FACULTY OF SCIENCES

SYLLABUS FOR

for the award of the Degree in

Bachelor of Science (Non-Medical & Computer Science)/ Honours
(Semester I to II)
(Offered under 4-year UG Honours Degree Programme)
under NEP 2020 Batch: 2024–28
(Under Credit Based Continuous Evaluation Grading System)

The Heritage Institution

KANYA MAHA VIDYALAYA
JALANDHAR
(AUTONOMOUS)

Kanya Maha Vidyalaya, Jalandhar *(Autonomous)*

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Non-Medical/ Computer Science)/ Honours

Session-2024-25

Bachelor of Science (Non-Medical/ Computer Science)/ Honours Semester-I								
Course Code	**Course Name**	**Course Type**	Credits	**Total Marks**	**Ext.**		**CA**	**Examination time (in Hours)**
					L	**P**		
BSNL/BCSL-1421 **BSNL/BCSL-1031** **BSNL/BCSL-1431**	**Punjabi (Compulsory)** **[1]Basic Punjabi** **[2]Punjab History and Culture (From Earliest Times To C 320)**	C	4	100	70	-	30	3
BSNL/BCSL-1212	**English Language Skills**	AEC	4	100	70		30	3
BSNL/BCSL-1333	**Mathematics (Algebra)**	DSC	4	100	70		30	3
BSNP/BCSP-1333	**Algebra Laboratory**		1	50		35	15	3
BSNL-1084	**Chemistry (Inorganic Chemistry-I: Atomic structure and periodic table)**	DSC	4	100	70		30	3
BSNP-1084	**Inorganic Chemistry-I: Lab qualitative analysis**		2	50		35	15	3
BCSM-1134	**Computer Science (Computer Fundamentals and PC Software)**	DSC	4	100	40	30	30	3
BSNL/BCSL-1395	**Physics (Electricity and Magnetism)**	DSC	4	100	70		30	3
BSNP/BCSP-1395	**Electricity and Magnetism Lab**		2	50		35	15	3
VACF-1491	**Foundation Course**	VAC	2	50	35		15	1

[1] Special paper in lieu of Punjabi (Compulsory) for those who have not studied Punjabi upto 8th/ 10th Class. .

[2] Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

***credits/ grade points of these courses will not be added in SGPA/ CGPAof the semester/ Programme and only grades will be provided.**

Kanya Maha Vidyalaya, Jalandhar *(Autonomous)*

SCHEME AND CURRICULUM OF EXAMINATIONS OF FOUR YEAR UNDERGRADUATE DEGREE PROGRAMME

Bachelor of Science (Non-Medical/ Computer Science)/ Honours

Session-2024-25

Bachelor of Science (Non-Medical/ Computer Science)/ Honours Semester-II								
Course Code	**Course Name**	**Course Type**	Credits	Total Marks	**Ext.**		**CA**	**Examination time (in Hours)**
					L	**P**		
BSNL/BCSL-2421 **BSNL/BCSL-2031** **BSNL/BCSL-2431**	**Punjabi (Compulsory)** **[1]Basic Punjabi** **[2]Punjab History & Culture (C.320 To 1000 A.D.)**	C	4	100	70	-	30	3
BSNL/BCSL-2212	**English Language And Literature**	MDC	4	100	70		30	3
BSNL/BCSL-2333	**Mathematics (Calculus)**	DSC	4	100	70		30	3
BSNP/BCSP-2333	**Calculus Laboratory**		1	50		35	15	3
BSNL-2084	**Chemistry (Organic Chemistry-I: Hydrocarbons and alkyl halides)**	DSC	4	100	70		30	3
BSNP-2084	**Organic Chemistry-I: Lab Functional group analysis**		2	50		35	15	3
BCSM-2134	**Computer Science (Programming in C)**	DSC	4	100	40	30	30	3
BSNL/BCSL-2395	**Physics (Mechanics)**	DSC	4	100	70		30	3
BSNP/BCSP-2395	**Mechanics Lab**		2	50		35	15	3
****BSNM/BCSM-2390**	**Vibrations and Waves**	SEC	3	100	40	30	30	3+3
****BSNM/BCSM-2330**	**Statistical Analysis Using Excel**	SEC	3	100	40	30	30	3+3
****BCSM-2130**	**Introduction to the Internet**	SEC	3	100	40	30	30	3+3
****BSNM-2080**	**From Molecules to Markets: Entrepreneurship in Chemistry**	SEC	3	100	40	30	30	3+3
***VACD-2161**	**Drug Abuse: Problem, Management and Prevention** (Compulsory)	VAC	2	50	35		15	3

[1] Special paper in lieu of Punjabi (Compulsory) for those who have not studied Punjabi upto 8th/ 10th Class. .

