and Pyrimidines, its regulation	
2.	Unit 5: Metabolism of Purines and Pyrimidines, its regulation	
3.	Unit 6: Interrelationship of carbohydrate, lipid and protein metabolism, Inborn errors of metabolism	
4.	Unit 6: Interrelationship of carbohydrate, lipid and protein metabolism, Inborn errors of metabolism	
5.	Unit 6: Interrelationship of carbohydrate, lipid and protein metabolism, Inborn errors of metabolism	
6.	Unit 6: Interrelationship of carbohydrate, lipid and protein metabolism, Inborn errors of metabolism	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2021

Name of the Teacher- **Dr. Moni Kankana Kalita**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 101: Biological Chemistry and Molecular Biology**

Units Assigned – Unit 4 & 6

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 4:** Nucleic acid as genetic material; structure, properties and types of DNA (A, B and Z)	
2.	**Unit 4:** RNA (hn RNA, mRNA, tRNA and rRNA)	
3.	**Unit 4:** C- value Paradox; Genome organization in 'prokaryotes' and eukaryotes; Structural and regulatory genes	
4.	**Unit 4:** DNA replication: semiconservative, enzymology of DNA replication	
5.	**Unit 4:** Basic concept of end replication problem and DNA synthesis by reverse transcriptase	
6.	**Unit 4:** Regulation of gene expression in 'prokaryotes'; operon concept, structure and function of lac.operon.	
7.	**Unit 6:** Polymerase chain reaction (PCR)	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2021

Name of the Teacher- **Dr. Moni Kankana Kalita**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 102: CELL BIOLOGY & GENETICS**

Units Assigned – Unit 3

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 3:** Carcinogens and mechanisms of carcinogenesis	
2.	**Unit 3:** Properties of cancer cells	
3.	**Unit 3:** Tumor viruses, oncogenes and suppressor genes	
4.	**Unit 3:** Tumor viruses, oncogenes and suppressor genes	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2021

Name of the Teacher- **Dr. Moni Kankana Kalita**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper - **LSC103: TECHNIQUE IN BIOLOGY, BIOSTATISTICS & BIOINFORMATICS**

Units Assigned – Unit 4

Marks Assigned – 06 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 4:** Sampling of statistical data; Central tendencies and dispersions	
2.	**Unit 4:** Sampling of statistical data; Central tendencies and dispersions	
3.	**Unit 4:** Sampling of statistical data; Central tendencies and dispersions	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Moni Kankana Kalita**

Course – M.Sc in Life Sciences

Class/Semester –2nd Semester **(CBCS)**

Name of the Paper - **LSC202: TOXICOLOGY, PEST MANAGEMENT, BIOETHICS & IPR**

Units Assigned – Unit 5, Unit 6

Marks Assigned – 10 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 5:** Agreement and treaties : GATT & TRIPs Agreement, Madrid Agreement, Hague Agreement, WIPO Treaties	
2.	**Unit 5:** Indian Patent Act 1970 and recent amendment. Patent cooperation treaty, Patent filing procedure.	
3.	**Unit 5:** Patent cooperation treaty, Patent filing procedure.	
4.	**Unit-6:** Overview of Intellectual Property Rights: Introduction and need of IPR	
5.	**Unit-6:** IPR in India and abroad. Role of IPR in modern Biotechnological research	
6.	**Unit-6:** Patents, Copyright, Trademarks and Geographical Indications. Process of patenting.	
7.	**Unit-6:** Patents, Copyright, Trademarks and Geographical Indications. Process of patenting.	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Moni Kankana Kalita**

Course – M.Sc in Life Sciences

Class/Semester –2nd Semester **(CBCS)**

Name of the Paper - **LSC203: TAXONOMY, EVOLUTION & BIODIVERSITY**

Units Assigned –Unit 4

Marks Assigned – 05 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 4:** Modern evolutionary synthesis; Origin of basic biological molecules	
2.	**Unit 4:** Concept of neutral evolution and molecular clocks	
3.	**Unit 4:** Chemical evolution – origin of life in the light of chemical evolution. Adaptive radiation.	
4.	**Unit 4:** Chemical evolution – origin of life in the light of chemical evolution. Adaptive radiation.	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Moni K. Kalita**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 101: Biological Chemistry and Molecular Biology**

