J. S. UNIVERSITY

SHIKOHABAD, FIROZABAD

SYLLABUS FOR

FOUR- YEAR INTEGRATED (EIGHT SEMESTER)

B.Sc.-B.Ed. COURSE

2017-18

ACADEMIC YEAR AND ONWARDS

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1.	Regulations for Four Year Integrated B.Sc.-B.Ed. & B.A.-B.Ed. Degree Programme	
2.	**For B.Sc.B.Ed. Programme** **Part III: Specialization of the subject**	
	1. Computer Science 2. Physics 3. Mathematics 4. Chemistry 5. Botany 6. Zoology	
3.	**For both B.Sc.B.Ed. & B.A.,B.Ed. Programme** **Part IV: Education components**	
4.		
5.		
6.		

GROUP	Math Group	Physics	Chemistry	Mathematics
	Bio Group	Botany	Chemistry	Zoology
	C.S. Group	Physics	CS	Mathematics

SEMESTER WISE COURSE STRUCTURE
B.Sc.-B.Ed.

(132) B.Sc.-B.Ed. Four Year Integrated Course (Math/Bio Group)

First Semester

Sr. No.	Paper Code	Paper Name	Total Marks	Internal	External
	Theory		Max/Min	Max/Min	Max/Min
1	BSED - 101	Physics	100/40	20/08	80/32
2	BSED - 102	Chemistry	100/40	20/08	80/32
3	BSED - 103	Mathematics	100/40	20/08	80/32
4	BSED - 104	Botany	100/40	20/08	80/32
5	BSED - 105	Computer Science	100/40	20/08	80/32
6	BSED - 106	Zoology	100/40	20/08	80/32
7	BSED - 107	Education in India – Status, Problem & Issues	100/40	20/08	80/32
8	BSED - 108	Childhood & Growing UP	100/40	20/08	80/32
9	BSED - 109	Foundation Course	150/60	X	150/60

Practical

10	BSED - 101P	Physics	50	X	50/20
11	BSED - 102P	Chemistry	50	X	50/20
12	BSED - 103P	Mathematics	50	X	50/20
13	BSED - 104P	Botany	50	X	50/20
14	BSED - 105P	Computer Science	50	X	50/20
15	BSED - 106P	Zoology	50	X	50/20

Grand Total   650/260

Note: 1. Marks of Foundation Course will not add in total marks.

Second Semester

Sr. No.	Paper Code	Paper Name	Total Marks	Internal	External
	Theory		Max/Min	Max/Min	Max/Min
1	BSED - 201	Physics	100/40	20/08	80/32
2	BSED - 202	Chemistry	100/40	20/08	80/32
3	BSED - 203	Mathematics	100/40	20/08	80/32
4	BSED - 204	Botany	100/40	20/08	80/32
5	BSED - 205	Computer Science	100/40	20/08	80/32
6	BSED - 206	Zoology	100/40	20/08	80/32
7	BSED - 207	Learning and Teaching	100/40	20/08	80/32
8	BSED - 208	Curriculum Development & School	100/40	20/08	80/32

Practical

9	BSED - 201P	Physics	50/20	X	50/20
10	BSED - 202P	Chemistry	50/20	X	50/20
11	BSED - 203P	Mathematics	50/20	X	50/20
12	BSED - 204P	Botany	50/20	X	50/20
13	BSED - 205P	Computer Science	50/20	X	50/20
14	BSED - 206P	Zoology	50/20	X	50/20
			Grand Total	**650/260**	

Third Semester

Sr. No.	Paper Code	Paper Name	Total Marks	Internal	External
	Theory		Max/Min	Max/Min	Max/Min
1	BSED - 301	Physics	100/40	20/08	80/32
2	BSED - 302	Chemistry	100/40	20/08	80/32
3	BSED - 303	Mathematics	100/40	20/08	80/32
4	BSED - 304	Botany	100/40	20/08	80/32
5	BSED - 305	Computer Science	100/40	20/08	80/32
6	BSED - 306	Zoology	100/40	20/08	80/32
7	BSED - 307	Educational Administration	100/40	20/08	80/32
8	BSED - 308	Gender School and Society	100/40	20/08	80/32

Practical

Sr. No.	Paper Code	Paper Name	Total Marks	Internal	External
9	BSED - 301P	Physics	50/20	X	50/20
10	BSED - 302P	Chemistry	50/20	X	50/20
11	BSED - 303P	Mathematics	50/20	X	50/20
12	BSED - 304P	Botany	50/20	X	50/20
13	BSED - 305P	Computer Science	50/20	X	50/20
14	BSED - 306P	Zoology	50/20	X	50/20
15	EPC- 1	Reading and Reflecting on Text	50/	10	40/

Grand Total   650/260 (Grand total 700)

EPC-1 Reading and reflecting on text 10+40 = 50 marks (Practical Subject) Subject left

Fourth Semester

Sr. No.	Paper Code	Paper Name	Total Marks	Internal	External
	Theory		Max/Min	Max/Min	Max/Min
1	BSED - 401	Physics	100/40	20/08	80/32
2	BSED - 402	Chemistry	100/40	20/08	80/32
3	BSED - 403	Mathematics	100/40	20/08	80/32
4	BSED - 404	Botany	100/40	20/08	80/32
5	BSED - 405	Computer Science	100/40	20/08	80/32
6	BSED - 406	Zoology	100/40	20/08	80/32
7	BSED - 407	Education Technology & ITC	100/40	20/08	80/32
8	BSED - 408	Creating an Inclusive School	100/40	20/08	80/32

Practical

Sr. No.	Paper Code	Paper Name	Total Marks	Internal	External
9	BSED - 401P	Physics	50/20	X	50/20
10	BSED - 402P	Chemistry	50/20	X	50/20
11	BSED - 403P	Mathematics	50/20	X	50/20
12	BSED - 404P	Botany	50/20	X	50/20
13	BSED - 405P	Computer Science	50/20	X	50/20
14	BSED - 406P	Zoology	50/20	X	50/20
15	EPC-2	**Drama and art in education**	50/20	10/	40/

Grand Total   650/260

EPC-2 Drama and art in education 10+40 = 50 marks (Practical Subject) Subject left

Fifth Semester

Sr. No.	Paper Code	Paper Name	Total Marks	Internal	External
	Theory		Max/Min	Max/Min	Max/Min
1	BSED - 501	Physics	100/40	20/08	80/32
2	BSED - 502	Chemistry	100/40	20/08	80/32
3	BSED - 503	Mathematics	100/40	20/08	80/32
4	BSED - 504	Botany	100/40	20/08	80/32
5	BSED - 505	Computer Science	100/40	20/08	80/32
6	BSED - 506	Zoology	100/40	20/08	80/32
7	BSED - 507	Guidance & Counseling in School	100/40	20/08	80/32
8	BSED - 508	Action Research	100/40	20/08	80/32

Practical

Sr. No.	Paper Code	Paper Name	Total Marks	Internal	External
9	BSED - 501P	Physics	50/20	X	50/20
10	BSED - 502P	Chemistry	50/20	X	50/20
11	BSED - 503P	Mathematics	50/20	X	50/20
12	BSED - 504P	Botany	50/20	X	50/20
13	BSED - 505P	Computer Science	50/20	X	50/20
14	BSED - 506P	Zoology	50/20	X	50/20
15	EPC-3	Education psychology practical and test	50/20	10	40/

Grand Total   650/260

EPC-3 Education psychology practical and test 10+40 = 50 marks (Practical Subject) Subject left

Sixth Semester

Theory Subjects

S. No.	Paper Code	Paper Name	Total Marks	Internal Marks	External Marks
		Theory	**Max/Min**	**Max/Min**	**Max/Min**
1.	BSED-601	Physics	100/40	20/08	80/32
2.	BSED-602	Chemistry	100/40	20/08	80/32
3.	BSED-603	Mathematics	100/40	20/08	80/32
4.	BSED-604	Botany	100/40	20/08	80/32
5.	BSED-605	Computer Science	100/40	20/08	80/32
6.	BSED-606	Zoology	100/40	20/08	80/32
7.	Choose any two subjects from concern group	Pedagogy of School Subject-I			
		Math Group- Choose only two Subjects			
		(BSED-607) Pedagogy of General Science	50/20	10/04	40/16
		(BSED-608) Pedagogy of Physical Science	50/20	10/04	40/16
		(BSED-609) Pedagogy of Mathematics	50/20	10/04	40/16
		Math Group- Choose only two Subjects			
		(BSED-607) Pedagogy of General Science	50/20	10/04	40/16
		(BSED-608) Pedagogy of Physical Science	50/20	10/04	40/16
		(BSED-610) Pedagogy of Biological Science	50/20	10/04	40/16
		CS Group- Choose only two Subjects			
		(BSED-607) Pedagogy of General Science	50/20	10/04	40/16
		(BSED-609) Pedagogy of Mathematics	50/20	10/04	40/16
		(BSED-611) Pedagogy of Computer Science	50/20	10/04	40/16
8.	BSED-612	Project	100/40		100/40

Practical

9.	BSED-601P	Physics	50/20	X	50/20
10.	BSED-602P	Chemistry	50/20	X	50/20
11.	BSED-603P	Mathematics	50/20	X	50/20

12.	BSED-604P	Botany	50/20	X	50/20
13.	BSED-605P	Computer Science	50/20	X	50/20
14.	BSED-606P	Zoology	50/20	X	50/20
15.		Project	100/40	----	100/40

Grand Total 650/260

Project File 100 marks (External Examiner)

Course Structure and Scheme of Instruction and Examination

B.Sc- B.Ed . Four Year Integrated Course

Science Group	Subjects		
MATH Group	Physics	Chemistry	Mathematics
BIO Group	Chemistry	Botany	Zoology
CS Group	Physics	Computer Science	Mathematics

Course structure and scheme of instruction and Examination

B.Sc.B.Ed. Four Year Integrated Course.

(Math Group)

First year   **Semester-I**

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Theory Subjects				
Foundation Course	As per higher education of U.P & concern university	2	100		100
Science Group	Select any three subject Combination as per University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC1- education status problems & issues	6	100	20	80
	CC2- childhood growing up	6	100	20	80
	Total		**500**	**100**	**400**

Practicum				
Physics practical		50		50
Chemistry practical		50		50
Mathematics		50		50
Total		150		150
Grand total		500	100	400
Grand total		**650**	**100**	**550**

- *Practical exam of physics , Mathematics and chemistry practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan PCM course

- Not –B.Sc. practicum as per university syllabus
- B. Sc. Subject as per university ordinance and higher education syllabus I semester to VI semester as follows
- 1. Mathematics
- 2. Physics
- 3. Chemistry
- Foundation Course numbers will not be added to the total mark.

Course Structure Scheme of Instruction and Examination

B.Sc.B.Ed. Four year Integrated Course
(Math Group)

First year   **Semester-II**

Theory Subjects					
	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC3- Learning and teaching	6	100	20	80
	CC4-curriculum development & school	6	100	20	80
Total			**500**	**100**	**400**

Practicum				
Physics practical		50		50
Chemistry practical		50		50
Mathematics		50		50
Total		150		150
Grand total		500	100	400
Grand total		**650**	**100**	**550**

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- *Practical exam of Mathematics, physic and chemistry practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan PCM course

- Not –B.Sc. practicum as per university syllabus

Course Structure Scheme of Instruction and Examination

B.Sc- B.Ed. Four year Integrated Course.

(Math Group)

Second year   **Semester-III**

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Theory Subjects					
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC5- education policies School leadership and Management	6	100	20	80
	CC6- gender school & Society	6	100	20	80
	Total		**500**	**100**	**400**

Practicum				
EPS -1 reading and reflecting on tests		50	10	40
Mathematics		50		50
Physics practical		50		50
Chemistry practical		50		50
Total		200	10	190
Grand total		500	100	400
Grand total		**700**	**110**	**590**

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- *Practical exam of EPS-1, Mathematics, physic and chemistry practical by external examiner appointed by university*
- Student have to choose three subjects as per university ordinance of B.Sc. (plan PCM course
- Not –B.Sc. practicum as per university syllabus

Course Structure Scheme of Instruction and Examination
B.Sc.- B.Ed. Four Year Integrated Course.
(Math Group)

Second year   **Semester-IV**

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Theory Subjects					
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC7- education Technology and ICT	6	100	20	80
	CC8 – creating an Inclusive school	6	100	20	80
	Total		**500**	**100**	**400**

Practicum				
EPC-2 Drama and art in education	2	50	10	40
Mathematics		50		50
Physics practical		50		50
Chemistry practical		50		50
Total		**200**	**10**	**190**
Grand total		**500**	**100**	**400**
Grand total		**700**	**110**	**590**

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- *Practical exam of EPS-2, Mathematics, physic and chemistry practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan PCM course

Course Structure Scheme of Instruction and Examination

B.Sc.B.Ed. Four Year Integrated Course

(Math Group)

Third Year   **Semester-V**

Theory Subjects					
	Course /paper	**Hours Per week**	**Total Marks**	**Internal (formative)**	**External (summative)**
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC9- optional course (**any one** of the subject mentioned Belo) a. Value Education b. Health and physical Edu. c. Guidance & counseling in school d. Education Administration & management	6	100	20	80
	CC10- action research	6	100	20	80
Total			**500**	**100**	**400**

Practicum				
EPC-3 Education psychology practical & test**	2	50	10	40
Mathematics		50		50
Physics practical		50		50
Chemistry practical		50		50
Total		200	10	190
Grand total		500	100	400
Grand total		700	110	590

-Practical exam of EPC-3, Mathematics, physics and chemistry practical by external examiner appointed by university

- Student have to choose three subjects as per university ordinance of B.Sc. (plan PCM course

- Student Will do any Four Experiments in Group A and Four in Group B

** SUGGESTED PSYCHOLOGY PRACTICUM AREAS

Group A- tests	Group B- Experiments
Interest	Intelligence
Intelligence	Aspiration
Adjustment	Creativity
Anxiety	Transfer of Learning
Achievement motivation	Trila and Error
Personality	Personality

Course Structure Scheme of Instruction and Examination
B.Sc.- B.Ed. Four Year Integrated Course
(Math Group)

	Theory Subjects				
	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC11- pedagogy of school Subject -1	6	100	20	80
	CC12- pedagogy of school Subject -2	6	100	20	80
Total			**500**	**100**	**400**

Practicum				
Project	2	100		100
Mathematics		50		50
Physics practical		50		50
Chemistry practical		50		50
Total		250		250
Grand total		500	100	400
Grand total		**750**	**100**	**650**

- *Practical exam of Project, Mathematics, physic and chemistry practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan PCM course

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Not – B. Sc. Practicum as per university syllabus

** student have to choose pedagogy of school subject 1& 2 mentioned below

Pedagogy of school subject -1	Pedagogy of school subject-2
Mathematics	Physical Science
	General Sciences

Course Structure Scheme of Instruction and Examination
B.Sc- B.Ed. Four Year Integrated Course
(Math Group)

Fourth year   **Semester-VII**

Course Code	Course name	No. of house			marks		
		LS	Prs	Total	Total	Int.	Ext.
	School internship Programme (SIP) Division Of (SIP) components given Below	-	-	-	-	-	
	Micro teaching (eight skills)				50	50	
	School internship				50	50	
	Final lesson -1				100		100
	Final lesson -2				100		100
	Unit plan				10	10	
	Unit test administration Evaluation and interpretation				10	10	
	Resource unit/ instructional kit/ Work book /working models				20	20	
	Observation records				10	10	
	Total				350	150	200

Practical exam of final 1&2 by external examiner appointed by university

Course Structure Scheme of Instruction and Examination

B.Sc.-B.Ed. Four Year Integrated Course
(Math Group)

Fourth Year   **Semester-VIII**

	Course paper	Hours Per week	Total Marks	Internal (formative)	External
Educative Course	CCI3- proficiency of English	6	100	20	80
	CC14- proficiency of Hindi	6	100	20	80
	Total		**200**	**40**	**160**

Practicum				
EPC-4 understanding the self	2	50	10	40
EPC 5-understanding of ICT	2	50	10	40
Total		100	20	80
Grand total		200	40	160
Grand total		300	60	240

Practical exam of EPC-4 & 5 by examiner appointed by university

*student have to choose subject as per university ordinance of B Sc. (plan – PCM/CBZ) course

Not- B.Sc. practicum as per university syllabus

COURSE STURCTURE AND SCHEME OF EXAMINATION

B.Sc.-B.Ed. FOUR YEAR PROGRAMME

(Maths Group)

FINAL MARKS DIVISION OF EIGHT SEMESTERS

	Total	Internal	External	
I	650	100	550	
II	650	100	550	
III	700	110	590	
IV	700	110	590	
V	700	110	590	
VI	750	100	650	
VII	350	150	200	
VII	300	60	240	
TOTAL MARKS CREDIT	**4800**	**840**	**3960**	

Course Structure Scheme of Instruction and Examination
B.Sc.- B.Ed. Four Year Integrated Course.
(Bio Group)
Semester-I

	Theory Subjects Sem - I				
	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Foundation Course	As per higher education of U.P, & concern university	2	100		100
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC1- education status, problem &issues	6	100	20	80
	CC2- childhood growing up	6	100	20	80
	Total		500	100	400

Practicum – Sem-I				
Zoology practical		50		50
Botany practical		50		50
Chemistry practical		50		50
Total		150		150
Grand total		500	100	400
Grand total		650	100	550

- Foundation Course numbers will not be added to the total mark.

- *Practical exam of Zoology, Botany and chemistry practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan CBZ) course

  Not – B.Sc. practicum as per university syllabus

  B. Sc. Subject as per university ordinance and higher education syllabus I semester to VI semester as follows

  1. Chemistry   2. Botany   3. Zoology

Course Structure Scheme of Instruction and Examination

B.Sc.-B.Ed. Four Years Integrated Course
(Bio Group)
Semester-II

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
info	**Theory Subjects Sem - II**				
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC3- learning and teaching	6	100	20	80
	CC4-curriculum development &school	6	100	20	80
	Total		500	100	400

Practicum –II				
Zoology practical		50		50
Botany practical		50		50
Chemistry practical		50		50
Total		150		150
Grand total		500	100	400
Grand total		650	100	550

- *Practical exam of Zoology, Botany and chemistry practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan –CBZ) course

  Not – B.Sc. practicum as per university syllabus

Course Structure Scheme of Instruction and Examination

B.Sc.-B.Ed. Four Year Integrated Course
(Bio Group)
Semester-III

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Theory Subjects Sem – III				
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC5- education policies school leadership and management	6	100	20	80
	CC6- gender school & society	6	100	20	80
	Total		500	100	400

Practicum – Sem-III				
EPC-1 reading and reflecting of teats	2	50	10	40
Zoology practical		50		50
Botany practical		50		50
Chemistry practical		50		50
Total		200	10	190
Grand total		500	100	400
Grand total		700	110	590

- *Practical exam of EPS-1, Zoology, Botany and chemistry practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan – CBZ) course

  Not –B .Sc. practicum as per university syllabus

Course Structure Scheme of Instruction and Examination

B.Sc.- B.Ed. Four Year Integrated Course
(Bio Group)
Semester-IV

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Theory Subjects Sem - IV					
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC7- education Technology and ICT	6	100	20	80
	CC8 – creating an Inclusive school	6	100	20	80
	Total		500	100	400

Practicum – Sem-IV				
EPC-2 Drama and art in education	2	50	10	40
Zoology practical		50		50
Botany practical		50		50
Chemistry practical		50		190
Total		200	10	190
Grand total		500	100	400
Grand total		700	110	590

- *Practical exam of EPS-2, Zoology, Botany and chemistry practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan – CBZ0)course

  Not – B.Sc. practicum as per university

Course Structure Scheme of Instruction and Examination

B.Sc.- B.Ed. Four Year Integrated Course
(Bio Group)
Semester-V

	Course /paper	Hoarse Per week	Total Marks	Internal (formative)	External (summative)
Theory Subjects Sem - V					
	Select any three subject combination as per university syllabus *	6	100	20	80
		6	100	20	80
		6	100	20	80
Education course	CC9- optional course (any one of the subject mentioned below) a. Value education b. Health and physical Edu. c. Guidance &counseling in school d. Management	6	100	20	80
	CC10- action research	6	100	20	80
	Total		500	100	400

Practicum – Sem- V				
EPC-3 education psychology practical &test **	2	50	10	40
Zoology practical		50		50
Botany practical		50		50
Chemistry practical		50		50
Total		200	10	190
Grand total		500	100	400
Grand total		700	110	590

- *Practical exam of EPS-3, Zoology, Botany and chemistry practical by external examiner appointed by university*
- Student have to choose three subjects as per university ordinance of B.Sc. (plan – CBZ0)course
- Student Will do any Four Experiments in Group A and Four in Group B
  Note – B.Sc. practicum as per university syllabus

** SUGGESTED PSYCHOGY PRACTICUM AREAS

Group A – tests	Group B – experiments
Interest	Intelligence
Intelligence	Aspiration
Adjustment	Creativity
Anxiety	Transfer of learning
Achievement motivation	Trial and error
Personality	Personality

Course Structure Scheme of Instruction and Examination

B.Sc.- B.Ed. Four Years Integrated Course
(Bio Group)
Semester-VI

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Theory Subjects Sem - VI					
	Select any three subject combination as per university syllabus *	6	100	20	80
		6	100	20	80
		6	100	20	80
Education course	CC11- pedagogy of school subject -1	6	100	20	80
	CC12- pedagogy of school subject-2	6	100	20	80
	Total		500	100	400
Practicum – Sem- VI					
Project Work		2	100		100
Zoology practical			50		50
Botany practical			50		50
Chemistry practical			50		50
Total			250		250
Grand total			500	100	400
Grand total			750	100	650

- *Practical exam of project, Zoology, Botany and chemistry practical by external examiner appointed by university.*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan – CBZ)course

  Not – B.Sc. practicum as per university syllabus .

  ** student have to choose pedagogy of school subject 1&2 mentioned bellow

Pedagogy of school subject -1	Pedagogy of school subject -2
Biological Science	Physical Science
Life science	General science
General science	

Course Structure Scheme of Instruction and Examination

B.Sc.-B.Ed. Four Year Integrated Course

(Bio Group)

Semester-VII

Course code	Course name	No. of hours			Marks		
		LS	Prs	Total	Total	Int.	Ext.

Practical

	School internship programme (SIP) division of SIP components given below	-	-	-	-	-	-
	Micro teaching (eight skills)				50	50	
	School internship				50	50	
	Final lesson -1				100		100
	Final lesson -2				100		100
	Unit plan				10	10	
	Unit text administration evaluation and interpretation				10	10	
	Resource unit / instructional kit work book /working models				20	20	
	Observation records				10	10	
					350	150	200

Practical *exam of first lesson 1 & 2 external examiner appointed by university.*

Course Structure Scheme of Instruction and Examination

B.Sc.- B.Ed. Four Year Integrated Course

(Bio Group)

Semester-VIII

	Course /paper	Hours per week	Total marks	Internal (formative)	External (summative)
Education course	CC13- proficiency of English	6	100	20	80
	CC14- proficiency of hind	6	100	20	80
	Total		200	40	160

Practicum – Sem – VIII				
EPC-4 Understanding the self	2	50	10	40
EPC-5 Understanding of ICT	2	50	10	40
Total		100	20	80
Grand total		300	70	230

- *Practical exam of EPC-4 & 5 , Zoology, Botany and chemistry and chemistry practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan – CBZ0)course

  Not – B.Sc. practicum as per university

COURSE STURCTURE AND SCHEME OF EXAMINATINO OF

FOUR YEAR B.Sc.–B.Ed. PROGRAMME

(Bio Group)

FINAL MARKS DIVISION OF EIGHT SEMESTERS

	Total	Internal	External	
I	650	100	550	
II	650	100	550	
III	700	110	590	
IV	700	110	590	
V	700	110	590	
VI	750	100	650	
VII	350	150	200	
VIII	300	60	240	
TOTAL MARKS CREDIT	**4800**	**840**	**3960**	

Course Structure Scheme of Instruction and Examination
B.Sc.- B.Ed. Four Year Integrated Course
(Computer Science Group)
Semester-I

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Foundation Course	As per higher education of U.P & concern university	2	100		100
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC1- education status problems & issues	6	100	20	80
	CC2- childhood growing up	6	100	20	80
	Total		500	100	400

Practicum – Sem-I				
Physics practical		50		50
Computer Science practical		50		50
Mathematics		50		50
Total		150		150
Grand total		500	100	400
Grand total		650	100	550

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Practical exam of physic , Mathematics and Computer Science   *practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan P.M.CS) course
- Not –B.Sc. practicum as per university syllabus
- B. Sc. Subject as per university ordinance and higher education syllabus I semester to VI semester as follows
- 1. Mathematics
- 2. Physics
- 3. Computer Science
- Foundation Course numbers will not be added to the total mark.