[2] Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

***credits/ grade points of these courses will not be added in SGPA/ CGPAof the semester/ Programme and only grades will be provided.**

**** Student Can opt any one of the given course**

Programme Specific Outcomes – B. Sc. Non Med (Phy. Chem. Maths.)

Upon successful completion of this course, students will be able to:

PSO1. Demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics and chemistry. Recognize and appreciate cultural nuances, idiomatic expressions, and social customs associated with the language.

PSO2: Solve complex mathematical problems by critical understanding, analysis and synthesis. Students will also be able to provide a systematic understanding of the concepts and theories of mathematics and their application in the real world – to an advanced level, and enhance career prospects in a huge array of fields or suitable to succeed at an entry-level position in a mathematics post graduate programme.

PSO3: Students will be able to integrate and apply a deep understanding of core physical principles by designing and conducting experiments, utilizing advanced mathematical and computational tools, and analyzing data to solve complex problems.

PSO4: demonstrate knowledge of organic, inorganic and physical chemistry and apply this knowledge to analyze a variety of chemical phenomena and will be able to interpret and analyze quantitative data.

PSO5: understand theoretical concepts of instruments that are commonly used in most physics and chemistry fields as well as interpret and use data generated in instrumental physical and chemical analyses.

PSO6: show that they have learned laboratory skills, enabling them to take measurements in a physics laboratory and analyse the measurements to draw valid conclusions. They will also be able to employ critical thinking and scientific inquiry in the performance, design, interpretation and documentation of laboratory experiments, at a level suitable to succeed at an entry-level position in industry or a physics/chemistry postgraduate program.

PSO7: capable of oral and written scientific communication in regional and international languages, i.e. able to communicate effectively by oral, written, computing and graphical means.

PSO8: They will demonstrate proficiency in experimental techniques, critical thinking, and effective communication of scientific ideas through written reports and presentations. Students will uphold ethical standards in research, apply their knowledge to practical and interdisciplinary challenges, and engage in research and innovation to contribute to advancements in physics and related fields.

Programme Specific Outcomes – B. Sc. C.Sc. (Phy. C.Sc. Maths.)
Upon successful completion of this course, students will be able to:

PSO1. Demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics and computers. Recognize and appreciate cultural nuances, idiomatic expressions, and social customs associated with the language.

PSO2: Solve complex mathematical problems by critical understanding, analysis and synthesis. Students will also be able to provide a systematic understanding of the concepts and theories of mathematics and their application in the real world – to an advanced level, and enhance career prospects in a huge array of fields or suitable to succeed at an entry-level position in a mathematics post graduate programme.

PSO3: Students will be able to integrate and apply a deep understanding of core physical principles by designing and conducting experiments, utilizing advanced mathematical and computational tools, and analyzing data to solve complex problems.

PSO4: Demonstrate knowledge of various languages of Computer programming and apply this knowledge to interpret and analyse quantitative data.

PSO5: understand theoretical concepts that are commonly used in most physics and computer fields as well as interpret and use data generated in instrumental physical and chemical analyses.

PSO6: show that they have learned laboratory skills, enabling them to take measurements in a physics laboratory and analyse the measurements to draw valid conclusions. They will also be able to employ critical thinking and scientific inquiry in the performance, design, interpretation and documentation of laboratory experiments, at a level suitable to succeed at an entry-level position in industry or a physics/computer postgraduate program**.**

PSO7: capable of oral and written scientific communication in regional and international languages, i.e. able to communicate effectively by oral, written, computing and graphical means.

PSO8: They will demonstrate proficiency in experimental techniques, critical thinking, and effective communication of scientific ideas through written reports and presentations. Students will uphold ethical standards in research, apply their knowledge to practical and interdisciplinary challenges, and engage in research and innovation to contribute to advancements in physics and related fields.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **PUNJABI (COMPULSORY)**
Course code: BSNL-**1421** for Bachelor of Science (Non-Medical)
BCSL-**1421** for Bachelor of Science (Computer Science)

COURSE OUTCOMES

CO1 : ‘d' ozr’(eftsk Gkr) Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo eftsk gqsh fdbu;gh, ;{M Bz{ g?dk eoBk j? sK fe T[j nkX[fBe d"o ftu uZb ojhnK ekft XkoktK ns/ ethnK pko/ frnkB jkf;b eo ;eD.fJ; dk j'o wB'oE eftsk dh ftnkfynk, ftPb/PD s/ w[bzeD dh gqfefonk s'A ikD{ eokT[Dk th j? sK fe T[j ;wekbh ;wki dhnK ;wZf;nktK Bz{ ;wM ;eD ns/ nkb'uBkswe fdqPNh pDk ;eD.

