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SHIVAJI UNIVERSITY, KOLHAPUR
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दूरध्वनी - इपीबीएक्स - २०६०९०००, अभ्यासमंडळे विभाग : ०२३१- २६०९०९४, २६०९४८७
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Ref.: SU/BOS/ *IDS* / 602 **Date: 06 - 10- 2025**

To,
The Head,
Departments of Education,
Shivaji University, Kolhapur.

Subject : Regarding revised syllabi of **B. Sc. B. Ed. Part -I** degree programme under the Faculty of Inter- Disciplinary Studies as per NEP-2020 (2.0).

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the revised syllabi, nature of question paper and equivalence of **B. Sc. B. Ed. Part -I** degree programme under the Faculty of Inter- Disciplinary Studies as per National Education Policy, 2020 (NEP 2.0).

This syllabus, nature of question and equivalence shall be implemented from the academic year **2025-2026** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in NEP-2020 (Online Syllabus)

The question papers on the pre-revised syllabi of above-mentioned course will be set for the examinations to be held in October /November 2025 & March/April 2026. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours Faithfully

(Dr. S. M. Kubal)
Dy Registrar

Encl. : As above.
Copy to: For Information and necessary action.

1	The Dean, Faculty of IDS	7	Affiliation T. 1 & T. 2 Section
2	Director, Board of Examination and Evaluation	8	Appointment A & B Section
3	The Chairman, Respective Board of Studies	9	P.G.Seminar Section
4	O. E. 3 Exam Section	10	I.T. Cell
5	Eligibility Section	11	Internal Quality Assurance Cell (IQAC)
6	P.G.Admission Section	12	Centre for Distance Education

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SHIVAJI UNIVERSITY, KOLHAPUR

B.Sc. B.Ed. (ITEP) Four Years Integrated Programme

B.Sc. B.Ed. Part I Sem I & II

(Dual Major Holistic Bachelor's Degree in Education & Science)

Secondary Stage Specialization

(9^{th} to 12^{th} Standard)

Under the Faculty of Interdisciplinary Studies

(As per NCTE -ITEP Amendment Regulations, 2019)
Introduced from Academic Year 2025-2026 Onwards
(Subject to the modifications made from time to time)

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SHIVAJI UNIVERSITY, KOLHAPUR

B.Sc. B.Ed (Integrated) Four Year Programme

Executive Summary of the Programme

National Council for Teacher Education (NCTE) has launched Integrated Teacher Education Programme (ITEP), which its flagship programme of NCTE under NEP-2020.

As per the NEP 2020 there are four stages in new school structure i.e. Foundational Preparatory, Middle and Secondary (5+3+3+4). Therefore B.Sc. B.Ed. is a Four-year dual-major holistic undergraduate degree programme is introduced for the students who choose teaching as a profession after Secondary school level, by choice. This integrated course will be benefit students since they will save one year by completing the course in 4 year rather than the customary 5 years required by the present B.Ed. programme.

This course will not only impart cutting – edge pedagogy but will also establish, a foundation in Early Childhood Care and Education (ECCE), Foundational literacy and Numeracy (FLN), Inclusive education and an understanding of India and its values /ethos/art/tradition among others. The course contributes substantially to the whole Teacher education sector. The irrespective teachers passing out of this course through a multi-disciplinary environment, grounded Indian values and traditions will be instilled with the needs at 21st century global standards hence, will be harbingers in shaping the future of new India. This programme will be four academic years with 8 semesters and students have to complete the programme with all 8 semesters. However as per the ITEP Multiple entry and Exit points and reentry options with appropriate certifications are available for this programme. As shown in Table No.1. as per NCTE and Government of Maharashtra's Notification:

Table No. 1. As per NCTE B.Sc.B.Ed (ITEP) Multiple Entry and Exit Points:

Sr. No.	Duration	Description	Certification received by Students
1	After completion of 1 year (2 semesters)	Award of UG certificate with 52 credits	**Certificate in** Science
2	After completion of 2 years (4 semesters)	Award of UG diploma with 96 credits	**Under Graduate Diploma in** Physics/Chemistry/Mathematics
3	After completion of 3 years (6 semesters)	Award of UG Bachelor Degree in Major with 144 credits	**B.Sc. Degree** (Physics/Chemistry/Mathematics)
4	After completion of 4 years (8 semesters)	Dual-major Bachelor's Degree with 188 credits	**B.Sc.-B.Ed. Dual Major Holistic Bachelor Degree in Education and Science** (Physics/Chemistry/Mathematics)

Programme Need:

This is flagship programme under the NEP 2020 and according to its recommendations all Teacher Education programs will be covered into Integrated Teacher programmers by 2030.

Student Demand for Programme:

In present situation the students spend 5 years to complete B.Ed. programme after completing under-graduations. So if they enroll for this B.Sc. B.Ed. programme after 12th Standard they will save one year and get dual Major Holistic Bachelor's Degree in Education & Science.

Institutional Capacity: 50 students

Eligibility/Entry Requirements:

1. Successful completion of Science Grade 12 (or equivalent stage of education such as Pre- University, Intermediate etc.) with a minimum of 50% marks in aggregate or an equivalent grade from a recognized Board / University.
2. Students also have to appear and able to eligible in National Level Entrance Test, which is conducted by National Testing Agency (NTA).

Programme Characteristics:

B.Sc. B.Ed. Integrated Four Years Programme aims at integrating general studies comprising Science subject, professional studies, foundations of education, pedagogy of school subject and practicum related to the task and functions of school teacher. It maintains a balance between theory and practice and coherence and integration among the components of the programme, representing a wide knowledge base of a Secondary school teacher. The programme aim at preparing teachers for secondary stages of education. On successful completion of the four-year integrated B.Sc. B.Ed. programme, student teachers will be able to develop:

1. Teaching Competency: Know, select and use of learner centered teaching methods, understanding of paradigm shift in conceptualizing disciplinary knowledge in school curriculum, necessary competencies for organizing learning experiences.

2. Pedagogical Skills: Applying teaching skills and dealing with classroom select and use of appropriate assessment strategies for facilitating learning problems.

3. Teaching through Nonconventional Modes: Evolving a system of education which enhances the potential of every learner to acquire, retain and transform knowledge leading to wisdom society through creative, experiential and joyful modes of learning.

4. Integration of Artificial Intelligence in Education: Transform the educational landscape by providing open access to quality, value based and socially relevant education to all by harnessing the disruptive potential of Artificial Intelligence.

5. Critical Thinking: Analysis of Curriculum, selecting appropriate teaching strategies according to needs of students and enhancing their critical thinking.

6. Effective Communication: Presenting seminar before peer students and teachers and practicing communication skills through various linguistic activities and applying it for better classroom communication.

7. Sensitivity Towards Inclusion: Identifying the diversities and dealing it in inclusive classrooms environment, guidance and counseling programmes for disabled students.

8. Content Analysis: Analyze the text-books and syllabus.

9. Effective Citizen Ethics: Understand different values, morality, and social service and accept responsibility for the society.

10. Self-directed Learning: Preparing scripts for seminars, lesson plans and with the help of synchronous and asynchronous learning.

11. Social Resilience: Understand about social entities and enable to tolerate absorb, cope up with adverse conditions of life.

12. Physical Development: Practice yoga, self-defense, sports and scouting-guiding.

13. Team Work: Enable to work as a member or leader in diverse teams and in multi-disciplinary settings by following the principles of collaborative learning, cooperative learning and team teaching.

Program Goals and Assessment:

The four year integrated Teacher Education Programme (ITEP) is offered after Secondary level and aims at preparing committed, responsible and professional teachers through Continuous and Comprehensive evaluations.

Vision Statement

To develop professionally competent, ethically grounded, and technologically skilled science educators committed to fostering inclusive and sustainable education for all learners.

Mission Statement

- To provide comprehensive knowledge of learner development, pedagogy, and curriculum practices.
- To prepare teachers with strong scientific understanding and pedagogical skills.
- To equip student-teachers with modern ICT tools and inclusive teaching strategies.
- To instill professional ethics, social responsibility, and environmental consciousness.
- To empower educators to contribute meaningfully to national educational goals and global citizenship.

Programme Educational Objectives (PEOs)

PEO1: Holistic Understanding of Education Systems

Graduates will demonstrate a comprehensive understanding of physical, cognitive, social, and emotional development of learners, and apply this understanding to address contemporary educational issues, analyze educational policies, implement effective teaching-learning strategies, and uphold professional ethics through active school internships and field engagement.

PEO2: Catering to Individual Differences and Educational Assessment

Graduates will be equipped to recognize and address individual differences among students by effectively utilizing psychological tools, ICT-based resources, and evaluative techniques to enhance learning, support guidance services, and plan inclusive and effective lessons.

PEO3: Real-World Teaching Proficiency and ICT Integration

Graduates will acquire practical experience in both traditional and online teaching environments, especially focusing on remote and underserved areas, by employing modern ICT tools and software, thereby ensuring effective and innovative pedagogy in diverse educational contexts.

PEO4: Inclusive and Value-Based Education

Graduates will develop the competencies needed to manage diverse and inclusive classrooms, promote education for human rights, environmental sustainability, and women empowerment, and design meaningful online learning content to meet the needs of all learners.

PEO5: Mastery in Subject-Specific Pedagogy (Science Education)

Graduates will deepen their subject-specific knowledge, particularly in science education, and apply discipline-based pedagogical skills to effectively teach and assess secondary school learners in alignment with contemporary curriculum standards and scientific inquiry.

Programme Specific Outcomes:

PSO1: Enable to comprehend the development in physical, cognitive, social and emotional areas, contemporary issues and educational policies of education system in India, teaching-learning methods, strategies, epistemological basis of education, school management, professional ethics and observation of school activities by school internship.

PSO2: Understand the individual differences among students, measuring the programmes and administering Psychological tools, ICT based communication attainment, evaluating progress, and assessing learning abilities, guidance and teaching and lesson planning.

PSO3: Practice teaching in Schools, inculcate the real experiences of classroom teaching and online teaching for remote areas‘ students by using ICT and its different tools and software.

PSO4: Understand the classroom diversities and enable them to deal with diverse learners in inclusive classroom setup, education for human rights and women empowerment, environmental education and developing online content.

PSO5: Enhance discipline specific knowledge of students specifically required for science teachers while teaching at secondary school stages.

Student Preparation:

Student teachers will learn key concepts and principles of education related to different aspects of pedagogical knowledge of secondary school teachers which are necessary for effective teaching and reflective practices in schools.

Working Days: The Stage-Specific ITEP will be organised on the semester pattern with two semesters in an academic year. Each semester will consist of 15 -16 weeks of teaching learning activities, excluding end-semester examinations. A semester will consist of a minimum 96 working days, excluding end-semester examination days. Each working week will have a minimum of 40 hours of instructional/contact time.

Regulations:

R.1 Admission

R.1.1 Admission to B.Sc. B.Ed. (Integrated) four years‘ programs at Shivaji University, Kolhapur, based on guidelines periodically provided by the Government of India's Ministry of Education (MoE). According to guidelines from the MoE, GoI, the number of seats in each Major Subject for the B.Sc.B.Ed program will be determined. Seats for different categories will be reserved in accordance with MoE, GoI guidelines as they become available.

R.1.2 The requirements set forth by the admission authority, which is periodically assigned by the MoE, GoI, must be met in order to be eligible for admission.

R.1.3 The chosen applicants cannot be admitted to the B.Sc. B.Ed. program unless they have fulfilled all entrance requirements set forth by Shivaji University, Kolhapur, and have paid the necessary fees.

R.1.4 In all cases pertaining to admission to the B.Sc.B.Ed. Program, the University will make the final decision as per the MoE and GOI rules.

R.1.5 Even after a candidate has been admitted, the Head of the Department of Education at Shivaji University may cancel the candidate's admission and report the incident to the

appropriate authorities if it is discovered that the candidate has not met any of the requirements set forth by the University or any other body or organization that the MoE/the Institute has entrusted with the admission process.

R.1.6 Shivaji University sets its own fees based on periodic orders from the Ministry of Education, Government of India.

R.1.7 At the time of admission, the student must select the Dual-Major subjects for the B.Sc. B.Ed. program from the available options in accordance with the eligibility requirements.

Registration and Enrollment

R.2.1 A student's selection of courses to be credited in the following semester in accordance with the applicable curriculum using the University's Admission Management System (AMS) within the time frame allotted by the Academic Section is referred to as registration. The act of physically reporting pupils to the Admission committee on the day designated by the academic section just before to the start of the semester is known as enrollment.

R. 2.2 A B.Sc.B.Ed. student may register a maximum of the regular credits for that semester, as specified by the applicable curriculum, excluding the eighth semester. However, students may overload one subject in addition to the customary credit for the semester if they are repeating failed courses or crediting dropped courses together with regular courses.

R.2.3 According to R.10, a student who receives a W/F for a core course is required to retake it. According to R.10, a student who receives a W/F in an elective course may choose to retake the course or, with the HoD's recommendation, enroll in a different elective.

R.2.4 Subject to the maximum number of courses allowed in R.5.2, registration for higher-semester courses is only allowed after registering for all pending core courses from lower semesters that are being offered at the moment.

R.2.5 Registration for courses in a higher semester is only allowed until all outstanding core courses from lower semesters that are currently being offered have been completed, up to the maximum number of courses allowed under R.5.2.

R.2.6 A student shall be eligible for registration and enrolment only if the minimum requirement to continue the programme as per regulation R.3 is satisfied cleared all the dues in the department, hostel, and library up to the end of the previous semester not debarred from enrolment by disciplinary action of the University completed the course feedback on the courses registered in the previous semester, as notified by the Academic Section paid all the tuition fees and all other relevant fees, if any, prescribed by the University.

R.2.7 If it is discovered that any of the requirements in R.2.6 were broken at the time of registration, the Institute retains the right to cancel the student's registration for a semester that follows, barring the case where the initial registration was made with the express consent required by University regulations.

R. 3 Minimum Requirement to Continue the Programme

R.3.1 A student admitted to B.Sc.B.Ed. programme in the first semester can continue up to the 8th semester, in ascending order, subject to the following conditions:
Successfully maintained registration for all the semesters.

Registration to the fourth-level courses shall be permitted only after successfully completing all courses up to and including the second-level courses.

R.4 Maximum Duration for Completion of the Programme

The B.Sc.B.Ed. Curriculum typically lasts eight semesters, or four years. A student may, nonetheless, take longer to finish the program at a slower pace; however, this should not exceed sixteen semesters (eight years), without including withdrawn semesters (temporary discontinuance per R.5 for medical reasons). However, in order to avoid the processes associated with registration cancellation, students must satisfy R.3.

R.5 Temporary Discontinuation

5.1 On the permission of the HoD, a student may be allowed to temporarily withdraw from the program for a maximum of two semesters due to illness or other medical conditions. When a student takes a leave from school due to illness, they must provide the required medical records and certifications from the treating physician, along with a clear justification for the break's duration. The Institute's Medical Officer should properly endorse the medical certificate. A fitness certificate from the student's treating physician, endorsed by the Institute's Medical Officer, is required before the student can return. Only two of these brief stops will be permitted for the duration of the event.

5.2 When a student is permitted to resume the program after the period of discontinuation, they must register for the approved equivalent courses (meeting the credits) as per the curriculum/syllabi, following the HoD's advice in the event that the curriculum or syllabus changes during the period of discontinuation.

5.3 In order to keep their program registration active until they resume their regular academic activities, students who are requesting a temporary cessation must pay the appropriate fees. The costs for regular students must be paid after they re-enroll following a brief break.

R. 6 Attendance and Leave

R.6.1 It is expected of students to attend every session of the courses for which they have signed up. As per the usual policy of the Institute, students who have completed 90% of their practicum and at least 80% of their classes are qualified to write the end-semester examinations for any course. The HoD may, however, set the attendance requirement for their courses in a way that does not go above the 80% threshold for theory. Students will be informed of the course's attendance rules during the first class. It needs to be submitted later and approved at the initial meeting. If a student cannot attend classes due to medical issues or other compelling reasons, a leave application as detailed below, must be submitted to the HoD. Application for any leave shall be submitted within five instructional days after returning from leave or on or before the last instructional day of the semester, whichever is earlier. Application for leave on medical grounds must be supported with necessary treatment records for the period of leave applied for. The student is expected to inform the course faculty before proceeding on medical leave under normal circumstances.

R.6.2 A student is not entitled to appear for the end-semester test for a course in which their attendance for any registered course throughout a semester falls below 80% or the limit set by the HoD, unless the absence is excused in accordance with the regulations. With the exception of first semester students, the percentage of attendance will be determined by counting the number of classes held starting on the day the semester officially began, in accordance with the academic calendar. For first-semester students, the count begins on the date of the student's admittance to the department or the first day of classes, whichever comes first.