Units Assigned – Unit 4 & 6

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 4:** Nucleic acid as genetic material; structure, properties and types of DNA (A, B and Z)	
2.	**Unit 4:** RNA (hn RNA, mRNA, tRNA and rRNA)	
3.	**Unit 4:** C- value Paradox; Genome organization in 'prokaryotes' and eukaryotes; Structural and regulatory genes	
4.	**Unit 4:** DNA replication: semiconservative, enzymology of DNA replication	
5.	**Unit 4:** Basic concept of end replication problem and DNA synthesis by reverse transcriptase	
6.	**Unit 4:** Regulation of gene expression in 'prokaryotes'; operon concept, structure and function of lac.operon.	
7.	**Unit 6:** Polymerase chain reaction (PCR)	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Moni Kankana Kalita**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 102: CELL BIOLOGY & GENETICS**

Units Assigned – Unit 3

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 3:** Carcinogens and mechanisms of carcinogenesis	
2.	**Unit 3:** Properties of cancer cells	
3.	**Unit 3:** Tumor viruses, oncogenes and suppressor genes	
4.	**Unit 3:** Tumor viruses, oncogenes and suppressor genes	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Moni Kankana Kalita**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper - **LSC103: TECHNIQUE IN BIOLOGY, BIOSTATISTICS & BIOINFORMATICS**

Units Assigned – Unit 4

Marks Assigned – 06 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 4:** Sampling of statistical data; Central tendencies and dispersions	
2.	**Unit 4:** Sampling of statistical data; Central tendencies and dispersions	
3.	**Unit 4:** Sampling of statistical data; Central tendencies and dispersions	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Moni Kankana Kalita**

Course – M.Sc in Life Sciences

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper – **LSC 301: Animal Physiology**

Units Assigned – Unit 2

Marks: 08 out of 45

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	**Unit 2:** Physical and chemical composition of blood	
2.	**Unit 2:** Blood groups	
3.	**Unit 2:** Blood coagulation	
4.	**Unit 2:** Blood volume and its regulation	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- - **Dr. Moni Kankana Kalita**

Course – M.Sc in Life Sciences

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper – **LSC 302: Immunology**

Units Assigned – Unit 2

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 2:** Immunoglobulin: molecular structure	
2.	**Unit 2:** Immunoglobulin: Classes and functions	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Dr. Kishor Haloi**

Course – M.Sc in Life Sciences

Class/Semester – 3rd Semester **(CBCS)**

Name of the Paper – **LSC 303: Developmental Biology**

Units Assigned – Unit 2

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 2:** Changes in the organization of the egg cytoplasm caused by fertilization	
2.	**Unit 2:** In vitro fertilization	

DIGBOI COLLEGE, DIGBOI

Course Plan : 2022-2023

Name of the Teacher- Aparajita Gogoi

Course –M. Sc

Class/Semester- 3rd Semester (CBCS)

Name of the Paper-LSC 301 – Animal Physiology

Units Assigned-Unit 3

Marks Assigned- 7 /45

Class	Topic/ Unit	Remarks
1.	Unit 3: Generation of impulse- resting and action potentials; transmission of impulse ; axonal , synaptic and neuromuscular transport of neuronal cells	

DIGBOI COLLEGE, DIGBOI

Course Plan : 2022-2023

Name of the Teacher- Aparajita Gogoi

Course –M. Sc

Class/Semester- 3rd Semester (CBCS)

Name of the Paper-LSC 302 – Immunology

Units Assigned-Unit 2

Marks Assigned- 7 /45

Class	Topic/ Unit	Remarks
1.	Unit 2 : Antigen quantification, by RID, RIA, ELISA	

DIGBOI COLLEGE, DIGBOI

Course Plan : 2022-2023

Name of the Teacher- Aparajita Gogoi

Course –M. Sc

Class/Semester- 2nd Semester (CBCS)

Name of the Paper-LSC 203 – Taxonomy, Evolution and Biodiversity

Units Assigned-Unit 5 & 6

Marks Assigned- 8 /45

Class	Topic/ Unit	Remarks
1.	**Unit 5** : Biodiversity-types, species, genetic and molecular diversity	
2.	Biodiversity hotspots in India and global mega diversity regions	
3.	**Unit 6**: Biogeographical realms of the world, geographic origins of species	
4.	Geographic distribution of species, Biogeographical Zones of India	

DIGBOI COLLEGE, DIGBOI

Course Plan : 2021-2022

Name of the Teacher- Aparajita Gogoi

Course –M. Sc

Class/Semester-1st Semester (CBCS)