Course Structure Scheme of Instruction and Examination

B.Sc.- B.Ed. Four Year Integrated Course

(Computer Science Group)

Semester-II

	Course /paper	Hour Per week	Total Marks	Internal (formative)	External (summative)
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC3- Learning and teaching	6	100	20	80
	CC4-curriculum development & school	6	100	20	80
	Total		500	100	400

Practicum – Sem-II				
Physics practical		50		50
Computer Science practical		50		50
Mathematics		50		50
Total		150		150
Grand total		500	100	400
Grand total		650	100	550

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- *Practical exam of Mathematics, physic and* Computer Science *practical by external examiner appointed by university*
- Student have to choose three subjects as per university ordinance of B.Sc. (plan P.M.CS) course
- Not –B.Sc. practicum as per university syllabus

Course Structure Scheme of Instruction and Examination

B.Sc.- B.Ed. Four Year Integrated Course

(Computer Science Group)

Semester-III

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC5- education policies School leadership and Management	6	100	20	80
	CC6- gender school & Society	6	100	20	80
	Total		500	100	400

Practicum – Sem-III				
EPC -1 reading and reflecting on tests	2	50	10	40
Mathematics		50		50
Physics practical		50		50
Computer Science practical		50		50
Total		200	10	190
Grand total		500	100	400
Grand total		700	110	590

- *Practical exam of EPS-1, Mathematics, physic and* Computer Science *practical by external examiner appointed by university*
- Student have to choose three subjects as per university ordinance of B.Sc. (plan P.M.CS) course
- Not –B.Sc. practicum as per university syllabus

Course Structure Scheme of Instruction and Examination

B.Sc.- B.Ed. Four Year Integrated Course

(Computer Science Group)

Semester-IV

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Science part	Select any three subject	6	100	20	80
	Combination as par	6	100	20	80
	University syllabus	6	100	20	80
Education Course	CC7- education Technology and ICT	6	100	20	80
	CC8 – creating an Inclusive school	6	100	20	80
	Total		500	100	400

Practicum – Sem-IV				
EPC-2 Drama and art in education	2	50	10	40
Mathematics		50		50
Physics practical		50		50
Computer Science practical		50		50
Total		200	10	190
Grand total		500	100	400
Grand total		700	110	590

- *Practical exam of EPS-2, Mathematics, physic and* Computer Science *practical by external examiner appointed by university*
- Student have to choose three subjects as per university ordinance of B.Sc. (plan P.M.CS) course

Course Structure Scheme of Instruction and Examination
B.Sc.- B.Ed. Four Year Integrated Course
(Computer Science Group)
Semester-V

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC9- optional course (any one of the subject mentioned Belo) a. Value Education b. Health and physical Education c. Guidance & counseling in school d. Education Administration & management	6	100	20	80
	CC10- action research	6	100	20	80
	Total		500	100	400

Practicum – Sem-V				
EPC-3 Education psychology practical & test**	2	50	10	40
Mathematics		50		50
Physics practical		50		50
Computer Science practical		50		50
Total		200	10	190
Grand total		500	100	400
Grand total		700	110	590

Practical exam of EPS-3, Mathematics, physic and Computer Science *practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan P.M.CS) course
- Student Will do any Four Experiments in Group A and Four in Group B
 ** SUGGESTED PSYCHOLOGY PRACTICUM AREAS

Group A- tests	Group B- Experiments
Interest	Intelligence
Intelligence	Aspiration
Adjustment	Creativity
Anxiety	Transfer of Learning
Achievement motivation	Trila and Error
Personality	Personality

Course Structure Scheme of Instruction and Examination
B.Sc.- B.Ed. Four Year Integrated Course
(Computer Science Group)
Semester-VI

	Course /paper	Hours Per week	Total Marks	Internal (formative)	External (summative)
Science part	Select any three subject Combination as par University syllabus	6	100	20	80
		6	100	20	80
		6	100	20	80
Education Course	CC11- pedagogy of school Subject -1	6	100	20	80
	CC12- pedagogy of school Subject -2	6	100	20	80
	Total		500	100	400

Practicum – Sem-VI				
Project	2	100		100
Mathematics		50		50
Physics practical		50		50
Computer Science practical		50		50
Total		250		250
Grand total		500	100	400
Grand total		750	100	650

Practical exam of Project*, Mathematics, physic and* Computer Science *practical by external examiner appointed by university*

- Student have to choose three subjects as per university ordinance of B.Sc. (plan P.M.CS) course

 Not – B. Sc. Practicum as per university syllabus

 ** student have to choose pedagogy of school subject 1& 2 mentioned below

Pedagogy of school subject -1	Pedagogy of school subject-2
Mathematics	Computer Science
General science	General science

Course Structure Scheme of Instruction and Examination
B.Sc.- B.Ed. Four Year Integrated Course
(Computer Science Group)
Semester-VII

Course Code	Course name	No. of house			marks		
		LS	Prs	Total	Total	Int.	Ext.
	School internship Programme (SIP) Division Of (SIP) components given Below	-	-	-	-	-	
	Micro teaching (Ten skills)				50	50	
	School internship				50	50	
	Final lesson -1				100		100
	Final lesson -2				100		100
	Unit plan				10	10	
	Unit test administration Evaluation and interpretation				10	10	
	Resource unit/ instructional kit/ Work book /working models				20	20	
	Observation records				10	10	
					350	150	200

Practical exam of final 1&2 by external examiner appointed by university

Course Structure Scheme of Instruction and Examination
B.Sc.- B.Ed. Four Year Integrated Course
(Computer Science Group)
Semester-VIII

	Course paper	Hours Per week	Total Marks	Internal (formative)	External
Educative Course	CCI3- proficiency of English	6	100	20	80
	CC14- proficiency of Hindi	6	100	20	80
	Total		200	40	160

Practicum – Sem –VIII				
EPC-4 understanding the self	2	50	10	40
EPC 5-understanding of ICT	2	50	10	40
Total		100	20	80
Grand total		200	40	160
Grand total		300	60	240

Practical exam of EPC-4 & 5 by examiner appointed by university

*student have to choose subject as per university ordinance of B Sc. (plan – PCM/CBZ/ P.M.CS)) course

Not- B.Sc. practicum as per university syllabus

COURSE STURCTURE AND SCHEME OF EXAMINATION
OF
FOUR YEAR B.Sc.–B.Ed. PROGRAMME
(Computer Science Group)
FINAL MARKS DIVISION OF EIGHT SEMESTERS

	Total	Internal	External	
I	650	100	550	
II	650	100	550	
III	700	110	590	
IV	700	110	590	
V	700	110	590	
VI	750	100	650	
VII	350	150	200	
VIII	300	60	240	
TOTAL MARKS CREDIT	4800	840	3960	

B.Sc.-B.Ed.(COMPUTER SCIENCE)
FIRSTSEMESTER
DETAILEDSYLLABUS
Computer Fundamentals

UNIT-I
Introduction to Computers:
Evolution of Computers, Generation of Computers, Classification of Computers Analog Digital and Hybrid Computers, Classification of Computers according to size, Super Computers, Mainframe Computers, Personal Computers (Different Types) and Terminals (Different Types), Characteristics of Computers, Block Diagram of a Digital Computer, types of OS.

Input / Output Devices:
Input Devices-Keyboard, Mouse, Output Devices – VDU, Printers. Internet, Multimedia, Computer viruses

Introduction to Programming Concepts:
Types of Programming Languages, software, Classification of software, Application software and System Software, Structured Programming, Algorithms and Flowcharts with Examples.

UNIT-II
Introduction to Number system and codes:
Different number systems and their conversions (Decimal, Binary, Octal, and Hexadecimal), 1's
Complement and 2's complement, Floating Point numbers, Coding – BCD, Gray, ASCII

Boolean algebra and Gate networks:
Fundamental concepts of Boolean algebra, Inverter gates, AND gate, OR gate, NAND gate, NOR gate, X-OR gate, X-NOR gate, The universal property of NAND gate and NOR gate, Basic laws of Boolean algebra, De Morgan's theorems, Simplification of Boolean expression, Karnaugh map (SOP)

UNIT-III
Introduction to C:
History of C, Structure of a C program. The C character set, Constants, Variables and keywords, Data type. Types of constants and variables. Type declaration and arithmetic instructions, Integer and float conversions. Type conversion in assignment, Operators in C , Hierarchy of operators, control instructions, Input- Output statements in C (Formatted and Unformatted)

UNIT-IV
Control Structures:
Decision control structures, Logical operators, conditional operator and relational operators. Loop control structures –while, do-while, for loop, Break statement, Continue statement, switch-case control structure, go to statement
Bitwise operators Bitwise AND, OR, exclusive OR, compliment, right shift and left shift operators

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UNIT-V
MS Word: Introduction, Menus, Toolbars, Creating, Saving, Inserting files, Formatting, Editing Text, Find and Replace, Header and Footer, Working with text boxes, columns, pictures, charts and graph, Tables, Equations, WordArt, Printing, Mail Merge. Import and Export files, spelling and grammar checking, Thesaurus, Creating Bookmark and Hyperlinks.

UNIT-VI
MS PowerPoint: Introduction, Creation of Presentation, Built-in-wizard, Working with Text, list, color and transitions. Header and Footer, Drawing tools, Animation and sound, Importing Objects from other applications.

Practical : PC Software based, DOS

B.Sc.- B.Ed (PHYSICS)
FIRST SEM SYALLBUS

UNIT-I

Inertial frame of reference, Newton's laws of motion, Dynamics of particle in rectilinear and circular motion, Conservative and Non -conservative forces, Conservation of mechanical energy, linear momentum and angular momentum examples of linear and corsuratmatic, Collision in one and two dimensions, cross impact parameter, scattering ample and scattering cross-section.

UNIT -II

Definition of a rigid body, Rotational energy and rotational inertia for simple bodies, the combined translational and rotation motion of a rigid body on horizontal and inclined planes, Simple treatment of the motions of a top.

Relations between elastic constants, bending of Beam, Cantilever and Torsion of Cylinder.

UNIT-III

Ideal Gas: Kinetic model, Deduction of Boyle's law, interpretation of temperature, estimation of r.m.s. speed of molecules. Brownian motion, estimatation of the Avogadro number. Equipartition of energy, specific heat of monoatomic gas, extension to di- and polyatomic gases, Behaviour of gases at low temperatures. Adiabatic expansion of an ideal gas, applications to atmospheric physics.

Real Gas: Vander Waals' gas, equation of state, nature of Vander Waals' forces, comparison with experimental P-V curves. The critical constants, gas and vapour. Joule expansion of an ideal gas, Vander Waals' gas, Joule Thomson effect, Joule coefficient, estimatation of J-T cooling.

UNIT -IV

Liquefaction of gases: Boyle's temperature and inversion temperature. Principle of regenerative cooling and of cascade cooling, liquefaction of hydrogen and helium gases. Refrigeration cycles, meaning of efficiency.

Transport phenomena in gases: Molecular collisions, mean free path and collision cross sections. Estimatation of molecular diameter and mean free path.

Transport of mass, momentum and energy and inter-relationship, dependence on temperature and pressure.

UNIT-V

Growth and decay of currents through inductive resistances, charging and discharging in R.C. and R.L.C. circuits, Time constant, Measurement of high resistance. A.C. Bridges, Maxwell's and Scherings Bridges, Wien Bridge. THEVENIN'S, NORTON'S Theorem and Superposition theorems and their applications.

UNIT -VI

Semiconductors, intrinsic and extrinsic semiconductors, n-type and p-type semiconductors, P.N. Junction diode forward bias and reverse bias, diode as a rectifier, diode characteristics, LED diodes, zener diode, avalanche and zener breakdown, power supplies, rectifier, bridge rectifier, capacitor input filter, voltage regulated power supply, zener regulator.

PRACTICALS

1- Study of laws of parallel and perpendicular axes for moment of inertia.
2- Study of conservation of momentum in two dimensional oscillations.
3- To determine the moment of inertia of a flywheel about its own axis of rotation.
4- M.I. of an irregular body by inertia table.
5- Study of a compound pendulum Determination of Poisson's ratio of rubber (in the form of a tube).
6- Study of K (spring constant) by dynamical and statical method.
7- Heating efficiency of electrical kettle with varying voltages.

Text and Reference Books

- EM Purcell, Ed: "Berkeley Physics Course, Vol. 1, Mechanics" (McGraw-Hill).
- J.C. Upadhyay: 'Mechanics'.
- G.G. Agarwal and H.P. Sinha "Thermal Physics"
- Shan & Shrivastava – Heat and Thermodynamics.
- B.G. Streetman; "Solid State Electronic Devices", IInd Edition (Prentice Hall of India, New Delhi, 1986).
- J.D. Ryder, "Electronics Fundamentals and Applications", lI Edition (Prentice- Hall of India, New Delhi, 1986).

B.Sc.-B.Ed. (MATHEMATICS)
FIRST SEMESTER SYLLABUS

Algebra
Unit-I
Sequence and its convergence (basic idea), Convergence of infinite series, Comparison test, ratio test, root test, Raabe's test, Logarithmic ratio test, DeMorgan and Bertrand test and higher logarithmic ratio test. Alternating series, Leibnitz test, Congruence modulo m relation, Equivalence relations and partitions.

Unit-II
Definition of a group with examples and simple properties, Permutation groups, Subgroups, Centre and normalizer, Cyclic groups, Coset decomposition, Lagrange's theorem and its consequences.

Calculus

Unit-III
Homomorphism and isomorphism, Cayley's theorem, Normal subgroups, Quotient group,

Unit-IV
Definition of the limit of a function, Continuous functions and classification of discontinuities, Differentiability, Chain rule of differentiability, Rolle's theorem, First and second mean value theorems, Taylor's theorems with Lagrange's and Cauchy's forms of remainder, Successive differentiation and Leibnitz's theorem.

Unit-V
Expansion of functions (in Taylor's and Maclaurin's series), indeterminate forms, Partial differentiation and Euler's theorem, Jacobians.

Unit-VI
Maxima and Minima (for functions of two variables), Tangents and normals (polar form only),
Geometry

Unit-VII
General equation of second degree, Tracing of conics, System of conics, Polar equation of a conic.

Unit-VIII
Three dimensional system of co-ordinates, Projection and direction cosines, Plane, Straight line.

Unit-IX
Sphere, Cone

Section –A - Inorganic Chemistry
Unit I
Atomic Structure

Idea of de-Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrödinger wave equation, significance of Ψ and Ψ^2, quantum numbers, radial and angular wave functions and probability distribution curves, shapes of s,p,d, orbitals. Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements, effective nuclear charge.

Periodic Properties

Atomic and ionic radii, ionization energy, electron affinity and electronegativity-definition, methods of determination or evaluation, trends in periodic table and applications in predicting and explaining the chemical behaviour.

Unit II
Chemical Bonding

Covalent Bond – Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions. Valence shall electron pair repulsion (VSEPR) theory to NH_3, H_3O^+, SF_4, CIF_3, ICl_2^- and H_2O. MO theory, homonuclear and heteronuclear (CO and NO) diatomic molecules, multicenter bonding in electron deficient molecules, bond strength and bond energy, percentage ionic character from dipole moment and electronegativity difference.

Ionic Solids

Ionic structures, radius-ratio effect and coordination number, limitation of radius-ratio rule, lattice defects, semiconductors, lattice energy and Born-Haber cycle, solvation energy and solubility of ionic solids, polarizing power and polarisability of ions, Fajan's rule. Metallic bond-free electron, valence bond and band theories.

Weak Interactions – Hydrogen bonding, vander Waals forces.

Section-B - Organic Chemistry
Unit III

Structure and Bonding

Hybridization, bond lengths and bond angles, bond energy, localized and delocalized chemical bonding, van der Waals interactions, inclusion compounds, clathrates, charge transfer complexes, resonance, hyperconjugation, aromaticity, inductive and field effects, hydrogen bonding.

Mechanism of Organic Reactions

Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond fissions. Types of organic reagents – electrophiles and nucleophiles. Types of organic reactions. Energy considerations.

Reactive intermediates – Carbocations, carbanions, free radicals, carbenes, arynes and nitrenes (with examples). Assigning formal charges on intermediates and other ionic species.

Methods of determination of reaction mechanism (product analysis, intermediates, isotope effects, kinetic and stereochemical studies).

AlkanesandCycloalkanes
IUPAC nomenclature of branched and unbranched alkanes, the alkyl group, classification of carbon atoms in alkanes. Isomerism in alkanes, sources methods of formation (with special reference to Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids), Physical properties and chemical reactions of alkanes. Mechanism of free radical halogenation of alkanes: orientation, reactivity and selectivity.

Cycloalkanes – Nomenclature, methods of formation, chemical reactions, Baeyer's strain theory and its limitations. Ring strain in small rings
(cyclopropane and cyclobutane), theory of strainless rings. The case of cyclopropane ring: bananabonds.

Unit IV
StereochemistryofOrganicCompounds
Concept of isomerism. Types of isomerism.
Optical isomerism – Elements of symmetry, molecular chirality, enantiomers, stereogenic center, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centers, disasteromers, threo and erythro diastereomers, meso compounds, resolution of enantionmers, inversion, retention and recemization. Relative and absolute configuration, sequence rules, D & L and R & S systems of nomenclature.
Geometric isomerism – Determination of configuration of geometric isomers. E & Z system of nomenclature, geometric isomerism in oximes and alicyclic compounds.
Conformational isomerism – Conformational analysis of ethane and   n- butane; conformations of cyclohexane, axial and equatorial bonds, conformation of mono-substituted cyclohexane derivatives. Newman projection and Sawhorse formulae, Fischer and flying wedge formulae. Difference between configuration and conformation.

Section-C - Physical Chemistry

Unit V
Mathematical Concepts and Computers
Logarithmic relations, curve sketching, linear graphs and calculation of slopes, differentiation of functions like k_x, e^X, x^n, sin x, log x; maxima and minima, partial differentiation and reciprocity relations. Integration of some useful/relevant functions; permutations and combinations. Factorials. Probability.
Computers
General introduction to computers, different components of a computer, hardware and software, input-output devices, binary numbers and arithmetics, introduction to computer languages. Programming. Operating systems.

Unit VI
Gaseous States
Postulates of kinetic theory of gases, deviation from ideal behavior, van der Waals equation of state.
Critical phenomena: PV isotherms of real gases, continuity of states, the isotherms of van der Waals equation, relationship between critical constants and van der Waals constants, the law of corresponding states, reduced equation of state.

Molecular velocities: Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Liquification of gases (based on Joule-Thomson effect).

Liquid State

Intermolecular forces, structure of liquids (a qualitative description). Structural differences between solids, liquids and gases.

Liquid crystals: Difference between liquid crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.

PRACTICAL

The duration of practical examination will be of six hours.   **M. M. = 50**

Distribution of Marks

Inorganic experiments	:	**15 Marks**
Organic experiments	:	**15 marks**
Physical experiments	:	**10 marks**
Record	:	**05 marks**
Viva	:	**05 marks**

Inorganic Chemistry

Inorganic mixture analysis (preferably by semi micro method) – The mixture will have six ions, preferably three cations and three anions. It may contain ions of the same group and an interfering anion such as phosphate, oxalate, borate and fluoride. Not more than one interfering anion is to be given. The formal group analysis will be done for the separation and identification of cations of Group I to VI.

Organic Chemistry

Qualitative Organic Analysis

Detection of extra elements (N, S and halogens) and functional groups (alcoholic, phenolic, aldehydic, ketonic, carbonyl, carboxylic, esters, carbohydrates, amines, amides, nitro and anilide) in simple organic compounds.

Laboratory Techniques

Calibration of thermometer: $80\text{-}82^0C$ (Naphthalene), $113.5\text{-}114^0C$ (Acetanilide), $132.5\text{-}133^0C$ (Urea), 100^0C (Distilled Water).

Determination of melting point: Naphthalene $80\text{-}82^0C$, Benzoic acid $121.5\text{-}122^0C$, Urea $132.5\text{-}133^0C$, Succinic acid $184.5\text{-}185^0C$, Cinnamic acid $132.5\text{-}133^0C$, Sallicylic acid $157.5\text{-}158^0C$, Acetanilide $113.5\text{-}114^0C$, m-initrobenzene 90^0C, p- ichlorobenzene 52^0C, Aspirin 135^0C.

Determination of boiling point: Ethanol 78^0C, Cyclohexane 81.4^0C, Toluene 110.6^0C, Benzene 80^0C. Mixed melting point determination: Urea-Cinnamic acid mixture of various compositions (1:4, 1:1, 4:1).

Distillation: Simple distillation of ethanol-water mixture using water condenser. Distillation of nitrobenzene and aniline using air condenser.

Physical Chemistry
Chemical Kinetics

1. To determine the specific reaction rate of the hydrolysis of methyl acetate/ethyl acetate catalyzed by hydrogen ions at room temperature.
2. To study the effect of acid strength on the hydrolysis of an ester.
3. To compare the strengths of HCl and H_2SO_4 by studying the kinetics of hydrolysis of ethylacetate.
4. To study kinetically the reaction rate of decomposition of iodide by H_2O_2.

Distribution Law

To study the distribution of iodine between water and CCl_4
To study the distribution of benzoic acid between benzene and water

Diversity of Viruses, Bacteria, Algae, Lichens & Pteridophytes

Unit- I
History, nature and classification of Viruses, Bacteria and Fungi. History of virology and bacteriology; prokaryotic and eukaryotic cell structure (bacteria, mycoplasma and yeast); structure, classification and nature of viruses; structure (gram positive and gram negative) and classification (based on cell structure) of bacteria; classification, thallus organization and reproduction in fungi; economic importance of fungi.

Unit-II
Viruses: Symptoms of virus infection in plants; transmission of plant viruses; genome organisation, replication of plant virus (tobacco mosaic virus); techniques in plant viruses - purification, serology and electron microscopy; structure and multiplication of bacteriophages; structure and multiplication of viroids.

Unit-III
General characters. Range of thallus organization, classification, ultrastructure of eukaryotic algal cell and cyanobacterial cell, economic importance of algae. Lichens, classification, thallus organization, reproduction, physiology and role in environmental pollution.

Unit- IV
The characteristics and life cycles of the following:-
Cyanophyta Microcystis, oscillatoria: **Chlorophyta** Volvox, Hydrodicyon, Oedogonium, Coleochaete, Chara; Baciliariophyta Navicula; **Xanthophyta** Vancheria; **Phaeophyta**; Ectocarpus, **Rhodophyta** Polysiphonia

Unit - V
Pteridophytes: General features, classification, stellar system and its evolution. Comparative study of morphology, anatomy, development, vegetative and reproductive systems of following: **Lycopsida** - Lycopodium, Selaginella; Psilopsida-Rhynia

Unit – VI
General and comparative account of gametophytic and sprophytic system in Filicopsida – Sphenopsida - Equisetum.Marsilea.Heterospory and seed habit.

The habits, morphology, physiology, reproduction, development (in outline) and classification of the following groups of animals including a detailed study of the types given in each:

Unit-I
Protozoa   - *Euglena*, *Monocystis, Paramecium*

Unit-II
Porifera   **-** *Sycon, Canal System in Sponges*

Unit-III
Annelida   - *Nereis*
Unit-IV
Arthropoda   - *Palaemon* (prawn)

Unit-V
Cell Biology I: Structure and function of cell, Ultra structure of Plasma membrane
Unit-VI
Cell Biology II: Structure and function of cell organelles with special emphasis on mitochondria, golgi bodies, nucleus, ribosome and endoplasmic reticulum.

B.Sc.- B.Ed. (Education Part)
SEMESTER -1
CC1 : EDUCATION An INDIA – STATUS , PROBLEMS AND ISSUES

Objectives
- To develop perception of the role and functions of a teacher as envisaged in the NPE 1986 and to familiarize the student teacher with the different projects and schemes at secondly level in U.P.
- To develop an understanding of the brief historical background of Indian education with special reference to secondary education .
- To develop an understanding of the objectives and scope of secondary education .
- To develop an awareness of the professional ethics.

CONTENT

UNIT 1. Concept of education .
- Indian and western. Aims of education functions of education
- Education as an instrument of social control social change .
- Preservation of cultural heritage and values.
- School and the society culture and education school as a social system. Agencies of education informal formal and non formal .

UNIT 2. Salient features of ancient Indian education
- Vedic Buddhist Islamic
- Tradition in education .
- Major landmarks of British system of education in colonial India particularly from the view Point of aims stretcher curricula and methods of education
- Efforts towards evolving a national system of education .

Unit 3 . secondary education
- General aims and objectives of secondary education and structure education during post independence period . constitutional provisions for education secondary education commission 1952-53 education commission 1964- 66 new education policy 1986 with programme of action 1992 ,
- Different streams of secondary education 1- C.B.S.E , 2- I.C.S.E and 3- KSEEB with respect to curriculum. .4 - examination system etc.
- Secondary school teacher –Qualifications competences job profile professional code of ethical conduct
- Role of secondary school teacher in emerging India.

Unit -4 Teacher education and secondary school curriculum .
- Status aims and objectives of teacher education in India .
- Role and responsibilities of NCTE ,NCERT ,DSERT ,CTE, IASE
- Professional organization in the field of teacher education
- Rastriya madhyamika shikshana abhiyan (RMSA) , NCF -2005
- Programmes for enhancing efficiency and productivity of school teacher in-service training orientation and content enrichment programmer.

Assignments (any two of the following)
- Prepare and execute a plan for making at least two children and one adult literate form the community
- Plan and organize a field trip/excursion to a nearby area of educational important and submit a report .
- Visit to black or district and divisional educational offices and study their education management patter and submit the report.
- Prepare one project for institutional planning
- Critically study the working of the one of parent teacher association in any two secondary schools
- A critical survey of Co- curricular activities in secondary schools

Reference :
- Anand C.L et al (1993) teacher and education in the emerging Indian society NCERT new delhi
- Coombs philps H (1996) the world crisis in education new york Oxford yniversily press new York
- Delors, jaeques (1985) learning the treasure within report to UNESCO of the internal commission on education for twenty first century UNESCO.
- Dewey I(1952) experience in education collier Macmillan.
- Dewey S (1956) democracy in education new York Macmillan
- Gandhi M K(1956) basic education Ahmadabad nalihiban
- Government of India (1952) report of secondary education commission new Delhi : ministry of education
- Government of India MHRD (1966) report of education commission ministry of education new Delhi
- Government of India MHRD (1986) (revised 1992) national policy of education new Delhi
- Government of India (1992) report of care group on value orientation of education planning commission
- Kneller G.F. (1978) foundation of education new York john willy and sons
- Kneller George (1978) introduction to philosophy of education new York John welled and sons
- Mani RS (1964) education ideas and Ideals of Gandhi and Tagore new book society new Delhi
- Mathur S.S.(1988) a sociological approach to indian education Agra vinod prakashan
- Mookherjee K.K (1972) some great education of the world fas Gupta & Gupta Ltd Calcutta
- Mukherjee S.N (1966) history of education in India baroda acharya book depot
- Naik J.P. and Syeden (1974) a student history of education in India new Delhi Macmillan co
- Naik J.P.(1975) equality quality and quantity the elusive triangle of Indian education bomboy : allied publishers
- NCTE (1988) Gandhi of education new Delhi
- Salamaliha (1979) education in social context. Next Delhi NCERT

CC2: CHILDHOOD & GROWING UP

Objectives

- To develop an understanding of different aspect of a child physical motor social and emotional development
- To understand the developmental process of children with diverse abilities in social cultural and political context
- To build sensitivity towards children 's developmental needs and capabilities within their socio cultural context
- To develop a sensitive and critical understanding of the different social educational /cultural /Political Realities at the core of the exploration into childhood
- To build an interdisciplinary frame work to interpret analyse observation and interaction from cross culture psychology
- To develop critical deconstruction of significant event that media highlights and creates during childhood
- To provide hands on experiences to interact with children and training in methods to understand aspects of the development of children
- To develop the power to interpret how gender, cast and social class may impact the lived experience of children.

CONTENT

Unit 1: perspectives in development

- Concept meaning scope and function and education psychology
- Introduction to development concept and introduction to perspectives in development humanistic psychology and developmental theory
- Enduring themes in the study of development as multidimensional and plural Development as continuing through the life span ways in which development is continuous discontinuous socio cultural contexts influencing Development
- Gathering date about children from different contexts naturalistic observations interviews reflective journals about children anecdotal records and narratives clinical methods with reference to piaget
- Method longitudinal cross sectional sequential cohort methods biographical case study and observational method .

Unit 2: stager of human development

- Child as a developing individual a psycho social entity stages of development
- Developmental characteristics of a child and an adolescent physical cognitive social emotional moral and language their interrelationships
- Developmental tasks of childhood and adolescence and their implications
- Factors influencing development such as heredity & environment media nutrition child rearing practice siblings and peers
- Commonalities and diversities within the notion of childhood and how multiple childhood are constructed with particular reference to the India context living in an urban slum Growing girl and growing up in dalit household

Unit 3: social and emotional development

- Basic understanding of emotions how differential gender socialization occurs

- Personality development Freud psycho social development Erikson; influence of early childhood experiences on later personality
- Social theories and gender development meaning of gender roles influences on gender roles stereotypes gender in the playground .
- Development of Emotion function attachment bowl by

Unit 4: contexts of socialization

- Concept of socialization family and child relationships parenting child rearing practices
- Schooling peer influences school culture relationships with teachers teacher expectations and school achievement beubg out of school overage learner
- Relationships with peer friendships and gender competition and cooperation competition coniflit aggression and bullying from early childhood to adolescence
- Social economic and cultural differences in socialization implications for inclusion .

Essential readings.

- Cole , M , cole , S. R. and lightfoot C, (2004) The Development of children new York worth publishers Chapter1 the study of human development
- Newman ,B,M. and newman ,P.H. (2007) theories of human development London Lawrence Erlbaum associates publishers chapter 1: introduction .
- Papalia ,D .E and olds S.W. (2003) human development new York McGraw hill higher education chapter I: the study of human development chapter 2: theory and research chapter 4: physical development during the first three years chapter 7: physical development in early childhood chapter 9: physical development in middle childhood
- Saraswathi T.S (Ed) (1999) culture socialization and human development theory research and application in India sage publication chapter 4: theoretical Frameworks in Cross-cultural Psychogy, Chapter 6:Individualism in a Collective Culture: A Case of Co-existence of opposites.
- Vasanta, D. (2004). Childhood, Work and Schooling: Some: Reflections. Contemporary Education Dialogue, Vol.2(1), 5-29.6.Mukunda, K, v. (2009). What Did You Ask in School today? A. Handbook on Child Learning. Noida: Harper Collms. Chapter 4: Child Development, 79-96.
- Reading for Discussion 1/ Aries. P. (1965). Centuries of Childhood-A social History of the family life random House Inc. Chapter 1: The Ages of life, Chapter 2: The discovery of Childhood, and conclusion – The two concepts of childhood. 2. Harris, M. and Butterworth, G. (2002). Developmental Psychology: a student's handbook. New York: Taylor & Francis Chapter 1: A Brief History of Developmental Psychology.