R.6.3 On or before the last day of instruction, students whose attendance falls below 80% or the cap set by the course faculty for any course registered in a semester must notify their instructor of the attendance shortfall.

R.6.4 Students who register for any course in a semester and have attendance below 80% or the cap set by the course faculty may be eligible to have their lack of attendance excused and therefore take the course exam at the end of the semester, provided they meet the requirements below. The attendance in that semester for the course concerned, without applying any condonation, is not less than 50% of the total classes handled for that course.
Attendance after applying for a medical exemption, which is greater than 80% of the cap set by the relevant authorities, and for co-curricular and extracurricular activities, which is based on permission from the appropriate authorities (maximum limit: 10% of classes taught by the course faculty).

R.6.5 Should a course have a set attendance requirement, all requests for the HoD to be consulted regarding the excused absences must be made. Before the date of the course's end-of-semester exam, the HoD will review these requests and any accompanying documentation and determine whether or not the absence is excused. Students may file an application with the university's Grievance Committee if they have a grievance against a decision.

R.6.6 Duty leave for on-the-job training placement activities is available to students who have enrolled in the University's Center for Career Development (CCD) for internship or placement-related activities, subject to the actual absence from class for these activities, for a maximum of ten days per semester. To validate the claims made by the pupils, CCD will furnish the relevant departments and schools with the attendance statistics on a day-by-day and company-by-company basis.

7. Examination
Semester Examination has following nature of Question paper and Practicum

<table>
<tr><th>Exam</th><th>Nature</th><th>Marks</th></tr>
<tr><td rowspan="2">Theory Exam</td><td>Theory Exam 50 Marks Course</td><td>(30+20(Internal) = 50 Marks)</td></tr>
<tr><td>Theory Exam 100 Marks Course</td><td>(60+40(Internal) = 100 Marks)</td></tr>
<tr><td rowspan="5">Practical Exam</td><td rowspan="2">I Year : Practical Exam
(Three Practical= 03+03+03 hrs = 09hrs)</td><td>Sem-I(50+50+50 = 150 Marks)</td></tr>
<tr><td>Sem-II (50+50 +50= 150 Marks)</td></tr>
<tr><td rowspan="2">II Year : Practical Exam
(Two Practical=03+03 hrs = 09hrs)</td><td>Sem-III (50+50) = 100 Marks)</td></tr>
<tr><td>Sem-IV (50+50) = 100 Marks)</td></tr>
<tr><td rowspan="2">III Year : Practical Exam
(Two Practical=06+03 hrs = 09hrs)</td><td>Sem-V (100+50 = 150 Marks)</td></tr>
<tr><td>Sem-VI (100+50 = 150 Marks)</td></tr>
</table>

Nature of Question Paper
Education (Major Subject)

Theory	**30**
Internal Exam/ Assignment	**20**
Total	**50**

Q.1

a. Fill in the blanks by selecting correct alternative - (Multiple Choice) (5 Marks)

1)

2)

3)

4)
5)

b. Short Questions. (5 Marks)

1) (1 Marks)

2) (1 Marks)
3) (1 Marks)
4) (1 Marks)
5) (1 Marks)

Q.2 Attempt any one out of two. (10 Marks)

1)
Or
2)

Q.3 Attempt any two out of five. (10 Marks)

1. (5 Marks)

2. (5 Marks)

3. (5 Marks)

4. (5 Marks)

5. (5 Marks)

Nature of Question Paper
Education

Theory	**60**
Internal Exam/ Assignment	**40**
Total	**100**

Q1.a. Fill in the blanks by selecting correct alternative - (Multiple Choice) (10 Marks)

1)
2)
3)
4)
5)
6)
7)
8)
9)
10)

Q2. Short Questions. (10 Marks)

1) (2 Marks)
2) (2 Marks)
3) (2 Marks)
4) (2 Marks)
5) (2 Marks)

Q3. Attempt any one out of two. (10 Marks)

1)
Or
2)

Q.4 Attempt any one out of two. (10 Marks)

1)
Or
2)

Q.5 Attempt any Five out of Seven. (20 Marks)

1. (5 Marks)
2. (5 Marks)
3. (5 Marks)
4. (5 Marks)
5. (5 Marks)
6. (5 Marks)
7. (5 Marks)

Nature of Question Paper
Education/Science

Theory	**30**
Internal Exam/ Assignment	**20**
Total	**60**

Nature of Question paper Total Marks: 30

Q.1 Multiple Choice questions (any six) 06 Marks

a)
b)
c)
d)
e)
f)
g)
h)

Q.2. Attempt any TWO of the following (Out of Three) 12 Marks (Essay type /Broad Questions)

a)
b)
c)

Q.3. Attempt any FOUR of the following (Out of SIX) 12 Marks
(Short answer Questions)

a)
b)
c)
d)
e)
f)

Nature of Practical Examination Total Marks: 50

Scheme of Practical Examination for B. Sc.B.Ed. (ITEP)

Part –I 1. Practical examination will be conducted semester wise.

2. Practical examination will be conducted for one day per batch.

3. The examination will be conducted in two sessions per day and each session will be of three hours duration.

4. Every candidate should perform one experiment each from Group I and Group II.

5. At least eighty percent practical should be completed by the student.

6. **The marks distribution for practical is as below**

Practical groups	**Marks**
Group- I	20
Group- II	20
Certified laboratory journal-	10
Total Marks-	**50**

Continuous Internal Evaluation Pattern for Practical based Courses as follows:

Sr. No.	**Assessment Activity**	**40 Marks**	**20 Marks**
1	Assessment of Journal	10	05
2	Assessment of Regular Notebook	10	05
3	Seminar	10	05
4	Surprise test based on	10	05

Practical work (Conduct at least two in each semester)

Method of Grading

8.1 Based on the each semester performance, every student will be awarded a final letter grade for each course, where the letter grades will correspond to the grade points as shown below.

Aggregate of Total marks	Letter Grade	Grade points
75-100	O (Outstanding)	10
60-74	A + (Excellent)	9
55-59	A (Very Good)	8
50-54	B+ (Good)	7
44-49	B (Above Average)	6
40-44	C (Average)	5
35-40	P (Pass)	4
below of 80% in Theory 90% Practicum	W (Insufficient attendance)	0
Not Submitted Practicum or Give Theory Paper	I (Incomplete assessment)	0

A student is said to have credited a course or earned credits in respect of a course when a grade other than F, W, or I is secured for that course.

R. 9 Grade Point Average

R. 9.1 The performance of a student in a semester is indicated by the Semester Grade Point Average (SGPA), which is given as

$$SGPA = \frac{\Sigma(C*GP)}{\Sigma C}$$

where C is the number of credits for a course, GP is the grade point scored by the student for that course, and the summation is for all courses registered by the student in the relevant semester.

R.9.2 The performance of a student up to and including a particular semester is indicated by the Cumulative Grade Point Average (CGPA), which is given as

$$CGPA = \frac{\Sigma(C*GP)}{\Sigma C}$$

where C is the number of credits for a course, GP is the grade point scored by the student for that course, and the summation is for all courses registered by the student up to and including the relevant semester.

R.9.3 The CGPA is not convertible to a percentage. However, notionally, the CGPA may be multiplied by a factor of 10 to obtain a numerical percentage.

R. 10 Class/Division

R.10.1 At the end of the programme, the Class/ Division awarded by the Institute shall be based on CGPA as follows.

First Class with Distinction: CGPA≥7.5
First Class: 7.5> CGPA ≥ 6 and
Second Class: 6 > CGPA ≥ 5

R. 11 Transfer of Credits

R.11.1 Within the broad framework of these regulations, university authorities may permit students to earn part of the credit requirements in other approved institutes of repute and status in the country or abroad. The appropriate credit mapping in the above cases will be done based on the recommendations from authorities.

R. 12 Eligibility for the Award of B.Sc./B.Sc. B.Ed. Degree

A student becomes eligible for the award of the B.Sc./B.Sc. B.Ed. Degree when

(i) credited all the courses in the respective levels as per the curriculum within the stipulated time
(ii) acquired the Major-wise minimum credits in the relevant B.Sc. B.Ed. curriculum
(iii) no dues to any Departments/Sections of the University, including hostels
(iv) no disciplinary action is pending

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SHIVAJI UNIVERSITY, KOLHAPUR

B.Sc. B.Ed. Four Year Integrated Programme

Introduced from Academic Year 2025-2026

Onwards

Structure of Semester-I							
Component	**Code**	**Title**		**Marks**	**Credits**	**Total Hours**	**Hours Per Week**
Student Induction Programme	--	--		--	--	80	40* (2 Weeks)
	Education Major						
Foundations of Education	F-I	Evolution of Indian Education		100 (T60+ I40)	04	60	06
	Discipline Major						
Disciplinary / Inter-disciplinary Courses	D-I	Course I	DSC I (2): Phy-I:	50 (T 30+ I 20)	02	30	02
			DSC II (2): Phy-II:	50 (T 30+ I 20)	02	30	02
			DSC P I (2) :	50	02	60	04
		Course II	DSC I (2): Chem-I:	50 (T 30+ I 20)	02	30	02
			DSC II (2): Chem -II:	50 (T 30+ I 20)	02	30	02
			DSC P I (2) :	50	02	60	04
		Course III	DSC I (2): Math-I:	50 (T 30+ I 20)	02	30	02
			DSC II (2): Math-II:	50 (T 30+ I 20)	02	30	02
			DSC P I (2) :	50	02	60	04
Ability Enhancement & Value-Added Courses	AEVC-I	Language-I (as per the 8th schedule of constitution of India)		100 (T 60+ I40)	04	60	06
	AEVC -II	Art Education (Performing and Visual)-I		50 (I 25+ E 25)	02	30	04
	AEVC -III	Understanding India (Indian Ethos and Knowledge Systems)-I		50 (T 30+ I20)	02	30	02
Self-Study	SS-I	Good Governance		Student required to qualify the internal exam.			
Total =				650	26	540	42

- Not Counted Per Week

Note- T: Theory, P: Practical/Practicum/Laboratory work, I: Internal, E: External

Structure of Semester-II							
Component	**Code**	**Title**		**Marks**	**Credits**	**Total Hours**	**Hours Per Week**
	Discipline Major						
Disciplinary / Inter-disciplinary Courses	D-II	Course I	DSC III (2): Phy-III:	50 (T 30+ I 20)	02	30	02
			DSC IV (2): Phy-IV:	50 (T 30+ I 20)	02	30	02
			DSC P II (2) :	50	02	60	04
		Course II	DSC III (2): Chem-III:	50 (T 30+ I 20)	02	30	02
			DSC IV (2): Chem -IV:	50 (T 30+ I 20)	02	30	02
			DSC P II (2) :	50	02	60	04
		Course III	DSC III (2): Math-III:	50 (T 30+ I 20)	02	30	02
			DSC IV (2): Math-IV:	50 (T 30+ I 20)	02	30	02
			DSC P II (2) :	50	02	60	04
Ability Enhancement & Value-Added Courses	AEVC -IV	Language-II (Other than Language-I)		100 (T60+I 40)	04	60	06
	AEVC -V	Understanding India (Indian Ethos and Knowledge Systems)		50 (T30+ I20)	02	30	06
	AEVC -VI	Teacher and Society		50 (T30+ I20)	02	30	04
Self-Study	SS-II	Constitution of India		Student required to qualify the internal exam.			
Total =				650	26	480	40

Note- T: Theory, P: Practical/Practicum, I: Internal, E: External

Structure of Semester-III							
Component	**Code**	**Title**		**Marks**	**Credits**	**Total Hours**	**Hours Per Week**
Foundations of Education	F-III	**Child Development & Educational Psychology**		100 (T60+I 40)	04	60	06
Disciplinary / Inter- disciplinary Courses	D-III	Major	Major V(2)	50 (T 30+ I 20)	02	30	02
			Major VI (2)	50 (T 30+ I 20)	02	30	02
			Major P III (2):	50	02	60	04
		Minor	Minor V(2)	50 (T 30+ I 20)	02	30	02
			Minor VI (2)	50 (T 30+ I 20)	02	30	02
			Minor P III(2)	50	02	60	04
Skill Enhancement Courses (SEC)	**Practicum**	**Practicals (Major)**		50	02	60	04
Stage-Specific Content-cum-Pedagogy	**SSCCP-I**	**Stage-Specific Content-cum- Pedagogy Courses-I**		100 (T80+ I 20)	04	60	06
Self-Study	SS-I	Environment Studies		Student required to qualify the internal exam.			
Total =				550	22	420	32

Note: Theory, P:Practical/Practicum, I:Internal, E:External

■ University may decide to offer maximum of three subjects (Courses) in the first year. The student may select one subject out of combination of three subjects (Courses), (which a student has chosen in the first year) as a **MAJOR** subject (Course) and one subject (Course) as **MINOR** Subject in the second year. Thereby it is inferred that the remaining third subject (Course) shall stand discontinued.

Structure of Semester-IV							
Component	**Code**	**Title**		**Marks**	**Credits**	**Total Hours**	**Hours Per Week**
Foundations of Education	F-IV	**Philosophical & Sociological Perspectives of Education-I**		100 (T60+P40)	04	60	06
isciplinary / Inter-disciplinary Courses	D-IV	Major	Major VII(2)	50 (T 30+ I 20)	02	30	02
			Major VIII (2)	50 (T 30+ I 20)	02	30	02
			Major P IV (2)	50	02	60	04
		Minor	Minor VII(2)	50 (T 30+ I 20)	02	30	02
			Minor VIII (2)	50 (T 30+ I 20)	02	30	02
			Minor P IV (2)	50	02	60	04
Skill Enhancement Courses (SEC)	**Practicum**	Practical (Major)		50	02	60	04
Stage-Specific Content-cum- Pedagogy	**SSCCP-II**	**Stage-Specific Content-cum- Pedagogy Courses-II**		100 (T60+ I 40)	04	60	06
Self-Study	SS-IV	Environment Studies		Student required to qualify the internal exam.			
Total =				550	22	420	32

Note: Theory, P:Practical/Practicum, I:Internal, E:External

Structure of Semester-V							
Component	**Code**	**Title**		**Marks**	**Credits**	**Total Hours**	**Hours Per Week**
Disciplinary / Inter-disciplinary Courses	**D-V**	Major	Major IX(2)	50 (T 30+ I 20)	02	30	04
			Major X (2)	50 (T 30+ I 20)	02	30	04
			Major P V (4)	100	04	120	06
		Minor	Major I (ELEC)(2)	50 (T 30+ I 20)	02	30	04
			Major P-I (ELEC) (2)	50 (T 30+ I 20)	02	60	04
VSC II (2) (Major specific)(P)	**Practicum**			50	02	60	04
Stage-Specific Content-cum-Pedagogy	**SSCCP - III**	**Stage-Specific Content-Cum- Pedagogy Courses-II**		100 (T 60+ I 40)	04	60	04
Ability Enhancement & Value-Added Courses	**AEVC - VII**	**ICT in Education**		50 (I 25+ E 25)	02	30	04
School Experience	SE-I	**Pre-Internship Practical (Demonstration lessons, Peer teaching)**		50 (Internal)	02	30	04
Total =				550	22	450	38

Note- T: Theory, P: Practical/Practicum, I: Internal, E: External

Structure of Semester-VI							
Component	**Code**	**Title**		**Marks**	**Credits**	**Total Hours**	**Hours Per Week**
Foundations of Education	F-V	Assessment & Evaluation		50 (T 30+ I 20)	02	30	04
	F-VI	Inclusive Education		50 (T 30+ I 20)	02	30	04
Disciplinary / Inter-disciplinary Courses	D-VI	Major	Major IX(2)	50 (T 30+ I 20)	02	30	02
			Major X (2)	50 (T 30+ I 20)	02	30	02
			Major P V (4)	100	04	120	08
		Minor	Minor I (ELEC)(2)	50 (T 30+ I 20)	02	30	02
			Minor P-I (ELEC) (2)	50	02	30	02
VSC II (2) (Major specific)(P)	**Practicum**	**Major specific**		50	02	60	04
Stage-Specific Content-cum-Pedagogy	SSCCP -IV	**Stage-Specific Content-cum-Pedagogy Courses-IV**		100 (T 60+ I40)	04	60	06
Ability Enhancement & Value-Added Courses	AEVC - VIII	**Mathematical & Quantitative Reasoning**		50 (T 30+ I20)	02	30	02
School Experience	SE-II	**School Observation (Field Practice)**		50	02	30	04
Total =				650	26	480	40