CO2: ‘;z;ko dhnK gqf;X j;shnK’ ihtBh dh ftXk Bz{ f;b/p; ftu Pkfwb eo e/ ftfdnkoEhnK nzdo ihtBh Bz{ gVQD dh o[uh Bz{ g?dk eoBk j? ns/ ihtBh irs Bkb i'VDk j?.

CO3: g?oQk ouBk ns/ g?oQk gVQ e/ gqPBK d/ T[so d/D dk wBo'E ftfdnkoEhnK dh p[ZXh B{z shyD eofdnK T[BK dh fbyD gqfsGk B{z T[ikro eoBk j?**.**

CO4: GkPk tzBrhnK L GkPk dk Ne;kbh o{g, GkPk ns/ T[g-GkPk ftu nzso,gzikph T[gGkPktK d/ gSkD -fuzBQ, gzikph GkPkL fBek; s/ ftek; gVQD Bkb ftfdnkoEh GkPk tzBrhnK s'A tke| j'Dr/.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **PUNJABI (COMPULSORY)**
Course code: BSNL-**1421** for Bachelor of Science (Non-Medical)
BCSL-**1421** for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ e[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB eoBk bklwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 14 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw ns/ gkm g[;seK

:{fBN-I

d' ozr (eftsk Gkr) (;zgkHjofizdo f;zx fYb'A ns/ gqhsw f;zx ;or'Xhnk), r[o{ BkBe d/t :{Bhtof;Nh, nzfwqs;o.

(ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ /ਕਵਿਤਾ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ/;ko) 14 nze

:{fBN-II

;z;ko dhnK gqf;ZX j;shnK (ihtBh BzL 1 s'A 9 sZe)

(;zgkHfgqzH s/ik f;zx, joBkw f;zx PkB),gzikph ;kfjs gqekPB, nzfwqs;o.

(ਵਿਸ਼ਾ-ਵਸਤੂ/ BkfJe fpzp/ ;ko) 14 nze

:{fBN-III

(T) g?oQk ouBk (fszB ftu'A fJZe)

(n) g?oQk gVQ e/ gqPBK d/ T[Zso. 14 nze

:{fBN-IV

(T) GkPk tzBrhnK L GkPk dk Ne;kbh o{g, GkPk ns/ T[g-GkPk ftu nzso,gzikph T[gGkPktK d/ gSkD-fuzBQ.

(n) gzikph GkPk L fBek; s/ ftek;

14 nze

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **BASIC PUNJABI**
Course code: BSNL-**1031** for Bachelor of Science (Non-Medical)
BCSL-**1031** for Bachelor of Science (Computer Science)

Course outcomes

CO1:w[ZYbh gzikph gVQkT[D dk wB'oE ftfdnkoEhnK B{z gzikph GkPk B{z f;ykT[D dh gqfefonk ftu gk e/ fJe j'o GkPk f;ZyD dk w"ek gqdkB eoBk j?. ftfdnkoEhnK B{z g?Ash nZyoh, nZyo eqw, g?o fpzdh tkb/ toD ns/ g?o ftu g?D tkb/ toD ns/ wksoktK (wZ[Ybh ikD gSkD) brk\o (fpzdh, fNZgh, nZXe) dh gSkD ns/ tos'A s'A ikD{ eotkfJnk ikt/rk.

CO2: ftfdnkoEhnK B{z gzikph Ppd pDso dh wZ[Ybh ikD gSkD (;kXkoB Ppd, ;z:[es Ppd, fwPos Ppd,w{b Ppd,nr/so ns/ fgS/so) s'A ikD{ eotkfJnk ikt/rk.

CO3: ftfdnkoEhnK B{z fBZs tos'A dh gzikph Ppdktbh L pkIko, tgko, foPs/Bks/, y/sh ns/ j'o XzfdnK nkfd s'A ikD{ eotkfJnk ikt/rk.