Advanced readings

- Kakkar, S. (1978). Indian Childhood: Cultural Ideas, And Social Reality. New Delhi: Oxford.
- Nambissan. G. (2010). Exclusion and Disrimination in Schools: Experiences of Dalit Children: Working paper series Volume 01, Number 01, Indian Institute of Dalit Studies and UNICEF.
- Kakkar S. (1991) the Inner world A psycho analaytic study of childhood and society in India Delhi oxford university press.
- Sandra I. bem (1987) gender schema theory and its implications for child development raising , gender a schematic children in a gender schematic society in M,R Walsh (ed) the psychology of women Harvard univereity press Cambridge 206-226 .

B.Sc.-B.Ed.(COMPUTER SCIENCE)
SECOND SEMESTER SYLLABUS

UNIT-I
Combinational circuit & Sequential circuit:
Adders (Half and Full), Decoder, Encoder, Multiplexer, De-multiplexer (Introductory Concepts only).
Flip-Flops:
Flip-flops (SR flip-flops, D flip-flops, JK flip-flops), Edge – Triggered flip-flops and Master Slave flip-flops,
Introduction to Registers and Counters:
Buffer register, Multivibrators – Astable , Monostable, Biastable.
Memory:
Memory Heirarchy, Primary Memory-Volatile and non-valatile memory, RAM and ROM, EPROM and EEPROM, Secondary Memory-Floppy Disk and Hard Disk.

UNIT-II
Disk Operating System:
Introduction to DOS Commands. Types of DOS Commands Wild Card Character in DOS Directory Related Commands. File Related Commands and Utilities. Filfers & Redirection, Batch file.
Introduction of Windows, Features, Application:
MS Windows, and its various elements of application windows title bar, menu bar, maximize and close buttons, borders and corners, scroll bars, windows icon, folder icons, dialog box and its items, starting Microsoft windows, searching the files, copying the files, disk clean up, deleting unnecessary files, Determining Free space on disk, disk defragmenter, sound recorder, using scan disk, imaging, character map, calculator notepad paint, Word Pad.

UNIT-III
Arrays:
One dimensional and multidimensional array, declaration, initialization and array Manipulations, sorting (Bubble sort) Strings – Basic Concepts, Library Functions.
Functions:
Definition, function definition and prototyping, types of functions, type of arguments, Recursion, passing arrays to functions, storage class in C-automatic, register, external and static variables.

UNIT-IV
Pointers:
Definition, notation, pointers and arrays, array of pointers and functions – call by value and Call by reference, Pointers to pointers. Definition, declaration, accessing structure elements, Array of structure in a structure, Pointers and structures, Unions – definition, declaration, accessing union elements, type def, Enum. Bit fields.
Types of C preprocessor directives, Macros, data file handling, file opening modes, Text and Binary files.

UNIT-V
MS Excel: Introduction, An overview of worksheet, Creating worksheet and workbook, Opening and saving Workbook and exiting Excel, Formatting, Protecting Cells, Producing Charts, Macros, Database, Using Tables, Using files with other Programme. Goal seek, scenario, Pivot table, different functions (Antiemetic / String / Date and Time function etc.)

UNIT-VI
MS Access: Introduction, Understanding Databases, Create Tables and Quires, Forms, Finding information in a Database, Create Report, Adding Graph.
Practical: Windows and programming in C.

B.Sc.- B.Ed (PHYSICS)
Second SEM SYALLBUS

UNIT - I

Central forces, Two particle central force problem, reduced mass, relative and centre of mass motion, Law of gravitation, Kepler's laws of planetary motion and their deductions, motions of planets and satellites, geo-stationary satellites.

UNIT II

Simple harmonic motion, differential equation of S. H. M. and its solution, uses of complex notation, damped and forced vibrations, composition of simple harmonic motion.

Differential equation of wave motion and its solution, plane progressive, harmonic waves in fluid media, reflection of waves, phase change on reflection, superposition, stationary waves, pressure and energy distribution, phase and group velocity and relation between them.

UNIT - III

The laws of thermodynamics: The Zeroth law, work done by and on the system, internal energy as a state function and other applications, first law of thermodynamics. Reversible and irreversible changes, Carnot cycle and its efficiency, Carnot theorem, Second law of thermodynamics. Its Internal combustion engines. Entropy, principle of increase of entropy and calculations. The thermodynamic scale of temperature; its identity with the perfect gas scale. Impossibility of attaining the absolute zero;

Third law of thermodynamics. Thermodynamic relationships: Thermodynamic variables, Maxwell's general relationships, application to Joule-Thomson cooling and adiabatic cooling in a general system, Vander Waals' gas, Clausius-Clapeyron heat equation. Thermodynamic potentials and equilibrium of thermodynamical systems, relation with thermodynamical variables. Cooling due to adiabatic demagnetization, production and measurement of very low temperatures.

UNIT -IV

Blackbody radiation: Pure temperature dependence, Stefan-Boltzmann law, pressure of radiation, spectral distribution of Black body radiation, Wien's displacement law, Rayleigh-Jean's law, Planck's law of radiations.

UNIT - V

Bipolar transistors, CE, CB, CC Confirmations and Characteristics, DC alpha, DC beta, characteristics of transistor curves in different modes. Transistor biasing circuits: base bias, emitter bias and voltage divider bias, DC load line.

Basic AC equivalent circuits, low frequency model, small signal amplifiers hybrid parameter of a transistor, common emitter amplifier, common collector amplifiers, and common base amplifiers, current and voltage gain, R.C. coupled amplifier, gain, frequency response, equivalent circuit at low, medium and high frequencies, feedback principles.

UNIT-VI

Barkhan Criters for sustained oscillations impedance, transistor as an oscillator, general discussion and theory of Hartley oscillator only.

Elements of transmission and reception, basic principles of amplitude modulation and demodulation. Principle and design of linear multimeters and their applications, cathode ray oscillograph and its simple applications.

PRACTICALS

1. Study of bad conductor by Lee Disc method.
2. To determine mechanical equivalent of heat by Callender and Barne's method.

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3. Half wave and full wave rectifiers.
4. Characteristics of a transistor in CE, CB and CC configurations
5. Frequency response of R.C. coupled amplifier.
6. P.N. Junction and Zener diode characteristics.
7. LED characteristics.

Text and Reference Books

- RP Feymman, RB Lighton and M Sands; "The Feymman Lectures in Physics", Vol. 1 (BI Publications, Bombay, Delhi, Calcutta, Madras).
- D.S, Mathur "Mechanics"
- S.K. Agarwal and B.K. Agarwal "Thermal Physics"
- Brijlal & Shubramaniam – Heat and Thermodynamics.
- W.D. Stanley: "Electronic Devices, Circuits and Applications" (Prentice-Hall).
- J Millman and A Grabel, "Microelectronics", International Edition (McGraw Hill Book Company, New York, 1988).

Algebra
Unit-I
Fundamental theorem of homomorphism, Conjugacy relation, Class equation, Direct product.

Unit-II
Introduction to rings, subrings, integral domains and fields, Characteristic of a ring, Homomorphism of rings, Ideals, Quotient rings.

Trigonometry

Unit-III
Complex functions and separation into real and imaginary parts, Exponential, direct and inverse trigonometric and hyperbolic functions, logarithmic function, Gregory's series, Summation of series.

Calculus

Unit-IV
Curvature, Envelopes and evolutes.

Unit-V
Asymptotes, Tests for concavity and convexity, Points of inflexion, Multiple points, Tracing of curves in Cartesian and polar co-ordinates, Reduction Formulae, Beta and Gamma Functions.

Unit-VI
Qudrature, Rectification, Volumes and surfaces of solids of revolution, Pappus theorem, Double and triple integrals, Change of order of integration, Dirichlet's and Liouville's integral formulae.

Geometry

Unit-VII
Cylinder, Elementary Concepts of Central Coni coids.
Vector Calculus

Unit-VIII
Scalar and vector product of three vector, Product of four vectors, Reciprocal Vectors, vector differentiation, gradient, divergence and curl.

Unit-IX
Vector Integration, Line integrals, Theorems of Gauss, Green and Stokes (with out proof) and problems based on these.

Section –A - Inorganic Chemistry
Unit I

s-Block Elements

Comparative study, diagonal relationship, salient features of hydrides, solvation and complexation tendencies including their function in biosystems, an introduction to alkyls and aryls.

Environmental Chemistry

Pollution, long distance movement of pollutants, air pollution (CO, CO_2, NO_x, SO_2, H_2S, pesticides, ozone layer depletion, smog, acid rain, monitoring and control), water pollution (BOD, COD, sewage treatment, industrial wastewater treatment, reverse osmosis), soil pollution (causes, effects and remedies)

Unit II
Block Elements

Comparative study (including diagonal relationship) of groups 13-17 elements, compounds like hydrides, oxides, oxyacids and halides of group 13-16, hydrides of boron – diborane and higher boranes, borazine, borohydrides, fullerenes, carbides, fluorocarbons, silicates (structural principle), tetrasulphur tetranitride, basic properties of halogens, interhalogens and polyhalides.

Chemistry of Noble Gases

Chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds.

Section-B - Organic Chemistry

Unit III

Alkens, Cycloaklenes dines and Alkynes nomenclature of alkenes, methods of ormation, regioselectivity in alcohol elimination, elimination, physical properties and relative stabilities of alkenes.

Chemical reactions of alkenes – Mechanisms involved in hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration- oxidation, oxymercuration-reduction. Epoxidation, ozonolysis, hydration, hydroxylation and oxidation with $KMnO_4$. Polymerization of alkenes. Substitution at the allylic and vinylic positions of alkenes. Industrial applications of ethylene and propene.

Methods of formation, conformation and chemical reactions of cycloalkenes.

Nomenclature and classification of dienes: Isolated, conjugated and cumulated dienes. Structure of allenes and butadiene, methods of formation, polymerization. Chemical reactions – 1,2- and 1,4- additions, Diels Alder reaction.

Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation, metal- ammonia reductions, oxidation and polymerization.

Unit IV
Arenes and Aromaticity

Nomenclature of benzene derivatives. Aryl group. Aromatic nucleus and side chain.

Structure of benzene: Molecular formula and Kekule structure.

Stability and carbon-carbon bond lengths of benzene, resonance structure, MO picture.

Aromaticity: The Huckle rule, aromatic ions.

Aromatic electrophilic substitution – General pattern of the mechanism, role of σ and π complexes, Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel-Craft's reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/para ratio. Side chain reactions of benzene derivatives. Birch reduction.

Methods of formation and chemical reactions of alkylbenzenes, alkynylbenzenes, biphenyl, naphthalene and anthracene.

Alkyl and Aryl Halides

Nomenclature and classes of alkyl halides, methods of formation, chemical reactions.

Mechanisms of nucleophilic substitution reactions of alkyl halides, S_{N2} and S_{N1} reactions with energy profile diagrams.

Polyhalogen compounds: Chloroform, carbon tetrachloride.

Methods of formation of aryl halides, nuclear and side chain reactions.

The addition-elimination and the elimination-addition mechanisms of nucleophilc aromatic substitution reactions.

Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides. Synthesis and uses of DDT and BHC.

Section-C - Physical Chemistry
Unit V
Solid State

Definition of space lattice, unit cell.

Laws of crystallography – (i) Law of constancy of interfacial angles, (ii) Law of rationality of indices and (iii) Law of symmetry. Symmetry elements in crystals.

X-ray diffraction by crystals. Derivation of Bragg equation. Determination of crystal structure of NaCl, KCl and CsCl (Laue's method and powder method).

Colloidal State

Definition of colloids, classification of colloids.

Solids in liquids (sols): Properties – kinetic, optical and electrical; stability of colloids, protective action, Hardy-Schulze law, gold number.

Liquids in liquids (emulsions): Types of emulsions, preparation. Emulsifier.

Liquids in solids (gels): Classification, preparation and properties, inhibition, general application of colloids, colloidal electrolytes.

Unit VI
Chemical Kinetics and Catalysis

Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction – concentration, temperature, pressure, solvent, light, catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions – zero order, first order, second order, pseudo order, half life and mean life. Determination of the order of reaction – differential method, method of integration, method of half life period and isolation method. Radioactive decay as a first order

phenomenon. Experimental methods of chemical kinetics: Conductometric, potentiometric, optical methods, polarimetry and spectrophotometer.

Theories of chemical kinetics: Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy.

Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis). Expression for the rate constant based on equilibrium constant and thermodynamic aspects.

Catalysis - Characteristics of catalysed reactions, classification of catalysis, homogeneous and heterogeneous catalysis, enzyme catalysis, miscellaneous examples.

PRACTICAL
The duration of practical examination will be of six hours.   **M M = 50**

  Distribution of Marks

Inorganic experiments	**10 marks**
Organic experiments	**20 marks**
Physical experiments	**10 marks**
Record	**5 marks**
Viva	**5 marks**

Inorganic Chemistry
Volumetric analysis: Any four double titrations from acid-base, redox and complexometric types.

Organic Chemistry
Crystallization: Concept of induction of crystallization. Phthalic acid from hot water (using fluted filter paper and steamless funnel). Acetanilide from boiling water. Naphthalene from ethanol. Benzoic acid from water.

Decolorisation and crystallization using charcoal:::: Decoloration of brown sugar (sucrose) with animal charcoal using gravity filtration. Crystallization and decolorisation of impure naphthalene (100 g of naphthalene mixes with 0.3 g of Congo Red using 1 g decolorizing carbon) from ethanol.

Sublimation
(simple acid. and vacu):::: Camphor, Naphtalene, Phthalic acid and Succinic acid

Physical Chemistry
Coolloids
1. To prepare arsenious sulphide sol and compare the precipitating power of mono-, bi- and trivalent anions

Viscosity, Surface Tension
1. To determine the percentage composition of a given mixture (non-interacting systems) by viscosity method
2. To determine the viscosity of amyl alcohol in water at different concentrations and calculate the excess viscosity of these solutions
3. To determine the percentage composition of a given binary mixture by surface tension method (acetone & ethyl-methyl ketone)

Unit- I
Bacteria: Nutritional types of bacteria (based on carbon and energy sources), metabolism in different nutritional types (basics only) and bacterial genome and plasmids; bacterial cell division, flagellation in bacteria - principles of genetic recombination; techniques in sterilization, bacterial culture and staining; economic importance.

Unit-II
Fungi: The characteristics and life cycles of the following: Mastigomycotina: Albugo, Zygomycotina – Mucor, Ascomycotina: Saccharomyces, Aspergillus; Basidiomycotina : Ustilago, Puccinia, Agaricus; Deuteromycotina: Alternaria.

Unit – III
Xanthopyta Vaucheria; Phaeophyta; Ectocarpus, Bryophytes, general characters, classification, reproduction and affinities. Gametophytic and soporophytic organization of: Bryopsida: Pogonatum; Anthocerotopsida: Anthoceros

Unit - IV
Gametophytic and sporophytic organization of Hepaticopsida: Riccia, Marchantia.

Unit - V
Gymnosperms: General characters, classification. Comparative study of morphology, anatomy, development of vegetative and reproductive parts in: Cycadales:Cycas.

Unit –VI
Study of morphology, anatomy, development and reproductive parts in: Coniferales – Pinus ; Gnetales – Ephedra Affinities and relationship of Gymnosperms, evolutionary significance. Elementary Palaeobotany: general account, types of fossils, methods of fossilization and geological time scale.

SECOND SEMESTER SYLLABUS
Lower (Coelenterata to Nematehelminathes) and Higher (Mollusca to Echinodermata) Non Chordata & Genetics

The habits, morphology, physiology, reproduction, development (in outline) and classification of the following groups of animals including a detailed study of the types given in each:

Unit-I

Coelenterata	-	*Obelia*
Ctenophora	-	Salient features

Unit-II

Platyhelminthes	-	*Fasciola* (liver fluke) and *Taenia*
(tape worm) Nematehelminthes	-	*Ascaris*

Unit-III

Mollusca	-	*Pila* (apple-snail)

Unit-IV

Echinodermata	-	*Asterias*

Unit-V

Genetics-I: Structure of Chromosomes, Watson & Crick Model of DNA, Nucleic acid, DNA replication   Differences between DNA & RNA, Cell Cycle, Cell Division: Mitosis and Meiosis. Mendel's principles of heredity on chromosomal basis, Monohybrid cross, test cross, dihybrid cross, back cross incomplete dominance, Multiple Alleles, Blood group inheritance. Linkage and crossing over, interaction of genes. The role of DNA in heredity.

Unit-VI

Genetics II: Sex determination, sex differentiation, prenatal detection of genetic diseases (amniocentesis), Sex-linked characters, Mutation, Genetic diseases and abnormalities, chromosomal aberrations, Eugenics.

SEMESTER –II
CC3: LEARNNG & TEACHING

Aims of the course
- To become aware of different contexts of learning and situate school as a special environment for learning
- To reflect on their own implicit understanding of the nature and kinds of learning
- Gain an understanding of different theoretical perspectives on learning with a focus on cognitive views of learning as well as social constructivists theories
- Explore the possibilities of an understanding of processes in human Cognition and meaning making them as basis for designing leaning environments and experiences at school : and
- Appreciate the critical role of learner based on differences and contexts in making meanings and hence draw out implications for schools and teachers

Unit 1: THEORETICAL PERSPECTIVES ON LEARNING
- Implicit knowledge and beliefs about learning (demystifying misconceptions)
- Perspectives on human learning : behaviourist (conditioning paradigm in brief) Cognitivist, information processing view humanist social constructivists (drawing selectively on the ideas of Skimmer Piaget Rogers Vygotsky)
- Concepts and principles or each perspective and their applicability in different learning situations

Unit 2: ROLE OF LEARNER IN LEARNING
- Role of leaner in Various Learning situations as seen in different theoretical perspectives
- Role of teacher in teaching learning, Situations: A transmitter of knowledge, B-Model , C-Facilitator, D - Negotiator, E- Co-Learner . (the focus is on building understanding of different psychological perspectives of learning and helping student teacher to learn to apply them in different learning situations)
- Distinctions between learning as construction of knowledge and learning an transmission and reception of knowledge .

Unit 3: LEARNING CONSTRUCTIVIST PERSPECTIVE
- Social constructivist perspective (also Bruner and Ausubel's perspective and applications of vygotky's ideas in teaching .
- Understanding processes that facilitate construction of knowledge (i) Experiential learning and reflection (ii) social mediation (iii) cognitive negotiability (iv) stuated tearning and cognitlce apprenticeship (v) meta cognition
- Creating facilitative learning environments teacher altitudes , expectations – enhancing motivation positive emotions self – efficacy collaborative and self regulated learning . (the focus is on learning as a constuctice rather than a reproductive process The learner centered orientation has implications understanding learning as contextual and self – regulated process and following suitable classroom practices)

Unit 4: INDIVIDUAL DIFFERENCES AMONG LEARNERS
- Dimensions of differences in psychological attributes cognitive abilities interest aptitude creativity personality Values.

B.Sc.-B.Ed. Semester wise syllabus, JS University, Shikohabad   Page 70

- Understanding learners from multiple intelligence perspective with a focus on Gardner's theory of multiple intelligences implications for teaching learning in the light of changing concept of intelligence including motional intelligence .
- Difference in learners based on predomimnal learning styles
- Differences in learners based on socio–cultural contexts Impact contexts impact of home languages of learners and language of instruction impact of differential cultural capital of learners
- Understanding differences based on a range of cognitive abilities – learning difficulty slow learners and dyslexics deficiency intellectual deficiency Intellectual giftedness implications for catering to individual variantions in view of difference rather than deficit perspective (the focus is on understanding the differential learning needs of the learners with regard to abilities learning styles language socio cultural defferences / disadvantage learning difficulties and their implivations for classroom practices and teaching)

CC4 . CURICULUM DEVELOPMENT & SCHOOL

OBJECTIVES :
- To acquaint students with the nature and types of curriculum.
- To acquaint students with the context of curriculum development and some innovative curriculum models .
- To familiarize students with designing of curriculum
- To give practical experience in evaluating designing and reviewing curriculum .

CONTENT

Unit 1:
- Curriculum meaning and nature types of curriculum , syllabus and Text books their interrelationship issues and problems of existing curriculum.

Unit II.
- Curriculum construction curriculum development and curriculum designing concepts and differences. Determinants and motives of curriculum development different curriculum models open university open school etc.

Unit III :
- Steps of designing different curriculum. Selection gradation and organization of curriculum development and implementation of curriculum enrichment of curriculum.

Unit IV : practical's
- Evaluation of B.Ed. curriculum
- Designing a curriculum in a given condition reviewing of syllabus books

REFERENCES
- Ashcroft kate and palacio david : the primary teacher 's Guide to the new national curriculum London flamer press 1995.
- Doll ronal C,: curriculum improvement decision making and process London allyn and bacon 1996.
- Eccles tone Kathryn how to assess the vocational curriculum London kogan page ltd 1996.

Hendricks joanne total learning development curriculum for the young child new York Maxwell mcmillan international 1994.

- Hooper ,R,: the curriculum context design and development the Chaucer press Ltd. Great Britain 1977.
- Kaushik A.V the curriculum theory and pravtices academy. Jaipur 1977.
- Kelly J.V ,: the curriculum – theory and practices. Harper and row publishers London 1982.
- Kell J.E (Ed) changing the curriculum university of London press Ltd , London 1970.
- Lawton ,D ,: class culture and the curriculum roulette and kegan paul ltd London 1975.
- Lowy ,A, (ed) handbook of curriculum international instituie for education planning new York ,1977.
- Lowy A (Ed) the international encyclopaedia of curriculum new York pergamun press 1991.
- Mamidi M,R and ravishankar curriculum development and educational technology sterling publishers pvt.Ltd new Delhi 1983.

- Nichols, S. H and smith ,B D curriculum George allen and unwin boston London 1986.
- Oriosky ,D.E and smith , ,B,D curriculum development lssucs and insighrs rand McNally college publishing company USA 1976.
- Prasad janardan & kasha V,K advanced curricuium constructiop new Delhi kanishka publishers 1997.
- Richmond K.W the school curriculum. Planning for modern schools London : Holt rinchart and Winston Inc. 1966.
- Wiles Jon & bonds Joseph C ,: curriculum development –A guide to practice London : Charles E Merrill publishing Co ,1986.

UNIT-I
Definition of operating system (OS), History of OS, Simple Batch Systems, Multi- programmed Batched Systems, Tim-Sharing Systems, Personal Computer system, Distributed Systems and Real-Time Systems, Operating System Structures- Command Interpreter System, Operating System Services, System Calls, System Programs.

Process Management:
Process **Concept**, Process control Block, process Scheduling, CPU scheduling-Basic Concepts.

UNIT-II
Storage Management:
Basic Concepts, Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging Segmentation, Virtual Memory- Demand Paging, Paging Replacement, Thrashing and Demand Segmentation.

File System:
File Concept, Access Methods, Directory Structure, Protection, File System Structure. Allocation methods, Free Space Management.

UNIT-III
OOP concept, Procedural vs OOP programming, OOP terminology and features, Tokens, Character set, Keywords, Data-types, Data Types declarations, Constants and variables, expressions, Standard Library and header files. Operator and Expressions: Arithmetic Operator, Increment/Decrement Operator, Relational Operator, Logical Operator and conditional operators, library functions, Logical Expressions, C++ shorthand,

UNIT-IV
Flow of control statements: Selection statements, Iteration statement, Jump statement, Construction of loops and implementation, While, Do-while, For statements nested loops. If-else, switch, break, continue and Go to statements.

Classes and Objects: Need for Classes, Declaration of Classes, referencing class Members, Scope of class and its members Nested Classes, Functions in a class: Inline Functions, Constant Member functions, Nesting of Member Functions, friend function, Memory allocation of objects, Arrays of objects, Static Class Member

UNIT-V
Structure, definition, and application, Lists, Basic Terminology, Static Implementation of Lists, Pointer Implementation of Lists, Insertion in a List, Deletion from a List, Storage of Sparse, Arrays using Linked List, Doubly Linked Lists, Circular Linked List

UNIT-VI
Defining Stack and Queue, Stack Operations and Implementation, Array Implementation, Pointer Implementation, Stack Applications, Convert Number Bases by Using Stacks, Infix to Postfix Conversion, Queues: Operations and Implementation, Queue Application, Priority Queues

Practical: Programming in C++

UNIT-I

Interference of a light: The principle of superposition of waves, two-slit interference, coherence requirement for the sources, Bi-Prism, Lloyd's Mirror optical path retardations, lateral shift of fringes, Rayleigh refractometer and other applications. Localised fringes; thin films, applications for precision measurements for displacements.

Haidinger fringes: Fringes of equal inclination, Michelson interferometer and its application for precision determination of wavelength, wavelength difference and the width of spectral lines. Twymann Green interferometer and its uses. Intensity distribution in multiple beam interference, Tolansky fringes, Fabry-Perrot interferometer and etalon grating.

UNIT -II

Fresnel diffraction: Fresnel half-period zones, zone plates, straight edge, rectilinear propagation of lights.

Fraunhoffer diffraction: Diffraction at a slit, half-period zones, phasor diagram and integral calculus methods, the intensity distribution, diffraction at a circular aperture and a circular disc, resolution of images, Rayleigh criterion, resolving power of telescope and microscopes systems.

Diffraction gratings: Diffraction at N parallel slits, intensity distribution, plane diffraction grating, reflection grating and blazed gratings. Concave grating and different mountings. Resolving power of a grating and comparison with resolving powers of prism and of a Fabry-Perot etalon.

UNIT-III

Electrostatics

Coulomb's law, Electric Field and potentials, Field due to a charged sphere, ring, disc, spherical shell and Derivations of Poisson and Laplace Equations, Gauss Law and its application: The field of a conductor. Electric dipole, Field and potential due to an electric dipole, Dipole approximation for an arbitrary charge distribution, Electric quadrupole, Field due to a quadrupole, Electrostatic Energy of a uniformly charged sphere, Energy of a condenser, methods of electrical images.

Magnetostatics

Magnetic field, Magnetic Induction and Biot- Savarts Law, Magnetic field due to circular coil, Helmholyz coil and solenoid Lorentz Force, Vector and scalar magnetic potentials, Magnetic Dipole, Magnetomotive force Ampere's circuital theorem and its applications to calculate magnetic field due to wire carrying current and solenoid.

UNIT-IV

Electromagnetic Induction

Faraday's laws of EMT induction and Lenz's Law. Mutual and Self Induction, pecipricity theorem Vector potential in varying Magnetic field, Induction of current
in continuous media, Skin effect, Motion of electron in changing magnetic field, Magnetic energy in field, Induced magnetic field (Time varying electric field), Displacement current, Maxwell's equations, Theory and working of moving coil, ballistic galvanometer.

UNIT-V
Matter Waves
Inadequacies of classical mechanics, Photoelectric effect, Compton Effect, wave particle duality, de- Broglie matter waves and their experimental verification, Heisenberg's Uncertainty principle, Complementary principle, Principle of superposition of waves, Motion of wave packets.

UNIT -VI
Schrodinger Equation and its Applications
Schrodinger wave equation, Interpretation of wave function, Expectation values of dynamical variables, Ehrenfest theorem, Orthonormal properties of wave functions, One dimensional motion in potential step, Rectangular potential barrier, Square potential well, Particle in a box, normalization, Simple harmonic oscillator.