Note- T: Theory, P: Practical/Practicum, I: Internal, E: External

tructure of Semester-VII						
Component	**Code**	**Title**	**Marks**	**Credits**	**Total Hours**	**Hours Per Week**
Foundations of Education	F-VII	Perspectives on School Leadership and Management	50 (T 30+ I20)	02	30	02
	F-VIII	Curriculum Planning & Development (textbooks , material development, etc.) - (Stage Specific)	50 (T 30+ I 20)	02	30	02
Ability Enhancement & Value-Added Courses	AEVC –IX	Art Education (Performing and Visual)	50 (I 25+ E 25)	02	30	04
	AEVC -X	Sports, Nutrition and Fitness	50 (I 25+ E 25)	02	30	04
	AEVC-XI	STEM Pedagogy	50 (T30+ I 20)	02	30	04
School Experience	SE-III	School-based Research Project	50 (I25+E25)	02	60	06
	SE-IV	Internship in Teaching	250 (I125+E25)	10	210	20
Total=			550	22	420	42

Note- T: Theory, P: Practical/Practicum, I: Internal, E: External

Structure of Semester-VIII						
Component	**Code**	**Title**	**Marks**	**Credits**	**Total Hours**	**Hours Per Week**
Foundations of Education	F- IX	Philosophical & Sociological Perspectives of Education -II	100 (T60+ I 40)	04	60	06
	F- IX	Education Policy Analysis	50 (T 30+ I20)	02	30	04
	OE-I	One Elective from the offered courses as per the choice of student-teachers a)Education for Sustainable Development b)Guidance and Counselling c)Economics of Education	100 (T 60+ I40)	04	60	06
Ability Enhancement & Value- Added Courses	AEVC - XII	Yoga and Understanding Self	50 (I 25+ E25)	02	30	06
	AEVC -XIII	Citizenship Education, Sustainability and Environment Education	50 (T 30+ I 20)	02	30	04
	AEVC-XIV	Experiential Learning through Educational Tour, Visit to well known Scientific and Educational Institutes and Presenting the Report	50 (I 25+ E25)	02	30	04
School Experience	SE-V	Post Internship (Review and Analysis)	50 (I 25+ E25)	02	30	02
	SE-VI	Creating Teaching Learning Material/Work Experience (Educational Toy making, local/traditional vocations, etc)	50 (I 25+ E25)	02	30	02
Community Engagement and Service	CE-I	Community Engagement and Service (Participation in NSS- related activities, New India Literacy Programme etc.)	50 (I 25+ E25)	02	120	08
Total=			550	22	420	42

Note- T: Theory, P: Practical/Practicum, I: Internal, E: External

Note:

- University may decide to offer maximum of three subjects (Courses) in the first year. The student may select one subject out of combination of three subjects (Courses), (which a student has chosen in the first year) as a **MAJOR** subject (Course) and one subject (Course) as **MINOR** Subject in the second year. Thereby it is inferred that the remaining third subject (Course) shall stand discontinued.
- DSC: Discipline Specific Course
- MAJOR: Mandatory/Elective
- MINOR: Course may be from different disciplines of same faculty of DSC Major
- OE(Open Elective): Elective courses/Open Elective to be chosen compulsorily from faculty other than that of the Major.
- VSC/SEC: Vocational Skill Courses (MAJOR related)/Skill Enhancement Courses
- AEC/ VEC / IKS: Ability Enhancement Courses (English, Modern Indian Language)/Value Education Courses/ Indian Knowledge System (Generic & Specific))
- OJT/FP/RP/CEP/CC: On-Job Training (Internship/Apprenticeship) / Field Project (Major related)/ Research Projects (Major related) Community Engagement (Major related)/ Co-Curricular courses(CC) such as Health& Wellness, Yoga Education, Sport, and Fitness, Cultural activities, NSS/NCC and Fine /applied/visual/performing Arts / Vivek Vahini etc.

Structure of Semester-I							
Component	**Code**	**Title**		**Marks**	**Credits**	**Total Hours**	**Hours Per Week**
Student Induction Programme	--	--		--	--	80	40* (2 Weeks)
	Education Major						
Foundations of Education	F-I	Evolution of Indian Education		100 (T60+ I 40)	04	60	06
	Discipline Major						
Disciplinary / Inter-disciplinary Courses	D-I	Course I	DSC I (2): Phy-I:	50 (T 30+ I 20)	02	30	02
			DSC II (2): Phy-II:	50 (T 30+ I 20)	02	30	02
			DSC P I (2) :	50	02	60	04
		Course II	DSC I (2): Chem-I:	50 (T 30+ I 20)	02	30	02
			DSC II (2): Chem -II:	50 (T 30+ I 20)	02	30	02
			DSC P I (2) :	50	02	60	04
		Course III	DSC I (2): Math-I:	50 (T 30+ I 20)	02	30	02
			DSC II (2): Math-II:	50 (T 30+ I 20)	02	30	02
			DSC P I (2) :	50	02	60	04
Ability Enhancement & Value-Added Courses	AEVC-I	Language-I (as per the 8th schedule of constitution of India)		100 (T 60+ I40)	04	60	06
	AEVC -II	Art Education (Performing and Visual)-I		50 (I 25+ E 25)	02	30	04
	AEVC -III	Understanding India (Indian Ethos and Knowledge Systems)-I		50 (T 30+ I20)	02	30	02
Self-Study	SS-I	Good Governance		Student required to qualify the internal exam.			
Total =				650	26	540	42

- Not Counted Per Week

Note- T: Theory, P: Practical/Practicum/Laboratory work, I: Internal, E: External

B.Sc. B.Ed. Four Year Integrated Programme
Part-I, Semester-I
Foundations of Education
F-I- EIE: Evolution of Indian Education
Semester -I

Marks	**100**	**Credits**	**04**
Total Hours (in One Semester)	**60**	**Hours Per Week**	**06**
Internal Exam Marks	**40**	**Theory Exam Marks**	**60**
		Duration of Theory Exam	**3 Hours**

Learning Outcomes-
After completion of this course, student teachers will be able to:

a. discuss genesis, vision and evolution of education in ancient India special reference to Vedic period with its silent features, Teaching and Learning Process, Finances and Management, Educational institutions, Guru-Shishya to the contemporary India.

b. discuss genesis, vision and evolution of education in ancient India special reference to Buddhist and Jain Period with its silent features, Teaching and Learning Process, Finances and Management, Educational institutions, Guru-Shishya to the contemporary India.

c. discuss genesis, vision and evolution of education in ancient India special reference to Post- Gupta Period to Colonial Period with its silent features, Teaching and Learning Process, Finances and Management, Educational institutions, Guru-Shishya to the contemporary India.

d. discuss genesis, vision and evolution of education in ancient India special reference to Post- Modern Indian Education with its Colonial Education.

e. examine the Shiksha ka Bhartiyakaran special reference to Swadeshi and Nationalist attempts of educational reforms.

f. describe the Education in Independent India
g. enable themselves to shape their educational perspective to act as an effective teacher.

Course Content:

UNIT:I- Ancient Indian Education: Vedic Period

a. Vision, objectives and salient features of Vedic Education System.
b. Teaching and Learning Process.
c. Development of educational institutions: Finances and Management.
d. Famous Educational institutions and Guru-Shishya.
e. Education at the time of Epics: Ramayana and Mahabharata.

UNIT:II -Ancient Indian Education: Buddhist and Jain Period

a. Vision, objectives and salient features of Buddhist and Jain Education System.
b. Teaching and Learning Process.
c. Finance and Management of Educational Institutions.
d. Educational Institutions: Nalanda, Taxila, Vikramshila, Vallabhi, Nadia.
e. Famous Guru-Shishya.

UNIT:III- Post-Gupta Period to Colonial Period

a. Vision, objectives,
b. brief historical development perspective
c. salient features of Education in India.
d. Teaching and Learning Process.
e. Finance and Management of educational institutions.

UNIT:IV- Pre and Post Education in India

a. Colonial Education in India- Woods Despatch, Macaulay's Minutes
b. Westernization of Indian Education
c. Shiksha ka Bhartiyakaran (Indigenous Interventions in Education)-
d. Swadeshi and Nationalist attempts of educational reforms
e. Educational Contribution of Indian thinkers – Savitribai and Jyotiba Phule, Rabindranath Tagore, Swami Vivekananda, Mahatma Gandhi, Sri Aurobindo, Gijubhai Badheka, Pt. Madanmohan Malaviya, Jiddu Krishnamurti and Dr. Bhima Rao Ambedkar others – to the education systems of India.

UNIT :V -Modern Indian Education

a. Education in Independent India
b. Constitutional values and educational provisions.
c. Citizenship Education: Qualities of a good citizen & Education for fundamental rights and duties.
d. 20th Century Committees, Commissions and Policies, UEE, RMSA, RTE Act 2009: Overview and impact.
e. NEP 2020: vision and implementation for a vibrant India.

SESSIONAL / PRACTICUM WORK: (Any Four)

1. Prepare a report highlighting educational reforms with special reference to school education in the light of NEP 2020.
2. Critically analyze the concept of good citizen from the perspective of education for democratic citizenship.
3. Compare vision, objectives, and salient features of education during different periods.
4. Working out a plan to develop awareness, attitude and practices related to Fundamental Rights or fundamental duties or democratic citizenship qualities, execute it in the class and write the details in form of a report.
5. Sharing of student experiences (in groups) related to Indian constitutional values, help them to reshape their concept and enable them to develop vision, mission and objectives for a school and their plan to accomplish the objectives in form of a group report.
6. Analyses of current educational strengths and weaknesses of one's own locality and work out a critical report.
7. Visit to places of educational significance and value centers and develop a project report.

8. Observation of unity and diversity in a social locality and matching it with unity and diversity in the class and work out a plan for awareness for national-emotional integration for class to develop awareness, attitudes, skills, and participatory values, execute it in the class and report the details.

TRANSACTIONAL MODE:

The course content transaction will include the following:

- Planned lectures infused with multimedia /power-point presentations.
- Small group discussion, panel interactions, small theme-based seminars, group discussions, cooperative teaching and team teaching, selections from theoretical readings, case studies, analyses of educational statistics and personal field engagement with educationally marginalized communities and groups, through focus group discussion, surveys, short term project work etc.
- Hands on experience of engaging with diverse communities, children and schools.

Mode of Assessment

The assessment will be based on the seminar, tests and assignments.

B.Sc. B.Ed. (Integrated) Four Years Programme

Semester-I

Paper Code:D-I

PHYSICS Paper-I

Title of the Paper: Mechanics

Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**2**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes:

1. Students are able to understand and identify scalar and vector physical quantities in mechanics
2. Students are able to understand and apply vector algebraic methods to elementary exercises in mechanics
3. Students are able to understand and apply basic concepts of rotational motion
4. In general, students are capable of correlating the above concepts and methods in mechanics to both theoretical and experimental domains revealing analytical as well as numerical skills

Unit No.	Topics	Total Lectures
Unit I	**1. Vector algebra (09)** Revision - (Vector Algebra: Components of vectors and unit vector, Addition and subtraction of vectors), Scalar product, Vector product and their properties, Scalar triple product and its physical significance, Properties of scalar triple product, Vector triple product, Properties of vector triple product.	**9**
Unit II	**1. Gravitation (06)** Newton's law of gravitation, Motion of a particle in a central force field (motion in a plane, angular momentum is conserved), Kepler's laws (statement only), Satellite in circular orbit and applications, Geosynchronous orbits, Weightlessness, Basic idea of global positioning system (GPS). **2. Momentum and energy (07)** Conservation of linear and angular momentum, work and energy theorem, conservation of energy (Single particle), Dynamics of a system of particles (linear momentum, angular momentum and energy), Center of mass, Motion of rockets (qualitative treatment only).	**13**
Unit III	**Rotational motion (08)** Angular velocity, Angular momentum and torque, Kinetic energy of rotation and moment of inertia, Moment of inertia of a spherical shell and solid cylinder (only about axis of symmetry), Motion of spherical shell and solid cylinder rolling down an inclined plane.	**8**

Reference Books:

1. Mathematical Physics -B. S. Rajput, 25th edition 2013, PragatiPrakashan, Meerut.
2. Mechanics – D. S. Mathur, 2009, S. Chand & Company Ltd., New Delhi.
3. Mathematical Physics – B. D. Gupta, 3rd edition, 2009, Vikas Publishing House Pvt. Ltd.,
   New Delhi.
4. Mathematical Physics – P. P. Gupta, R. P. S. Yadav, G. S. Malik, 4th edition 1983-84, Kedar Nath Ram Nath, Meerut, Delhi.
5. University Physics. FW Sears, MW Zemansky and HD Young, 13/e, 1986, Addison - Wesley.
6. Mechanics Berkeley Physics course, V.1: Charles Kittel, et. Al. 2007, Tata McGraw Hill.
7. Physics – Resnick, Halliday & Walker 9/e, 2010, Wiley Eastern Ltd, New Delhi.
8. Engineering Mechanics, Basudeb Bhattacharya, 2ndedn., 2015, Oxford University Press.

SESSIONAL WORK: (IF REQUIRED)
TRANSACTIONAL MODE:
ESSENTIAL READINGS:
REFERENCES: (APA Style)

B.Sc. B.Ed. (Integrated) Four Years Programme
Semester-I
Paper Code:D-I
PHYSICS Paper-II
Title of the Paper: Electricity and Magnetism I

Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**2**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes:

Students are able to understand the physical significance of gradient, divergence and curl.

Students are able to apply concepts in vector calculus such as gradient, divergence and curl related to vector and scalar fields using Gauss, Stokes and green`s theorem.

Students are able to understand and apply concepts of electrostatic field, potential to point charges, electric dipole and geometrically regular charged bodies.

Students are able to understand and apply concept of energy density in electric field.

Students are capable of applying above concepts to solve numerical exercise in electrostatics

Unit No.	Topics	Total Lectures
Unit I	**Vector algebra (07)** Del operator, Gradient of a scalar field and its physical significance, Divergence of vector field and its physical significance, Curl of vector field, Line, surface and volume integral (definitions only), Gauss divergence theorem and Stoke's theorem (statements only).	**7**
Unit II	**1. Electrostatics (8)** Coulomb's law, Electrostatic field, electric flux, Gauss's theorem of electrostatics, electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere, calculation of electric field from potential. **2. Dielectrics (6)** Dielectric medium, Polarisation vector, Displacement vector, Electric vector, Relation between E, P and D vectors, Electric susceptibility of dielectrics.	**14**
Unit III	**Magnetostatics (9)** Introduction to magnetization and intensity of Magnetization, Biot-Savart's law & its applications- straight conductor, circular coil, solenoid carrying current, Divergence and curl of magnetic field, Magnetic vector potential, Ampere's circuital law. .	**9**

Reference Books:

1. Mathematical Physics -B. S. Rajput, 25th edition 2013, Pragati Prakashan, Meerut.
2. Mathematical Physics – B. D. Gupta, 3rd edition, 2009, Vikas Publishing House Pvt. Ltd., New Delhi.
3. Mathematical Physics – P. P. Gupta, R. P. S. Yadav, G. S. Malik, 4th edition 1983-84, Kedar Nath Ram Nath, Meerut, Delhi.
4. Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education.
5. Electricity and Magnetism, J.H. Fewkes & J. Yarwood. Vol.I, 1991, Oxford University Press.
6. Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
7. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
8. Electricity and Magnetism ,Khare and Shrivastav. Atma Ram & Sons, Delhi, 1976
9. University Physics 9th Edition ,Young and Freedman.

SESSIONAL WORK: (IF REQUIRED)
TRANSACTIONAL MODE:
ESSENTIAL READINGS:
REFRENCES: (APA Style)

B.Sc. B.Ed. (Integrated) Four Years Programme
Semester- I
Paper Code: D-I

Title of the Paper :PHYSICS Practical I

Marks	**50**	**Credits**	**2**
Total Hours	**60**	**Hours Per Week**	**4**
Internal Exam Marks	**-**	**External Exam Marks**	**50**
		Duration of External Examination	**3 Hours**

Learning Outcomes:

1. Apply fundamental mechanical principles: Utilize concepts like moment of inertia, simple harmonic motion, and gravity to design and conduct experiments, analyzing and interpreting results.
2. Develop experimental skills: Demonstrate competence in setting up apparatus, taking precise measurements, and calculating uncertainties, understanding limitations and sources of error.
3. Explore electrical components and circuits: Classify and characterize resistors, capacitors, and galvanometers based on their properties and roles in circuits, measuring resistance and magnetic field strength.
4. Investigate wave phenomena and their interactions: Analyze the behavior of sound waves in different media (magnetic vs. non-magnetic), employing a sonometer to determine frequency and comprehend the influence of material properties.