Name of the Paper-LSC 101 – Biological Chemistry and Molecular Biology

Units Assigned-Unit 2

Marks Assigned- 8 /45

Class	Topic/ Unit	Remarks
1.	Unit 1: Chemical bonds –types and features	
2.	Law of Thermodynamics	
3.	Concept of free energy in biological system, high energy compounds and their biological significance	
4.	Unit 2: Concept of electron transport system & ATP synthesis	
5.	Oxidative phosphorylation –substrate level	

DIGBOI COLLEGE, DIGBOI

Course Plan : 2021-2022

Name of the Teacher- Aparajita Gogoi

Course –M. Sc

Class/Semester-1st Semester (CBCS)

Name of the Paper-LSC 102 – Cell Biology and Genetics

Units Assigned-Unit 2

Marks Assigned- 8 /45

Class	Topic/ Unit	Remarks
1.	Unit 2: Cellular communication- cell adhesion, role of different adhesion molecules	
2.	Cell signalling; signalling molecules	
3.	Receptors of cell signalling; second messengers, mechanism of signal transduction	

DIGBOI COLLEGE, DIGBOI

Course Plan : 2021-2022

Name of the Teacher- Aparajita Gogoi

Course –M. Sc

Class/Semester-1st Semester (CBCS)

Name of the Paper-LSC 106 – Entomology-1 Insect Diversity and Evolution

Units Assigned-Unit 2

Marks Assigned- 8 /45

Class	Topic/ Unit	Remarks
1.	3: Classification of economically important groups upto super family	
2.	6. Insect societies- Groups of social insects and their societies, honey bees, aphids	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Miss. Priyanka Debnath**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 101: Biological Chemistry and Molecular Biology**

Units Assigned – Unit 2 & 4

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	Unit 2: Glycolysis	
2.	Unit 2: Substrate level phosphorylation	
3.	Unit 2: Gluconeogenesis	
4.	Unit 2: Cori cycle	
5.	Unit 2: Oxidative decarboxylation of Pyruvic acid & PDH complex	
6.	Unit 2: Krebs cycle and its energetics	
7.	Unit 2: Amphibolic pathways & Anaplerotic reaction of Krebs cycle	
8.	Unit 2: Urea Cycle & its link with kreb's cycle	
9.	Unit 2: Omega-oxidation of fatty acids	
10.	Unit 2: Synthesis of fatty acid (Palmitate)	
11.	Unit 2: Oxidative deamination, decarboxylation, transamination	
12.	Unit 4: Semiconservative Replication & DNA Polymerase	
13.	Unit 4: DNA Replication	
14.	Unit 4: End Replication problem	
15.	Unit 4: DNA Replication by Reverse Transcriptase	
16.	Unit 4: Structural & Regulatory genes	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Miss. Priyanka Debnath**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 102: CELL BIOLOGY & GENETICS**

Units Assigned – Unit 1

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	Unit 1: Dynamics of cytoskeletons (microfilaments)	
2.	Unit 1: Role of actin & microtubule cytoskeleton in cell shape, intracellular motility	
3.	Unit 1: Role of actin & microtubule cytoskeleton in mitosis & locomotion	
4.	Unit 1: Functions of intermediate filaments	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Miss. Priyanka Debnath**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper – **LSC 103: TECHNIQUE IN BIOLOGY & BIOSTATISTICS & BIOINFORMATICS**

Units Assigned – Unit 4

Marks Assigned – 6 out of 60

Class	Topic/ Unit	Remarks
1.	Unit 4: Basic probability concepts	
2.	Unit 4: Theoretical distributions (binomial)	
3.	Unit 4: Theoretical distributions (poisson)	
4.	Unit 4: Theoretical distributions (normal)	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Miss. Priyanka Debnath**