CO4: ftfdnkoEhnK B{z gzikph ftu j|s/ d/ ;Zs fdBK d/ BK, pkoQK wjhfBnK d/ BK, oZ[sK d/ BK, fJe s'A ;" sZe frDsh PpdK ftu f;ykT[Dk j?.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **BASIC PUNJABI**
Course code: BSNM-**1031** for Bachelor of Science (Non-Medical)
BCSM-**1031** for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ eZ[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB eoBk bklwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 14 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw

:{fBN-I

g?Ash nZyoh, nZyo eqw, g?o fpzdh tkb/ toD ns/ g?o ftu g?D tkb/ toD ns/ wksqtK (wZ[Ybh ikD gSkD) brk\o (fpzdh, fNZgh, nZXe) L gSkD ns/ tos'A . 14 nze

:{fBN-II

gzikph Ppd pDso L wZ[Ybh ikD gSkD (;kXkoB Ppd, ;z:[es Ppd, fwPos Ppd, w{b Ppd, nr/so ns/ fgS/so) 14 nze

:{fBN-III

fBZs tos'A dh gzikph Ppdktbh L pklko, tgko, foPs/ Bks/, y/sh ns/ j'o XzfdnK nkfd Bkb ;zpzXs. 14 nze

:{fBN-IV

j|s/ d/ ;Zs fdBK d/ BK, pkoQK wjhfBnK d/ BK, oZ[sK d/ BK, fJe s'A ;" se frDsh PpdK ftu .

14 nze

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: Punjab History and Culture (From Earliest Times to C 320)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Course code: BSNL-**1431** for Bachelor of Science (Non-Medical)
BCSL-**1431** for Bachelor of Science (Computer Science)

COURSE OUTCOMES

After completing Semester I and course on Punjab History and Culture students of History will be able to identify and have a complete grasp on the sources and writings of Ancient Indian History of Punjab

CO1: Identify and understand the sources and physical features of Punjab
CO 2: To study the earliest civilisation (Indus Valley Civilization) and original home of Aryans
CO 3: To examine the Social, Religious and Economic life during Early and Later Vedic Age
CO 4: To comprehend the Buddhist, Jain and Hindu faith and their relevance in the modern time

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: Punjab History and Culture (From Earliest Times to C 320)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Course code: BSNL-**1431** for Bachelor of Science (Non-Medical)
BCSL-**1431** for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setter:

1. **Question paper shall consist of four Units**
2. **Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.**
3. **Candidates shall attempt 5 questions in 1000 words, by at least selecting One Question from each Unit and the 5th question may be attempted from any of the four Units.**
4. **Each question will carry 14 marks**

Unit-I

1. **Physical features of the Punjab**
2. **Sources of the ancient history of Punjab**

Unit-II

3. **Harappan Civilization: social, economic and religious life of the Indus Valley People.**
4. **The Indo-Aryans: Original home**

Unit-III

5. **Social, Religious and Economic life during Early Vedic Age.**
6. **Social, Religious and Economic life during Later Vedic Age.**

UNIT-IV

7. **Teachings of Buddhism**
8. **Teachings of Jainism**

Suggested Readings

B.N. Sharma, Life in Northern India, Delhi. 1966.
Budha Parkash, Glimpses of Ancient Punjab, Patiala, 1983.
Chopra, P.N., Puri, B.N., and Das,M.N.(1974). A Social, Cultural and Economic History of India, Vol. I, New Delhi: Macmillan India.
L. M Joshi (ed.), History and Culture of the Punjab, Art-I, Patiala, 1989 (3rd edition)
L.M. Joshi and Fauja Singh (ed.), History of Punjab, Vol.I, Patiala 1977.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **ENGLISH LANGUAGE SKILLS-1**
Course code: BSNL-**1212** for Bachelor of Science (Non-Medical)
BCSL-**1212** for Bachelor of Science (Computer Science)

COURSE OUTCOMES

After passing this course, the students will be able to:

CO 1: understand fundamental grammatical rules governing tenses, the use of modal verbs and make correct usage in their language through the study of "English Grammar in Use" by Raymond Murphy

CO 2: to develop the art of creative expression by writing a paragraph on any given topic

CO 3: comprehend the meaning of texts and answer questions related to situations, episodes, and characters depicted in them through the study of the essays in the text "Prose for Young Learners"

CO 4: appreciate the writings of various Indian and foreign story and prose writers and relate them to their socio-cultural milieu through the study of the essays in the text "Prose for Young Learners"

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **ENGLISH LANGUAGE SKILLS-1**
Course code: BSNL-**1212** for Bachelor of Science (Non-Medical)
BCSL-**1212** for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Examiner:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question will carry 14 marks.