PRACTICALS
1. To determine the wavelength of sodium light with the help of Fresnel's Bi- prism.
2. To determine the height of a tower or wall with the help of sextant.
3. Study of diffraction at a straight edge or a single slit.
4. Resolving limit of a telescope system.
5. Polarization of light by the reflection.
6. Study of optical rotation for any system.
7. Study of decay of currents in LR and RC circuits.
8. Response curve for LCR circuit and resonance frequency and quality factor.
9. Study of spectra of hydrogen and deuterium (Rydberg constant and ratio of masses of electron to proton).
10. Study of Zeeman Effect for determination of Lande g-factor.
11. Study of laser as a monochromatic coherent source

Text and Reference Books
- A K Ghatak, "Physical Optics" (Tata McGrew Hill).
- D P Khandelwal; "Optics and Atomic Physics" (Himalaya, Publishing House, Bombay, 1988).
- Berkeley Physics Course; Electricity and Magnetism, Ed. E.M. Purcell (Mc GrawHill). Halliday and Resnik; "Physics", Vol 2.
- A S Mahajan and A A Rangwala; "Electricity and Magnetism" (Tata McGraw- Hill). A M Portis; "Electromagnetic Fields".
- H E White; "Introduction to Atomic Physics".
- H S Mani and G K Mehta; "Introduction to Modern Physics" (Affiliated East-West Press 1989). A Beiser, "Perspectives of Modern Physics".

Linear Algebra

Unit-I
Vector spaces and their elementary properties, Subspaces, Linear dependence and independence, Basis and dimension, Direct sum, Quotient space.

Unit-II
Linear transformations and their algebra, Range and null space, Rank and nullity, Matrix representation of linear transformations, Change of basis.

Unit-III
Linear functionals, Dual space, Bi-dual space, Natural isomorphism, Annihilators, Bilinear and quadratic forms,
Differential Equations

Unit-IV
Formation of a differential equation (D.E.), Degree, order and solution of a D.E., Equations of first order and first degree : Separation of variables method, Solution of homogeneous equations, linear equations and exact equations, Linear differential equations with constant coefficients, Homogeneous linear differential equations,

Unit-V
Differential equations of the first order but not of the first degree, Clairaut's equations and singular solutions, Orthogonal trajectories, Simultaneous linear differential equations with constant coefficients, Linear differential equations of the second order (including the method of variation of parameters),

Unit 6.
Order, degree and formation of partial differential equations, Partial differential equations of the first order, Lagrange's equations, Charpit's general method,
Dynamics

Unit 7.
Velocity and acceleration along radial and transverse directions, and along tangential and normal directions, Simple harmonic motion, Motion under other laws of forces.

Unit 8
Motion in resisting medium, Constrained motion (circular and cycloidal only).

Unit 9
Motion on smooth and rough plane curves, Rocket motion,

B.Sc.-B.Ed. (CHEMISTRY)
THIRD SEMESTER DETAILED SYLLABUS

Section –A - Inorganic Chemistry

Unit I

Chemistry of Elements of First Transition Series

Characteristic properties of block elements.

Properties of the elements of the first transition series, their binary compounds (hydrides, carbides and oxides) and complexes with respect to relative stability of their oxidation states, coordination number and geometry.

Chemistry of Elements of Second and Third Transition Series

General characteristics, comparative treatment with their 3d-analogues with respect to ionic radii, oxidation states, magnetic behaviour, spectral properties and stereochemistry. Comparison of Zr/Hf, Nb/Ta and Mo/W.

Unit II

Coordination Compounds

Werner's coordination theory and its experimental verification, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition metal complexes.

Section –B - organic Chemistry

Unit III

Electromagnetic Spectrum: Absorption Spectra

Ultraviolet (UV) absorption spectroscopy – Absorption laws (Beer-Lambert law), molar absroptivity, presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation. Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and enones.

Infrared (IR) absorption spectroscopy – Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum, fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds.

Unit IV

Alcohols Classification and nomenclature.

Monohydric alcohols – Nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature. Reactions of alcohols.

Dihydric alcohols – Nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [$Pb(OAc)_4$ and HIO_4] and pinacol- pinacolone rearrangement.

Trihydric alcohols – nomenclature, methods of formation, chemical reactions of glycerol, synthesis of glycerol.

Phenols

Nomenclature, structure and bonding, preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion. Reactions of phenols – electrophilic aromatic substitution, acylation and carboxylation. Mechanisms of Frie's rearrangement, Claisen rearrangement, Gatterman syntheis, Hauben-Hoesch reaction, Lederer-Manasse reaction and Reimer- Tiemann reaction.

Section –C - Physical Chemistry
Unit V
Thermodynamics – I
Definitions of Thermodynamic Terms
System, surroundings etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work.
First Law of Thermodynamics
      Statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's law – Joule-Thomson coefficient and inversion temperature. Calculation of w, q, dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.
Thermmochemistry
      Standard state, standard enthalpy of formation – Hess's law of heat summation and its applications. Heat of reaction at constant pressure and at constant volume. Enthalpy of neutralization. Bond dissociation energy and its calculation from thermo-chemical data, temperature dependence of enthalpy. Kirchhoff's equation.
   Thermodynamics – II
Second Law of Thermodynamics
      Need for the law, different statements of the law, Carnot cycle and its efficiency. Carnot theorem. Thermodynamic scale of temperature.
Concept of Entropy
      Entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical change, Clausius inequality, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases.
Gibbs and Helmholtz Functions
      Gibbs function (G) and Helmhotz function (A) as thermodynamic quantities. A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change, Variation of G and A with P, V and T.
Third Law of Thermmodynamics
      Nernst heat theorem, statement and concept of residual entropy. Nernst distribution law – Thermodynamic derivation, applications.
  Unit VI
Chemical Equilibrium
      Equilibrium constant and free energy. Thermodynamic derivation of law of mass action. Le-Chatelier's principle.
      Reaction isotherm and reaction isochore – Clapeyron-Clausius equation and its applications.
  Solutions
      Liquid-liquid mixtures: Ideal liquid mixtures, Raoult's and Henry's law. Non-ideal system: Azeotropes, HCl-H_2O and ethanol-water systems.
      Partially miscible liquids: Phenol-water, trimethylamine-water, nicotine- water systems, immiscible liquids, steam distillation.
PRACTICAL
The duration of practical examination will be of six hours.
Distribution of marks: Total marks 50 will have inorganic volumetric and preparation of standard solutions 20 marks, organic expt 10 marks, physical expt 10 marks, record 5 marks and viva of 5 marks.

Inorganic Chemistry

Calibration of fractional weights, pipettes and burettes. Preparation of standards solutions. Dilution – 0.1 M to 0.001 M solutions.

Quantitative Analysis

Volumetric Analysis

(a) Determination of acetic acid in commercial vinegar using NaOH

(b) Determination of alkali content of antacid tablet using HCl

(c) Estimation of calcium content in chalk as calcium oxalate by permanganometry

Organic Chemistry
Systematic Qualitative Organic Analysis

Identification of an organic compound through the functional group analysis, determination of melting point and preparation of suitable derivatives

Laboratory Techniques

A. Thin Layer Chromatography

Determination of Rf values and identification of organic compounds:

(a) Separation of green leaf pigments (spinach leaves may be used)

(b) Preparation of separation of 2,4-dinitrophenylhydrazones of acetone, 2-butanone, hexan-2, and 3-one using toluene and light petroleum (40:60)

(c) Separation of a mixture of dyes using cyclohexane and ethyl acetate (8.5:1.5)

Physical Chemistry

Transition Temperature

1. Determination of the transition temperature of the given substance by thermometric /dialometric method (e.g. $MnCl_2.4H_2O/SrBr_2.2H_2O$)

Phase Equilibrium

1. To study the effect of a solute (e.g. NaCl, succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. phenol- water system) and to determine the concentration of that solute in the given phenol-water system

2. To construct the phase diagram of two component (e.g. diphenylamine – benzophenone) system by cooling curve method

THIRD SEMESTER DETAILED SYLLABUS
Taxonomy of Angiosperms, Cytology, Genetics & Plant Physiology

Unit - I
Systematics: Principles of classification, nomenclature; comparative study of different classification systems, viz. Linnaeus, Bentham & Hooker, Engler & Prantl, Hutchinson. Herbarium techniques and important Botanic Gardens.

Unit – II
Taxonomic study of following families and their economic importance: Dicots; Ranunculaceae, Papaveraeae, Malvaceae, Brassicaceae, Cucurbitaceac, Rosaceae, Leguminosacae, Rutaceae, Apiaceae, Apocynaceae,Solanaceae, Convolvulaceae, Acanthaceae, Lamiaceae, Asteraceae, Rubiaceae, Euphorbiaceae, and Amaranthaceae. **Monocots:** Poaceae, Liliaceae.

Unit - III
Cell structure, cell organelles, nucleus, chromosome structure, nucleosome and solenoid model, salivary gland, lampbrush and B chromosomes. Cell division – mitosis, meiosis; their significance, chromosomal aberrations

Unit- IV
Genetics, laws of inheritance; gene interaction; linkage and; cytoplasmic inheritance; sex determination.

Unit - V
Plant and water relationship, diffusion, Osmosis, Plasmolysis. Water uptake, conduction, transpiration, mechanism and its regulation by environmental variables. Mineral nutrition : Macro, and micronutrients, their role, deficiency and toxicity symptoms, plant culture practices, mechanism of ion uptake and translocation.

Unit - VI
Photosynthesis and Chemosynthesis: photosynthetic pigments, O_2 evolution, photophosphorylation, CO_2 fixation - C_3- C_4 and CAM plants. **Respiration:** aerobic and anaerobic respiration, respiratory pathways glycolysis, krebs 'cycle, electron transport, oxidative phosphorylation, pentose phosphate pathway, photorespiration.

B.Sc.-B.Ed.(ZOOLOGY)
THIRD SEMESTER DETAILED SYLLABUS
Lower Chordata, Animal distribution, Evolution & Physiology

Unit- I

Hemichordata: Classification, affinities and detailed study (habit, morphology, anatomy, physiology and development) of *Balanoglossus*

Cephalochordata: Classification, affinities and detailed study (habit, morphology, anatomy and physiology) of *Branchiostoma* (*Amphioxus).*

Unit -II

Urochordata: Classification, affinities and detailed study (habit, morphology, anatomy, physiology and post embryonic development) of *Herdmania*

Unit-I

Animal distribution: Geological and geographical distribution with their characteristic fauna; fossils.

Unit-II

Origin of Life, concept of species (classical & modern concept)

Evolution: Evidences (including physiological and serological); Theories of evolution (including Neo-Lamarckism, Darwin-Wallace theory of natural selection, Neo-Darwinism, Modern synthetic theory). Evolution of Man. Mutation

Unit-I

Physiology of digestion, respiration, and blood and circulation

Unit-II

Physiology of excretion and osmoregulation, neural transmission, muscles

SEMESTER –III
CC-5 EDUCATION POLICIES SCHOOL LEADERSHIP AND MANAGEMENT

Objectives :
- To develop perception of the role and function of a teacher as envisaged in the NPE 1986 to and familiarize the student Teacher with the different project and schemes at secondary level in Uttar Pradesh
- To develop an understand of the brief historical background of India education with special reference to secondary education
- To acquire elementary knowledge of educational administration and management .

Unit 1: education policies
- General aims and objectives of education policies in reference of secondary education
- Different education policies during pre and post independence period wood dispatch maqualey minutes wrdha summit Indian act -1935 basic shiksha and mudaliar commission Tailem Radha Krishnan commission Kothari commission NPE 1986 ,NPE emended 1992 serve sheikhs abhiyan and RTE – 2010

Unit –II : school curriculum
- Main features of secondary school curriculum and the process of curriculum development
- General principles of school curriculums
- Critical analysis of secondary school curriculum in context of Uttar Pradesh

Unit – III : leadership
- Leadership in school concept need and importance of leadership dimension and style of leadership at secondary levels role of leadership in school effectiveness.
- Implementation of leadership at secondary level issues and challenges .
- Types styles problems of leadership role of school head master prinicipal in institutional planning .

Unit –IV education management
- Concept need characteristics principles of educational management .
- Basic of management –planning organization control decision making and financing
- Prevailing education management pattern in Uttar Pradesh

Unit –V : function of management
- Time management – principles and importance of time management in school curricular and co curricular activities .
- Resource management –Different types of resources at school level maximum optimization of resources

Reference
- Agrawal J.C 2005 : Nai shiksha nati Prabhat prakeshan new Delhi
- Bhatnagar ,R.P Vidhya shaikishik prashan engle book depot meerut
- NCERT (1998) school mapping new Delhi
- NIEPA (1988) school mapping new Delhi saxena N.R swaroop dhikshan kala cvam padhtiyan loyal book depot mccrut
- Combs .PH (1970) what is education ? IIEP (unesco) paris.
- Hardy C. & altcin R. (1986) understanding school as organization penguin London
- Naik J.P planning asia institute for education planning & administration new Delhi

CC6: GENDER SCHOOL AND SOCIETY

Course objectives :

To enable the student teacher to :
1. To acquaint the student teachers with the concept of gendered roles in society and their challenges .
2. To develop an understanding of the inequality and disparities in equal opportunities in education in societal context .
3. To enable the student teacher to critically examine the stereotypes and rethink their beliefs.
4. To help student teacher to develop abilities to handle notion of gender and sexuality

Course contents :

Unit -1: Gender Issues : key concepts
1. The meaning and concept of gender and experience of gender in across different social group regions and time – periods challenges in gendered roles in society: family caste religion culture the media and popular culture (films advertisements songs etc .) law and the state .
2. Unequal access of education to girls access to school ; gender identity construction at home and in society .
3. Indian societal context power and authority in India social system (patriarchy) socialization of child into a specific gender influences and opportunities for education

Unit – II : Gender challenges and education
4. Challenging gender inequalities or reinforcing gender parity : the role of schools peers teachers curriculum and textbooks etc.
5. Representation of gendered roles relationship and ideas in textbooks and curricula .
6. School nurture or challenge creation of young people as masculine and feminine selves.

Unit –III: gender lssues and role of teacher
1. Counseling and guidance teachers need help to develop abilities to handle notions of gender and sexuality (often addressing the issues under diverse cultural constraints their own and their ; instead if shying away from the same .)
2. Sex education perceptions of safety at school home and beyond (the formulation of positive nations of sexuality among people impact larger issues .
3. Identification of sexual abuse /violence and its verbalization,(combating the dominant societal outlook of objectification of the female body, and so on.)

UNIT-IV: Role of the Media and Life Skills Education
1. Role of the media in propagation of popular beliefs, reinforcing gender roles in the popular culture and by implication at school.,
2. Life Skills courses in school: provisions to deal with some issues of gender identity roles and performativity for the development of positive notions of body and self).
3. Gender equality Education of regions and exploring the roles of the institutions (family, case , religion, culture, media and popular culture, law and the state)

Assignment
1. Group Discussion: B.Ed. students will observe and study the distribution of roles and responsibilities in schools and classrooms rituals and school routines, processes of disciplining distinctly as for girls and boys, and in classroom interaction. Studying the everyday activities where the majority of girls constitute the assembly choir group and

the boys form the inter-school cricket team; girls partnered to be seated with other girl students and boys with boys; sciences associated with boys and humanities with girls; art and craft considered to be the domain of the girls and physical education that of the boys; etc. Teachers need to question such stereotypes and help students rethink their beliefs. Why these issues are delineated only for supplementary extra-curricular periods in school and not integrated into subjects of study need to be discussed .

2. Group work& activities, brainstorming, audio-visual presentations: prospective teachers to attend and themselves undertake sessions of open verbalization with school students, voluntary cum friendly involvement in discussions, together with the co-participation of school (teachers, counselors and other resources), home (parents and siblings) and society (NGOs, other expert groups, etc)

3. Assignments and Projects; Student-teachers will be exposed and trained to prepare pedagogic material and practice a pedagogy which can develop abilities and confidence in their students to critically evaluate and challenge gender inequalities, which being sensitive to social groups and .

EPC 1 : READING AND REFLECTING ON TEXTS

Objectives

- To enable the student to read and response to a verity of text in deferent ways
- To develop meta cognitive awareness
- To enhance the capacities as readers and writers by becoming participants in the process of reading
- To enable the student teacher to work on the field and make predications and check their predictions and then to summarize

Unit - 1 : reading sells

- Creating environment for reading – reading clubs class libraries
- Reading aloud and silent reading .
- Scaffolding concept and activities .
- Reading different tests types like stories , poems ,riddle, jokes and instructions for games.

Unit –II : reading with comprehension

- Reading for global and local comprehension
- Inferences analysis and extrapolation .
- Reading strategies including word – attack strategies
- Discourse analysis .
- Using reading as a tool for reference skills ie , use of dictionary encyclopedia and

Interest

- Using ideas of critical literacy to analyze chapters from textbooks.
- Acquisition of reading skills

Unit – III : types of text

- Narratives text
- Expository
- Autobiographical narratives
- Field notes
- Ethnographies
- Addressing deferent types of skis and strategies

Mode of transaction

- Participation to tasks and activates to improve proficiency in the receptive and productive skills of English .
- Text analysis of school textbooks to improve skills in critical literacy.
- Reflecting on one " s own learning to make connections with pedagogy .

Essential readings

- Light own , P .M & spade N (1999) How languages are learned oxford oxford university press .
- Maley .A & duff ,A (1991) drama techniques In language learning A resource book of communication activities for language teachers (2nd ed) Cambridge – comb ridge
- Morgan ,J.& involucel ,M (1983) once upon a time using stories in the lanfuage classroom Cambridge university press
- Wright a (1989) pictures for language learning Cambridge Cambridge. University press

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Advanced reading
1. Parrot M. (1993) tasks for language teacher combridge Cambridge ' University press
2. Richards J. & Lockhart . C (1994) . reflective teaching in second in second language classrooms Cambridge : comb ridge university press
3. Slatternly M .& wiliis J (2001) . English for primary teachers a handbook of activities & classroom language oxford oxfond : oxford university press .

UNIT-I
CPU scheduling, Scheduling Criteria, Round Robin Scheduling, Real Time Scheduling

UNIT-II
Definition Deadlock, Deadlock Characterizations, method for Handling Deadlocks, Deadlock prevention, Avoidance, Detection, recovery from Deadlock.

UNIT-III
Functions, function definition, Default arguments, Constant arguments, Call by value, Call by reference, returning from a function, storage class specifier and variables, storage class specifier and Functions automatic, external and static variables, Pointer: Declarations, Passing to a function, Operations on Pointers

UNIT-IV
Arrays two dimensional and multidimensional arrays, Arrays of Pointers, Pointers and functions, Constructors and Destructor: Declaration, Definition and characteristics, Function Overloading, Inheritance: Need, Different forms, Single Inheritance, Multilevel Inheritance, C++ Memory Map: Dynamic and Static Allocation of Memory, Stacks Queues and Linked Lists, Declarations, File handling: Open, Close, Create, Process, Detecting EOF.

UNIT-V
Defining Graph, Basic Terminology, Graph Representation, Graph Traversal, Depth First Search (DFS), Breadth First Search (BFS), Shortest Path Problem, Minimal Spanning Tree, Binary Trees, In order Traversal, Post order Traversal, Preorder Traversal, Binary Search Trees, Operations.

UNIT-VI
Searching and Sorting techniques, Sequential Search, Binary Search, Internal Sort, Insertion Sort, Bubble Sort, Quick Sort, 2-way Merge Sort, Heap Sort
Practical: C++ and Data structure using C.

UNIT - I

Polarization, Double refraction in uniaxial crystals, Nicol prism, polaroids and retardation plates. Analysis of polarised light. Optical activity and Fresnel's explanation, Half shade and Biquartz polar meters.

Matrix representation of plane polarized waves, matrices for polarizers, retardation plates and rotators.

UNIT-II

Laser system: Purity of a spectral line, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients, spontaneous and induced emissions, conditions for laser action, population inversion.

Application of Lasers: Pulsed lasers and tunable lasers, spatial coherence and directionality, estimates of beam intensity; temporal coherence and spectral energy density.

UNIT-III

Dielectric constant, polarization, Electronic polarization, Atomic or ionic Polarization, Polarization charges, Electrostatic equation with dielectrics, Field, force and energy in Dielectrics.

Intensity of magnetization and magnetic susceptibility, Properties of dia, Para and ferromagnetic materials, Curie temperature, Hysteresis and its experimental determination.

UNIT -IV

Electromagnetic Waves

The wave equation satisfied by E and B, plane electromagnetic waves in vacuum, Poynting's vector, reflection at a plane boundary of dielectrics, polarization by reflection and total internal reflection, Faraday effect; waves in a conducting medium, reflection and refraction by the ionosphere.

UNIT - V

Spectra of hydrogen and alkali atoms, spectral terms, doublet fine structure, screening constants for alkali spectra for s, p. d, and f states, selection rules.

Singlet and triplet fine structure in alkaline earth spectra, L-S and J-J couplings. Continuous X-ray spectrum and its dependence on voltage, Duane and Haunt's law. Characteristics X-rays, Moseley's law, doublet structure and screening parameters in X-ray spectra, X-ray absorption spectra.

UNIT -VI

Discrete set of electronic energies of molecules, quantisation of vibrational and rotational energies, determination of internuclear distance, pure rotation and rotation- vibration spectra, Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra.

PRACTICALS

1. To determine the focal length of combination of two lenses separated by a distance d and to verify the formula.
2. Characteristics of a ballistic galvanometer.

3. Setting up and using an electroscope or electrometer.
4. Use of a vibration magnetometer to study a field.
5. Measurement of low resistance by Carey-Foster bridge or otherwise.
6. Study of Lorentz force.
7. To determine the refractive index of liquid by the Newton's ring method.
8. Thickness of a wire by wedge shape air film.
9. To study the polarization of light by reflection and to verify the Brewster's and Malu's laws.
10. Sensitivity of a cathode-ray oscilloscope.
11. Characteristic of a choke.

Text and Reference Books

- F Smith and JH Thomson; "Manchester Physics Series: Optics" (English Language Book Society and John Wiley, 1977).
- Born and Wolf; "Optics"
- A S Mahajan and A A Rangwala; "Electricity and Magnetism" (Tata McGraw- Hill). A M Portis; "Electromagnetic Fields".
- Pugh and Pugh; "Principles of Electricity and Magnetism" (Addison-Welsley).
- G.M. Barrow; "Introduction to Molecular Physics".
- R P Feymann, R B Leighton and M Sands; "The Feyrnann Lectures on Physics, Vol. III (B I Publications. Bombay. Delhi, Calcutta, Madras).

Unit - 1
Inner product spaces, Cauchy-Schwarz's inequality, Bessel's inequality and orthogonality.
Matrices

Unit - 2
Symmetric and skew-symmetric matrices, Hermitian and skew-Hermitian matrices, Orthogonal and unitary matrices, Triangular and diagonal matrices, Rank of a matrix, Elementary transformations, Echelon and normal forms, Inverse of a matrix by elementary transformations.

Unit - 3
Characteristic equation, Eigen values and Eigen vectors of a matrix, Clayey- Hamilton's theorem and its use in finding inverse of a matrix, Application of matrices to solve a system of linear (both homogeneous and non-homogeneous) equations, Consistency and general solution.

Unit - 4
Linear partial differential equations with constant coefficients. Partial differential equations of the second order, Monge's method..

Unit - 5
The concept of transform, Integral transforms and kernel, Linearity property of transforms, Laplace transform, Inverse Laplace transform, Convolution theorem, Applications of Laplace transform to solve ordinary differential equations.

Unit - 6
Fourier transforms (finite and infinite), Fourier integral, Applications of Fourier transform to boundary value problems, Fourier series.

Unit - 7
Central orbits and Kepler's law, Motion of a particle in three dimensions. Statics

Unit - 8
Common catenary, Stable and unstable equilibrium.

Unit - 9
Centre of gravity in two and three dimensions.

Section –A Inorganic Chemistry

Unit I

Chemistry of Lanthanide Elements Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation. Ceric ammonium sulphate and its analytical uses.

Unit II

Chemistry of Actinides

Electronic configuration, oxidation states and magnetic properties, chemistry of separation of Np, Pu and Am from U. Similarities between the later actinides and the later lanthanides.

Section – B Organic Chemistry

Unit III

Ethers and Epoxides

Nomenclature of ethers and methods of their formation, physical properties. Chemical reactions – cleavage and autoxidation, Ziesel's method.

Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxides.

Aldehydes and Ketones

Nomenclature and structure of the carbonyl groups. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties.

Mechanism of nucleophillic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction.

Use of acetals as protecting group. Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolf-Kishner, $LiAlH_4$ and $NaBH_4$ reductions. Halogenation of enolizable ketones. An introduction to α, β unsaturated aldehydes and ketones.

Unit IV

Carboxylic Acids

Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Synthesis of acid chlorides, esters and amides. Reduction of carboxylic acids. Mechanism of decarboxylation.

Methods of formation and chemical reactions of halo acids. Hydroxy acids: Malic, tartaric and citric acids.

Methods of formation and chemical reactions of unsaturated monocarboxylic acids.

Dicarboxylic acids: Methods of formation and effect of heat and dehydrating agents.

Carboxylic Acid Derivatives

Structure and nomenclature of acid chlorides, esters, amides (urea) and acid anyhydrides.

Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution.

Preparation of carboxylic acid derivatives, chemical reaction. Mechanisms of esterificaton and hydrolysis (acidic and basic).

Organic Compounds of Nitrogen

Preparation of nitroalkanes and nitroarenes. Chemicalreactions of nitroalkanes. Mechanisms of nuclephilc substitution in nitroarenes and their reductions in acidic, neutral and alkaline media. Picric acid. Halonitroarenes: Reactivity.

Amines: Structure and nomenclature of amines, physical properties. Stereochemistry of amines. Separation of a mixture of primary, secondary and tertiary amines. Structural features effecting basicity of amines. Amine salts as phase-transfer catalysts. Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles), reductive amination of aldehydic and ketonic compounds. Gabriel-phthalimide reaction, Hofmann bromamide reaction. Reactions of amines, electrophilic aromatic substituton in aryl amines, reactions of amines with nitrous acid. Synthetic transformations of aryl diazonium salts, azo coupling.

Oxidation and Reduction

Electrode potential, electrochemical series and its applications. Principles involved in the extraction of the elements.

Acids and Bases

Arrhenius, Bronsted-Lowry, the Lux-Flood, solvent system and Lewis concept of acids and bases.

Non-aqueous Solvents

Physical properties of a solvent, types of solvents and their general characteristics. Reactions in non-aqueous solvents with reference to liquid NH_3 and Liquid SO_2.

Section –C Physical Chemistry

Unit V

Electrochemistry – I

Electrical transport: Conduction in metals and in electrolyte solutions, specific conductance molar and equivalent conductance, measurement of equivalent conductance, variation of molar, equivalent and specific conductances with dilution.

Migration of ions and Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations. Weak and strong electrolytes. Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsager equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf method and moving boundary method.

Applications of conductivity measurements: Determination of degree of dissociation, determination of K_a of acids, determination of solubility product of a sparingly soluble salt, conductometric titrations.

Unit VI

Electrochemistry – II

Types of reversible electrodes – Gas-metal ion, metal-metal ion, metal- insoluble salt-anion and redox electrodes. Electrode reactions, Nernst equation, derivation of cell EMF and single electrode potential, strandard hydrogen electrode-reference electrodes and their applications, standard electrode potential, sign conventions, electrochemical series and its significance.

Electrolytic and Galvanic cells–Reversible and irreversible cells, conventional representation of electrochemical cells.

EMF of a cell and its measurements. Computation of cell EMF. Calculation of

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thermodynamic quantities of cell reactions (ΔG, ΔH and K).

Concentration cell with and without transport, liquid junction potential, application of concentration cells, valency of ions, solubility product and activity coefficient, potentiometrictitrations.