Course – M.Sc in Life Sciences

Class/Semester –1st Semester **(CBCS)**

Name of the Paper - **LSD106: A. BIOCHEMISTRY-I INTERMEDIARY METABOLISM**

Units Assigned – Unit 1, 2, 3, 5, 6,

Marks Assigned : 40 out of 60

Class	Topic/ Unit	Remarks
1.	Unit 1: Types and features of biochemical reactions	
2.	Unit 1: Bioenergietics: redox reaction, redox potential and free energy	
3.	Unit 1: oxidative and photophosphorylation and their mechanism	
4.	Unit 1: Structure of ATPase and Chemiosmotic theory of ATP synthesis	
5.	Unit 2: Metabolism of Carbohydrates: Regulation of Glycolysis	
6.	Unit 2: Metabolism of Carbohydrates: Regulation of Kreb's Cycle	
7.	Unit 2: Metabolism of Carbohydrates: Regulation of HMP pathway	
8.	Unit 2: Metabolism of Carbohydrates: Regulation of glycogenesis	
9.	Unit 2: Metabolism of Carbohydrates: Regulation of glycogenolysis	
10.	Unit 2: Metabolism of Carbohydrates: Regulation of Glyoxylate cycle	
11.	Unit 3: Lipids: β oxidation of saturated and unsaturated fatty acids	
12.	Unit 3: ω– oxidation; metabolismof ketone bodies	
13.	Unit 3: biosynthesis of saturated fatty acids, its regulation	
14.	Unit 3: metabolism of eicosanoids and cholesterol.	
15.	Unit 5: Metabolism of Purines and Pyrimidines, its regulation	
16.	Unit 6: Interrelationship of carbohydrate, lipidnand protein	

	metabolism,	
17.	Unit 6: Inborn errors of metabolism	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Miss. Priyanka Debnath**

Course – M.Sc in Life Sciences

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper - **LSC 301: ANIMAL PHYSIOLOGY**

Units Assigned – Unit 1

Marks Assigned – 8 out of 45

Class	Topic/ Unit	Remarks
1.	**Unit 1:** Types , structure & function of nephrons	
2.	**Unit 1:** Renal Blood Flow , Glomerular Filtration & their control	
3.	**Unit 1:** Tubular reabsorption and secretion	
4.	**Unit 1:** Concentration of Urine	
5.	**Unit 1:** Osmoregulation & Acid base balance	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Miss. Priyanka Debnath**

Course – M.Sc in Life Sciences

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper - **LSC 302: IMMUNOLOGY**

Units Assigned – Unit 2

Marks: 08 out of 45

Class	Topic/ Unit	Remarks
1.	**Unit 2:** Immunoglobulin: molecular structure, classes & functions	
2.	**Unit 2:** Ig gene Arrangement	
3.	**Unit 2:** RID	
4.	**Unit 2:** RIA	
5.	**Unit 2:** ELISA	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Miss. Priyanka Debnath**

Course – M.Sc in Life Sciences

Class/Semester –3rd Semester **(CBCS)**

Name of the Paper – **LSC 303: DEVELOPMENTAL BIOLOGY**

Units Assigned – Unit 3

Marks: 08 out of 45

Marks Assigned – 13.25 out of 53

Class	Topic/ Unit	Remarks
1.	**Unit 3:** Properties of cleavage & chemical changes during cleavage	
2.	**Unit 3:** Totipotency and nuclear transfer experiments	
3.	**Unit 3:** Distribution of cytoplasmic substances in the egg during cleavage	
4.	**Unit 3:** Morphogenetic gradients of egg cytoplasm	
5.	**Unit 3:** Concepts of determination: competence and induction	
6.	**Unit 3:** Mechanism of action of the inducing substances	

DIGBOI COLLEGE, DIGBOI

Course Plan, 2022

Name of the Teacher- **Miss. Priyanka Debnath**

Course – M.Sc in Life Sciences

Class/Semester – 3rd Semester **(CBCS)**

Name of the Paper – **LSD306: C. BIOCHEMISTRY –III (MOLECULAR BIOLOGY)**

Units Assigned –Unit 1, 4, 5

Marks Assigned – 40 out of 60

Class	Topic/ Unit	Remarks
1.	**Unit 5:** Clonal Selection Theory	
2.	**Unit 5:** Hybridoma Technology & production of monoclonal antibodies	
3.	**Unit 5:** Heavy & Light chain gene of Ig	
4.	**Unit 5:** Molecular basis of diversity (Gene arrangement)	
5.	**Unit 4:** DNA damage & repair- Mutagens	
6.	**Unit 4:** DNA damage & repair- BER, NER	
7.	**Unit 4:** DNA damage & repair- Thymine Dimer	
8.	**Unit 4:** DNA damage & repair- Recombination error	
9.	**Unit 4:** DNA damage & repair- SOS repair	
10.	**Unit 1:** Organisation of DNA in chromosomes	
11.	**Unit 1:** Molecular structure, physiochemical properties of DNA	
12.	**Unit 1:** DNA replication	
13.	**Unit 1:** DNA polymerase in Prokaryote	
14.	**Unit 1:** DNA polymerase in eukaryote	
15.	**Unit 1:** DNA sequencing	
16.	**Unit 1:** Satellite DNA	
17.	**Unit 1:** Palindrome sequence & repetitive DNA	