Group I

1. Measuring dimensions of the body/object by using a Vernier caliper and screw gauge.
2. To determine the MI of the disc using an annular ring.
3. To determine the MI of the flywheel.
4. To determine the modulus of rigidity by dynamic method.
5. To determine ‘g’ by Bar Pendulum.
6. To study the motion of a spring and calculate (a) spring constant (b) value of g.
7. To determine ‘g’ by Kater’s Pendulum.
8. Exponential decay of amplitude of simple pendulum.

Group II

1. Use of multimeter.
2. To study different types of resistors and capacitors.
3. Series and Parallel connections of resistances.
4. Verification of Ohm’s law.
5. To determine the resistance of the galvanometer using PO box.
6. Measurement of field strength B and its variation in a solenoid (Determine dB/dx).
7. To determine the frequency of A. C. mains by sonometer (magnetic material of wire).
8. To determine the frequency of A. C. mains by sonometer (non-magnetic material).

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H. T. Worsnop, 1971, Asia Publishing House.
2. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. College Practical Physics – Khanna and Gulati (S. Chand and Co. Ltd, Delhi).
5. Practical Physics – Gupta and Kumar (PragatiPrakationMeerat)
6. Advanced Level Practical Physics – J.M. Nelcon, J.M. Ogloom (EIBS).
7. Engineering Practical Physics- S. Panigrahi & B.Mallick,2015, Cengage Learning India Pvt. Ltd.
8. B.Sc. Practical Physics - Harnam Singh and P S Hemne, S Chand publications.
7. Advanced Practical Physics for students, B.L.Flint & H. T. Worsnop, 1971, Asia Publishing House.

B.Sc. B.Ed. (Integrated) Four Years Program
Chemistry
Semester- I
Paper Code: D-I, Paper I
Title of the Paper: Inorganic Chemistry

Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**2**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes

a. To learn and understand introductory inorganic chemistry. To understand size, shape and electron distribution in shells and sub- shells of an atom.

b. To learn different types of bonds and nature of bonding in inorganic compounds. Calculations of different energies associated with ionic bonding.

c. Knowledge of nature of bonding, geometry, stability, and magnetic characters of covalent compounds by applying VBT.

d. Understanding of role of acids and bases in chemistry. The study is useful in all chemical areas.

e. To learn and understand the properties and uses of the compounds of p-block elements.

UNIT: I Atomic Structure and Periodicity of Elements, Chemical Bonding and Molecular Structure: Ionic Bonding (14 hours)

a. **Atomic Structure and Periodicity of Elements**: Bohr's theory of hydrogen atom and its limitations, Wave particle duality, Heisenberg uncertainty principle, Quantum numbers and their significance, Shapes of s, p and d atomic orbitals, Electrons filling rules in various orbitals: a) Aufbau's principle b) Hund's rule of maximum multiplicity c) Pauli's exclusion principle, electronic configuration of elements, Stability of empty, half-filled and completely filled orbitals

b. Periodicity of the elements: General discussion of the following properties of the elements with reference to s block elements: a) electronic configuration b) atomic radii c) ionic radii d) ionization energy e) electron affinity f) electronegativity g) metallic characters h) reactivity i) oxidation state j) melting and boiling points k) chemical properties

c. **Chemical Bonding and Molecular Structure- Ionic Bonding:** Types of Chemical Bonds: a) Ionic Bond b) Covalent Bond c) Co-ordinate bond d)

metallic bond e) Hydrogen Bond f) Van-der walls force, Definition and formation of ionic bond. General characteristics of ionic bonding, Energetic in Ionic bond formation.

d. Born-Haber cycle for NaCl and its applications. Fajan's Rule, Applications of Fajan's rule for, i) Polarizing power and polarizability ii) Ionic character in covalent compounds iii) Bond moment, dipole moment and percentage ionic character.

UNIT: II Chemical Bonding and Molecular structure: Valence bond theory (VBT) (8 hours)

a. **Chemical Bonding and Molecular structure: Valence bond theory (VBT):** VSEPR Theory. Concept of hybridization

b. Different types of hybridization and geometry of following molecules, i) Linear geometry- $BeCl_2$ (sp hybridization) ii) Planer trigonal geometry- BF_3 (sp_2 hybridization) iii) Tetrahedral geometry- $SiCl_4$ (sp_3 hybridization). Trigonal bipyramidal geometry- PCl_5 (sp_3d hybridization) v) Octahedral geometry- SF_6 (sp_3d_2 hybridization) vi) Pentagonal bipyramidal geometry – IF7 (sp_3d_3 hybridization)

UNIT: III Acids and Bases and P -block elements (8 hours)

a. **Acids and Bases:** Theories of Acids and Bases – Arrhenius concept, Bronsted –Lowry concept, Lewis concept, Lux-Flood concept (Definition and examples only). Hard and Soft Acids and Bases (HSAB concept), Classification of Acids and Bases as hard soft and borderline, Pearson's HSAB concept, Acid –Base strength and hardness-softness, Application and limitations of HSAB concept.

b. **P-Block Elements:** Position of elements in periodic table, Characteristics of group 13th, 14th and 15th elements with special reference to electronic configuration and periodic properties. Compounds of group 13th, 14th and 15th elements, Boron –diborane (only structure), Allotropes of carbon and phosphorus, Oxyacids of Nitrogen (HNO_2, HNO_3).

REFRENCES:

1) Lee, J. D. Concise Inorganic Chemistry ELBS, 1991.

2) Cotton, F.A., Wilkinson, G. & Gaus, P.L. Basic Inorganic Chemistry, 3rd ed., Wiley.

3) Douglas, B. E., McDaniel, D. H. & Alexander, J. J. Concepts and Models in Inorganic Chemistry, John Wiley & Sons.

4) Huheey, J. E., Keiter, E. A., Keiter, R. L. & Medhi, O. K. Inorganic Chemistry.

5) Principles of Structure and Reactivity, Pearson Education India, 2006.

6) Puri, Sharma, Kalia. Principles of Inorganic Chemistry

7) Madan R. L. Chemistry for Degree Students (B. Sc. First year), S. Chand.

B.Sc. B.Ed. (Integrated) Four Years Programme

Semester- I

Paper Code: D-I, Paper-II

Title of the Paper: Organic Chemistry

Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**2**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes

a. The students are expected to understand the fundamentals and basic principles involved in organic chemistry.

b. Understanding the spatial arrangement of atoms of organic molecule and types of stereoisomers.

c. Knowledge of general properties and fundamental reactions of aromatic compounds.

d. To understand the basic knowledge of heterocyclic compounds. To get knowledge of methods to preparation, physical and chemical properties of some heterocyclic compounds with five and six membered heterocycles containing N as the hetero atom (Pyrrole and Pyridine).

UNIT I: Fundamentals of Organic Chemistry (9 hours)

a. Fundamentals of Organic Chemistry: Introduction, Curved arrow notations, Cleavage of Bonds: Homolysis and Heterolysis. Organic molecular species: Nucleophiles and electrophiles.

b. Electronic Displacements: Inductive Effect, Electrometric Effect, Resonance and Hyper conjugation effect. Reactive Intermediates: Generation, Structure, Stability and Reactions of Carbocations, Carbanions, Carbon free radicals, Carbene and Nitrene.

UNIT II: Stereochemistry (9 hours)

a. Stereochemistry: Introduction, Types of Stereoisomerism, Representation of organic molecules using Wedge, Fischer, Sawhorse and Newman formula. Optical Isomerism: Concept of Chirality, Elements of Symmetry, Optical Isomerism in

tartaric acid, 2, 3 Dihydroxybutanoic acid, Enantiomerism, Diastereomerism and Meso compounds

b. Geometrical isomerism in C=C, C=N and alicyclic compounds. Nomenclature of stereoisomers: D and L, Erythro and Threo, R and S, E and Z

UNIT III: Aromaticity and Heterocyclic Compounds (12 hours)

a. **Aromaticity:** Introduction, Characteristics properties of aromatic compounds. Meaning of terms: Aromatic, Nonaromatic, Antiaromatic, Pseudoaromatic, Classification of aromatic compounds

b. Structure of Benzene: Kekule structure, Resonance structure, M.O. picture, Modern theory of Aromaticity. Mechanism of Electrophilic substitution reactions: Nitration, Sulphonation, Halogenation and Friedel - Crafts reaction

c. **Heterocyclic Compounds:** Introduction, Classification and Nomenclature of heterocyclic compounds.

d. Nitrogen Heterocycles: a) Pyrrole: - Introduction, Synthesis, Physical and chemical properties. Pyridine: - Introduction, Synthesis, Physical and chemical properties.

REFRENCES:

1) Graham Solomon, T. W., Fryhle, C. B. & Snyder, S. A. Organic Chemistry, John Wiley & Sons (2014).

2) McMurry, J. E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Pvt Ltd, Edition, 2013.

3) Sykes, P. A Guidebook to Mechanism in Organic Chemistry, Orient Longman, New Delhi (1988)

4) Eliel, E. L. Stereochemistry of Carbon Compounds, Tata McGraw Hill education, 2000.

5) Finar, I. L. Organic Chemistry (Vol. I & II), E.L.B.S.

6) Morrison, R. T. & Boyd, R. N. Organic Chemistry, Pearson, 2010.

7) Bahl, A. & Bahl, B. S. Advanced Organic Chemistry, S. Chand, 2010.

8) Nasipuri, D. Stereochemistry of Organic compounds: Principles and Applications.

9) Madan, R. L. Chemistry for Degree Students (B. Sc. First Year), S. Chand Publication.

10) Heterocyclic chemistry, J.A. Joule and K. Mills, 4th ed., Blackwell Publishing 2000

11) John A. Joule, Keith Mills.; Heterocyclic Chemistry, 5th Edition, April 2010, ©2010, Wiley Blackwell.

12) Gilchrist, T. L. Heterocyclic chemistry; 3rd ed.; Addison Wesley Longman: Edinburgh Gate, 1997.

13) Joule, J. A.; Mills, K.; Heterocyclic chemistry; 4th ed.; Blackwell Science: Oxford, 2000.

B.Sc. B.Ed. (Integrated) Four Years Program
Semester- I
Paper Code: D-I, Chemistry Practical I

Marks	**50**	**Credits**	**2**
Total Hours	**60**	**Hours Per Week**	**4**
Internal Exam Marks	**-**	**External Exam Marks**	**50**
		Duration of External Examination	**3 Hours**

Sr. No.	Name of experiment
1	To determine quantity of Fe (II) ions from the given solutions by titrating it with 0.1N $K_2Cr_2O_7$ solution by using internal indicator.
2	To estimate amount of Cu (II) ions by Iodometric titration by using $Na_2S_2O_3$ solution.
3	To prepare standard 0.1 N $KMnO_4$ solution and to determine the strength of given oxalic acid solution.
4	Estimation of amount of Acetic acid from the given vinegar sample by titrimetric method.
5	To standardize supplied EDTA solution by titrating with 0.01 M ZnSO4 solution and to estimate amount of calcium from given solution by using Erio- T as an indicator.
6	Estimation of Aniline. (by Bromination method)
7	Estimation of Acetamide.
8	Estimation of Aspirin tablet.
9	Purification of organic compounds by crystallization (from water and alcohol) and distillation.
10	Determination of heat of ionization of weak acid by using polythene bottle.

1) Svehla, G. Vogel's Qualitative Inorganic Analysis, Pearson Education, 2012.

2) Mendham, J. Vogel's Quantitative Chemical Analysis, Pearson, 2009

3) Vogel's Text Book of Quantitative Chemical Analysis. (Longmann) ELBS Edition.

4) Vogel's Text Book of Qualitative Chemical Analysis. (Longmann) ELBS Edition.

5) Hand book of Organic Qualitative Analysis: Clarke.

6) Comprehensive Practical Organic Chemistry – Qualitative Analysis by V. K. Ahluwalia, Sunita Dhingra. University Press. Distributor – Orient Longman Ltd.

7) Comprehensive Practical Organic Chemistry preparation and Quantitative Analysis: V. K. Ahluwalia, Renu Aggarwal. University Press. Distributor – Orient Longman Ltd.

8) A Laboratory Hand - Book of Organic Qualitative Analysis and Separation: V. S. Kulkarni. Dastane Ramchandra & Co. Pune

9) Practical book of Physical Chemistry: Nadkarni, Kothari &Lawande.

10) Experimental Physical Chemistry: A.Findlay.

11) Systematic Experimental Physical Chemistry: S. W. Rajbhoj, Chondhekar. (Anjali Publication.)

12) Experiments in Physical Chemistry: R. C. Das and B. Behra. (Tata McGrawHill)

13) Advanced Practical Physical Chemistry: J. B. Yadav (Goel PublishingHouse.)

14) Practical Physical Chemistry: B. D. Khosala. (R. Chand &Sons)

15) Experiments in Chemistry: D. V. Jahagirdar.

16) A Textbook of Quantitative Inorganic Analysis Including Elementary Instrumental Analysis: A.I. Vogel (Third Ed.) (ELBS)

B.Sc. B.Ed. Mathematics (Integrated) Four Years Programme Semester-I

Paper Code: D-I, Title of the Paper: Basic Algebra

Marks	**50**	**Credits**	**02**
Total Hours	**30**	**Hours Per Week**	**02**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes: Upon successful completion of the course students will able to:

CO 1. apply De-Moivre's theorem.
CO 2. find rank, eigen values, eigen vectors of the matrix.

CO 3. solve system of linear homogeneous and non-homogeneous equations. CO 4. understand

Hermitian and Skew Hermitian matrices

UNIT – 1: ALGEBRA OF COMPLEX NUMBERS (10 hrs.)

1.1. Sums and Products, Moduli, Polar form, Geometrical representation of Complex Numbers,

Exponential form, arguments of Products and Quotients.

1.2. De-Moivre's Theorem and examples

1.3 Applications of De-Moivre's Theorem

1.3.1 nth roots of unity.

1.3.2 Expansion of cos nθ, sin nθ

UNIT – 2: Hyperbolic Functions (05 hrs.)

2.1 Circular functions and hyperbolic functions.

2.2 Relations between circular and hyperbolic functions.

2.3 Inverse circular and hyperbolic functions.

UNIT – 3 : MATRICES (15 hrs.)

3.1. Introduction

3.2 Definitions of Hermitian and Skew Hermitian matrices.

3.3. Properties of Hermitian and Skew Hermitian matrices.

3.4. Rank of a Matrix, Row-echelon form and reduced row echelon form, normal form.

3.5. System of linear homogeneous and non-homogeneous equations.

3.5.1. Condition for consistency.

3.5.2. Nature of the general solution.

3.5.3. Gaussian elimination and Gauss Jordon method (Using row-echelon form and reduced row echelon form).

3.6. Characteristic equation, eigen values and eigen vectors of a matrix and examples

3.7. Cayley Hamilton theorem and examples.

Recommended Books:

1. Applied Mathematics by Ch.V. Ramana Murthy, N. C. Shrinivas, S. Chand and Company Ltd., 1st Edition, 2001.

Scope: Chapter No. 1: Art.1.2 to Art.1.13, Art. 1.15, Art. 1.17 to Art. 1.19, Art.1.23

2. Higher Engineering Mathematics by H. K. Dass, Er. Rajnish Verma, S. Chand and Company Pvt. Ltd. 3rd Revised Edition 2014.

Scope: Art. 19.1 to Art. 19.3, Art. 21.1 to Art. 21.6, Art. 21.27 to Art. 21.30,
Art. 20.1 to Art. 20.4

Reference Books:

1. Elementary Linear Algebra (Application Version), Howard Anton and Chris Rorres, 10th Edition, 2010.

2. Complex Variables and Applications, James Ward Brown and Ruel V. Churchill, Mc-Graw Hill, 8th Edition, 2009.

3. Modern Algebra, A. R. Vasishtha, Krishna Prakashan, Meerut 1994.

4. A Text Book of Matrices - Shanti Narayan (Revised by P. K. Mittal), S. Chand and Co., 11th Edition, reprint 2007.

B.Sc. B.Ed. Mathematics (Integrated) Four Years Programme Semester-I

Paper Code: D-I, Title of the Paper: Calculus

Marks	**50**	**Credits**	**02**
Total Hours	**30**	**Hours Per Week**	**02**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Course Learning Outcomes: Upon successful completion of the course students will able to:

CO 1. find higher derivatives of product two differentiable functions using Leibnitz theorem.

CO 2. learn conceptual variations while advancing from one variable to several variables in calculus.

CO 3. understand the consequences of mean value theorems for differentiable functions.

CO 4. apply L' Hôpital's rule to various indeterminate forms.

Unit – 1: Differentiation (15 hrs.)