Definition of pH and pK_a, determination of pH using hydrogen, quinhydrone and glass electrodes by potentiometric methods.

Buffers – Mechanism of buffer action, Henderson-Hazel equation, application of buffer solution. Hydrolysis of salts

Phase Equilibrium

Statement and meaning of the terms-phase, component and degree of freedom, derivation of Gibbs phase rule, phase equilibria of one component system– water, CO_2 and S systems.

Phase equilibria of two component systems – Solid - liquid equilibria, simple eutectic – Bi-Cd, Pb-Ag systems, desilverisation of lead.

Solid solutions – Compound formation with congruent melting point (Mg-Zn) and incongruent melting point ($FeCl_3$-H_2O) and ($CuSO_4$-H_2O) system.

PRACTICAL

The duration of practical examination will be of six hours.

Distribution of marks: Total marks 50 will have inorganic volumetric and gravimetric solutions 20 marks, organic expt 10 marks, physical expt 10 marks, record 5 marks and viva of 5 marks.

Inorganic Chemistry

VolumetricAnalysis

a) Estimation of hardness of water by EDTA.
b) Estimation of ferrous and ferric by dichromate method.
c) Estimation of copper using thiosulphate.

Gravimetri Analysis

Analysis of Cu as Cu SCN, Ni as Ni(dimethylgloxime) and Ba as $BaSO_4$

Organic Chemistry

A. Paper Chromatography: Ascending and Circular

Determination of R_f values and identification of organic compounds:

(a) Separation of a mixture of phenylalanine and glycine. Alanine and aspartic acid. Leucine and glutamic acid. Spray reagent – ninhydrin.

(b) Separation of a mixture of D, L – alanine, glycine, and L-leucine using n-butanol:acetic acid:water (4:1:5). Spray reagent – ninhydrin.

(c) Separation of monosaccharides – a mixture of D-galactose and D- fructose using n-butanol:acetone:water (4:5:1). Spray reagent – aniline hydrogen phthalate.

Physical Chemistry

Thermochemistry

1. To determine the solubility of benzoic acid at different temperatures and to determine ΔH of the dissolution process

2. To determine the enthalpy of neutralization of a weak acid/weak base versus strong base/strong acid and determine the enthalpy of ionization of the weak acid/weak base

B.Sc.B.Ed. (BOTANY)
FOURTH SEMESTER DETAILED SYLLABUS
Diversity of Angiosperms, Evolutions, Ecology & Biochemistry

Unit - I

External morphology of vegetative and floral parts; modifications – phyllodes, cladodes, and phylloclades. **Meristems-** Kinds study of tissue system - epidermal, ground, and vascular. Anatomy of roots, stems, and leaves. Cambium - its function and anomalies in roots and stems.

Unit – II

Structure and development of male and female gametophytes – microsporogenesis microgametogenesis, megasporogenesis and megagametogenesis, embryo sac types. Double fertilization development of embryo, endosperm development and its morphological nature, apomixis and polyembryony.

Unit-III

Mutation- spontaneous, induced mutations, molecular mechanism and evolutionary significance; polyploidy- origin, kinds and role in evolution. Evidences and theories of evolution.

Unit - IV

Ecology, relation with other disciplines. Plant types: Hydrophytes - Hydrilla, Eichhorina, Nymphaea, Typha. Xerophytes – Nerium, Casuarina, Saccharum, Begonia. Plant succession – xeroseres, hydroseres. Ecosystems - concept, basic types, components, &functioning.

Unit - V

Nitrogen metabolism: atmospheric nitrogen fixation, nitrogen cycle, nitrogen assimilation, Growth: general aspects of phytohormones, inhibitors-auxins. kinetin, gibberellins, and ethylene: action and their application; photoperiodisin and vernalization. Germination, growth movements, parthenocarpy, abscission and senescence.

Unit - VI

Biomolecules : Classification, properties and biological role of carbohydrates, Protein and lipids. Chemistry of nucleic acids. Discovery and nomenclature. Characteristics of enzymes, concepts of holoenzyme, apoenzyme, coenzyme and cofactors. Regulation of enzyme activity, Mechanism of action.

Higher Chordata, Developmental Biology & Biochemistry

Unit-I

Classification of different classes of vertebrates (**Pisces, Amphibia, Reptilia**,) up to order with characters and examples. Poisonous and non poisonous snakes and biting mechanism. Neoteny, parental care in amphilia.

Unit-II

Classification of different classes of vertebrates (**Aves and Mammalian**) up to order with characters and examples. Dentition in mammals. Respiration in pigeon, migration in birds.

Unit-III

Developmental Biology I:Aims and scope of Developmental Biology.
Gametogenesis, Fertilization, Egg: structure and types. Types & patterns of cleavage.

Unit-IV

Developmental Biology II: Process of Blastulation & Gastrulation. Fate Map.
Development of Chick up to formation of Primitive streak Extra embryonic membranes of chick. Placentation and types of Placenta.

Unit-V

Physiology of endocrine system, thermoregulation

Unit-VI

General chemistry and classification of carbohydrates, lipids and proteins; Enzymes

SEMESTER –IV
CC-7 EDUCATION TECHNOLOGY & ICT

Objectives : upon the completion of the course the student will able to

- Explain meaning components functions of computer and its historical backgrounds .
- Understand the computer peripherals and its organization in computer system.
- Develop skill in handling computer and using word documents
- Develop skill in computation analysis and interpretation of date by using excel spread sheets .
- Understand the educational implications of power point presentation and its use in classroom context.
- Understand the applications of information technology in the field of teacher education programme and context.

Unit -1 : Fundamentals of Computer

       1.1 history and generations of computer

       1.2 meaning definition and characteristics of computer .

       1.3 basic functions of computer input process output concepts

       1.4 anatomy of computer

       1.5 classification of computer

             1.5.1 based on size and capacity (micro , mini mainframe and super computer)

             1.5.2 based on working principle (analog , digital and Hybrid Computes).

Unit 2: computer organization hardware and software

2.1 input devices :

       2.1.1 key board mouse scanner digital camera mike digital board

2.2 central processing unit arithmetic and logic unit control unit and memory units.

2.3 memory devices (storage devices)

       2.3.1 primary memory devices : RAM , R0M , PROM , EPROM ' and EEPROM .

       2.3.2 Secondary memory devices hard disk , CD- ROM ,DVD optical disk ,pen drive

2.4. output devices : Monitor ,printer ,plotter , speaker

2.5 operating system :

       2.5.1 needs and functions of operating system

       2.5.2 Types of operating system- Single user and multi user.

2.6 programming languages types of languages –LLL and HLL .

2.7 computer software system software Application software and operating system

2.8 computer virus and its prevention

Unit -3 Microsoft windows (system software)

3.1 introduction to MS – windows elements of MS – windows start menu desktop windows accessories control panel , windows explorer

3.2 application programme: MS- OFFICE (application software) MS – WORD ,MS , EWCEL AND MSPOWERPOINT .

3.3 Microsoft word :

    3.3.1 parts of MS word windows ,MS – word standard formatting drawing toolbars .

3.3.2 starting of MS-word opening a new document opening old document naming the new document saving the document using save and save as commands .

3.3.3 formatting the document fonts font style size bold italics underline normal spacing paragraph : Line spacing paragraph paragraph borders bullets numbered list shadings page setup : paper orientation margins and paper size alignment centre lift right justified.

3.3.4 editing the document cot copy paste , paste special undo redo select all find replace go to page number clear.

3.3.5 inserting frame, objects pictures headers, footers page number date and time.

3.3.6 tabs, tables columns : insert table delete cells merge cells split cells select row, select column select table , table auto format cell height and width heading sort and formula .

3.3.2 working with the drawing tools : line rectangle ellipse arc style freeform text box callout format callout fill colour, line bring to front send to back bring to front of text send behind text flip vertical flip vertical rotate right reshape .

3.3.8 page stating the document and mail merge .

3.3.9 education based applications : preparation of lesson plans using Ms word .

3.4 Microsoft excel :

3.4.1 parts of excel window excel standard , formatting drawing toolbars.

3.4.2 creating a new worksheet , opening as exiting worksheet saving the worksheet .

3.4.3. working with worksheet in serting and deloting row and columns sorting inserting charts. Merge cells. Formula.

3.4.4 preparation of school time table marks list ,salary bill etc.

3.5   Microsoft power point .

3.5.1 parts of PowerPoint   windows PowerPoint   standard formatting drawing toolbars .

3.5.2. working with text –changing fonts changing   font size and bold alignments moving text etc

3.5.3   working with graphics – moving the frames and inserting clip arts , inserting pictures inserting new slide, organization of charts tables designing templates master slide , color box etc.

3.5.4 Presentation of slides- saving slides uto content wizard.

3.5.5 Education based application use of the power point.

Unit -4 : applicators information and communication technology in education .

4.1 introduction to ICT : meaning need and importance of ICT .

4.2 introduction to multi media

4.2.1 meaning of multi media

4.2.2 scope of multi media

4.2.3 components of multi media .

4.2.4 per-requisites of multi techniques .

4.2.5 graphic effects and techniques .

4.2.6. sound and music .

4.2.7 developing a lesson plan using a multimedia package.

4.2.8 uses of multi media for teaching .

4.3   introduction to internet .

4.3.1 meaning of internet .

4.3.2 characteristics of internet .

4.3.3 uses of internet .

4.3.4 educational based applications of internet.

4.4 computer application in education

4.4.1 computer assisted instruction : concept characteristics, modes , merits and demerits

4.4.2 computer assisted testing : concept characteristics, mode merits and demerits

4.3 computer managed instruction : concept characteristics, mode merits and demerits

4. 5 introduction to website - meaning and importance

4.5.1 social websites (blog / titter / face book) .

Requirements

1. Infrestructure Erquiements in order to implement ICT literacy in –in service teacher education and ICT laboratory /multimedia centre may have to be setup no . of PCs / systems will be required .

2. It is recommended that for each student teacher get hands on experience all etleast one hour per work , college is free to deign the practical time table .

3. It is recommended that out of a House a week . (2 hours theory and 2 hour practical's)

4. Institution should have to appoint ICT teacher with minimum qualification of PGDCA/BCA/MCA.

Assignments : (Any one uniform pattern)

1. Write the history and generations of computer .

2. Write the input , output and storage devices of computer system.

3. Preparation of lesson plan , student list litters, invitation – hard copy and soft copy .

4. MS Excel preparation of a school time table marks list –Analysis of data and graphical representation – Hard copy and soft copy.

5. MS PowerPoint preparation of animated slides (insert pictures , cliparts , word art sound effects animation etc …) for reaching any concept on your subject .

6. Internet : surfing educative websites downloading taking a printout creating email Id .

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CC8: CREATING AN INCLUSIVE SCHOOL

Objectives: On completion of the Course the Student Teacher will be able to :
1. Identify the children of special needs.
2. Understand the nature of special needs their psychoeducational characterstics and functional limitation.
3. Familiarize with assessment and placement procedure for children with special needs.
4. Develop understanding about accommodating special needs in regular classroom.
5. Appreciate the education of children with special needs.

Course Content:

Unit 1- Special needs and education-
- Concept and types of special needs.
- Education of children with special needs and its implecation for universilisation of elementary education.
- Understanding and respecting diversity-trends of education for children with special need in India.
- Policies schemes and legistations about the education of children with special educational needs.

Unit 2-Nature, types and characterstics of children with special needs
- Psycho-social and educational characterstics functional limitations with reference to-
- Locomoter impairment
- Hearing impairment
- Visual impairment
- Learning disability
- Gifted and disadvantaged children
- Mental retardation and slow learners.

Unit 3-Inclusive education
- Concept and philosophy of inclusive education.
- Teaching competencies required for inclusive education.
- Roll of class teachers and Resource teacher in inclusive education.
- Specific roll of family and community participation.
- School and classroom management for implementing inclusive education
- Guidance and councelling in inclusive education.
- Support services needed for inclusive schools.

Unit 4-Identification and assessment of children with special educational needs
- Concept and techniques of assessment
- Identification and functional assessment of children with special needs
- Implecation of assessment for instructional planning and curriculum.
- Curriculum, adaptation, teaching strategies and evaluation in inclusive school.
- principles and methods of curriculum adapatation and adjustment to address diversity.
- Teaching learning strategies for children with special educational needs.
- Comparative learning peer tutoring behavior modification, multisensory approach, perceptual strategy and system approach.
- Individual educational program (IEP) and use of emerging technology.
- Adaptation in evaluation procedures.

Practicum: Any one of the following:

(suggested practicum but more activities can be take up by the teacher based on any topic from above unit)
1. Preparation of a report on importance of education for children with special needs.
2. Case study of children with special needs school in school situation.
3. Observation of class room situation and identification of special needs.
4. Identification of gifted/creative/slow learner/children with learning disability using standardized test/
5. Preparation of teaching plan for accommodation special need (Any one type) in regular classroom.
6. List out the resources for effective implementation of integration programme with reference to any one category of special needs.
7. Apart from the above similar activities from the five units will be identified and given.

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References:
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3. Hallahan and kuffiman J.M (1984) exceptional children, prentice hall
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EPC II : DRAMA AND ART IN EDUCATION

INTRODUCTION

The need to integrate arts education in the formal schooling of our students is to retain our unique cultural identity in all its diversity and richness and encourage young students and creative minds to do the arts. An understanding of the arts, will give our youth the ability to appreciste the richtiess and variety of artistic tradition as well as make them liberal, creative Thinkers and good citizens of the nation . Keeping in view some of these ideas , the national curricular area, which mist he tanght in every school as a compulsory subject (up to class X) and facilities for the same may be provided in every school. Keeping this in view , it is all the more Improant that arts education is integrated in the school curriculum to provide an aesthetically viable atmosphere in schools encouraging creativity for this, not only art teacher but every teacher in the school system should be senditized to understand and experience the use of arts for holistic development of the learner, as a teacher as well as and individual.

OBJECTIVES

1. Understanding basics of different Art forms – Impact of Art froms on the human mind .
2. Enhance artistic and aesthetic sendibility among learners to enable them to respond to the beauty in different art forms through genuine exploration, experience and free expression .
3. Enhance skills for integrating different art forms across school curriculum at secondary level Enhance awareness of the rich cultural heritage, artists and artisans,

COURSE CONTENT

Unit 1 – VISUAL ARTS ANS CRAFTS (PRACTICAL)

1. Experimentation with different materials of visual Art, such as pastel, poster, pen and ink rangoli clay , etc.
2. Exploration and experimentation with different methods of Visual Arts, like painting block printing collage clay , modeling paper cutting and folding .
3. Paper framing and display of art works,

UNIT-2: PERFORMING ARTS: DANCE, MUSIC, THEATRE AND PUPPETRY (PRACTICAL)

• Listening/viewing and exploring Regional Art forms of music, dance, theatre and puppetry.
• Viewing/listening to live and recorded performances of Classical and Regional Art forms
• Participation and performance in any one of the Regional Arts forms keeping in mind the integrated approach.
• Planning a stage-setting for a performance/presentation by the student-teacher.

UNIT 3: APPRECIATION OF ARTS

• Meaning and concepts of Arts and aesthetics and its significance at secondary 'level of school education
• What is the difference between Education in Arts and Arts in Education
• Identification of different performing Art forms and artists; dance, music and musical instrument, theatre, puppetry, etc. (based on a set of slides, selected for the purpose)
• Knowledge of Indian Craft Traditions and its relevance in education, (based on a set of slides, selected for the purpose)
• Knowledge of Indian Contemporary Arts and Artists; Visual Arts (based on a set of slides, selected for the purpose)
• Indian festivals and its artistic significance.,

Project Work (Units 1 and 2)
Theme-based projects from any one of the curricular areas covering its social, economic, cultural and scientific aspects integrating various Axts and Craft forms; Textbook analysis to find scope to integrate Art forms either in the text or activities or exercises; Documentation of the processes of any one Art or Craft form with the pedagogical basis such as weaving or printing of textiles, making of musical instruments, folk performances in the community, etc. — how the artist design their products, manage their resources, including raw materials, its marketing, problems they face, to make them aware of these aspects of historical, social, economic, scientific and environmental concerns, Student-teacher should prepare at least ten lesson plans in their respective streams of subjects (Science/Maths / Social Sciences/Languages etc.) while integrating different art forms.

Workshop
Two workshops of half a day each, of one week duration for working wi artists/artisans to learn basics of Arts and Crafts and understand its pedagogical significance. The. Arts forms learnt during the course should be relevant to the studentteachers in their profession. Activities, such as drawing, and painting, rangoli, clay modelling, pottery, mixed collage; woodcraft, toy making, theatre, puppetry, dance, music, etc. region specific should be given more importance for making arts learnercentred. The focus of the workshops should be on how art forms can be used as tool/ method of teaching-learning of languages, Social Sciences, Mathematics and Sciences

PRACTICAL PART
1 . BODY MOVEMENT- Different theatre games, Exercises, Martial Arts, Folk Dances.
2. MEDITATION- Focus, Concentration.
3. SCRIPT WRITING- characterization, dialogue, time and space, ,beginning, ' middle, end.
4. POETRY RECITATION- Rigved Mantras, Vaachik Abhinay.
5. SELECTION OF PLAY FOR CHILDREN.
6. CASTING.
7. BUILDING OF A CHARACTER.
8. '-PARTS OF SPEECH- Volume, Pitch, Speed, clarity, Audibility, Diction, Intonation, Feel and Toner Quality, Projection.
9. DESIGN OF A PRODUCTION.
10. PRODUCTION- Poster Making, Audience, Execution of Different Aspects of Production, Analysis of Increase in Understanding of Children through Drama.

Suggested Approach for Teaching—learning Procnis
        Every student-teacher must participate and practice different Art forms, They need to be encouraged to visit places of arts/see performances/ exhibitions/art and craft fairs/local craft bazaars, etc. Artists and artisans may be invited for demonstrations and interactions from the community. Student-teachers should be encouraged to maintain their diary on art interactions to enhance their knowledge and awareness in this area. Student-teachers can also be motivated to interpret art works/ commercials/events etc. to enhance their aesthetics sensibility.

        A Resource Centre for Arts and Crafts should be a part of all the RIEs, where materials, including books, CDs, audio and video cassettes, films, software, props, art works of Regional and National level, books and journals must be displayed for the purpose of reference and continuous motivation. Application of Arts and Aesthetics in day-to-day life, in the institute and in the community are some of the practical aspects, which needs to be taken care too. Student teachers must organise and participate in the celebrations of festivals, functions, special days, etc.

Modes of Assessment

The complete course is of 50 marks. It is recommended that evaluation of this course should be done at both the levels; (i) Internal as well as (ii) External. Practical - Activities (Units 1 and 2 of 30 marks) in nature arc more on the process than the product, hence need continuous and comprehensive evaluation(CCE). Therefore, recommended to be evaluated by the internals. The theory and project part (Unit 3 and Project work of 20 marks) can be in viva-voce and in presentation mode therefore recommended to be evaluated by the externals. The engagement of student-teacher in the above set of experiences should be evaluated on continuous and comprehensive manner, based on (a) submission of work/project; (b) participation in 'the activities; (c) creative potential displayed; (d) application of aesthetic sensibility in campus events and in other course activities.

B.Sc.-B.Ed.(COMPUTER SCIENCE)
FIFTH SEMESTER DETAILED SYLLABUS
Visual Basic and Introduction to Web-Designing

UNIT-I
Basics of Visual Basic Language, Requirements for VB 6.0, Toolbars, Menu Bars- File, Edit, View, Project, format, Tools, Add-Ins menu, Project Explorer, properties Window, Code, form, Debug Windows, Immediate Debug Window, Local Debug Window, Watch Debug Window, Toolbox Window, Adding/Removing Custom Control to Toolbox,
Creating and saving a Project, visual Development and event Driven Programming, OOPS, Object and Classes, Properties Methods and Events.

UNIT-II
Operating, Controll Flow Statements, Decision Making Statements, Select Case Statement, Iterations For Loop Structure, Do-loop Structure, Do-Loops Do-Until Loops, Do…While, While….Wend, With…End With Statements, Array : Accessing Array elements, Double Dimensional or Multidimensional Arrays, Dynamic Arrays, Redimensioning an Array, Lbound and Ubound statements Option Base Statement, Collections, Interacting with the basic Controls, Forms, Form Collection, Controlling one form within another MDI form, command Buttons, Label Control, Text Box Control, Capturing the Key Strokes, List Box Controls, Combo Box Controls, Lab Assignments, more Controls : Radio Buttons, Scrollbars, Example program timer Control, Running Lights Application, Image Control, Drive List Box, Searching a drive the directory list box, file Box copying a file, Deleting a File, Renaming a File, Moving a File, Lab Assignments.

UNIT-III
Introduction of Microprocessor: Evolution of microprocessor, Embedded microprocessor, Bit-Slic Processors RISC and CISC Processor, Vector Processor Array processor.
Intel 8086 Microprocessor: Pin description of Intel 8085, operating model of 8085, Register organization of 8085, Bus Interface and Execution Unit (BIU and EU), Interrupts 8085 Read and write Bus Cycle.

UNIT-IV
8086 Instruction Group: Data transfer Instruction, Arithmetic Instruction, Logical Instruction processor Control Instructing, string Instructions, Interrupts instructions and Addressing modes of 8086 up, Assembly Language Programming.

UNIT-V
Data, Information and Knowledge, Introducing Databases and Different kinds of database users, Concept Of A Database, Interacting With A Database, Architecture Of A Database, Using Relational Databases, Basics Of Relational Databases, Using Relational Databases, Identifiers For Relations, characteristics of database, database system concepts and Data Independence, Content of Data Dictionary, Data administration function, DBMS, Concurrency control, Database security, Database recovery

UNIT-VI

Traditional Data Model – ANSI/SPRC 3-level Architecture, Overview of three Traditional models—Hierarchical, Network and Relational Models, Comparison of these models

File organization technique—Random file organization technique, Multi key file organization technique, Entity relationship Model, ER Model

Structured Query Language- Introduction, Data definition, views and queries in SQL, Specifying constraints and indexes in SQL, Data Manipulation, Data maintenance, Multiple Table Operations, Transaction integrity facilities,

Practical: HTML, DBMS

UNIT-I

Reference systems, inertial and non-inertial frames, Galilean invariance and conservation laws, Michelson-Morley experiment; search for ether.

Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, velocity addition theorem, variation of mass with velocity, mass-energy equivalence ($E=mc^2$), particle with a zero rest mass.

UNIT -II

The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a prior probabilities, probability distribution and its narrowing with increase in number of particles. The expressions for average properties. Constraints; accessible and inaccessible states, distribution of particles with a given total energy into a discrete set of energy states.

UNIT-III

Lattice translation vectors and lattice, Symmetry operations, Basis and Crystal structure, Primitive Lattice cell, Two-dimensional lattice type, Number of lattices, Point groups and plane groups, three dimensional lattice type, Number of Lattices, Points groups and space groups. Index system for crystal planes Miller indices, Simple crystal structures, NaCI, hcp, diamond, Cubic ZnS; and hexagonal, Occurrence of Non-ideal crystal structures, random stacking of poly-prism, glasses.

Bragg law, Experimental diffraction method, Laue method, Rotating crystal method, Powder method, Derivation of scattered 'wave amplitude, Fourier analysis, Reciprocal lattice vectors, Diffraction conditions, Ewald method, Brillion zones, Reciprocal lattice to sc, bcc and face lattices , Fourier analysis of the basis and atomic form factor.

UNIT -IV

Crystal of inert gases, Van der Walls-London interaction, repulsive interaction,

Equilibrium lattice constants, Cohesive energy, compressibility and bulk modulus, ionic crystal, Madelung energy, evaluation of Madelung constant, Covalent crystals, Hydrogen-bonded crystals, Atomic radii.

Lattice heat capacity, Einstein model, Vibrations of monatomic lattice, derivation of dispersion relation, First brillouin zone, group velocity, continuum limit, Force constants, Lattice with two atoms per primitive cell, derivation of dispersion relation, Acoustic and optical modes, Phonon momentum. Free electron theory, Fermi energy, density of states, Heat capacity of electron gas, Paramagnetic susceptibility of conduction electrons, Hall effect in metals. Origin of band theory, Qualitative idea of Bloch theorem, Kronig-Penney model, Number of orbitals in a band, conductor, Semi-conductor and insulators, Effective mass, Concept of holes.

UNIT-V

Diffusion of minority carriers in semiconductor, work function in metals and semiconductors Junctions between metal and semiconductors, P.N. Junction diode, Depletion layer, Junction Potential Width of depletion layer, Field and Capacitance of depletion layer, Forward A.C. and D.C. resistance of junction, Reverse Breakdown.

Zener and Avalanche diodes, Tunnel diodes, Point contact diode, their importance at High

frequencies, LED photodiodes, Effect of temperature on Junction diode Thermistors.

UNIT -VI
Transistor parameters, base width modulation, transit time and life-time of minority carriers, Base- Emitter resistance, Collector conductance, Base spreading resistance, Diffusion capacitance, Reverse feedback ratio, Equivalent circuit for transistors, Basic model, hybrid model and Y parameter equivalent circuit, Input and output impedances.

PRACTICAL
1. To draw the characteristic of curves of PN junction diode.
2. Determination of dielectric constant.
3. Hysteresis curve of transformer core.
4. Hall-probe method for measurement of magnetic field
5. Specific resistance and energy gap of a semiconductor
6. Characteristics of a PNP transistor
7. Characteristics of a tunnel diode
8. Study of voltage regulation system
9. Study of VTVM
10. Study of AF and RF oscillators

Text and Reference Books
- Beiser, "Concepts of Modern Physics" (McGraw-Hill).
- B B Laud, "Introduction to Statistical Mechanics" (Macmillan 1981).
- Nuclear Physics by D.C. Tayal.
- Nuclear Physics by B.N. Shrivastava.
- Language Book Society). Eisenberg and Resnik, "Quantum Mechanics of Atoms, Molecules, Solids, Nuclei and Particles" (John Wiley).
- B G Streetman; "Solid State Electronic Devices", UK Edition (Prentice-Hall of India. New Delhi, 1986).
- W D Stanley; "Electronic Devices, Circuits and Applications" (Prentice-Hall, New Jersey, USA. 1988).

REAL ANALYSIS
Unit - 1
Axiomatic study of real numbers, Completeness property in *R*, Archimedean property, Countable and uncountable sets, Neighbourhood, Interior points, Limit points, Open and closed sets, Derived sets, Dense sets, Perfect sets, Bolzano- Weierstrass theorem.

Unit - 2
Sequences of real numbers, Subsequences, Bounded and monotonic sequences, Convergent sequences, Cauchy's theorems on limit, Cauchy sequence, Cauchy's general principle of convergence, Uniform convergence of sequences and series of functions, Weierstrass *M*-test, Abel's and Dirichlet's tests.

Unit - 3
Sequential continuity, Boundeness and intermediate value properties of continuous functions, Uniform continuity, Meaning of sign of derivative, Darboux theorem.

Unit - 4
Functions of a complex variable, Concepts of limit, continuity and differentiability of complex functions, Analytic functions, Cauchy-Riemann equations (Cartesian and polar form), Harmonic functions, Orthogonal system, Power series as an analytic function.

Unit - 5
Elementary functions, Mapping by elementary functions, Linear and bilinear transformations, Fixed points, Cross ratio, Inverse points and critical points, Conformal transformations.

Unit - 6
Complex Integration, Line integral, Cauchy's fundamental theorem, Cauchy's integral formula,
Numerical Analysis

Unit - 7
Shift operator, Forward and backward difference operators and their relationships, Fundamental theorem of difference calculus, Interpolation, Newton-Gregory's forward and backward interpolation formulae.

Unit - 8
Divided differences, Newton's divided difference formula, Lagrange's interpolation formula, Central differences, Formulae based on central differences: Gauss, Striling's, Bessel's and Everett's interpolation formulae, Numerical differentiation.

Unit - 9
Numerical integration, General quadrature formula, Trapezoidal and Simpson's rules, Weddle's rule, Cote's formula, Numerical solution of first order differential equations : Euler's method, Picard's method, Runge-Kutta method

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Section –A Inorganic Chemistry
Unit I
Metal-ligand bonding in Transition Metal Complexes

Limitations of valance bond theory, an elementary idea of crystal field theory, crystal field splitting in octahedral, tetrahedral and square planner

complexes, factors affecting the crystal-field parameters.

Thermodynamic and Kinetic Aspects of Metal Complexes

A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, stability constants of complexes and their determination, substitution reactions of square planar complexes.

Unit II
Magnetic Properties of Transition Metal Complexes

Types of magnetic behavior, methods of determining magnetic susceptibility, spin-only formula, L-S coupling, correlation of μ_s and μ_{eff} values, orbital contribution to magnetic moments, application of magnetic moment data for 3d-metal complexes.

Electronic spectra of Transition Metal Complexes Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, spectrochemical series, Orgel-energy level diagram for d^1 and d^9 states, discussion of the electronic spectrum of $[Ti(H_2O)_6]^{3+}$ complex ion.

Section –B Organic Chemistry

Unit III
Spectroscopy

Nuclear magnetic resonance (NMR) spectroscopy: Proton magnetic resonance (^{1}H NMR) spectroscopy, nuclear shielding and deshielding, chemical shift and molecular structure, spin-spin splitting and coupling constants, areas of signals, interpretation of ^{1}H NMR spectra of simple organic molecules such as ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromoethane, ethyl acetate, toluene and acetophenone.

Problems pertaining to the structures elucidation of simple organic compounds using UV, IR and ^{1}H NMR spectroscopic techniques.

Unit IV

Organometallic Compounds				
Organomagnesium compounds:	The Grignard reagents– Formation,			

structure and chemical reactions.

Organozinc compounds: Formation and chemical reactions. Organolithium compounds: Formation and chemical reactions.

Organosulphur Compounds

Nomenclature, structural features, methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides and sulphaguanidine.

Hetrocyclic Compounds

Introduction: Molecular orbital picture and aromatic characteristics of pyrrole,

furan, thiophene and pyridine. Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reaction in pyridine derivatives. Comparison of basicity of pyridine, piperidine and pyrrole.

Introduction to condensed five and six-membered heterocycles. Preparation and reactions of indole, quinoline and isoquinoline with special reference to Fisher indole synthesis, Skraup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilc substitution reactions of indole, quinoline and isoquinoline.

Section –C Physical Chemistry

Unit V

Elementary Quantum Mechanics

Black-body radiation, Planck's radiation law, photoelectric effect, heat capacity of solids, Bohr's model of hydrogen atom (no derivation) and its defects, Compton effect. de-Broglie hypothesis. Heisenberg uncertainty principle. Hamiltonian Operator.

Schrödinger wave equation (time dependent and time independent) and its importance, physical interpretation of the wave function, postulates of quantum mechanics, particle in a one dimensional box.

Schrödinger wave equation for H-atom, separation into three equations (without derivation), quantum numbers and their importance, hydrogen like wave functions, radial wave functions, angular wave functions.

Molecular orbital theory, basic ideas – Criteria for forming MO from AO, construction of MO by LCAO – H_2^+ ion, calculation of energy levels from wave functions, physical picture of bonding and anti-bonding wave functions, concept of $\sigma, \sigma^*, \pi, \pi^*$ orbitals and their characteristics. Hybrid orbitals – sp, sp^2, sp^3; calculation of coefficients of atomic orbitals used in sp and sp^2 hybrid orbitals and interpretation of geometry.

Introduction to valence bond model of H_2, comparison of MO and VB models.

Unit VI

Spectroscopy

Introduction: Electromagnetic radiation, regions of the spectrum, basic features of different spectrometers, statement of the Born-Oppenheimer approximation, degrees of freedom.

Rotational Spectrum

Diatomic molecules. Energy levels of a rigid rotor (semi-classical principles), selection rules, spectral intensity, distribution using population distribution (Maxwell-Boltzmann distribution) determination of bond length, qualitative description of non-rigid rotor, isotope effect.

Vibrational Spectrum

Infrared Spectrum: Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies, effect of anharmonic motion and isotope on the spectrum, idea of vibrational frequencies of different functional groups.

Raman spectrum: Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules.

Electronic Spectrum

Concept of potential energy curves for bonding and antibonding molecular orbitals, qualitative description of selection rules and Franck-Condon principle.

Qualitative description of σ, π and η MO, their energy levels and the respective transition.

PRACTICAL

The duration of practical examination will be of six hours.   MM = 50

Distribution of marks:

One inorganic experiment	20 marks
One organic experiment	10 marks
One physical experiment	10 marks
Record	05 marks
Viva- voice	05 marks

Inorganic Chemistry

Synthesis and Analysis

(a) Preparation of sodium trioxalatoferrate(III), $Na_3[Fe(C_2O_4)_3]$ and determination of its composition by permanganometry

(b) Preparation of Ni-dmg complex, $[Ni(dmg)_2]$

(c) Preparation of copper tetraammine complex. $[(Cu(NH_3)_4]SO_4$

(d) Preparation of *cis*-and*trans*-bisoxalatodiaquochromate(III) ion.

Organic Chemistry

Qualitative Analysis

Analysis of an organic mixture containing two solid components using water, $NaHCO_3$, NaOH for separation and preparation of suitable derivatives

Synthesis of Organic Compounds

(a) Acetylation of salicylic acid, aniline, glucose and hydroquinone. Benzoylation of aniline and phenol

(b) Aliphatic electrophlic substitution
Preparation of iodoform from ethanol and acetone

(c) Aromatic electrophilic substitution Nitration
Preparation of m-dinitrobenzene
Preparation of p-nitroacetanilide
Halogenation
Preparation of p-bromoacetanilide Preparation of
2,4,6-tribromophenol

(d) Diazotization/coupling
Preparation of methyl orange and methyl red

(e) Oxidation
Preparation of benzoic acid from toluene

(f) Reduction
Preparation of aniline from nitrobenzene Preparation of
m-nitroaniline from m-dinitrobenzene.

Physical Chemistry

Elctrochemistry

1. To determine the strength of the given acid conductometrically using standard alkali solution
2. To determine the solubility and solubility product of a sparingly soluble electrolyte conducometrically
3. To study the saponification of ethyl acetate condutometrically.
4. To determine the ionization constant of a weak acid condutometrically.
5. To titrate potentiometrically the given ferrous ammonium sulphate solution using $KMnO_4/K_2Cr_2O_7$ as titrant and calculate the redox potential of Fe^{2+}/Fe^{3+} system on the hydrogen scale

Refractrometry, Polarimetry

1. To verify law of refraction of mixtures (e.g. of glycerol and water) using Abbe's refractometer
2. To determine the specific rotation of a given optically active compound
   To determine stoichiometry and stability constant of complexes.

Unit I

Centres of diversity of plants, origin of crop plants. Domestication and introduction of crop plants. Concepts of sustainable development; cultivation, production and uses of - wheat, rice, legumes, sugarcane

Unit II

A general account of plants yielding oils, spices, beverages. An account of major fiber, medicinal, petro, plants of Uttar Pradesh.

Unit – III

Nucleic acid as genetic material, nucleotides, structure of nucleic acids, properties of genetic code, codons assignments, chain initiation of codons mechanism of protein synthesis and its regulation.

Unit - IV

Structure and properties polysaccharides, aminoacids, proteins, vitamins and harmones; Enzymes: active sites, specificity, mechanisms, factors, general aspects of enzyme kinetics. Bioenergetics: Laws of thermodynamics, concept of Gibb's free energy, high energy compounds.

Unit - V

Mineral resources of planet earth, Conservation of mineral resources. soils; types, properties and various problem soils; water; the source of water, physico- chemical and biological properties of water. Sustainable management of water; energy resources in India; Forests: global forest wealth, importance of forests, deforestation.

Unit - VI

Environmental pollution: air, water, soil, radioactive, thermal and noise pollutions, their sources, effects and control. (Greenhouse effect, ozone depletion and acid rain). CO_2 enrichment and climate change.

Applied Zoology, Biotechnology, Immunology, Ecology & Microbiology

Unit-I
Parasitoloy:
(a) Structure, life cycle, pathogenicity, including diseases, causes, symptoms and control of the following parasites of domestic animals and humans: *Trypanosoma, Giardia and Wuchereria,*

Unit-II
Vectors and pests: Life cycle and their control of following pests: Gundhi bug, Sugarcane leafhopper, Rodents. Termites and Mosquitoes and their control

Unit-III
Biotechnology: Genetic Engineering (concept and recombinant DNA technology) and its application in agriculture & medical areas and energy production. Biotechnology of food-processing, pharmaceuticals (e.g. use of microbes in insulin production) and fermentation.

Unit-VI
Immunology. Concepts of immunity, types of immunity, Antigen and Antibodies, vaccines of different diseases and immunological reactions.

Unit- V
Ecology: Ecosystem: Concept, components, fundamental operations, energy flow, food-chain, foodwebs and trophic levels, ecological niche, abiotic and biotic factors. Population: Characteristics and regulation. Ecological succession. Adaptation: Aquatic, terrestrial, aerial and arboreal.

Unit-VI
Microbiology: Morphology, physiology and infection (outline) of bacteria and viruses. Bacterial and viral diseases.

SEMESTER V

Optional Course: (Any One of the Subject mentioned below)

A. VALUE EDUCATION

Objectives: Upon completion of the course the student-teachers will be able to:

1. Understand the concept and types of values.

2. Understand the meaning and basic-theories of axiology.

3. Get an insight into the strategies of inculcation of values among children.

4. Develop awareness about the different agencies working in the sphere of value education.

5. ;Develop skills and techniques needed to teach valueeducation...

6. Understand the role of the teacher in value education.

Unit I: Introduction to Values

1.1 Values: Concept, Nature, Types and Significance

1.2 •. Classification of Values - Intrinsic Values,, Instrumental Values, Moral Values, Aesthetic Values, Economic Values, Social Values

1.3 Contemporary Valdesip Inclian'tontext

   1.3.1 Panchakosha Theory of-Values

   1.3.2 Basic Human Values — Truth, Beauty, Goodness, Love, Peace, Non Violence

   1.3.3 Contemporary Values — Scientific Temper, Intellectual Honesty, Social Service and Protection of. Environment.

Unit 2: Strategies of Ineuliation of Values

2.1 Sources of Value Education — Autobiography and Biography of Great People, Parables, Vedas, Bhagavadgita, Shlokas, Poems, Newspaper Clippings, Episodes from Real Life, Documents etc.

2.2 Techniques of Inculcating Values in Life

   2.2.1 Ashtangayoga (Yama, Niyama, Asana, Pranay'ama, Piatityahara, Dhyana, Dharana, and Samadhi)

2.3 Role of Teachers I Value Education,

Unit 3: Role of Social Agencies in Value Education

3.1 Family

3.2 Religion

3.3 Educational Institutions

3.4 Community .

3.5 Mass Media (Print and Electronic)

3.6 Information and Communication Technology (Computer and Internet)

Unit 4 : Value Education in Secondary Schools

4.1 Integrated approach

4.2 Direct Approach,

4.3 Incidental approach

4.4 Co-curricular and Extra-Curricular Activities

   4.4.1 Resolving Value Conflicts (value crisis)

   4.4.2 Discussion of Burning Social and Moral Problems

   4.4.3 Project Work and Community Centered Activities

Assignments (any one)

1. Visit to religious institutions which are involved 'in' Educational endeavor

2. Documentation or the contributions of the great personalities and institutions for the promotion and protection of values

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3. Selection of incidences/ episodes from the biographies depicting particular/ selected value
4. Preparation of Value Judgment Scale

Reference:
• Broudy S. Harry (1961) Building a Philosophy of Education, USA, Prentice- hall Inc.
• ,Dewey, J. (1916) Democracy and Education. New York: Macmillan.
• Doyle, T.F. (1973) Educational Judgments. London: Roufledge and Kegam Paul.
• Feather T., Norman (1975) Values in Education and Society, New York: A Division of Macmillan Publishing Co.
• Gupta, N.L. (1986) Value-education: Theory and Practice, Amjeer, Krishna brothers.
• Kneller, G.F., (1971) Introduction to the Philosophy of Education. New York: Johnwilly and Sons.
 • Lowenthal, F. and Vandamme F. Eds..(1986) Pragmatics and Education. New York. Planeum.
• Marlow A.H., Ed. (1959) New Knowledge in Human Values. London: Harper and Row
• Peters, R.S. (190) Authority, Responsibility and Education. London: George Allen and Unwin.
• Rogers, C.R. (1980) A Way of Being. Houghton Mifflin, Boston. & Russell, B. (1972) Education and the Good Life. New York: Leveright.
• Venkataiah N. (Ed), (1998) Value Education. New Delhi: APH Publishing   Corporat.

B. HEALTH AND PHYSICAL EDUCATION
Objectives : Upon completion of the course the student-teacher will be able to :
1. Understand the significance of Health Education for the all-round development.
2. Maintain and promote good health.
3. Develop the understanding of physical education and its related fields.
4. Acquire the knowledge about the teaching methods of physical education and its activities.
5. Know about the effective organization of physical education activities.

Unit 1 : Health and Physical Education .
1.1 Health : Meaning, Aims and Objectives, Importance and Scope
1.2 Physical Education : Meaning, Aims and Objectives, Importance and Scope
1.3 Related fields - Recreation, Health Education and Education
1.4 National and Emotional Integration through Sports and Physical Education
1.5 Yoga Meaning - Astanga Yoga - Significance in Modem Society.

Unit 2 : Health Service and Supervision
2.1 Medical Inspection - Meaning, Procedure and Importance
2.2 Personal Care - Skin, Eyes, Ears and Teeth
2.3 Safety Education - Meaning and Significance, Safety in Classrooms, Play field, Gymnasium, Roads and Homes.
2.4 First Aid - Meaning, Significance, principles of giving first aid
2.5 Fatigue - Meaning, Causes and Remedies.
2.6 Balance DIET - Meaning and Benefits

Unit 3 : Leadership, Discipline, Incentives and Awards
3.1 : Leadership
      3.1.1 Qualities of good leader in physical education
      3.1.2 Teacher leadership
      3.1.3 Student leadership
3.2 : Discipline
      3.2.1 Meaning .
      3.2.2 Common forms of indiscipline in schools
      3.2.3 Causes for indiscipline
      3.2.4 Steps to check indiscipline
      3.2.5 Rewards and discipline
      3.2.6 Punishment and 'discipline
3.3 : Incentives and Awards
      3.3.1. Letter — Crest
      3.3.2   Cup
      3.3.3 Trophy
      3.3.4 Medal
      3.3.5 Honour Board
      3.3.6 Scholarship-
      3.3.7 Certificate
      3.3.8 Cash prize based on the Player's Performance.

Unit 4 : Organization of Physical Education Activities
4.1 Intramural and Extramural Competitions: Meaning, Organization, Benefits
4.2 Tournaments : Meaning, Types — Knock-out and league, Benefits.
4.3 Sports meet : Meaning, Organization, Benefit's.
4.4 'Camps and Hikes : Meaning, Organization, Benefits.

Practicum
1. Participation in any one major game and one sports item.
2. Ground marking for selected games and sports
3. Commands, line formation and marching, ceremonial parade
4. Participation in two National festival programmes for flag hoisting

References
• Kamalesh and Sangral, (2000), Principles and History of Physical Education, Ludhiana : Tandon Publication,.
• Nadgir, K.G. (1998), Shark Shikshanad Vidhanagalu, Dharwad : Mallesajjan Vyayama Shale.
• Nadgir, K.G.(1997) , Arogya Muttu Aragya Shikshana, Dharwad : Millasajjana Vyama Shale.
• Prakash Brothers (2000) Organization, Administration and Recreation in Physical Education, Ludhiana : Prakash Brother Publication.
• Rao, V. K. (2003), Physical Education, New Delhi : A.P.H. Publishing Corporation.
• Sarojkant Bihari and Prasanna Kumar Chowdhary (2003), Health and Physical Education. Ludhiana : Kalyeni Publishers.
• Vijendra Kumar (2000), Modern Methods of Teaching Physical Education, New Delhi : Sarup & Sons.

Note –
1. One Assignment among the practical activities mentioned above, for ten marks 2. Internal test for ten marks

C. GUIDANCE AND COUNSELLING IN SCHOOLS

Objectives: Upon completion of this course the student-teacher will be able to :

1. Understand the principles, scope and need of guidance and counselling in schools
2. Acquaint himself with nature of different problems faced by children in context of learning and development.
3. Understand the acquisition and process of-learning in children with special needs.
4. Acquaint himself with learning disabilities of children and its remedies
5. Take up minimum guidance programme at school level.

Unit 1: Guidance and Counseling

1.1 Introduction to Guidance and Counseling.

1.2 Nature, Purpose and Scope of Guidance and Counseling.

1.3 Difference between Guidance and Counseling.

1.4 Counseling.

       1.4.1 Principles

       1.4.2 Approaches

1.5 Areas of Guidance

       1.5.1 Educational Guidance

       1.5.2 Vocational Guidance

       1.5.3 Personal Guidance

Unit-2: Problems of Developments in Children

2.1 Problems related to physical development

       2.1.1 Common problems faced by children

       2.1.2 Nutrition

2.2 Problems related with Emotional Development

       2.2.1 Adjustment to Home

       2.2.2 Adjustment to School

       2.2.3 Adjustment to Peer Group

       2.2.4 Problems related to academic achievement

       2.2.5. Problems related to Gender bias and Gender related issues.

2.3 Applications of the whole child concept for parents, teachers and counselors

2.4 Acquisition and Process of Learning

       2.4.1 Concept of learning

       2.4.2 Factors affecting learning

       2.4.3 Psychological factors

       2.4.4 Socio-emotional factors

       2.4.5 Educational factors

Unit 3: Learning Disabilities of Children

3.1 Factors Contributing to Learning Problems

       3.4.1 External factors — Psychological and Educational

       3.4.2 Internal factors — Low general ability, Attention, Specific reading, writing etc.

3.2 Assessment of the child

       3.2.1 Case history

       3.2.2 Assessment of general abilities

3.3 Remediation

       3.3.1 Principles of Guidance Services

3.3.2 Designing remedial strategies.

Unit 4: Guidance for Children with Special Needs
4.1 Meaning, definitions and types of exceptional children
4.2 Gifted and Creative children
4.3 Slow learners and backward children
4.4 Strategies for helping exceptional children to overcome their problems.
Assignments (Any one)
1. Case study of a child with special problem.
2. Publication of a career bulletin bated on authentic sources of Jobs. Employment
3. Organization of career conference , Campus Interviews, etc.
4. Organization of Counselling session for (Individual / Groups) students who, are genuinely in need of Counselling..
5. Organization of Guidance sessions about services and facilities available in a school or college.

References

- Adams, J.F.(1965) Counselling and Guidance : A Summary, New York : The . Mc Milian company Ltd. & Aggarwal. J. C. Educational & Vocational Guidance & Counselling. Delhi : Doaba House.
- Asha Bhatnagar (1999) Guidance and Counselling : Theoretical Perceptive. Vol- I. New Delhi : Vikas Publishing House.
- Berki B. G. & Mukhopadhya. B. Guidance & Counselling : A Manual, New Delhi : Sterling Publishers.
- Byrne, M. and Sheranian. C (1977), Introduction to Communicative Deriders, New York: Harper and Row.
- Cattle, W.C. and Downnie N M (1970) Preparation for Counselling, Eaglewood Cliffs. N J : Prentice Hall.
- Hammil, O D and Bartel N R (Eds) (1975) Teaching Children with Learning and Behavioural Disorder. Boston : Allyn and Bacon.
- Harr, E L and Cramer,. S H (1972) Vocational Guidance and Career Developments , in the Schools: ' Towards 'a Systems Approach. Boston Houghton Mifflin.
- Jones, A J. (1963) Principles of Guidance. New York: McGraw Hill.
- Kochhar. S. K Educational & Vocational Guidance in Secondary Schools. Sterling Publishers : New Delhi.
- Learner, LC (1985) Leaming Disabilities, Boston, Houghton Miffilin.
- Lowning, L. N. (1968) Guidance and Counselling Services: Introduction, Mc. Grow Hill Book Company.
- Myers, G. Principles and Techniques of Vocational Guidance. New York : McGraw Hill,.
- Rao. S. N Counselling & Guidance. New Delhi : Tata McGraw Hill.

D. EDUCATIONAL ADMINISTRATION & MANAGEMENT
COURSE OBJECTIVES
 1. To acquaint the student teachers with the concept and concerns of educational administration.
 2. To develop an understanding of the role of the headmaster and the teacher in school management.
 3. To enable the students to understand to concept at Importance of communication and its possible barriers in educational administration.
 4. To enable the student teacher to critically analyze the administrative scenario In relation to the functioning of the other secondary schools of the area.
 5. To acquaint the student teacher with the scientific practices of educational management and kepp him to apply it In work situation.
COURSE CONTENTS

UNIT-I
1. Conceptual framework concept of educational administration.
2. Concept of educational management human beings as inputs, process and products inputs.
3. Nature, objectives and scope of educational administration.

UNIT-II
1. Role and functions of head master teacher: Basic functions administration planning, organising directing and controlling.
2. Maintenance of discipline, control management.
3. Co-ordination and growth, development,
4. Supervision and inspection, defects in the present supervision and inspection.
5. Scope of educational supervision,
6. Types of supervision.
7. Providing guidance; leadership function,
8. Crisis In management
9. Decision making.

UNIT-III
1. Communication in . Educational Administration Role of communication in effective management and administration.
2. Methods of communication.
3. Barriers of communication in educational administration.
4. Overcoming barriers to communication and effective communication in educational administration.

UNIT-IV
Management of Schools : Role of headmaster in planning of school activities, approaches to management manpower approach, cost benefit approach; social demand approach, social justice approach.
1. Involvement of other functionaries and agencies In the preparation of a plan.
2. Delegation of authority and accountability.
3. Role of the headmaster in monitoring, supervision and evaluation.
4. Role of the headmaster in motivating the staff, in resolution of interpersonal conflicts.

5. Role of the headmaster In creating resources and managing financial matters.
6. Optimum use of available resources for growth and development of the school.
7. Staff development programmes.
8. Role of teachers in school management and administration.

UNIT-V
1. Educational administration in the state : The administrative structure in the field of education in the state.
2. Control of school education in the state - a critical analysis.
3. Functions of the state government in relation to secondary and higher secondary schools.
4. Functions of the board of secondary education in controlling secondary schools.
5. Problems of secondary school administration in government schools.

PRACTICUM –
The student-teacher is expected to conduct a study on any issue or problem relating to a school administration. The report should be in about 700 words.

REFERENCE
1. Bhatnagar, R.P. & Verma. I.B.: Educational Administration, Lyall Book Depot Meerut.
2. Bhatanagar, R.R & Agrawal, Vidya : Educational Administration, Supervisign Planning and Financing. R. Lail nook Depot. Meerut.

CC: 10 ACTION RESEARCH

Objectives : Upon completion of this course the student-teacher will be able to:
 1. Acquire the knowledge of concept of research and educational research.
 2. Understand the concept of basic, applied and action research and their differences.
 3. Understand the meaning, significance and scope of action research
 4. Become aware of action research problems in different areas in schools.
 5. Acquire the knowledge of steps involved and tools used in action research.
 6. Acquire the skills of conducting action research and to develop the skills of interpreting and reporting the findings of action research.

Unit I : Research and Educational Research
    1.1 Research — meaning, definition and importance.
    1.2 Educational Research — meaning, definition and importance.
    1.3 Steps in Educational Research.
    1.4 Types of Research : Fundamental/Basic, Applied and Action Research —meaning definition and importance.
    1.5 Methods of research : Historical, Experimental and Survey
    1,6 Differences between applied and action research with reference to — i) purpose, ii) definition, iii) hypotheses, iv) sample, v) data collection instruments, vi) data analyses, vii) generalization, viii) limitations

Unit 2 : Action Research
    2.1 Meaning, definition and scope of action research.
    2.2 Importance of action research to classroom teachers, administrators and guidance personnel.
    2.3 Limitations of action research
    2.4 Action problems in different areas in schools — examples.

Unit 3 : Research Steps and Tools
3.1 Steps in Action Research
3.1.1 Identifying the problem area (examples — experimental design and qualitative design).
3.1.2 Pinpointing the problem.
3.1.3 Problem analysis in terms of causes.
3.1.4 Identifying the objectives.
3.1.5 Formulating action hypotheses.
3.1.6 Designing action plan.
3.1.7 Execution of the plan.
3.1.8 Analyzing the data. –
3.1.9 Findings
3.1.10 Reporting.
3.2 Tools of Data Collection.
3.2.1 Achievement Test, Questionnaire, Interview Schedule, Checklist, Rating Scale — meaning, need, advantages and limitations.
3.2.2 Tests/Inventories of Aptitude, Attitude, Interest, Personality; Values, Intelligence and Creativity (Knowledge of at least 2 tests in, each category).
3.2.3 Measures in classroom — Sociometric technique and Classroom Social Distance Scale (uses of these tools in action research)
3.3 Quantitative and Qualitative data : meaning and examples.

3.3.1 Analysis of the Data — frequency distribution, measures • of central tendency, variability,
3.3.2 Co-efficient of correlation (Pearson's rank difference method).
3.3.3 Interpretation of data with an example descriptive and graphical. (Note : to be discussed without computation)

Unit 4: Action Research Report
4.1 Format of report in terms of steps of action research has in 3.1 above),
4.2 Summary, bibliography and appendix.

Assignments (any one)
Preparation of an action plan on a classroom problem such as :
a. identifying causes of poor reading ability and suggesting remedial measures.
b. identifying the causes and types of spelling errors and suggesting remedial measures.
c. identifying the causes of poor map-reading skills and suggesting remedial measures.
d. identifying the causes for poor drawing of diagrams and suggesting remedial measures.
e. identifying the causes of truancy and suggesting remedial measures.
f. identifying the causes of problem behaviour of students in the classroom and suggesting remedial measures. (any other problems similar to above mentioned)

Reference
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 • Best, J. W. and Kahn, J. V. (2002), Research in Education, .(7th Ed.) New   Delhi : Prentice Hall Pvt. Ltd.
• . Corey,.S.M. (1953), Action Research to Improve School Practices, New York: Bureau of Publications, Columbia University.
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• Sidhu, K.S. (1984), Methodology of Research in Education, New Delhi : Sterling Publishers Pvt. Ltd.
• -1/an Olden, D. (1973) Understanding Educational Research : An Introduction. New Delhi : McGraw Hill Book Co.

EPC III- EDUCATIONAL PSYCHOLOGY PRACTICAL

PSYCHOLOGY TEST (ANY FIVE)
1. Intelligence Test- Verbal
2. Intelligence Test-Non Verbal
3. Interest Test
4. Attitude Test
5. Learning by Whole and Part Method
6. Personality test -Introvert arid Extrovert
7. Value Test
8. Adjustment Test
9. Anxiety Test
10. Achievement Test
11. Vocational Aspiration

UNIT-I

Creating Menu Based Applications: Menus and the Menu Editor, Designing Menus, programming Menu Commands, Manipulating Menus at runtime, Creating a Menu's Control Array, Types of Dialog Boxes (Command Custom Predefined dialog Box), Procedures and functions: Introduction to procedure types, procedures: Sub. Procedure, General procedures, Event Procedures, Function procedures, Creating new procedures, Selecting existing procedures, Calling sub procedures, Calling Function Procedures, Calling procedures in other modules, passing arguments to procedures, passing arguments by value, Passing arguments by Reference, Using Optional Arguments, Using an Indefinite number of arguments.