1.1. Successive Differentiation

1.1.1. Higher order derivatives: notations.

1.1.2. Calculation of nth derivative: Standard results

1.1.3. Determination of nth derivative of rational functions: Examples.

1.1.4. The nth derivative of product of the powers of sine and cosines: Examples.

1.1.5. Leibnitz's Theorem. The nth derivative of product of two functions.

1.1.6. Examples on Leibnitz's Theorem.

1.2. Partial differentiation

1.2.1. Introduction to functions of two and more variables

1.2.2. Partial derivative: first order and higher order – examples.

1.2.3. Geometrical interpretation of partial derivatives of first order.

Unit – 2: Mean Value Theorems (08 hrs.)

2.1 Rolle's Mean Value Theorem, Geometrical interpretation.

2.2. Lagrange's Mean Value Theorem, Geometrical interpretation.

2.3. Meaning of sign of derivative

2.4. Cauchy's Mean Value Theorem.

Unit – 3 : Indeterminate forms (07 hrs.)

3.1. Indeterminate forms: L' Hôpital's rule for 0/0 and ∞/∞ form (Statement only).

3.2. The indeterminate forms $0 \times \infty$, $\infty - \infty$, $0^0, 1^\infty, \infty^0$

3.3. Expansion of functions

3.3.1. Maclaurin's theorem (statement only): Examples.

3.3.2. Taylor's theorem (statement only): Examples.

Recommended Books:
1. Differential Calculus, Shanti Narayan and P.K. Mittal, S. Chand publishing, 15th edition (2016). Scope: Unit 1 – 1.1: Chapter 5: 5.1 to 5.5

1.2: Chapter 11: 11.6, 11.6.1, 11.7.1
Unit 2 – Chapter 8: 8.1, 8.2, 8.3, 8.5

Unit 3: Chapter 10: 10.1 to 10.6, Chapter 6: 6.1, 6.2 Reference Books:

1. Differential Calculus, Gorakh Prasad, Pothishala Pvt. Ltd., 19th edition (2016).

2. Aspects of Calculus, Gabriel Klambauer, Springer-Verlag (1986).

3. Differential Calculus, Hari Kishan, Atlantic Publishers & Dist. (2007).

4. Calculus, George B. Thomas Jr., Joel Hass, Christopher Heil & Maurice D. Weir, Pearson Education, 14th edition (2018).

B.Sc. B.Ed. Mathematics (Integrated) Four Years Programme Semester-I

Paper Code: D-I, Title of the Paper: Lab work I

Marks	**50**	**Credits**	**02**
Total Hours	**60**	**Hours Per Week**	**04**
Internal Exam Marks	**–**	**External Exam Marks**	**50**
		Duration of External Examination	**3 Hours**

Part I

Pr. No	**Title of the Practical**	**No. of Practicals**
1	Examples on De-Moivre's Theorem	1
2	n^{th} roots of unity	1
3	Expansion of $\cos n\theta$, $\sin n\theta$	1
4	Solution of system of linear homogeneous equations.	1
5	Solution of system of linear non-homogeneous equations.	1
6	Eigen values and Eigen vectors of matrix	1
7	Cayley Hamilton Theorem (Verification and finding inverse of matrix)	1
8	Examples of n^{th} derivative	1
9	Examples on Leibnitz's Theorem.	1
10	Examples on partial differentiation	1
11	Examples on expansion of functions	1
12	Lagrange's Mean Value Theorems.	1
13	Cauchy's Mean Value Theorems.	1
14	L' Hospital's rule for $0 \times \infty$ and $\infty - \infty$ form.	1
15	L' Hospital's rule for $0^0, 1^\infty, \infty^0$ form.	1
	Total Practicals	15

B.Sc. B.Ed. Four Year Integrated Programme
Part-I, Semester-I Part-I, Semester-I
Paper Code: AEVC-I -Title of the Paper- Language-1 (English)

Marks	**100**	**Credits**	**04**
Total Hours (in One Semester)	**60**	**Hours Per Week**	**06**
Internal Marks	**40**	**Theory Exam Marks**	**60**
		Duration of Theory Examination	**3 Hours**

Learning Outcomes:

After completing this course, the student teachers will be able to:

a. understand language and cognition of communication.
b. use correct English language grammar during day today communication.
c. acquire English language listening and speaking skills.
d. acquire English language reading skills.
e. acquire English language writing skills.

UNIT: I- Understanding Language, Communication and Cognition

a. Language, communication, and cognition: Definitions and functions of language. Types of communication, Language, culture and society, Bi-/Multilingualism in India, Language learning, translation, formal and informal communication, verbal and non-verbal communication, gestures language skills (listening, speaking, reading, & writing), and the new-age technologies. Language as a means of communication and language as a medium of cognition**.**

b. Nature and process of communication: principles, Definition, and types; **Language:**
Definition, characteristics, functions.

c. Language and society: language variation, language and dialect, language policy and language planning, language standardization; Multilingualism in the Indian context, Language as a means of communication and language as a medium of cognition.

d. The process of communication: barriers to communication, written and oral communication, the story of human communication from early times to new age: Language variation, Multilingualism.

e. Context of communication: the role of decoder, face-to-face interaction, turn taking. conversation, politeness principles, opening and closing, regional variation, social variation, and the standard language.

UNIT-II - Understanding Grammar

a. **Classification of speech sounds and letters:** stress, pitch, tone, intonation and juncture, parts of speech, identification of morphemes, word formation processes.
b. **Sentences**: simple, complex, and compound, semantics and pragmatics, lexical semantics, and speech acts.
c. **Production of speech sounds in languages; Suprasegments:**

stress, pitch, tone, intonation; Word formation processes; Sentence formation, semantics, and pragmatics.

d. **Morphemes/Sentence Formations:** Identification of morphemes, word formation processes; Sentence formation, vocabulary. formation; Pragmatics and speech acts.
e. **Sound production in the language:** Coining new words and speech acts.

UNIT-III- Listening Skills & Speaking Skills

a. **Why listening is important;** kinds of listening; Listening strategies. Need for modeling good listening behavior, Listening across the curriculum, and note- taking.
b. **Listening comprehension and Recorded speeches/texts**: Understanding of various accents.
c. **Speaking to learn and learning to speak:** situational conversations and role plays; tasks/activities for developing speaking (speech, elocution, discussion, debate, storytelling, illustrations).
d. **Activities for developing speaking, role play:** The impact of culture on speaking.
e. **Presentation and speaking skills:** Practicing narrative skills; Body language, voice, and pronunciation; Creating interest and establishing a relationship with the audience.

UNIT – IV - Reading Skills

a. **Reading comprehension:** types of reading, text, meaning and context, reading as an interactive process; strategies for making students active readers and developing critical reading skills.
b. **Understanding denotative and connotative aspects** of a text, Vocabulary development through reading.
c. **Features that make texts complex**, reading as an interactive process; Understanding denotative and connotative aspects of a text.
d. **Vocabulary development through reading:** Skimming and Scanning.
e. Reading discipline-based texts; **Vocabulary development:** through reading. **Speech versus writing;** Types of writing; writing for specific purposes (essays, letters, and reports).

UNIT – V - Writing Skills

a) **Speech versus writing;** Types of writing; writing for specific purposes (essays, letters, and reports).

b) **Language and style of Writing;** Dealing with New Words (Academic Vocabulary Building) Summarizing and Paraphrasing techniques.

c) **Academic writing components**: development of academic language; Activities to develop academic writing skills. Developing Critical, analytical, and interpretive thinking skills. Learning to analyze.

d) **Critical thinking:** Enhancing Critical thinking abilities; Critical Interpretation, Questioning and Challenging your Beliefs and Values; developing ideas and evaluating

e) **Language and style of Writing;** Dealing with New Words (Academic Vocabulary Building) Summarizing and Paraphrasing techniques.an argument. Observing a problem, describing the problem, framing the problem, comparing,and evaluating a problem.

Practicum (40 Marks along with internal Viva-Voce)

a. Analyze a recorded video from the perspective of voice and pronunciation and write a report.
b. Observing, describing, and framing a problem and evaluating it.
c. Maintain a reflective diary regarding Learning English Communication \Skills and write a report.
d. Internal Viva-Voce for assessment of English Language Skills.

Mode of Transaction

Teaching this course will involve a mix of interactive lectures, tutorials, and practical involves such as discussion, role plays, projects, simulations, workshops, and language-awareness activities. The teaching intends deeper approaches to learning involving in-classroom discussion, developing the critical thinking/problem-solving abilities among the students, and will also focus on situations where in our daily lives one would be performing tasks that involve a natural integration of language skills. The students are expected to read assigned chapters/ articles before the session and the course requires active participation from the students.

Suggestive Reading Materials:

Brown, C. (2019). The Power of Listening. HarperCollins
Johnson, A. (2018). Mastering Public Speaking. Penguin Books.
Smith, J. (2020). The Art of Reading. Random House.
Williams, M. (2021). Essential Grammar Rules. Oxford University Press.
"Fluent Forever: How to Learn Any Language Fast and Never Forget It" by Gabriel Wyner "The Language Instinct: How the Mind Creates Language" by Steven Pinker
"How Languages Are Learned" by Nina Spada and Patsy M. Lightbown
Speaking:
"Talk Like TED: The 9 Public-Speaking Secrets of the World's Top Minds" by Carmine Gallo"Speak with Impact: How to Command the Room and Influence Others" by Allison Shapira"The Art of Public Speaking" by Dale Carnegie
Listening:"Active Listening 1 Student's Book with Self-study Audio CD" by Steven Brown and Dorolyn Smith "Listen Like a Dog: And Make Your Mark on the World" by Jeff Lazarus
"Listening Myths: Applying Second Language Research to Classroom Teaching" by Steven Brown

B.Sc. B.Ed. (Integrated) Four Years Programme

Semester-I

Title of the Paper: (AEVC-II) Art Education (Performing and Visual)- I

Total Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**4**
Internal Exam Marks	**25**	**External Exam Marks**	**25**
		Duration of External Examination	**45 Minutes per Student**

Learning Outcomes:

After completion of this course, student will be able to –

a. Get basic knowledge of visual and performing art through its definitions and basic concepts.

b. Understand basic knowledge of various types of visual arts.

c. Get an insight into various forms of performing arts.

d. Learn practically basic outline of Swar, Alankar, Tal, Raga and Sugam.

Unit-I : Importance of Aesthetics and Art Education

a. Basic Idea of aesthetics and art.
b. Ways in which the aesthetic dimension manifests itself in human life.
c. Use of various examples of art identifying aesthetic aspects of daily life.
d. Development of aesthetic judgment and gaining familiarity with role of art in education.
   Three aspects of art in education:
   The value of art itself and its use as an instrument in education
e. Moral dimensions of works of art and the controversial distinction between the value of popular art and High art.

Unit-II : Introduction to Theatre and Beginning with the Body

a. Essentials in the aesthetics of theatre as like Performance, the Makers, the audience and the context and relating it to the world around in everyday lives.
b. Use of theatre in Social Movements and it's Contribution to educate the larger population about important social issues.
c. Theatre work as like Budhan theatre and Manalmagudi-physical nonverbal theatre.
d. The role of theatre in pedagogy and practice.
e. Use of body and voice in a given space and time with respect to other bodies (teaching it with several games and exercises) for familiarize them with certain basics of movement, voice, acting, in group and as individuals.

Unit-III : Arriving at a Script and Performance of the script

a. Adopting and devising a script with actors. Process of borrowing it from everyday experiences of memory, Soundb and visuals without a written text or spoken word.

b. Reading of different plays, stories, poems, newspapers, articles by reflecting analyze, re-create like- why, why Grill by Mahashweta Devi, Ratna Pakshil, by k Ramaiah – Beyond the land of Hattamala and scandal In Fairyland by Baadal Sircar and songs of Kabir etc. (The texts chosen will have a direct relation with topics from studies moral and political education.

c. Considering unit-II exploring, ideating, Creating finally writing the scripts in groups considering the king of stories narratives and character they choose to perform related to the education system.

d. Performing the script by rehearsing in groups apart from using bodies to play characters and designing the aesthetic elements like sets, props, costumes, lights, music and sounds for the performance.

e. Final performance in front of a small audience followed by a brief post-performance discussion. Students will engage in discussing and reflecting on the vents, questions and comments shared by the audience.

Transaction mode:

The Pedagogy is basically hands on traing and experiential learning. Learning the art in connation with the education. The process through different forms of art-line arts, playing with colours, costume designing, facial make up, script writing, music and performance.

References:

- Lowenfield, V. and W. Lambert .1987- Creative and Mental Growth. Malmillan. London.
- Prasad, D. 1998. Art , the basis of education, National Book Trust . New Dellhi.
- National Council for Educational Research And Training . New Dellhi. Source Book an Assessment for Classes I-V : Art Education. 2008.
- Dewey , J. (1934). Art as Experience. New York : Capricorn Books

Uhrmacher, P.B. (2009). Toward a Theory of Aesthetic Learning Experience. Curriculum Inquiry, 39(5), 613- 636

- Greene, M.(2001). Variations an a Blue Guitar: The Lincoln Center institute lectures an thetic education.
- New York: Teachers College Press.
- A Practical Guide for Teaching K-12 visual Arts Edited by John A. Michael, 1993
- Educational Theatre Association (ETA). http: //www.edta.org
- Local Arts Education Partmership grant Program.

http://www. cac.ca.gov

sTeaching Arts .org .http:// www.teaching arts.org

B.Sc. B.Ed. (Integrated) Four-Year Programme
Part I, Sem-I

AEVC -V

Understanding India (Indian Ethos and knowledge system)

Marks	**50**	**Credits**	**02**
Total Hours (in One Semester)	**30**	**Hours Per Week**	**04**
Internal Exam Marks	**20**	**Theory Exam Marks**	**30**
		Duration of Theory Examination	**1.5 Hours**

Learning Outcomes : After the completion of the course, students will be able to:

- **Critically analyze the scope and relevance of Indian Knowledge Systems** in contemporary academic and socio-cultural contexts, drawing connections between ancient wisdom and modern applications in areas such as education, sustainability, governance, and health.
- **Interpret the role of traditional Indian art, literature, and performing arts** in shaping cultural identity, spiritual practices, and social values, while examining their transformation under globalization and modernization.
- **Evaluate ancient Indian systems of governance, law, and economics**—including concepts from *Dharmaśāstra*, *Arthashāstra*, and Chanakyaniti—for their applicability in current discourses on decentralization, justice, and equitable development.

Compare indigenous Indian approaches to environmental sustainability and health with modern paradigms, particularly in the areas of ecological balance, Ayurvedic health practices, mental wellness, and sustainable living models.

UNIT - I: Foundations of Indian Knowledge and Cultural Identity

a. **Definition and Scope of Indian Knowledge Systems**: Understanding the framework, principles, and interdisciplinary nature of Indian knowledge systems; their relevance in modern education, science, and technology.

b. **Revisiting Ancient Knowledge for Contemporary Applications**: Exploring the need to study ancient Indian traditions, texts, and practices to address modern challenges in sustainability, ethics, and innovation.

c. **Fine Arts and Their Cultural Significance**: Traditional and contemporary Indian fine arts; their connection to spirituality, identity formation, and their role in navigating globalisation.

d. **Performing Arts as Cultural Expressions**: Diversity of Indian dance systems, traditional music forms, visual arts, and folk arts; their role in preserving cultural heritage.

e. **Indian Literary Traditions**: Evolution of Sanskrit, religious texts, Indian poetry, folk literature, and regional literature (Sangam, Kannada, Malayalam, Bengali); their contributions to cultural identity.

UNIT - II: Governance, Law, and Economic Systems in Ancient India

a. **Political Systems and Administration**: Structure of kingship, oligarchies, and republics; decentralized governance through local village systems.

b. **Dharma-Based Legal Systems**: Role of dharma in shaping laws; organization of criminal justice systems, including police, jails, and punishment mechanisms.

c. **Chanakyaniti and Equitable Governance**: Key principles from Chanakya's Arthashastra for fair and effective governance; their relevance to modern administration.

d. **Evolution of Indian Economy**: Economic systems from the Stone Age to the Gupta period; role of urbanization, castes, guilds, Harappan economy, agriculture, and new occupations.

e. **Trade, Commerce, and Land Systems**: Internal and external trade routes, Indo-Roman contacts, South Indian maritime trade, temple economy, land grants, property rights, and land revenue systems.

UNIT - III: Environment and Health in Indian Tradition

a. **Society's Perception of Natural Resources**: Traditional views on forests, land, water, and animals; practices for achieving ecological equilibrium.

b. **Sustainable Architecture and Urban Planning**: Indigenous approaches to architecture, urban design, and environmental practices for sustainable living.

c. **Traditional Indian Health Systems**: Principles of Ayurveda, Siddha, Ashtavaidya, and Unani; key insights from Sushruta Samhita and Charaka Samhita.

d. **Mental Health and Holistic Practices**: Indian concepts of mind, dhyana, mind-body relationship, and contributions from Ayurveda, Yoga Darshan, and the concept of atman.

e. **Indigenous Sustainable Development Models**: Traditional Indian models for sustainable development, integrating environmental, social, and economic balance.