UNIT-II

HTML tags and VB Script
<HTML>, <HEAD>,<BODY>, Paragraphing, line Break tag, Bullet and Numbering tag, Text formatting tags,(Bold, Italic, Underline, strike through, subscript, superscript) Marquee tag, Hyperlink tag, Inserting Back ground image, Horizontal Rule, Changing the Background and fore ground color, Creating table, merging cells, splitter cells, Inhering Colum heading table caption etc. VB script, variable and constant declaration, Output function decision making statement, **Looping control statement etc.**

UNIT-III

Synchronous Data Transfer, Asynchronous Data Transfer, Interrupt Driven Data Transfer DMA Controller Address space partitioning – Memory mapped I/O scheme, I/O mapped I/O scheme.

UNIT-IV

Data Communication, Types of Transmission media. Topology - Mesh, Star, tree, Bus, Ring, Hybrid. Transmission mode-Simplex, Half Duplex Full Duplex Categories of Networks-LAN, MAN, WAN the OSI model, Functions of the Layer- Physical Layer, Data Link Layer, Network Layer, Transport Layer session Layer, Presentation Layer, Application layer.

UNIT-V

Why Software Engineering? Software processes-Software Process model (water Fall model, iterative, spiral model) Software Requirements: Functional and non- functional requirements user requirements, system requirements Software requirement document, DFD, Pert Chart ER Diagram.

UNIT-VI

Software Testing –System testing Component testing, test case design test automation. Software Cast Estimation-Software productivity, Estimation technique, Algorithmic Cost modeling project duration and staffing.
Practical: VB, DBMS, HTML and microprocessor

B.Sc. B.Ed (PHYSICS)
Sixth SEM DETAILED SYALLBUS

UNIT - I

Some universal laws: The space representation, division of space into energy cells and into phase cells of arbitrary size, applications to one-dimensional harmonic
oscillator and free particles. Equilibrium before two systems in thermal contact. Probability and entropy, Boltzmann entropy relation. Statistical interpretation of second law of thermodynamics. Boltzmann canonical distribution law and its applications; rigorous form of equipartition of energy.

UNIT -II

Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, r.m.s. and most probable speeds and their values. Doppler broadening of spectral lines.

Transition to quantum statistics: 'h' (Plank's constant) as a natural constant and' its implications, cases of particle in a one-dimensional box and one-dimensional harmonic oscillator, Indistinguishability of particles and its consequences, Bose- Einstein, and Fermi-Dirac distributions, photons in black body chamber, free electrons in a metal, Fermi level and Fermi energy.

UNIT - III

1. **General Properties of Nucleus:**
   Brief survey of general Properties of the Nucleus, Mass defect and binding energy, charges, size, spin and magnetic moment.
2. **Nuclear Forces:**
   Saturation phenomena and Exchange forces, Deutron ground state properties.
3. **Nuclear Models:**
   Liquid drop model and Bethe Weiszacker mass formula, Single particle shell model (only the level scheme in the context of reproduction of magic numbers).
4. **Natural Radioactivity:**
   Fundamental laws of radioactivity, Soddy-Fajan's displacement law and law of radioactive disintegration, Basic ideas about α, ☐ and ☐ decay.

UNIT-IV

1. **Nuclear Reactions:**
   Nuclear reactions and their conservation laws, Cross section of nuclear reactions, Theory of fission (Qualitative), Nuclear reactors and Nuclear fusion.
2. **Accelerators and detectors:**
   Vande Graff, Cyclotron and Synchrotron, Interaction of charged particles and gamma rays with matter (qualitative), GM counter, solid state detector, Scintillation counter and neutron detectors.
3. **Elementary Particles:**
   Basic classification based on rest mass, Spin and half life, particle interactions (gravitational, Electromagnetic, week and strong Interactions). Elementary idea about querks.

UNIT V

Current and Voltage gain, Biasing formula for transistors, Base bias, emitter bias and mixed type bias mixed type biasing for small and large signal operation. Transistor circuit application at low frequencies, their AC and DC equivalent for three different modes of operation, Large signal operation of transistors, Transistor Power amplifiers, Class A and B operation, Maximum power output Effect of temperature, heat sinks, thermal resistance Distorsion in amplifiers, cascading of stages, Frequency response, Negative and positive feedback in transistor amplifiers.

UNIT -VI

Field effect transistors and their characteristics, biasing of FET, use in preamplifiers, MOSFET and their simple uses.

Power Supplies:

Electronically regulated low and high voltage power supplies, Inverters for battery operated equipments.

Miscellaneous:

Basic linear integrated circuits, phototransistors, Silicon Controlled rectifiers, Unijunction transistor and their simple uses.

PRACTICAL

1.   To draw the characteristic curve of a zener diode
2.   To draw the characteristic curve of FET and to determine the pinch off voltaged
3.   To study the different types of logic gates
4.   To determine the frequency of Wien bridge oscillator.
5.   Study of, a regulated power supply
6.   Study of Lissajuous figures using a CR0
7.   Characteristics of a NPN transistor
8.   To draw the characteristic curve of a LED
9.   Study of RC and TC coupled amplifiers
10.   Study of Lissajuous figures using a CR0

Text and Reference Books

- F Reif, "Statistical Physics" (McGraw-Hill 1988).
- K Haung, "Statistical Physics" (Wiley Eastern, 1988).
- Puri and Babbar, "Solid State Physics" (S. Chand).
- C. Kittel, "Introduction to Solid State Physics"- Vth Edition (John Wiley & Sons). H.S. Mani and G.K. Mehta, "Introduction to Modern Physics" (Affiliated East-West Press—1989).
- J D Ryder; "Electronics Fundamentals and Applications" 2nd Edition (Prentice-Hall of India. New Delhi, 1986).
- I Miliman and A Grabel; "Microelectronics", International. Edition (McGraw- Hill Book Company, New York, 1988).

Unit - 1
Limit and continuity of functions of two variables, Taylor's theorem for functions of two variables, Maxima and minima of functions of three variables, Lagrange's method of undetermined multipliers.

Unit - 2
Riemann integral, Integrability of continuous and monotonic functions, Fundamental theorem of integral calculus, Mean value theorems of integral calculus, Improper integrals and their convergence, Comparison test, m-test, Abel's test, Dirichlet's test, Integral as a function of a parameter and its differentiability and integrability.

Unit - 3
Definition and examples of metric spaces, Neighbourhoods, Interior points, Limit points, Open and closed sets, Subspaces, Convergent and Cauchy sequences, Completeness, Cantor's intersection theorem.

Unit - 4
Morera's theorem, Liouville theorem, Maximum Modulus theorem, Taylor and Laurent series.

Unit - 5
Singularities and zeros of an analytic function, Rouche's theorem, Fundamental theorem of algebra, Analytic continuation.

Unit - 6
Residue theorem and its applications to the evaluation of definite integrals, Argument principle.

Unit - 7
Milne's method, Numerical solution of linear, homogeneous and simultaneous difference equations, Generating function method.

Unit - 8
Solution of transcendental and polynomial equations by iteration, bisection, Regula-Falsi and Newton-Raphson methods, Algebraic eigen value problems : Power method, Jacobi's method, Given's method, Householder's method and QR method, Approximation : Different types of approximations, Least square polynomial approximation, Polynomial approximation using orthogonal polynomials, Legendre approximation, Approximation with trigonometric functions, exponential functions, rational functions, Chebyshev polynomials.

Programming in C

Unit - 9
Programmer's model of computer, Algorithms, Data type, Arithmetic and input/out instruction, Decisions, Control structures, Decision statements, Logical and conditional operators, Loop case control structures, Functions, Recursion, Preprocessors, Arrays, Puppetting of strings Structures, Pointers, File formatting.

B.Sc.-B.Ed. (CHEMISTRY)
SIXTH SEMESTER DETAILED SYLLABUS

Section –A Inorganic Chemistry
Unit I
Organometallic Chemistry
Definition, nomenclature and classification of organometallic compounds,
Preparation, properties, bonding and applications of alkyls and aryls of Li, Al, Hg, Sn and Ti.
Metal carbonyls: 18-electron rule, preparation, structure and nature of bonding in the mononuclear carbonyls.
Silicones and Phosphazenes
Silicones and phosphazenes as examples of inorganic polymers, nature of bonding in triphosphazenes.

Unit II
Hard and Soft Acids and Bases (HSAB)
Classification of acids and bases as hard and soft. Pearson's HSAB concept, acid-base strength and hardness and softness. Symbiosis, theoretical basis of hardness and softness, electronegativity and hardness and softness.
Bioinorganic Chemistry
Essential and trace elements in biological processes, metalloporphyrins with special reference to hemoglobin and myoglobin. Biological role of alkali and alkaline earth metal ions with special reference to Ca^{2+}. Nitrogen fixation.

Section –B Organic Chemistry
Unit III
Carbohydrates
Classification and nomenclature. Monosaccharides, mechanism of osazone formation, interconversion of glucose and fructose, chain lengthening and chain shortening of aldoses. Configuration of monosaccharides. Erythro and threo diastereomers. Conversion of glucose into mannose. Formation of glycosides, ethers and esters. Determination of ring size of monosaccharides. Cyclic structure of D(+)-glucose. Mechanism of mutarotation.
Structures of ribose and deoxyribose.
An introduction to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination.
Amino Acids, Peptides, Proteins and Nucleic Acids
Classification, structure and stereochemistry of amino acids. Acid-base behavior, isoelectric point and electrophoresis. Preparation and reactions of α-amino acids. Structure and nomenclature of peptides and proteins. Classification of proteins. Peptide structure determination, end group analysis, selective hydrolysis of peptides. Classical peptide synthesis, solid- phase peptide synthesis. Structures of peptides and proteins. Levels of protein structure. Protein denaturation/ renaturation.
Nucleic acids: Introduction. Constituents of nucleic acids. Ribonucleosides and ribonucleotides. The double helical structure of DNA.
Unit IV
Fats, Oils and Detergents
Natural fats, edible and industrial oils of vegetable origin, common fatty acids, glycerides, hydrogenation of unsaturated oils. Saponification value, iodine value, acid value.

Soaps, synthetic detergents, alkyl and aryl sulphonates.
Synthetic Polymers
Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler-Natta polymerization and vinyl polymers.

Condensation or step growth polymerization. Polyesters, plyamides, phenol formaldehyde resins, urea formaldehyde resins, epoxy resins and polyurethanes. Natural and synthetic rubbers. Elementary idea of organic conducting polymers.

Synthetic Dyes
Colour and constitution (electronic concept). Classification of dyes. Chemistry and synthesis of Methyl orange, Congo red, Malachite green, Crystal violet, Phenolphthalein, Fluorescein, Alizarin and Indigo.

Organic Synthesis via Enolates
Acidity of α-hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate.

Alkylation of 1, 3-dithianes. Alkylation and acylation of enamines.

Section –C Physical Chemistry
Unit V
Physical Properties and Molecular Structure
Optical activity, polarization – (Clausius-Mossotti equation), orientation of dipoles in an electric field, dipole moment, induced dipole moment, measurement of dipole moment-temperature method and refractivity method, dipole moment and structure of molecules, magnetic properties- paramagnetism, diamagnetism and ferromagnetism, Magnetic susceptibility, its measurements and its importance.

Photochemistry
Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grothus-Drapper law, Stark-Einstein law, Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions – energy transfer processes (simple examples), kinetics of photochemical reaction.

Unit VI
Solutions, Dilute Solutions and Colligative Properties
Ideal and non-ideal solutions, methods of expressing concentrations of solutions, activity and activity coefficient.

Dilute solution, colligative properties, Raoult's law, relative lowering of vapour pressure, molecular weight determination. Osmosis, law of osmotic pressure and its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point. Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties.

Abnormal molar mass, van't Hoff factor, colligative properties, degree of dissociation and association of solutes.

PRACTICAL
The duration of practical examination will be of six hours.   MM = 50

Distribution of marks: One inorganic experiment of 10 marks, one instrumentation experiment of 10 marks, one organic experiment of 10 marks and one physical experiment of 10 marks will be given in the annual practical examination. 5 marks are for record and 5 marks are for viva.

Inorganic Chemistry

Instrumentation

Colorimetry
(a) Job's method   (b) Mole-ratio method
(c) Adulteration of food stuffs   (d) Effluent analysis, water analysis

Solvent Extraction
Separation and estimation of Mg(II) and Fe(II)

Ion Exchange Method
Separation and estimation of Mg(II) and Zn(II)

Organic Chemistry

Laboratory Techniques

Steam Distillation
Naphtalene from its suspension in water Clove oil from cloves Separation of *o-* and *p-*nitrophenols

Column Chromatography
Separation of fluorescein and methylene blue Separation of leaf pigments from spinach leaves Resolution of racemic mixture of ($\pm$) mandelic acid

Stereo-chemical Study of Organic Compounds via Models
R and S configuration of optical isomers E,
Z configuration of geometrical isomers
Coformational analysis of cyclohexanes and substituted cyclohexanes

Physical Chemistry

Refractrometry, Polarimetry
1. To verify law of refraction of mixtures (e.g. of glycerol and water) using Abbe's refractometer
2. To determine the specific rotation of a given optically active compound
3. To determine stoichiometry and stability constant of complexes

Molecular Weight Determination
1. Determination of molecular weight of a non-volatile solute by Rast method/ Beckmann freezing point method
2. Determination of the apparent degree of dissociation of an electrolyte (e.g. NaCl) in aqueous solution at different concentrations by ebullioscopy

Colorimetry
To verify Beer-Lambert law for $KMnO_4/K_2Cr_2O_7$ and determine the concentration of the given solution of the substance from absorbance measurement.

B.Sc.-B.Ed. (BOTANY)
SIXTH SEMESTER DETAILED SYLLABUS
Conservation, Palynology, Biostatics, Biotechnology, Diversity and Plant Pathology

Unit I

Conservation of plants resources for agriculture and forestry. *Insitu* conservation santuaries, national parks, biosphere reserves, wetlands, ,mangroves. *Exsitu* conservation; botanical gardens, field gene banks, seed banks, cryobanks.

Unit II

An introductory knowledge to palynology, morphology, viability and germination of pollens. Classification of data, mean, median and mode. Standard deviation, standard error, variance, co-relation, X^2 test and experimental designs

Unit - III

Replication of DNA in prokaryotes and enkaryotes, gene expression and regulation. Hormonal control and second messengers Ca-+, Cyclic AMP, IP_3 etc.

Unit- IV

Introduction to biotechnology, recombinant DNA technology, plant tissue culture, methods of gene transfer, transgenic plants, biotechnology and healthcare, microbial and environmental biotechnology.

Unit - V

Biodiversity and Phytogeography: biotic communities and populations, their characteristics and population dynamics. Natural vegetation of India, static and dynamic plant geography, basic principles governing geographical distribution of plants, endemism.

Unit - VI

Etiology of viral, bacterial, fungal and insect-pest diseases: mosaic diseases on tobacco, and cucumber, yellow vein mosaic of hindi; citrus canker, potato scab, little leaf of brinjal; damping off of seedlings late blight of potato, red rot of sugarcane. Integrated pest disease management

Economic Zoology, , Biological Tools, Techniques and Biostatistics & Animal Behavior and Pollution & Toxicology

Unit-I
Animal breeding and culture: Aquaculture, Pisciculture, Poultry, Sericulture, Apiculture, Lac-culture.

Unit-II
Wild Life of India: Endangered species. Important sanctuaries; national parks of India; Different projects launched for the preservation of animal species; *in-situ* and *ex-situ* conservation of wild life.

Unit-III
Biological Tools and Techniques: Principles and uses of instruments: pH Meter, Calorimeter, Microtome, Spectrophotometer & Centrifuge. Microscopy (light, transmission and scanning electron microscopy) Chromatography and Electrophoresis.

Unit-IV
Biostatistics: Sampling, Measures of central tendency (mean, median and Mode) and dispersion (variance, standard deviation and standard error); Correlation and Regression

Unit-V
Animal Behavior: Introduction to Ethology, Patterns of behavior (taxes, reflexes, instinct and motivation); biorhythms; learning and memory, Migration of fishes & birds.

Unit-VI
Pollution and Toxicology: Concept, sources, types (air, water, soil, noise & radiation), and control of environmental pollution. Exposure of toxicants (routes of exposure, and duration and frequency of exposure); dose -response relationship categories of toxic effects.

PC (I) PEDAGOGY OF A SCHOOL. SUBJECT — PART 1 (SCIENCE)

Objectives :
- Develop insight on the meaning and nature of General science for determining aims and strategies of teaching- learning.
- Appreciate that science is a dynamic and expanding body of knowledge.
- Appreciate the fact that every child possesses curiosity about his/her natural surroundings.
- Identify and relate everyday experiences with learning of science.
- Appreciate various approaches of teaching- learning of science.
- Explore the process skill in science and role of laboratory in teaching-learning.
- Use effectively different activities / experiments/ demonstrations / laboratory experiences for teaching-learning of science.
- Integrate the science knowledge with other school subjects.
- Analyze the contents of science with respect to pots, branches, process skills, knoviledge organization and other critical issues.
- Develop process-oriented objectives based on the content themes/units.
- Identify the concepts of science that are' alternatively conceptualized by teachers and students in general.

Unit-I: Nature and Scope of General Science
1. Concept, Nature, Need & Importance of Science & Science Teaching.
2. Main discoveries and development of science (special reference to ancient India) Science as a domain of enquiry, as a dynamic and expanding body of knowledge, science as a process of constructing knowledge. Science as interdisciplinary area of leatning (Physics, chemistry, biology etc) science for environment, health, peace & equity, science and society, Fact, concept, principles, laws and theoriestheir characteristics in context of general science.

Unit-II: Teaching-learning of social science
1. Questioning; Collaborative strategies; games, simulations, dramatization, role plays; Values clarification; problem-solving, Discussion, story-telling, project and decision-making, use of media and technology, concept mapping.
2. Methods: Interactive verbal learning; experiential learning through activities, experiments; Investigative field visits.
3. Planning, organizing and conducting of small community survey.

Unit III- Teaching-learning of Central Science
1. Principles of science and its applications consistent with the stages of Cognitive development of learners.
2. Pedagogical shift from science as fixed body of knowledge to constructing knowledge, scientific method — observation, enquiry, hypotheSis, experimentation, data collection, generalization (teacher-educator will illustrate taking examples from different stage-specific content arras keeping in mind the variation , e.g. structure and function, molecular aspects, interaction between living and non-living, biodiversity, etc.): CommunicatiOn in sciences.

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3. Questioning; Collaborative strategies; simulations, Demonstration, lab Method, Problem Solving, Heuristics Project Method, Inductive and deductive Method, Heurastic, use of media and technology, concept mapping
4. Innovative methods of science teaching. .

UNIT IV-ICT & Materials in Teaching-learning of General Science
1. Use of ICT: Video clips, Power points presentations, films etc.
2. Planning, preparation and presentation of Instructional. Material. Techniques: Using textbookS and atlas as a part of oral lessons, non-oral working lessons; using medium and large scale maps; using, pictures, photographs, satellite imageries and aerial photographs; using audio-visual aids, CDs, multimedia and internet; case study approach.
3. Planning, Organisation and activity of science club.

Unit-V:,Teaehing-learning Resources in General Science
1. People as resource: the significance of oral data.
2. Types of primary and sedondary sources: data from field, textual materials, journals, magazines, newspapers, etc.
3. Using the libray for secondary sources and referene material, such as dictionaries and reference material, such as dictionaries and encyelopedias.
4. Various teaching aids, Audio-visuals & Online resources.

Refernces:-

* Sharma, Dr H.L. (1989) "School science Educaiton in India Published by commonwealth publishers 4378/4B ansari road murari lal Street New Delhi -0 110002
* Sood, J.K. 1987 Teaching Life sciences Kohli Publishers, Chandigarh
* Sharma, L.M. 1977 Teaching of Sviences & Life Sciences Dhanpat Rai & Sons, Delhi
* Kulsherstha, S.P. 1988 Teaching of Biology, Loyal Book Depot, Meerut
* Yadav, K 1993 Teaching of Life Sciences, Anmol Publisher Delhi.
* Singh U.K. & 2003, Science Education Common Wealth Publishers Darayaganj Nayab, A.K. New Delhi
* Venkataih.S 2001 , Science Education in 21 st Century anmol Publishers Delhi
* Yadav M.S. (Ed) 2000, Teaching Science at Hindi Level anmol Publishers, Delhi
* Edger, Marlow & Rao D.B. 2003 Teaching Scieoence Successfully, Discovery Publishing House, New Delhi.

Physics /Chemistry

Objectives: Upon Completion of the course, the student teacher will be able to:
1) Understand the nature, scope and importance of physical science with special reference to secondary school content.
2) Understand the aims and objectives of teaching physical science
3) State the specific behavioral changes under each objective
4) Understand and make use of different approaches & methods of teaching physical science.
5) Prepare objective based lesson plans and use them in their internship
6) Understand and employ several teaching techniques helpful to develop scientific attitude and scientific method.
7) Plan, use and maintain the physical science laboratory systematically.
8) Understand the principles of text-book construction
9) Understand the importance of apporiate instructional materials (Hardwares and softwares) in teaching physical science and them by preparing/selecting them in their practice teaching
10) Understand the importance of principles of curriculum construcation in the orgaanisation of physical science contact
11) Gett mastery in Physical science content and imbibe the special qualities of physical science
12) Prepare and use different tools of evaluation to assess the achivments of students in Physical science
13) Develop professionally by attending lectures of professional interest, reading journals, and magazines and enroll as members of professional organization
14) Organize co-curricular activities in science i.e. seminars, field trips, exhibitions discussions etc through the science club.
15) Apply the knowledge of physical science to develop scientific thinking and scientific outlook.
16) Develop skills in analyzing the constent in terms of concepts and in learning experiences
17) Construct and administer unit test, conduct experiments improves teaching aids

Unit 1: Meaning, nature and Impact of Physical science
- Conecpt of science –science as process and science as a product;
- Nature and Sciope of Physical Science
- Impact of Science and Technology on modern living.
- Scientific Attitude Meaning Definition and Importance
- Qualities of person who possesses scientific attitude
- Scientific Metho-Meaning importance and steps involved (with an illustration)

                                                                                8 hours

Unit 2: Aims And Objectives Of Teaching Physical Science
- Aims of teaching Physical science in Secondary schol:
  1. Personal development aim,
  2. Learner's academic and process skills development aim,
  3. Disciplinary aim and
  4. Cultural aim.
- **Objective of teaching physical science**
1. Bases of formulation of objective
2. Objective of teaching physical science at secondary level; (to be discussed keeping in view of the objective of teaching physical science educated in the physical science syllabi of secondary school of U.P.); Instructional objectives of teaching physical science and

stating them in observable behavioral changes ; I) Knowledge)ii Understanding iii) Application, iv) skill, v) attitude, vi) Interest, vii) Appreciation

Unit 3 : Approaches and methods of teaching physical science

- Enquiry approach Meaning uses with Illustrations, Advantages and disadvantages
- Inductive Approach-Meaning Uses with Illustrations, Advantages and disadvantages.

  Deductive Approach-Meaning, uses with Illustrations, Advantages aned disadvantages
- Problem Solving Approach Meaning Uses with Illustration, Steps Advantages and disadvantages.
- Demonstration Method-Meaning uscs, Advantages and disadvantages
- Laboratory Method –Meaning uses with Illustration Advantages and disadvantages
- Guided Discovery Method-Meaning uses with Illustration, Advantages and disadvantages.
- Biographical method meaning uses with Illustration Advantages and disadvantages.
- Individual Instruction Techniques and Active Learning Strategics.
- Concept Mapping Its use for summarizing a unit and evaluating students understanding

Unit 4: Instructional Design, Resources and Teaching Aid for   teaching physical Science;

- Lesson Planing-Meaning Steps, Importance and format of Lesson Plan according to active learning strategies.
- Unit Plan-Meaning Steps, Importance and format of Lesson Plan
- Resource Unit-Meaning Steps, Importance and format of lesson Plan
- Audio-Visual Aids (Preparation and Use)
    i.   Charts;
    ii. Models;
    iii. OHP transparencies;
    iv. Filmstrips;
    v.   Solids;
    vi. Video tapes
    vii. Films;
    viii. Educational C.D.'s
- Mass Media-
    i. Television (T.V.);
    ii. Radio –Meaning and importance
- Community Resources and Self learning materials-
  iii Meaning and importance
- Physical Science Library
- Importance & organizing of Physical science library;
- Sections of science libray;
- Choice of book for science library.

References
- Ahmed, Shaikiti R (1983) Management of Laboratory Science Programme:
- Administration New Delhi NEPA Mimeo.
- Bhandula & Chand (1986) Teaching of science Prakash Brothers, Ludhina

- Bose, A. H. Sood, J.K. and Vaidya n (1970) Strategies in Science Education regional Institute of Education, Ajmer & Carin/Sound Teaching Science Through Discovery C.E. Merrill publishing Co londan
- Cleaveland J.M. (1964) Physical Science C.E. Merrill publishing Co., Ohio
- Craig (1958) Science for the Elementary Schol Teaching gin & co New York
- Das R.C. (1985) Science teaching in Schools, teaching in schools, sterling publishers, Pv.t Ltd. New Delhi
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- Gupta S.K. (1983) Technology Of Science Education, Vikas Publishing House Pvt. Let, New Delhi.
- Gupta .S.K. (1985) Physical Science Teaching In Secondary Schols, Sterling Publishers, Pvt, Ltd, New Delhi
- Jacobson David Et Al (1985) Methods For Teaching A Skill Approach Charles, E Merrill Publishing Co., Columbus.
- Jennings Terry (1987) The Young Scientist Inveestigator The Teaching Manual of Oxford Univeristy Press
- Joseph-Bradwin, et al (1998) Sourcebook for Physical Science Brandwain Watson Blackwood
- Kalaa R.M. (1981) Innovation in Science Teaching Prakashan Kendra Lucknow
- Kohli V.K. (2003) How to teach Science (A Tratise on Methodology of teaching Physics and chemistry) Viveka Publishers, Ambaia
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- Nagel E. (1961) the Structure of Science Harcourt Brace and world Inc, new York
- Nair C.P.S., (1971) Teaching Science in Our Schools. S. Chand & co, new Delhi
- Schwab J.J. and Brqawein P.F. (1962) The Teaching of Science, marks, Harvard University Press, Cambridge
- Sharma R.C. (1995) Modem Science Teaching Dhanpat Rai & Sons Delhi
- Siddiqi M.N. and Yadav R.A. (1995) Teaching of Science Today and Tommooroow Doaba House, Delhi -110 006
- UNESCO (1985) Teaching Schol chemistry Sterling Publishera Pvt. Ltd, New Delhi
- UNESCO (1978) New UNESCO Source Book's for science Teaching New Delhi ; Oxford and IBH Puublishing Co.,
- Waiter A Thurkar and Alferd T. Colletter (1964) Teaching Science in Todays Secondary Schols, New Delhi Prentics Hall.

PC. (II): PEDAGOGY OF SCHOOL SUBJECT

LIFE SCIENCE

Objectives :-

- Explore different ways of creating learning situations for different concepts of biological science.
- Formulate meaningful inquiry episodes, problem-solving situations, investigatory and discovery learning projects based on upper primary, secondary and senior secondary stages.
- Facilitate development of scientific attitudes in learners. Examine different pedagogical issues in learning biological science. Construct appropriate assessment tools for evaluating learning of biological science.

- Stimulate curiosity, inventiveness and creativity in biological science.
- Develop ability to use biological science concepts for life skills. Develop competencies for teaching, learning of biological science through different measures.
- To introduce with Professional development programmes of teachers. To plan organization and report on various programmes of Professional development of teachers.

Note- Any two activities are mandatory. Out of which one must be directly related to field.