Practicum (40 Marks)

The modes of curriculum transaction will include lectures, Tutorials, and Practicum.

- Practicum will include organization of day trips that help student teachers watch events relating to visual and performing art; activities that enable student teachers to identify and record through photos, videos, etc. the elements of ancient architecture still existing in the city around them.

- organization of Individual and group presentations based on themes such as Polity, Law and Economy etc.,

- organization of a Knowledge of India‘ day in the institution to celebrate the culture (e.g. food, clothes, etc.) that they would have been explored in lectures and tutorials;

- Interactions with family members, elders, neighbors, and other members of society about the evolution of local systems and economy etc.

Mode of Transaction

- Lectures will include learner-driven participatory sessions, and Guest lectures by experts.

and practitioners, such as fine arts and performing arts practitioners along with contemporary poets & writers of Indian literature. 182

- Tutorials will include Screening of documentaries and films followed by a discussion; Learner-driven discussions in the form of focus group discussions (FGDs), Socratic Discussions, etc.; Debate/discussion can be organized to explain India‘s Vaad tradition; discuss on how some of the ancient methods of teaching are relevant in today‘s time; discussions that help Identify ethical dilemmas in daily lives and understanding the importance of ancient ethics and values to resolve them.

Suggestive Mode of Assessment

The approaches to learning assessment will include, for example:

- Supporting the curiosity and interest of student teachers in the selected themes through a multi-modal approach, including regular assessments and actionable feedback that enable learners to outline and interpret the processes and events of the formation & evolution of knowledge of India through a multidisciplinary lens.
- Enabling student teachers to demonstrate critical analysis and independent thinking about the processes and events in the formulation and evolution of different traditions helps them evaluate the diverse traditions of India, distinguishing its achievements and limitations.
- Use of first-hand or second-hand experiences that enable student-teachers to develop and articulate an ethics-based education **rooted in Indian thought to their students in the classroom context.**

Reading Material

Kapoor, K., & Singh, A. K. (Eds.). (2005). *Indian knowledge systems* (Vols. 1–2). D.K. Printworld.

Sharma, R. S. (2005). *India's ancient past*. Oxford University Press.

Harle, J. C. (1994). *The art and architecture of the Indian subcontinent* (2nd ed.). Yale University Press.

Wade, B. C. (2005). *Performing arts in India: Essays on music, dance, and drama*. Manohar Publishers.

Das, S. K. (1991–2005). *A history of Indian literature* (Vols. 1–8). Sahitya Akademi.

Sen, S. N. (1999). *Ancient Indian history and civilization*. New Age International.

Hiltebeitel, A. (2011). *Dharma: Its early history in law, religion, and narrative*. Oxford University Press.

Kautilya. (2016). *Arthashastra: The science of wealth* (T. R. Trautmann, Trans.). Penguin Classics.

Das, S. K. (2006). *The economic history of ancient India*. Munshiram Manoharlal Publishers.

Chandra, M. (1977). *Trade and trade routes in ancient India*. Abhinav Publications.

Krishna, N. (Ed.). (2010). *Ecological traditions of India*. C.P.R. Environmental Education Centre.

Shukla, D. N. (2008). *Vastu Shastra: Hindu science of architecture*. Munshiram Manoharlal Publishers.

Lad, V. (1984). *Ayurveda: The science of self-healing*. Lotus Press.

Cope, S. (2000). *Yoga and the quest for the true self*. Bantam Books.

Dwivedi, O. P. (Ed.). (2000). *Traditional knowledge systems and environmental sustainability*. Indian Institute of Advanced Study.

B.Sc.B.Ed. (Integrated) Four Years Programme Part-I, Sem-I

Self Study SS-I: Good Governance

Students have to do Self –Study and Qualify the internal Exam

Unit: I Democracy in India

a: Dimensions of Democracy: Social, Economic and Political – Decentralisation: Grassroots Level Democracy – Challenges before Democracy: women and marginalised sections of the society

Unit: II Election to Local Self Government Bodies

73rd and 74th Constitutional Amendment Acts: Institutions at the local level and Role of State Election commission – Local Body Elections: Urban & Rural – Duties of an Individual towards electoral process

Unit: III Good Governance

Meaning and concept – Government and Governance – Good Governance initiatives in India

Structure of Semester-II							
Component	**Code**	**Title**		**Marks**	**Credits**	**Total Hours**	**Hours Per Week**
	Discipline Major						
Disciplinary / Inter-disciplinary Courses	D-II	Course I	DSC III (2): Phy-III:	50 (T 30+ I 20)	02	30	02
			DSC IV (2): Phy-IV:	50 (T 30+ I 20)	02	30	02
			DSC P II (2) :	50	02	60	04
		Course II	DSC III (2): Chem-III:	50 (T 30+ I 20)	02	30	02
			DSC IV (2): Chem -IV:	50 (T 30+ I 20)	02	30	02
			DSC P II (2) :	50	02	60	04
		Course III	DSC III (2): Math-III:	50 (T 30+ I 20)	02	30	02
			DSC IV (2): Math-IV:	50 (T 30+ I 20)	02	30	02
			DSC P II (2) :	50	02	60	04
Ability Enhancement & Value-Added Courses	AEVC -IV	Language-II (Other than Language-I)		100 (T60+I 40)	04	60	06
	AEVC -V	Understanding India (Indian Ethos and Knowledge Systems)		50 (T30+ I20)	02	30	06
	AEVC -VI	Teacher and Society		50 (T30+ I20)	02	30	04
Self-Study	SS-II	Constitution of India		Student required to qualify the internal exam.			
Total =				650	26	480	40

Note- T: Theory, P: Practical/Practicum, I: Internal, E: External

B.Sc. B.Ed. (Integrated) Four Years Programme
Semester-II
Paper Code:D-II
PHYSICS Paper-III
Title of the Paper : Properties of Matter

Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**2**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes:

1. Students are able to understand concept of elasticity, surface tension, viscosity.

2. Students are able to understand measurements and principles: Utilize advanced techniques like

Unit No.	Topics	Total Lectures
Unit I	**Elasticity (9)** Introduction (Hooke's law, Elastic moduli-Relation between elastic constants), Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants, Bending of beam, Bending moment, Cantilever (without considering weight of cantilever), Beam supported at both ends (without considering weight of beam). Torsional oscillation, Determination of Rigidity modulus and moment of inertia - q, η and σ by Searle's method	**9**
Unit II	**Surface tension (6)** Surface tension (definition), angle of contact and wettability, relation between surface tension, excess of pressure and radius of curvature, experimental determination of surface tension by Jaeger's method, Applications of surface tension.	**6**
Unit III	**1. Fluid dynamics (8)** Introduction, Concept of viscous force and viscosity, Coefficient of viscosity, Steady and Turbulent flow, Reynolds number, Equation of continuity, Bernoulli's Theorem, practical applications: (i) Law of hydrostatic pressure (ii) Filter pump (iii) Speed of efflux (iv) Ventury tube **2. Viscosity (7)** Introduction, Ideal and viscous fluids, Flow of liquid through capillary tube, Poiseuille's equation, Experimental determination of coefficient of viscosity of liquid by Poiseuille's method, effect of temperature and pressure on viscosity of liquid.	**15**

3. Poiseuille's method, bending, and vibration to measure viscosity, Young's modulus, and Poisson's ratio, demonstrating understanding of fluid dynamics and elasticity.
4. Students are able to analyze surface tension and its impact: Employ Jaeger's method to investigate surface tension, recognizing its role in various phenomena and its dependence on material properties.

Reference Books:

1. Physics – S.G. Starling and Woodal Longmams and Green Co. Ltd.
2. Elements of properties of matter – D.S. Mathur, Shamlal Charitable trust New Delhi.
3. A text Book of properties of matter–N.S. Khare and S. Kumar. Atmaram and sons New Delhi.
4. Physics Vol. I and Vol. II–David Halliday and Robert Resnik, Willey eastern Ltd, New Delhi.
5. Concepts of Physics -H.C. Varma -Bharati Bhavan Publishers

SESSIONAL WORK: (IF REQUIRED)
TRANSACTIONAL MODE:
ESSENTIAL READINGS:
REFRENCES: (APA Style)

B.Sc. B.Ed. (Integrated) Four Years Programme
Semester-II
Paper Code: D-II
PHYSICS Paper-IV
Title of the Paper : Electricity and Magnetism-II

Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**2**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes:

1. Students are able to understand importance of complex numbers in analysis of AC Circuits contacting Inductance(L) Capacitor(C) and Resistance (R) and their various configurations.
2. Students are able to define and apply the concepts in AC circuits such as Impedance (Z), reactance (XC and XL), Admittance, Susceptance and Quality Factor (Q).
3. Students are able to understand and design AC bridge: Owen`s Bridge.
4. Students are able to understand basic working principle of Ballistic galvanometer.
5. Students are able to define constants of ballistic galvanometer.
6. Students are able to understand the explain the phenomenon of hysteresis in magnetism.
7. Students are able to discriminate different magnetic materials based on their characteristic properties

Unit No.	Topics	Total Lectures
Unit I	**A.C. circuits (10)** Complex numbers and their application in solving a. c. series LCR circuit using j operator and phasor diagram, Resonance in LCR series circuit, Sharpness of resonance (qualitative treatment only), Resonance in LCR Parallel circuit, complex Impedance, Reactance, Admittance, and Susceptance, Examples of series and parallel resonance, A.C. Bridge - Owen's Bridge Q-factor (definition only).	**10**
Unit II	**1. Electromagnetic induction (5)** Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils, Energy stored in magnetic field. **2. Ballistic galvanometer (7)** Construction and working of B. G., expression for charge flowing through ballistic galvanometer, Correction for damping in galvanometer, Constants of ballistic galvanometer.	**12**
Unit III	**Magnetic materials and their properties (8)** Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. diamagnetic, paramagnetic, ferromagnetic: Hysteresis and hysteresis curve, ferrimagnetic and antiferromagnetic materials.	**8**

Reference Books:

1. Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education.
2. Electricity and Magnetism, J.H. Fewkes& J. Yarwood. Vol.I, 1991, Oxford University Press.
3. Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
4. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
5. Electricity and Magnetism ,Khare and Shrivastav.Atma Ram & Sons, Delhi, 1976
6. University Physics 9th Edition ,Young and Freedman.
7. Foundations of Electromagnetic Theory ,Rritz and Milford. Pearson Publication
8. Electricity and Magnestism, Gupta,Kumar and Singal
9. Basic Electronics and Liner Circuits, N.N.Bhargava, D.C.Kulshrestha and S.S.Gupta, Tata McGraw-Hill
10. Electronic Fundamentals and Applications, J.D.Ryder, Prentice-Hall of India Pvt.Ltd
11. Network theory and Filter Design, V.K.Aatre, New Age International Publisher
12. Principals of Electronics, V.K.Mehata, S. Chan

SESSIONAL WORK: (IF REQUIRED)
TRANSACTIONAL MODE:
ESSENTIAL READINGS:
REFRENCES: (APA Style)

B.Sc. B.Ed. (Integrated) Four Years Programme
Semester- II
Paper Code: D-II
PHYSICS Practical II

Title of the Paper

Marks	**50**	**Credits**	**2**
Total Hours	**60**	**Hours Per Week**	**4**
Internal Exam Marks	**-**	**External Exam Marks**	**50**
		Duration of External Examination	**3 Hours**

Learning Outcomes:

After going through the course, the student should be able to

- Acquire skills in setting up experiments.
- Develop practical skills and techniques for accurate measurements.
- Acquire observational skills.
- Determine the least counts of different measuring instruments.

Group I

1. To determine the coefficient of viscosity by Poiseuille's method.
2. To determine Y by method of bending.
3. Surface tension by Jaeger's method.
4. To determine the viscosity of viscous liquid by the Stokes method.
5. To determine Poisson's ratio of rubber (rubber tube).
6. Young's modulus of the material of bar by vibration.
7. To determine the time period and constant of the logarithmic decrement of B. G.
8. To determine constants of B. G.

Group II

1. To determine the impedance of the series LCR circuit.
2. To study the series LCR circuit.
3. To study a parallel LCR circuit.
4. Verification of Kirchhoff's current law.
5. Verification of Kirchhoff's voltage law.
6. Owen's Bridge- To determine the resistance of a coil by DC balance.
7. Study of transformers.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H. T. Worsnop, 1971, Asia
2. Publishing House.
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011,

Kitab Mahal, New Delhi. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn,

4th Edition, reprinted 1985, Heinemann Educational Publishers

3. College Practical Physics – Khanna and Gulati (S. Chand and Co. Ltd, Delhi).
4. Practical Physics – Gupta and Kumar (PragatiPrakationMeerat)
5. Advanced Level Practical Physics – J.M. Nelcon, J.M. Ogloom (EIBS).

7.Engineering Practical Physics- S. Panigrahi & B.Mallick,2015, Cengage Learning India Pvt. Ltd.

6. B.Sc. Practical Physics - Harnam Singh and P S Hemne, S Chand publications.
7. Advanced Practical Physics for students, B.L.Flint & H. T. Worsnop, 1971, Asia Publishing House.
9. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
8. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition,
9. reprinted 1985, Heinemann Educational Publishers
10. College Practical Physics – Khanna and Gulati (S. Chand and Co. Ltd, Delhi).
11. Practical Physics – Gupta and Kumar (PragatiPrakationMeerat)
12. Advanced Level Practical Physics – J.M. Nelcon, J.M. Ogloom (EIBS).

B.Sc. B.Ed. (Integrated) Four Years Program

Semester- II

Paper Code: D-II
Paper III

Title of the Paper: Physical Chemistry

Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**2**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes

a. Learning and coherent understanding of basic concepts and rules of logarithms, graphs, derivative and integrations. Knowledge and coherent understanding of basic concepts in thermodynamics will be gained by the student.

b. Learning and understanding the knowledge about basic concepts in kinetics and first order, second order reactions with characteristics and suitable examples.

c. Learning and coherent understanding of surface tension, viscosity and refractive index with suitable examples.

d. Learning and coherent understanding of basic concepts in electrochemistry, conductors and conductivity cells, measurement of conductance with suitable examples and numerical problems.

UNIT I: Basic Mathematical Concepts and Thermodynamics, Chemical Kinetics (16 hours)

a. **Basic Mathematical Concepts and Thermodynamics**: Logarithm: Basic rules and calculations. Graph - Quadrants, drawing of linear graph, Slopes and Intercept, Derivative and Integration: Basic rules. Thermodynamics: Introduction, Basic terms used in thermodynamics, zeroth law of thermodynamics

b. first law of thermodynamics: Mathematical equation, sign conventions, statements of first law and its limitations, Spontaneous and non-spontaneous processes. Second law of thermodynamics, Heat engine, Carnot's Cycle and efficiency of heat engine, Numerical Problems.

c. **Chemical Kinetics:** Introduction, rate of reaction, definition, and units of rate constant, Factors affecting rate of reaction, Order and Molecularity of reaction. First order reaction: Derivation of rate constant, Characteristics of the first order reaction, Pseudo- first order reactions –i) Hydrolysis of methyl acetate in presence of acid, ii) Inversion of cane sugar

d. Second order reaction: Derivation of rate constant for equal and unequal concentration of the reactants, Examples of Second order reaction: i) Reaction between K2S2O8 and KI and ii) Saponification of ethyl acetate, Characteristics of Second order reactions. Numerical problems.

Unit II: Physical properties of liquids and Electrochemistry (7 hours)

a. Physical properties of liquids: Introduction to states of matter, qualitative description of intermolecular forces in liquids, structure of liquids, classification of physical properties. Surface tension and its determination using stalagmometer and differential rise method

b. Viscosity and its determination using Ostwald's viscometer, Refractive index (Snell's law) specific and molecular refractivity's and its determination using Abbe's refractometer. Numerical Problems.

Unit III: Electrochemistry (8 hours)

a. Electrochemistry: Introduction, types of cell, phenomenon of electrolysis, Faradays Laws of electrolysis, Types of conductors, Explanations of Conductance, specific conductance, equivalence and molecular conductance. Variation of specific conductance, equivalence and molecular conductance with dilution, equivalent conductance at infinite dilution.

b. Dipping type of conductivity cell, modifications in the technique used before measurement of conductance w.r.to use of alternating current, use of conductivity water, conductivity cell and temperature control. Measurement of conductance by Wheatstone bridge, Cell constant and its determination, Numerical problems.

Reference Books:

1) Barrow, G.M. Physical Chemistry Tata McGraw-Hill (2007).

2) Castellan G.W. Physical Chemistry 4 th Ed. Narosa(2004).

3) Kotz, J.C. Treichel, P.M.&Townsend,J.R.General Chemistry, Cengage Learning India Pvt Ltd: New Delhi(2009).

4) Mahan, B.H. University Chemistry, 3rd Ed. Narosa (1998).

5) Petrucci, R.H. General Chemistry, 5th Ed., Macmillan Publishing Co,: New York(1985).

6) Elements of Physical Chemistry S., Glasstone, D.Lewis.(2010)

7) Principles of physical Chemistry Marron and Prutton. (2007).

8) Elements of Physical Chemistry P.W. Atkins (2017-18)

9) Essentials of Physical Chemistry Bahl and Tuli. S. Chand,2010.

10) Physical Chemistry Danials and Alberty (2016)

11) University General Chemistry C. N. R.Rao(2016)

12) Priniples of Physical Chemistry, Puri, Sharma and Pathania 47th Edison, Vishal Publishing Co.

13) Physical Chemistry, A. J.Mee

14) Advanced Physical Chemistry, GurudeepRaj

15) Physical Chemistry, R. A. Alberty 16) General Chemistry, 5th Edition, Macmillan Publishing Co., New York (1985)

B.Sc. B.Ed. (Integrated) Four Years Programme

Semester- II

Paper Code: D-II
Paper IV

Title of the Paper: Analytical Chemistry

Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**2**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes

a. Learning various analytical procedures and importance also sampling, accuracy and precision. Distinguish between classical and industrial chemistry. Learning and understanding basic concepts and concentration terms Knowledge of IPR.

b. Knowledge of chromatographic separation technique and terms involved in it. Learning paper chromatography and thin layer chromatography.

c. Knowledge of various type of titrations, neutralization curves, indicators used in various titrations.

d. Knowledge about the chemical nature and cleansing action of soap.

UNIT I: Introduction to analytical Chemistry and Fundamentals of Industrial Chemistry and IPR (10 hours)

a. Introduction, Importance of analysis, Analytical processes (Qualitative and Quantitative), Methods of analysis (Only classification), Sampling of solids, liquids and gases. Errors, types of errors (determinate and indeterminate), methods of expressing accuracy (Absolute and relative error), Significant figures, mean, median, standard deviation (Numerical problems expected).

b. Fundamentals of Industrial Chemistry and IPR: Difference between classical and industrial chemistry, Raw materials for chemical industry, Material safety data sheets (MSDS), Definition and Explanation of terms - Molecular weight, Equivalent weight, Molarity, Normality, Molality, Molarity of mixed solution, Acidity of base, Basicity of acid, ppt, ppm, ppb solutions, Mole Fraction. Weight fraction, Percentage composition by W/W, W/V, V/V, Problems based on Normality, Molarity, mole fraction, mixed solution, etc. IPR- Introduction to IPR and its significance in presence scenario.

UNIT II: Chromatography (8 hours)

a. Chromatography: Introduction, Basic Principle of Chromatography, Basic terms, Classification of Chromatography, Paper Chromatography- Principle, Methodology- types of papers and treatment, sample loading, choice of solvent. Development- ascending, descending, circular, location of spots, determination of Rf value, Applications, advantages and disadvantages.

b. Thin layer chromatography- Principle, Solvent system, stationary phases, preparation of TLC plate, Detecting reagents, methodology-sample loading. Detection of spot, Rf value, Applications, advantages and disadvantages, Comparison of paper chromatography and TLC.

UNIT III: Theory of titrimetric Analysis, Soaps and Detergents (12 hours)

a. Introduction, Acid-base indicators, Theory of indicators w.r.t. Ostwald's ionization theory and quinoid theory. Neutralization curves and choice of indicators for a. Strong acid-strong base b. Strong acid-weak base c. Strong base-weak acid

b. Complexometric titrations a. Introduction b. Types EDTA titrations c. Metallochromic indicators-Eriochrome black- T d. Indicator Action of Eriochrome black- T.

c. Soaps and Detergents: Introduction, Soaps - Raw materials, Types of soaps, Cleansing action of soap. Manufacture of soap - Boiled or Hot Process, Cold process.

d. Detergents - Types of Detergents: Anionic, cationic and amphoteric (with example), Preparation of Teepol and Deriphat. Preparation of Shampoos, Comparisons between soaps and detergents.

Reference Books:

1) Principles of Physical Chemistry by Puri, Sharma and Pathania, Vishal Publishing company Jalindhar.

2) Essential of Physical Chemistry by Bahl B.S., Tuli G.D. and BahlArun, S.Chand and Company Ltd.New Delhi

3) Modern Analytical Chemistry by David Harvey, McGRAW-Hill International Edition, 2000

4) Industrial chemistry by B. K. Sharma, Goel Publishing Housing, 16th edition2011

5) Advanced Inorganic Chemistry, Vol.No.1, by Gurudeep Raj, Krishna Prakashan Media Ltd, Goel Publication, Meerut

6) Analytical chemistry by B.K. Sharma, Krishna Prakashan Media Ltd, Meerut, edition 3rd 2011

7) Principles of electroplating and electroforming by Blum and Hogaboom

8) Chemical Process Industries by Shreve and Brink

9) Industrial Chemistry by Loutfy Madkor and Helen Njenga

10) Elementary Principles of Chemical Processes by Richard Felder and Ronald Rousseau, John Wiley and Sons

B.Sc. B.Ed. (Integrated) Four Years Programme
Semester- II
Paper Code: D-II
Chemistry Practical II

Marks	**50**	**Credits**	**2**
Total Hours	**60**	**Hours Per Week**	**4**
Internal Exam Marks	**-**	**External Exam Marks**	**50**
		Duration of External Examination	**3 Hours**

	Name of experiment
1	Quality control-To determine percentage purity of the given sample of soda ash (Na_2CO_3) by titrimetric method.
2	Chromatography: Separation and identification of cations by Paper Chromatography technique from the following mixtures: a) Ni^{2+} + Cu^{2+} b) Ni^{2+} + Co^{2+}
3	Spot Test: Identify the following metal ions by spot test method. Cu^{2+}, Ni^{2+}, Co^{2+}, Fe^{3+}, Al^{3+},Pb^{2+}, Zn^{2+}, Hg^{+2}, Mg^{+2}, Mn^{+2}
4	Organic Qualitative Analysis: Detection of physical constant, type, elements, functional group, and Confirmatory test. Identification of Organic Compounds (at least eight) (four containing at least one extra element- N, S, Cl) a) Acids: Oxalic acid, Benzoic acid, Cinnamic acid b) Phenols: Beta-Naphthol, p-Nitrophenol c) Base: Aniline, p-Nitroaniline d) Neutral: Acetone, Acetanilide, Chloroform, m-Dinitrobenzene, Thiourea, Bromobenzene
5	Purification of organic compounds by crystallization (from water and alcohol) and distillation.
6	Determination of viscosity of given liquids A and B (Density data of liquids, viscosity of water to be given) [Any two liquids from Acetone, Carbon tetra chloride, Chloroform, Ethyl alcohol, Benzyl alcohol, Ethylene glycol and n-propyl alcohol].
7	To study the velocity constant of hydrolysis of methyl acetate in presence HCl/ H_2SO_4.
8	To study the reaction between Potassium persulphate and Potassium iodide kinetically (equal concentration).
9	Determination of heat of ionization of weak acid by using polythene bottle.
10	Preparation and standardization of HCl/H_2SO_4 solution from the bulk.

References:

1) Svehla, G. Vogel's Qualitative Inorganic Analysis, Pearson Education, 2012.

2) Mendham, J. Vogel's Quantitative Chemical Analysis, Pearson, 2009

3) Vogel's Text Book of Quantitative Chemical Analysis. (Longmann) ELBS Edition.

4) Vogel's Text Book of Qualitative Chemical Analysis. (Longmann) ELBS Edition.

5) Hand book of Organic Qualitative Analysis: Clarke.

6) Comprehensive Practical Organic Chemistry – Qualitative Analysis by V. K. Ahluwalia, Sunita Dhingra. University Press. Distributor – Orient Longman Ltd.

7) Comprehensive Practical Organic Chemistry preparation and Quantitative Analysis: V. K. Ahluwalia, Renu Aggarwal. University Press. Distributor – Orient Longman Ltd.

8) A Laboratory Hand - Book of Organic Qualitative Analysis and Separation: V. S. Kulkarni. Dastane Ramchandra & Co. Pune

9) Practical book of Physical Chemistry: Nadkarni, Kothari &Lawande.

10) Experimental Physical Chemistry: A.Findlay.

11) Systematic Experimental Physical Chemistry: S. W. Rajbhoj, Chondhekar. (Anjali Publication.)

12) Experiments in Physical Chemistry: R. C. Das and B. Behra. (Tata McGrawHill)

13) Advanced Practical Physical Chemistry: J. B. Yadav (Goel PublishingHouse.)

14) Practical Physical Chemistry: B. D. Khosala. (R. Chand &Sons)

15) Experiments in Chemistry: D. V. Jahagirdar.

16) A Text Book of Quantitative Inorganic Analysis Including Elementary Instrumental Analysis: A.I. Vogel (Third Ed.)(ELBS)

B.Sc. B.Ed. Mathematics (Integrated) Four Years Programme Semester-II

Paper Code: D-II

Title of the Paper: Differential Equations I

Marks	**50**	**Credits**	**02**
Total Hours	**30**	**Hours Per Week**	**02**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Course Learning Outcomes: Upon successful completion of the course students will able to: CO 1. classify differential equations.

CO 2. solve different types of differential equations.

CO 3. find orthogonal trajectories.

CO 4. apply the knowledge of differential equations to tackle problems occurring in physics and engineering.

Unit 1. Ordinary differential equations of first order and first degree (15 hrs.)

1.1 Introduction.

1.2 Exact differential equations.

1.2.1 Necessary and sufficient condition for exactness.

1.2.2 Differential equations reducible to exact, integrating factors with rules.

1.3 Linear differential equations.

1.4 Differential equations reducible to linear.

Unit 2. Applications of Differential Equations (06 hrs.)

2. .1 Law of growth.

2..2 Law of decay.

2. .3 Newton's law of cooling.

2.4 Orthogonal trajectories to Cartesian and Polar curves.

Unit 3. Linear differential equations with constant coefficients (15 hrs.)

3.1 Introduction.

3.2 Auxiliary equation, Complementary function.

3.3 Types of complementary functions:

3.3.1 Distinct real roots, repeated real roots, complex roots, repeated complex roots,

3.4 Particular integrals for various functions

3.5 Applications to Electrical circuits.

3.6 Examples based on 2.1 to 2.5.

Recommended Book:

1. M. D. Raisinghania, Ordinary and Partial Differential Equations, 20th Revised Edition 2022; S.Chand and Company Pvt.Ltd.NewDelhi.

Scope: Part 1 : Unit 2: 2.12 to 2.32, Unit 3: 3.1 to 3.8, Unit 5 : 5.1 to 5.25.

Reference Books:

1. Dr. A. B. Mathur and V. P. Jaggi, Advanced Engineering Mathematics, Khanna Publishers, 2nd edition, 2001.

2. R. K. Ghosh and K. C. Maity, An Introduction to Differential Equations, Book and Allied (P) Ltd., Seventh Edition, 2000.

3. D. A. Murray, Introductory Course in Differential Equations, Khosala Publishing House, Delhi. 4. Zafar Ahasan, Differential Equations and Their Applications, Second Edition, PHI2004.

B.Sc. B.Ed. Mathematics (Integrated) Four Years Programme Semester-II

Paper Code: D-II

Title of the Paper: Discrete Mathematics

Marks	**50**	**Credits**	**02**
Total Hours	**30**	**Hours Per Week**	**02**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Course Learning Outcomes: Upon successful completion of the course students will able to:

CO 1. analyze the logical structure of statements symbolically, including the proper use of logical connectives, predicates, and quantifiers.

CO 2. construct truth tables, prove or disprove a hypothesis, and evaluate the truth of a statement using the principles of logic.

CO 3. understand and apply the fundamental concepts in graph theory.

CO 4. acquire the basic knowledge of graphs namely vertex, edge, special types of graph, isomorphic graphs, matrix representation of graphs.

Unit- 1 Propositional Calculus (15 hrs.)

1.1 **Revision**

1.1.1 Propositional Logic.

1.1.2 Propositional equivalence.

1.2 **Predicates and Quantifiers:**

1.2.1 Pedicate, n-place Pedicate, n-ary Pedicate.

1.2.2 Quantification and Quantifiers, Universal Quantifier, Existential Quantifier, Quantifiers with restricted domains.

1.2.3 Logical Equivalence involving Quantifiers.

1.3 **Rules of Inference:**

1.3.1 Argument in propositional Logic.

1.3.2 Validity Argument (Direct and Indirect methods)

1.3.3 Rules of Inference for Propositional Logic.

1.3.4 Building Arguments

1.4 Numerical Problems based on 1.2 to 1.3

Unit- 2 Graph Theory **(08 hrs.)**

2.1 Basic Terminology

2.2 Special types of Graphs (Complete graph, Regular graph, Bipartite and complete Bipartite graph)

2.3 Isomorphism

2.4 Adjacency and Incidence Matrix of Graph

2.5 Problems based on 2.2 to 2.4

Unit- 3. Operations on Graph **(07 hrs.)**

2.1 Subgraphs, vertex deletion, Edge addition.

2.2 Complement of a graph and self-complementary graphs.

2.3 Union, Intersection and Product of graphs.

2.4 Problems based on 2.1 to 2.3

Recommended Book:

1. Discrete Mathematics, S. R. Patil , M. D. Bhagat , R. S. Bhamare, S. M. Waingade, N. M. Phatangare and K. D. Masalkar, Nirali Prakashan, Pune.

Reference Books:

1. Discrete Mathematics, D. S. Malik and M. K. Sen, Cengage Learning India Pvt. Ltd, New Delhi.
2. Discrete Mathematical Structures (sixth edition), Kolman, Busby, Ross, Pearson Education (Prentice Hall).
3. Introduction to Graph Theory, Mamta Chaudhary, Vani Sharma and Pooja Yadav, Sultan Chand & Sons, Educational Publishers, New Delhi.
4. Schums Outline of Discrete Mathematics, Seymour Lipschutz, Marc Lipson, Revised Third Edition-McGraw-Hill (2009).