Unit-I: **Learning Resources** (Any two activities are mandatory. Out of which one must be related to science club.)

- Identification and use of learning resources in biological science, exploring alternative sources.
- Developing science kit and biological science laboratory; Designing biology laboratory. Planning and organizing field observation; Textbooks, audio-visual materials, multimedia-selection and designing
- Use of ICT experiences in learning biological science; using community resources for biology learning
- Pooling of learning resources in School complex/ block/district level; handling hurdles in utilization of resources.
- Establish science club in school and conduct at least five activities relatedtoo biological science

Unit-II : Tools and Techniques of Assessment

- Performance-based assessment; learner's record of observations, field diary herbarium and collection of materials
- Oral presentation of learners work in biological science portolio; collaborative learning.
- Construction of test items (open-ended and structured) in biological science and administration of tests.
- Developing assessment framework in biological science; assessment of experimental work in biological science.

Unit-III : Biological Science – Lifelong Learning

- Eacibtating learning progress of learners with various needs in biology; ensuring equal partnership of learners with special; stimulating creativity and inventiveness in biology, planning drama, poster making on issues related to (science/biology;)

planning and organizing fileld experiences, science exhibition; Nurturing creative talent at local level and exploring linkage with district/state/central agencies

Unit-IV : Projects in biological science

Projects in biological sciences interconnections of science with other disciplines: selection of relevant problem planning though group work, implemenatation & reporting.

Unit-V: Professional Development of Teachers

- Professional competencies of subject teacher
- Professional development professional development of teachers references:-
- Agarwal, D.D. (2004) Modem methods of Teaching biology saruk & sons (saruklooks.com)
- Miller, David F.& blaydes, Gilenn W. (1938) Methods and materials for teaching biological science Mc GRAW Hill book company Inc New York and London.
- Chudhary S (2010) Teaching of biology APH PUBLISHING CORPARATION New Delhi Sood, J.K. (1987) teaching of life science kohli publishers Chandigarh
- Yadav, M.S. (2000) MOdersn methods of teaching science, Anmol publishers, Delhi
- Bhar Suraj Prakash (2006) teacher training lotus press New Delhi
- Singh Veena (2007) Teaching of biology addyanyan publishers & distributors, New Delhi

MATHEMATICS

Objectives: Upon completion of this course student teachers will be able to

1. Recall the meaning, nature and scope of mathematics. 2. Acquaint aims and objectives of teaching mathematics in Secondary school
2. level.
3. Plan teaching in mathematics at micro and macro level.
4. Prepare unit plans, resource unit and organize lesson to meet at different class
5. room situations.
6. Analyse and evaluate the curriculum of mathematics at Secondary school
7. level.
8. Apply different approaches and methods of teaching mathematics in
9. classroom situations.
10. Prepare and use instructional materials in teaching mathematics. Prepare different kinds of test and understand the comprehensive evaluation.
11. Participate and organize the different co-curricular activities in mathematics.
12. Understand the professional competencies, commitments and expectations of mathematics teacher.

Unit 1: Meaning, Nature and Scope of Mathematics

1.1 Meaning of Mathematics
    1.1.1. As a Science of Number
    1.1.2. As a Science of Quantity
    1.1.3. As a Science of Measurement
    1.1.4. As a Science of Logical reasoning
1.2 Nature of Mathematics
1.3 Scope of Mathematics
    1.2.1. Place of Mathematics in day today life activities
    1.2.2 Mathematics use in day to day life activities
    1.2.3 Relation with School subjects
    1.2.4 Relation with other Disciplines-Enginering, Agriculture, Medicine

Unit 2: Aims and Objectives of Teaching Mathematics

2.1 Aims/Values of Teaching Mathematics
    2.1.1 Meaning of Aim/Values
    2.1.2 Utilitarian Aim/Values
    2.1.3 Disciplinary Aim/Values 3
    2.1.4 Cultural Aim/Values
    2.1.5 Intellectual Aim/Values
    2.1.6 Aesthetic and Recreational Aim/Values
2.2 Instructional objectives of Teaching Mathematics
    2.2.1 Meaning of Instructional Objectives
    2.2.2 Instructional Objectives and there specifications of teaching mathematics
    2.2.3 Knowledge
    2.2.4 Understanding
    2.2.5 Application
    2.2.6 Skill
    2.2.7 Attitude
    2.2.8 Appreciation

2.2.9 Interest

2.2.10 Forinulation and Statement of objectives in behavioural terms

Unit 3: Instructional Design in Mathematics and Co-curricular Activities in Mathematics :

3.1 Lesson Planning: Meaning, Steps, Importance and Format of Lesson Plan

3.2 Unit Plan-Meaning ,Steps , Importance and Format of Lesson Plan

3.3 Resource Unit-Meaning, Steps, Importance and Format of Lesson Plan

3.4 Yearly Planning-Meaning, Principles and Format :

3.5 Mathematics Club : Objectives of Maths club, organisation and activities

3.6 Mathematics Olympiads : objectives and importance

3.7 Mathematics Quiz: Organisation and importance

3.8 Mathematics Museum : Organisation and importance

3.9 Mathematics Fair : Organisation and importance

3.10 Mathematics Laboratory : Objective, importance and uses

3.11 Recreational activities in mathematics : Games, Puzzles, Riddles, etc.,

3.12 Ethno Mathematics

Unit 4: Approaches, Methods and Techniques of Teaching Mathematics

4.1 Learner Centered Approach

    4.1.1 Inductive method and Deductive method

    4.1.2 Analytical method and Synthetic method

4.2 Activity Centered Approach

    4.2.1 Guided discovery method and Problem Solving Method

    4.2.2 Project Method and Discovery Learning Method

    4.2.3 Active Learning Strategies

    4.2.4 CAI in Teaching Mathematics

4.3 Concept Mapping-Meaning, Advantages and Disadvantages

4.4 Techniques of teaching Mathematics

    4.4.1 Supervised study

    4.4.2 Oral work and written work

    4.4.3 Drill and Review

    4.4.4 Assignment in Maths

    4.4.5 Home work

References

- Butler and Wren (1960) The Teaching of Secondary Mathematics, Tokyo McGraw Hill Book Company
- Henderson, K, et al (1975) Dynamics of Teaching Secondary Mathematics, London Houghton Miffin. & Howard Eves, An Introduction to the History of Mathematics.
- Jantli, R.T. (2000) Subodha Ganitha Bodhane, Vidhyanidhi Prakashan, Gadag.
- Krulik and Weise (1975). Teaching Secondary School Mathematics. London W.B. Saunders.
- Kuppuswamy Ayyangar, N. (1988) The Teaching of Mathematics in New Education, Bangalore.
- Mangal, S.K. (1989) Teaching of mathematics. Ludhiana: Prakash Brothers Publishers. & Sidhu, KS. Teaching of Mathematics, B'lore Sterling Publishers.

SEMESTER - VII
INTERNSHIP GUIDE

Description of Roles

Interns are students who is a graduate in their subject major, and are spending a four month working with experienced mentor teachers on their teaching practice while taking graduate courses in the Teacher Education department.

Mentor Teachers are experienced school teachers who mentor interns. They provide guidance, insight and opportunities for supported practice.

Supervisors work with school administrators/ Mentors to determine school experience for interns, mediate in difficult situations, and oversee interns progress in schools and with respect to program requirements. They are faculty who organize campus based lectures and seminars in each subject area. They provide supervision and guidance for the interns in and out of the campus.

Intern Responsibilities

Interns are students of teaching. In contrast to traditional student teaching programs, interns are not expected to begin the year ready to teach on their own. Instead, they are expected to engage in observations, co-planning and co-teaching with their mentor teachers and to build their capacity toward assuming responsibility for extended lead teaching during the semester.

Interns are in a period of transition from students to professional teachers. During this transition, they must retain the perspective of a learner as they take on the new and unfamiliar role of a teacher. Intern are expected to take an active role in their own learning and to contribute to the learning of fellow in terms.

Planning and Communication

- Keep supervisor informed about classroom schedules and events
- Direct questions or concerns to supervisors or mentor
- Schedule observations and conferences with the mentor and inform supervisor of changes promptly
- Meet regularly with the mentor to discuss planning for instruction .

Prepare written lesson and unit plans according to both mentor teacher and supervisor's expectations

- Arrange to share all plans and materials with the mentor in a timely way, to allow for feedback before using them .
- Keep the focus class binder up to date with plans and materials and ensure that it is accessible to the mentor and supervisor at all times
- Engage in reflective diary writing or other communication forums required by mentors and/or supervisors
- Provide mentor/supervisor with copies of plans and materials
- Confer regularly with the mentor teacher and supervisor about progress and concerns

Professional Activities

- Prepare for and participate in seminars
- Participate in orientation activities, faculty meetings and other school events
- Initiate introductions to school faculty, staff and administrators
- Maintain accurate contact information for mentor teacher(s) and supervisor
- In case of absence, inform absence everyone affected promptly, i.e. prior to the absence
- Comply with the school absence policies and have substitute teacher plans available if scheduled to teach lessons during the absence

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- Comply with the internship attendance policy
- Dress professionally
- Comply with the Professional Conduct policy Consult mentor teacher and supervisor about the work schedule for any part time job and arrange a mutually acceptable schedule

Personal Learning

- Take initiative in asking questions, searching out resources, inviting feedback and creating opportunities to learn
- Reflect on teaching and learning through discussions and assignments
- Prepare a professional portfolio (reflective diary)
- Work with intern as a co-teacher as soon as possible, sharing decisions and observations
- Observe intern's teaching and help the intern think about student understanding, alternative approaches, grouping, management, etc.
- Provide interns with oral and written feedback about their teaching, including written feedback
- Observe teachers and students carefully, taking notes and asking questions
- Study and participate in the formation and maintenance of a classroom learning community
- Begin the year co-planning and co-teaching lessons and activities, moving toward independent planning and teaching as the year progresses

Mentor Teacher Responsibilities

Planning and Communication;-

- Negotiate with in term and supervisor a sequence of in term responsibilities in accordance with the program standards
- Provide intern with an outline or list of topics intem will be responsible for : teaching, allowing extra time for intern to locate resources, plan, receive
  feedback from mentor teacher and supervisor, and revise
- Establish regular times to confer with the intern about unit planning and provide support for identifying big ideas and appropriate curriculum materials
- Help identify places in the curriculum where the intern can try out ideas learned in seminars
- Confer regularly with the supervisor about progress and concerns
- Participate in all school activities from morning assembly to evening assembly

Supporting Intern Learning

- Facilitate and monitor intern's progress from observation to co-planning and co-teaching to lead teaching
- Guide the intem through daily school-based experiences such as working with other teachers, dealing with classes on an assembly day, etc.
- Provide appropriate, classroom-based learning opportunities throughout the ycar.
- Reflect with the intem about teaching, student learning and ideas and strategies studied in seminars.

Assessment

- Participate in assessment conferences
- Write and submit an Exit Performance Description at the end of the internship programme

- Help interns think about their careers as educators and assist with reviewing portfolios, videotaping, writing letters of recommendation, etc.

Supervisor Responsibilities

Meetings, Observation Visits, and Assessments
- Provide copies of written assessments to interns and mentor teachers
- Conduct five feedback sessions with the intern and mentor teacher, at the appropriate point of time
- Prepare participants for sessions by explaining what to bring and topics to discuss
- Make at least five observation visits during a week
- Prepare written assessments prior to feedback sessions, using the appropriate forms for your intern's subject area, and provide copies for the intern and mentor teacher at the conference

Write and submit an Exit Performance Description at the end of the internship programme.

Communication
- Facilitate communication among interns, mentor teachers and others involved with the internship
- Communicate regularly with each intern, at least every other da
- Communicate regularly with each mentor teacher
- Communicate regularly, as scheduled, with subject area leaders about interns" progress and problame
- Provide the intern and mentor teacher with detailed notes and written feedback about observation visits
- Make sure intem and mentor clearly understand expectations and program standards
- Keep informed about program developments and pass this information on to interns and mentors promptly
- Know where to direct questions and relay answers as soon as possible

Support of Intern Learning by the supervisor
- Observe the intern's teaching and confer about the planning and teaching of each observed lesson
- Provide constructive written and oral feedback for each observed lesson
- Identify the intern's specific needs and work on them with the inter and mentor teacher
- Inform subject area leader about problems promptly
- Help interns to develop their portfolios by giving feedback on materials, assisting with videotaping, etc. Records
- Keep notes of all observation visits, including date, progress observed, suggestions made and actions taken
- Keep notes of all communication with interns and mentor teachers
- Keep examples of intern work indicative of progress or problems
- Keep copies of all written assessments and professional development plans :
- Submit evaluation reports and professional development plans to the department head.

This highlights the intern's field experience that contribute to the overall esign of the internship year experience. In schools with other configurations of class me, intems and mentors should discuss with their field instructors how the intern's ad teaching time will be distributed throughout the year. Key aspects of any intern's ad teaching schedule include:

- After the initial week or two of school, the intern should have lead teaching responsibility (but not sole teaching responsibility) for at least one class period in a week.
- Interns are novice teachers for whom out-of-class preparation and reflection takes longer than it does for more experienced teachers. Having regular time during the school day to plan well for their teaching and reflect carefully on it is vital for the growth of the intern's practice and for the quality of the instruction they can provide to the students they share with their mentor. Interns may spend some of this time outside the classroom, and they may spend some of it in observation and analysis of the mentor's teaching.
- In the initial internship programme, short periods of increased lead (sole) teaching responsibilities should be preceded and followed by periods during which interns return to teaching only the focus class. From each period of increased lead teaching responsibility to the next, the demands on the intern's planning, teaching, and/or assessing should increase.

Interns' on-campus classes do not meet every week of the internship. During certain weeks, the classes do not meet so that interns can be in their placement schools all five days of the week. Interns' obligations to their courses during this time focus more on at-school or in-class activities and less on lengthy reading or writing assignments. The following files will be prepared by students during the school internship course. (Preparation or files is mandatory)

Internal Assessment Scheme of Practical	Mark
1- Micro Teaching (10 Skill and 20 Plan)	
2- Macro teaching (40 Lesson of Both Teaching Subject)	
3- Criticism Plan (4 Plan)	
4- Observation of Lesson Plan (40)	
5- Teaching Aids (5x4 of VII&VIII Sem)	
6- Seminar/Workshop	
7- School Internship (To Learn All School Record Maintain)	
8- Unit Plan	
9- Unit Test Administration Evaluation and Interpretation	

10- Blue Print of a paper	

SEMESTER – VIII
CC-13 Proficiency of English

Total Marks - 50
Terminal-40
Sessional-10

Unit-I: Basic Language Skills: Grammar &Usage
A)Simple, Compound and Complex sentences
B)Clauses C)Tenses D)Prepositions
E) Direct and Indirect Narration
F) Active and Passive Voice
G) Modals
H) Subject -Verb agreement

Unit II :Writing Skills:
a) Paragraph Writing: Describing an event, object, process.
b) Letter Writing: Business/Official/ Social.
d) Report Writing
e) Notice and Circulars
f) Expansion of an Idea

Unit-III: Literary texts
a)Poetry:
- Jolin Keats- When I have fears that I may cease to be
- Wilfred Owen-Futility
- W.B Yeats- Lake Isle of Innisfree Gieve Patel: On Killing a Tree Jayanta Mahapatra: The Captive air of Chandipur on Sea.
- Sarojini Naidu: Coromandel Fishers b)Prose
- Brooker T. Washington- My struggle for an Education c)Short Stories:
- R.N. Tagore-Hungry Stones *Ruskin Bond- The Tunnel
- Leo Tolstoy- How much land does a man need d)Speech:
- John F. Kennedy: A Tiny Ripple of Hope Martin Luther King: I Have a Dream

Unit --IV: Phonetics:-:
- Production of speech sounds: Vowels and Consonants
- Stress: Strong and Weak Syllabus

Suggested Readings
1. English Phonetics-Peter Roach
2.Phonetics and Spoken English-Bala Subhramanium

CC -14 Proficiency of Hindi
(Answers must be written in Hindi)

Marks = 100
Ext= 80
Int = 20

Section-A
1. History of Hindi Language and Nagari Lipi.
- Grammatical and applied forms of Apbhransh, Awàhatta & Arambhik Hindi.
- Development of Braj and Awadhi as literary language during medieval period,
- Early form of Khari-boli in Siddha-Nath Sahitya, Khusero, Sant Sahitaya, Rahim etc. and Dakhni Hindi:
- Development of Khari-boli and Nagari Lipi during 19th Century.
- Standardisation of Hindi Bhasha & Nagari Lipi.
- Development of Hindi as national Language during freedom movement.
- The development of Hindi as a National Language of Union of India.
- Scientific & Technical development of Hindi Language.
- Prominent dialects of Hindi and their inter-relationship.
- Salient features of Nagari Lipi and the efforts for its reform & Standard forin of Hindi...
- Grammatical structure of Standard Hindi.

Section-B
2. History of Hindi Literature.
1. The relevance and importance of Hindi literature and tradition of writing History of Hindi Literature.
2. Literary trends of the following four periods of history of Hindi Literature..
A. Adikal-Sidh, Nath and Raso Sahitya. Prominent poets-Chandvardai, Khusaro, Hemchandra, Vidyapati.
B. Bhaktikal-Sant Kavyadhara, Sufi Kavyadhara, Krishna Bhaktidhara and Ram Bhaktidhara. Prominent Poets-Kabir, Jayasl, Sur & Tulsi.
C. Ritikal-Ritikavya, Ritibaddhakavya & Riti Mukta Kavya. Prominent Poets-Keshav, Bihari, Padmakar and Ghananand.
D. Adhunik Kai
- Renaissance, the development of Prose, Bharatendu Mandal.
- Prominent Writers : Bharatendu, Bal Krishna Bhatt & Pratap Narain Mishra.
- C. Prominent trends of modern Hindi Poetry : Chhayavad, Pragativad, Proyogvad, Nai Kavita, Navgeet and Contemporary poetry and Janvadi Kavita. Prominent Poets : Maithill Sharan Gupta, Prasad, Nirala, Mahadevi, Dinkar, Agyeya, Muktibodh, Nagarjun.

III. Katha Sahitya .
- Upanyas & Realism
- The origin and development of Hindi Novels.
- Prominent Novelists : Premchand, Jainendra, Yashpal, Renu and Bhism Sahani.
- The origin and development of Hindi short story.
- Prominent short Story Writers: Premchand, Prasad, Agyeya, Mohan Rakesh & Krishna Shobti.

IV. Drama & Theatre
- The origin & Development of Hindi Drama.

- Prominent Dramatists : Bharatendu, Prasad, Jagdish Chandra Mathur, Ram Kumar Verma, Mohan Rakesh.
- The development of Hindi Theatre.

V. Criticism
- The origin and development of Hindi criticism : Saiddhantik, Vyavharik, Pragativadi, Manovishleshanvadi & Nai Alochana.
- Prominent critics : Ramchandra Shukla, Hajari Prasad Dwivedi, Ram Vilas Sharma & Nagendra.

VI. The other forms of Hindi prose-Lalit Nibandh, Rekhachitra, Sansmaran, Yatravrittant

EPC 4: Understanding the Self

Objectives

- The main aim of this course is to facilitate the development of individuals who can take responsibility for their own learning and give a conscious direction to their lives. Students are encouraged to explore and develop through self reflection a greater insight into their aims of life, strengths and weaknesses and dynamics of formation of identity and a true, individuality.
- Students also develop a capacity for social-relational sensitivity, effective communication skills and ways to create harmony within one's own self and society. The workshops are also aimed at equipping the students with positive attitudes, attributes and skills that help in facilitating the personal growth of their own students while teaching.
- To help student teachers discover and develop open-mindeness, the attitude of å self motivated learer, having self-knowledge and self-restraint.
- To help student teachers develop the capacity for sensitivity, sound communication skills and ways to establish peace and harmony.
  To develop the capacity to facilitate personal growth and social skills in their own students

Unit 1: Exploring the Aim of Life Objectives

1. To enable students to develop a vision of life for themselves.
2. To encourage students to give conscious direction to their lives to take responsibility for their actions.
3. To develop a holistic and integrated understanding of the human self and personality

Workshop themes

- Vision as a person: Aspiration and purpose of life. . Giving a conscious direction to life.

Understanding different dimensions of self and personality and way in which they influence the dynamics of identity formation, values and direction of life.

Unit 2: Discovering one's True Potential

- To facilitate the personal growth of the students by helping them to identify their own potential
- To develop the power of positive attitude.
  To encourage students to develop the capacity for self-reflection and personal integration.

Workshop themes

- Understanding one's strengths and weaknesses through self observation exercises.
- Taking responsibility for one's own actions.
- Developing positivity, self esteem and emotional integration.
- Exploring fear and trust; competition and cooperation
- Developing skills of inner self organization and self reflection
- Writing a self-reflective journal

Unite 3 : Developing Sensitivity

- To enable students to examine and challenge the stereotypical attitudes and prejudices that influence identity formation and the process of individuation.
- To encourage students to develop the capacity for perspective taking and appreciating different points of view.

- To develop sensitivity towards needs of children by connecting with one's own childhood experiences Workshop Themes
- Understand and challenge the unconscious, conditioned attitudes that are stereotyped and prejudiced (gender, caste, class, race, region, disability etc.) and critically examine the sources of stereotyped messages (e.g., media).
- Defining consciously one's own values towards self and society and develop a capacity to understand and appreciate divergent points of view. Widening their realm of consciousness.
- Developing the capacity for empathic listening and communication skills.
- Understanding one's own childhood and adult-child gaps in society.

Unit 4: Peace, progress and Harmony
- To develop the capacity to establish peace within oneself
- To develop the capacity to establish harmony within a group and methods of conflict resolution
- To understand the meaning of leadership and develop attitudes and skills of a catalyst
- To understand the basis of social disharmony, the factors those contribute to it and ways to facilitate change

Workshop themes
- Establishing peace within oneself: exercises of concentration and meditation
- Understanding group dynamics and communication
- Creating group harmony: exploring methods of creating a collective aspiration for progress and conflict resolution
- Exploring the bases of social disharmony: becoming the agents and catalysts of change and exploring methods of facilitating change

Unit 5: Facilitating personal Growth : Applications in Teaching
- To explore attitudes and methods needed for facilitating personal growth in students
- To explore ways of integrating the facilitation of personal growth and social skills within the formal curriculum

Workshop themes
- Becoming a self-reflective practitioner; becoming conscious of one's own attitudes and communication pattern while teaching,
- Observing children: appreciating social, economic, cultural and individual differences in children and relating with them.
- Exploring and practicing ways to facilitate personal growth and develop social skills in students while teaching

Mode of Transaction

There is no standard prescribed material for these workshops. The professional experts are expected to engage with the students with specially designed activities. These could be based on the facilitators personal integration and unique individual and group characteristics and are rooted within the context of student's lives and contemporary realities. It is suggested that the students be given space to explore and articulate their own sense of life and its issues. They can be encouraged to think a fresh on issues that most closely concern them and use creativity and imagination to develop a perspective on them. The resource materials are an aid in this process. The Resource materials can also include newspaper/web articles on contemporary concerns and

movies/documentaries and other audio-visual materials. There is a suggested list of resource materials which should be contextualised and updated periodically. Expertise/ Specialization required to teach this course Specialists who have conducted personal development workshops and who have a qualification in clinical and counseling Psychology.

Essential Readings
1. Antoine de Saint-Exupery. (1977). The Little Prince. London, UK: Wordsworth Edition Translated by Irene Testot-ferry (available in Hindi).
2. Dalal, A.S. (2001). Our Many Selves. Pondicherry, India: Sri Aurobindo Ashram.
3. Frankl, V. (1946). Man's Search for Meaning. New York: Pocket Books.
4. Joshi, K. (ed) (2005). The Aim of Life. Auroville, India: Saiier.
5. Krishnamurti, J. (1953). Education and the Significance of Life, Ojai, California, USA: Krishnamurti Foundation Trust.
6. NCERT, (2006). Education for Peace, Position Paper, New Delhi: NCERT.
7. Walk with Me: A Guide for Inspiring Citizenship Action. (2006). New Delhi: Pravah Pub.

Readings for Discussion
1. Bach, R (1994). Jonathan Livingston Seagull, London, UK: Harper Collins Publications. :
2. Chatterjee, D. (1998). Leading Consciously, MA, USA: Butterworth Heinemann.
3. Gibran, K. (1996). The Prophet, Calcutta, India: Rupa & Co. Gupta, L. (2008). Growing up Hindu or Muslim: How Early does it Happen. Economic and Political Weekly, 63(6), 35-41.
4. Haldar, B. (2006). A Life Less Ordinary. New Delhi: Penguin Books. Translated by Urvashi Butalia.
5. Hall, E. and Hall, C. (1988). Human Relations in Education. London, UK: Routledge.
6. Joshi, K. (1996). Education for Character Development. Dharam Hinduja International Centre for Indic Research.
7. Joshi, P. (2006). Negotiating Identity: Voices of Children with Disabilities in Regular Schools. Contemporary Education Dialogue. 3(2), 1175-195.
8. Kumar, K. (1986). Growing Up Male, Seminar, No. 318.
9. Seminar, Identity. No. 387, November 1991. New Delhi.
10. UNESCO, (2001). Learning the way of Peace: A Teachers' Guide to Peace Education. New Delhi: United Nations Educational, Scientific and Cultural Organization.

Suggested Audio-Visual Resources
1. Aim of Life by Kireet Joshi (DVD) for DVD/facilitation contact mothersinstitute@hotmail.com
2. Full of Life: A sensitive Japanese Teachers explores feelings, death with 10 year olds. (http://www.arvindguptatoys.com/films.html)
3. Personality Development (Interactive CD, Computer Only) Witti Yoga and Guided Meditation Modules, Indus Quality Foundation :
4. The House on Gulmohar Avenue by Samina Mishra (www.cultureunplugged.com)

Advanced Readings
1. Dalal, A.S. (1987). Living Within, Pondicherry, India: Sri Aurobindo Ashram Trust
2. Dalal, A.S. (2001). A Greater Psychology. Pondicherry, India: Sri Aurobindo Ashram Trust

<div align="center">

EPC 5 : UNDERSTANDING OF ICT

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Objectives: Upon the completion of the course the student-teachers will able to:

- Develop skill in handling computer and using word documents.
- Develop skill in computation, analysis and interpretation of data by using Excel Spread sheets.
- Understand the Educational implications of Power Point Presentation and its use in classroom context.
- Understand the applications of Information Technology in the field of teacher education programme and training.

Practicum:

1. Computer Fundamental

- Instructions on operating the Computer
- Connecting of all peripherals to CPU for a system
- Switching on/off/restart
- Inserting/removing a floppy from the floppy drive
- Running a file from a floppy using floppy drive. Copying a file from hård disk to floppy disk
- Inserting/removing a CD from the CD-ROM drive
- Running a file from a CD-ROM using CD-ROM drive
- Copying files from one drive to another
- Creating a new folder
- Running a file from hard disk
- Connecting the printer and print out hard copies

2. Exercise in MS-Word

- Creating a new document
- Formatting and editing of a document
- Inserting pictures, objects, frames and tables
- Practicing Mail-Merge facility
- Working with the drawing tools

3. Exercise in MS-Excel :

- Creating a new worksheet
- Inserting and deleting rows columns in worksheet
- Formatting and editing of a document - sorting
- Preparation of statement of marks and using of some statistical concepts - Descriptive Statistics
- Preparation of School Time Table
- Preparation of Tables

4. Exercise in Ms-Power Point

- Preparation of MS-PowerPoint presentation using text, picture, sound, word art, clipart, and the other available tools with animation :

5. Exercise in Information and Communication Technology

- Browsing the Internet and down loading - search word using search engine
- Working with Multimedia
- Receiving/Sending of e-mail and attachment