B.Sc. B.Ed. Mathematics (Integrated) Four Years Programme Semester-II

Paper Code: D-II
Title of the Paper: Lab work II

Marks	**50**	**Credits**	**02**
Total Hours	**60**	**Hours Per Week**	**04**
Internal Exam Marks	**–**	**External Exam Marks**	**50**
		Duration of External Examination	**3 Hours**

Part I

Pr. No	Title of the Practical	No. of Practicals
1.	Differential equations reducible to exact	1
2.	Linear differential equations	1
3.	Bernoulli's Differential equations	1
4.	Law of growth	1
5.	Law of decay	1
6.	Newton's law of cooling	1
7.	Orthogonal Trajectories to Cartesian Curves	1
8.	Orthogonal Trajectories to Polar Curves	1
9.	Linear differential equations with constant coefficients (examples on finding C. F.)	1
10.	Particular integrals of the functions: sin ax, cos ax	1
11.	Particular integrals of other functions	1
12.	Test the validity of the argument using truth table.	1
13.	Show the implications without using truth table.	1
14.	Draw the graph represented by the given adjacency matrix.	1
15.	Find the incidence matrix of the given graphs.	1

B.Sc. B.Ed. Four Year Integrated Programme
Semester-II
Title of the Paper: (AEVC-IV) Language-I (Other than Language-I) -Hindi

Marks	**100**	**Credits**	**4**
Total Hours	**60**	**Hours Per Week**	**6**
Internal Exam Marks	**40**	**External Exam Marks**	**60**
		Duration of External Examination	**3 Hours**

अध्यन निष्पत्ती :

पाठ्यक्रम पुरा करणे के बाद छात्र अध्यापन संबध मे कार्य करणे मे सक्षम होंगे |

a. भाषा, समाज और शिक्षा के बारे मे जानकारी दे पायेंगे |

b. L२ मे भाषण और लेखन कर पायेंगे |

c. L२ के व्याकरण को समझ पायेंगे और उसका उपयोग सही और सटीक रूप मे करेंगे |

d. बुनियादी संचार कौशल का उपयोग पारस्पारिक संबध बढाने के लिये कर पायेंगे |

e. भाषा और मानसिक कौशोलोन्के बीच का संबध पह्चानेगे और उसका उपयोग कर पायेंगे |

इकाई – I भाषा, समाज और शिक्षा

a. द्विभाषिकता/बहुभाषिकता और शैक्षिक उपलब्धियां; बहुभाषिकता को बढ़ावा देने की आवश्यकता; भाषाई आदध्यानविविधता और सामाजिक विविधता; भाषाएँ, बोलियाँ और विविधताएँ, सांस्कृतिक विविधताएँ।

b. भाषा का संचरण, भाषाऔरलिंग; भाषा और पहचान; भाषा और शक्ति।

c. संवैधानिक प्रावधान और राष्ट्रीय शिक्षानीति 2020।

d. भाषा अर्जन और भाषा सीखना; मातृभाषा ओंसे भाषा सीखना अन्य भाषाओंके प्रति आकर्षण; अन्य भाषाएँ सीखने के लाभ; भाषा और शिक्षा।

e. प्रथम भाषा, द्वितीय भाषा और अन्य की धारणा।

इकाई – II भाषण और लेखन

a. लेखन प्रणालियाँ: भाषण और लेखन।

b. भाषा में मनमानी।

c.लेखन के प्रकार प्रणालियां।

d. वाक्ध्वनियों के वर्गीकरण सत्र: स्वर, व्यंजन, और अन्य।

e. अधिखंडीय: तनाव, पिच, टोन, स्वरशैली और संधि; ध्वनिक ध्वन्यात्मकी।

इकाई - III व्याकरण को समझना

a. शब्द और अर्थ; भाषण के भाग।

b. व्याकरणिक श्रेणियाँ।

c. शब्दनिर्माण: प्रत्यय, संयोजन, पुनरावृत्ति शब्दावली निर्माण।

d. वाक्य और उसके घटक: सरल, जटिल और मिश्रित वाक्य ।

e. अर्थ विज्ञान और व्यावहारिक: शाब्दिक अर्थ-
पर्यायवाची, विलोम, मेरोनिमी, व्याकरणिक अर्थ, भाषणकार्य।

इकाई - IV में बुनियादी संचार कौशल

a. उच्चारण एवं सुनने की समझ कौशल।

b. पढ़ने और पढ़ने की समझ कौशल।

C. प्रभावी लेखन कौशल।

d. प्रभावी प्रस्तुति और बोलने का कौशल।

e. सारांश और पैराफ़्रेज़िंग कौशल।

इकाई – V आलोचनात्मक पठन एवं चिंतन कौशल

a. आलोचनात्मक सोच और पढ़ने के घटक

b. उच्चक्रम संज्ञानात्मक विकास

c. चिकित्सक विचार

d. आलोचनात्मक सोच और समस्या समाधान

e. तर्क संगत जांच

प्रैक्टिकम (४० मार्क्स)

१. रिकॉर्ड किए गए भाषण को सुनें और ध्वनियों के आधार पर उसे वर्गीकृत करें: स्वर, व्यंजन और अन्य; सुप्रासेगमेंटल: तनाव, पिच, टोन, स्वर और जंक्शन; ध्वनिक ध्वन्यात्मकी।

२.वाक्यों और उनके घटकों का सरल, जटिल और मिश्रित वाक्यों के रूप में विश्लेषण करें
लिखित कार्य से।

३.आलोचनात्मक पठन एवं लचंतन कौिल का उपयोग करके अहवाल नलखना ।

४. लहंदी भाषा के अवगत ककये गये कौिल का मोनखक परीक्षण ।

लेन-देन का सुझावात्मक तरीका

इस पाठ्यक्रम को पढ़ाने में इंटरैक्टिव व्याख्यान, ट्यूटोरियल और व्यावहारिक शामिल होंगे

जैसे कि चर्चा, भूमिका निभाना, परियोजनाएं, सिमुलेशन, कार्यशालाएं और भाषा-जागरूकता
गतिविधियाँ। शिक्षण का उद्देश्य कक्षा में सीखने के गहन तरी कों को शामिल करना है
चर्चा, छात्रों में आलोचनात्मक सोच/समस्या समाधान क्षमता का विकास करना और
उन स्थितियों पर भी ध्यान केंद्रित किया जाएगा जहां हमारे दैनिक जीवन में कोई ऐसे कार्य कर रहा होगा जो भाषा कौशल का एक स्वाभाविक एकीकरण शामिल है।छात्रों से अपेक्षा की जाती है कि वे दिए गए काम को पढ़ें। सत्र से पहले अध्याय/लेख और पाठ्यक्रम में छात्रों की सक्रिय भागीदारी की आवश्यकता होती है ।

छात्र मूल्यांकन का सुझावात्मक तरीका

a. शिक्षार्थी का मूल्यांकन मुख्य रूप से भाषाई और भाषाई दोनों पहलुओं के मूल्यांकन पर आधारित होगा।
b. विभिन्न परीक्षणों और परीक्षण प्रकारों, समूहकार्य और परियोजनाओं का उपयोग करके संचार कौशल विकसित करना।

सुझावात्मक पठनसामग्री

शिक्षक विद्यार्थियों की आवश्यकता और सीखने की विषय-वस्तुके अनुसार पुस्तकें/पाठ्य-सामग्री सुझा सकतेहैं।

कलाशिक्षा (प्रदर्शनऔरदृश्य) और रचनात्मक अभिव्यक्ति

कला - दृष्टिकोण

1.प्रत्येक छात्र को दृश्य और दृश्य कला में 2 क्रेडिट के दो पाठ्यक्रम पूरे करने होंगे।
कला प्रदर्शन।

2.दृश्य कला और प्रदर्शन कला दोनों के अंतर्गत कई कला रूप हैं।

3.इन सभी रूपों में शिक्षक की विशेषज्ञता के साथ-साथ छात्र के लिए समय और संसाधनों की भी आवश्यकता होती है ।

4. वर्णन किया है तीन आदर्श कला पाठ्यक्रम दृश्य और के विभिन्न रूपोंपर आधारित
कला प्रदर्शन।

5.संस्थान संकाय की उपलब्धता के आधार पर किसी विशिष्ट कलारूप को चुनने का विकल्प चुन सकते हैं और संसाधन । संस्थान फिर इन तीन उदाहरणों के आधार पर अपने पाठ्यक्रम तैयार कर सकते हैं।

B.Sc. B.Ed. Four Year Integrated Programme
Semester-II

AEVC-V:Understanding India

(Indian Ethos and Knowledge Systems)

Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**2**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes

After the completion of the course, students will be able to:

a. Compare the core principles and key thinkers of Indian philosophical schools (Vaishesika, Nyaya, Samkhya, Yoga, Purva Mimansa, Vedanta, Jain, Buddhist, Charvaka) and distinguish Advaita, Vishishtadvaita, and Dvaita Vedanta, applying them to contemporary philosophical contexts.

b. Analyses regional, religious, and Ayurvedic influences that shape Indian cuisines and textiles and costumes reflect status, gender, and religion, assessing globalisation's impact on both.

c. Explain ancient India's advancements in arithmetic, logic, natural sciences (math, physics, metallurgy, chemistry), astronomy, and technologies in agriculture and transportation, highlighting their historical and modern significance

Course Units

UNIT I: Introduction to Knowledge of India : Philosophy, Ethics and Values

a. Recap of the previous semester's definition and introduction. Recap of previous knowledge.
b. Schools of Philosophy: Vaishesika, Nyaya, Samkhya, Yoga, Purva Mimansa, Vedanta (Uttara Mimansa), Jain, Buddhist, and Charvaka traditions – key theories and major thinkers.
c. Vedanta Philosophical Systems: Advaita, Vishishtadvaita, and Dvaita – core principles and distinctions.
d. Ethics, Morality, and Social Dilemmas: Relevance of self-leadership and ethical decision-making in contemporary society.
e. Spirituality in Indian Context: Exploring the role of spirituality in social responsibility and its importance in modern times.
e. Ethics in a Technologically Volatile World: Balancing ethical principles with modern technological advancements for a meaningful life.

UNIT II: Culture and Lifestyle (Food, Clothing, Sports, Yoga as a lifestyle and Cultural Connectedness)

a. Regional cuisines, Ayurvedic diet, food in festivals, vegetarianism, Jainism's influence on food, hospitality, and globalisation's impact.
b. Traditional Indian textiles, religious costumes, clothing as a status symbol, gender dynamics, and global influences.
c. Traditional Indian sports, martial arts, gender roles in sports, and the impact of globalisation.
d. Adapting ancient practices for longevity and well-being.
e. Reflection of food, clothing, and lifestyle on India's cultural diversity and global integration.

UNIT-III Science & Technology and Linguistic Traditions

a. Arithmetic and logic. Natural sciences: math, physics, metallurgy, and chemistry.

b. Astronomy: India's contributions to the world. Indian notions of time and space.

c.Technology in the economy: agriculture, transportation, etc

d.Linguistic Traditions: History of linguistics in India (conceptualising ancient Indian linguistics, oral traditions, etc.)

e. Language as Culture: Evolution of Languages over the years & language as building blocks to different cultures and societies. Language: Identity, Culture, and History.

Suggestive Practicum The modes of curriculum transaction will include lectures, Tutorials, and Practicum.

• Practicum will include organization of day trips that help student teachers watch events relating to visual and performing art; activities that enable student teachers to identify and record through photos, videos, etc. the elements of ancient architecture still existing in the city around them; organization of Individual and group presentations based on themes such as Polity, Law and Economy etc., organization of a 'Knowledge of India' day in the institution to celebrate the culture (food, clothes, etc.) that they would have been explored in lectures and tutorials; interactions with family members, elders, neighbors, and other members of society about the evolution of local systems and economy etc.

Mode of Transaction

• Lectures will include learner-driven participatory sessions, and Guest lectures through experts and practitioners, such as fine arts and performing arts practitioners, along with contemporary poets & writers of Indian literature.

• Tutorials will include Screening of documentaries and films followed by a discussion; Learner-driven discussions in the form of focus group discussions (FGDs), Socratic Discussions, etc.; Debate/discussion can be organized to explain India's Vaad tradition; discuss on how some of the ancient methods of teaching are relevant in today's time; discussions that help Identify

ethical dilemmas in daily lives and understanding the importance of ancient ethics and values to resolve them.

Mode of Assessment The approaches to learning assessment will include, for example:

• Supporting the curiosity and interest of student teachers in the selected themes through a multi-modal approach, including regular assessments and actionable feedback that enable learners to outline and interpret the processes and events of the formation & evolution of knowledge of India through a multidisciplinary lens.

• Enabling the student teachers to demonstrate critical analysis and independent thinking of the processes and events in the formulation & evolution of different traditions that help student teachers evaluate the diverse traditions of India to distinguish its achievements and limitations.

• Use of first-hand or second-hand experiences that enable student teachers to develop and articulate an ethics-based education rooted in Indian thought to their students in the classroom context.

Reading Materials: Teachers may suggest books/readings as per the needs of the learners and the learning content

B.Sc. B.Ed. (Integrated) Four Years Programme
Semester-II
Title of the Paper: (AEVC-VI) Teacher and Society

Total Marks	**50**	**Credits**	**2**
Total Hours	**30**	**Hours Per Week**	**4**
Internal Exam Marks	**20**	**External Exam Marks**	**30**
		Duration of External Examination	**1.5 Hours**

Learning Outcomes: After completion of the course, student teachers will be able to:

a. Examine the relationship between teacher beliefs, values, character, life history, social and cultural context, and teaching critically.

b. Explain the teacher roles and characteristics; the personal and professional self; the teacher as a communicator, the charismatic influencer, the reflective practitioner, competent learner, and much more, and their significant role in nurturing the posterity.

c. Differentiate between the narrow curricular aims of education and the broader educational aims and their role in shaping self, school, and society.

d. Demonstrate an ability to develop positive classrooms through engaging in the ethic of care.

e. Demonstrate an ability to critically reflect on personal and collective practices so as to improve learning and teaching.

f. Conceptualize teacher agency, its individual, contextual, and structural dimensions, and how it gets impacted and in turn shapes education.

Unit I: Understanding the Teacher: Exploring the Personal Teacher (8 hrs)

A. Exploring the wider personal and general social context of the teacher: Life history, teacher beliefs, values and aspirations, diverse identities, social contexts, and commitment to learning and education.

B. Exploring the professional teacher: Qualifications, education in teaching, attitude, aptitude, experience, and exposure: The Charismatic Teacher, the Communicator Teacher, The Missionary Teacher, The Competent Practitioner, The Reflective Practitioner, The Learning Teacher. Reflexive practice: Nurturing the professional capital through collaborative and/or collective engagement with self, others, and the social context.

Unit II: Nurturing the Teacher: A Dialogue Beyond the Curricular Goals, for Life and Posterity (7 hrs)

A. Teaching: One profession, many roles, teaching character: Nurturing teachers for human flourishing, Holistic teacher development: Nurturing the Panchakoshas, Teacher values, beliefs, and current philosophy of teaching: A reflective dialogue.

B. Developing an ethic of care in teacher education: Nurturing teachers towards a pedagogy of care, Teacher agency: What is it and why does it matter?

C. Individual, cultural, and structural dimensions of teacher agency: Teacher discourses, philosophy, relationships, networks, and professional development: Shaping teacher agency and creative insubordination.

D. Challenges and issues in fostering teacher agency: Performativity, non-academic engagements, systemic apathy, policy and practice gaps, and others and Role of the teacher in shaping educational policy, practice, and reforms.

Unit III: Teacher as an Architect of the New India: Shaping the Society of Tomorrow (8 hrs)

A. Engaging in critical education: Dialogues on power relations associated with gender, ethnicity, culture, disability, class, poverty, the reproduction of disadvantage and realizing true human potential.

B. Being a critical teacher: Raising debates around rapid technological advancement and its impact on individual, family, and social life; the growing isolation and impact on mental and social health and well-being.

C. Changing relationships between the 'state' and the 'market' and their impact on formal education.

D. The conceptualization of teacher, teaching, and teacher roles, 'globalization' and the reconstructed nationalism shaping the socio-political milieu and impact on social psyche, growing materialistic urge.

E. Sensory drives and the gradual deterioration of the individual and societal character.

TRANSACTIONAL MODE:

● **Teacher and Society** is a reformatory course that invites teachers to re-think teachers and teaching. It awakens and inspires teachers to realize broader educational aims through an action and reflection cycle. The approach, therefore, would include a blend of lectures, in-class seminars, thinking exercises, critical reflections, group work, case-based approaches, and enquiry-based learning.

● Learners would also be exposed to case studies featuring teachers from a representative cross-section of schools in India and critically analyze their exercise of agentic force in school improvement and the improvement of teaching practice.

● Situating themselves in the geo-political context, the learners will get to critically engage in some of the policy dialogues.

● Learners would reflect on their practice as pre-service interns, knowledge, skills, and understandings—and identify opportunities to apply course learning to their school context.

ESSENTIAL READINGS:

- **National Curriculum Framework 2023**
- **National Education Policy 2020**

REFERENCES: (APA Style)

- Caggart, G. L. (2005): **Promoting Reflective Thinking in Teachers.** Crowin Press.
- Irvine, J. J. (2003): **Educating Teachers for Diversity: Seeing with a Cultural Eye.** New York: Teachers College Press.
- Joyce, B., and Weal, M. (2003). **Models of Teaching (7th Ed.).** Boston: Allyn & Bacon.
- Lampert, M. (2001). **Teaching Problems and the Problems of Teaching.** New Haven: Yale University Press.
- Linda Darling Hammond & John Bransford (Ed.) (2005): **Preparing Teachers for a Changing World.**
- Martin, D. J. & Kimberly S. Loomis (2006): **Building Teachers: A Constructivist Approach to Introducing Education.** Wadsworth Publishing, USA.
- Ram, S. (1999): **Current Issues in Teacher Education.** Sarup & Sons Publications, New Delhi.
- Schon, D. (1987): **Educating the Reflective Practitioner: Towards a New Design for Teaching and Learning in the Professions.** New York: Basic Books.

B.Sc. B.Ed. (Integrated) Four Years Programme
Part-I, Sem-II
Self -Study
SS-II Constitution of India
Student Required to do the Self Study

Course Outcome:

1) The students will get knowledge about making and philosophy of Indian Constitution

2) The students will become aware about Fundamental Rights, Directive Principles and Duties

3) The students will get knowledge about procedure of constitutional amendment.

Module I: Historical Background, Making of Indian Constitution and Salient Features

A) Historical Background of Indian Constitution: Acts of 1909, 1919 & 1935

B) Making of Indian Constitution: Constituent Assembly

C) Salient Features of the Indian Constitution

Module II: Philosophy, Fundamental Rights, Directive Principles and Fundamental

Duties

A) Philosophy of the Indian Constitution: The Preamble

B) Fundamental Rights & Directive Principles of State Policy

C) Fundamental Duties

Reference Books:

1) Basu D.D., Introduction to Constitution of India Princeton,New Delhi, 1994

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