Unit I

English Grammar in Use, 5th Edition by Raymond Murphy, CUP (Units: 1-37)

Unit II

Paragraph Writing and English Grammar in Use (Units: 38-48)

Unit III

Prose for Young Learners: Essays at Sr. No. 1, 2, 3, 5 and 6

Unit IV

Prose for Young Learners: Essays at Sr. No. 7, 8, 9, 10 and 11

Texts Prescribed:

1. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP
2. *Tales of Life* (Guru Nanak Dev University, Amritsar)
3. *Prose for Young Learners* (Guru Nanak Dev University, Amritsar)

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **Mathematics (Algebra)**
Course code: BSNL-**1333** for Bachelor of Science (Non-Medical)
BCSL-**1333** for Bachelor of Science (Computer Science)

COURSE OUTCOMES

After passing this course, the students will be able to:
CO 1: Understand the concept of matrix congruence of skew symmetric matrices and its reduction in the real field. Solve a system of linear equations.
CO 2: Obtain Eigenvalues, Eigen vectors, minimal and characteristic equation of a matrix and to apply it in advanced dynamics and electric current.
CO 3: Classify real quadratic form in variables, definite, semi- definite and indefinite real quadratic form.
CO 4: To find the relations between the roots and coefficients of general polynomial equation in one variable, distinguish between solution of cubic equations and Bi-quadratic equations

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **Mathematics (Algebra)**
Course code: BSNL-**1333** for Bachelor of Science (Non-Medical)
BCSL-**1333** for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setter: Eight questions of equal marks (16 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section. Each question will carry 14 marks.

Unit-I

Partitioning of Matrices, Matrices Partitioned conformably for Multiplication, Rank of a Matrix, Normal form, Row rank, Column rank of a matrix, Equivalence of column and row ranks, rank of product of matrices, Linear independence of row and column vectors Applications of matrices to a system of linear (both homogeneous and non–homogeneous) equations. Theorems on consistency of a system of linear equations.

Unit-II

Eigenvalues, Eigenvectors, Hermitian Matrix, Skew Hermitian matrix and unitary matrix and properties of Eigen value, minimal and the characteristic equation of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix.

Unit-III

Quadratic Forms, quadratic form as a product of matrices. The set of quadratic forms over a field. Congruence of quadratic forms and matrices. Congruent transformations of matrices. Elementary congruent transformations. Congruent reduction of a symmetric matrix. Reduction in the real field. Classification of real quadratic forms in n variables. Definite, semi–definite and indefinite real quadratic forms. Characteristic properties of definite, semi–definite and indefinite forms.

Unit-IV

Relations between the roots and coefficients of general polynomial equation of degree n in one variable. Vieta ‘s Formula, Fundamental Theorem of Algebra (Statement only) Transformation of equations, Equations of Squared differences, Solution of cubic equations by Cardan method, Discriminant of polynomial equation, Discriminant of Cubic equation, nature of roots of cubic, Solution of Biquadratic by Ferrari’s Method with illustrations, Descartes’s Rules of Signs with illustrations.

Text Books:-

1. Shanti Narayan and P.K. Mittal: Text Book of Matrices.
2. K.B. Datta : Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.

Reference Book:-

1. Tom M. Apostol: Calculus: An Indian Adaptation, Wiley India, 2023

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **Algebra Laboratory**
Course code: BSNP-**1333** for Bachelor of Science (Non-Medical)
BCSP-**1333** for Bachelor of Science (Computer Science)

COURSE OUTCOMES:

After passing this course, students will be able to:

CO1: Students will demonstrate the ability to conduct a specific experiment from a given list, applying theoretical knowledge and practical skills to accurately complete the procedure and obtain reliable results.

CO2: Students will be able to articulate the theoretical background and principles underlying the chosen experiment.

CO3: Students will demonstrate their understanding of the experiment through oral questioning and discussion.

CO4: Students will maintain a well-organized and accurate practical file documenting all experiments conducted.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **Algebra Laboratory**
Course code: BSNP-**1333** for Bachelor of Science (Non-Medical)
BCSP-**1333** for Bachelor of Science (Computer Science)

Credits: 0-0-1 **Max Marks: 50 (ESE Marks: 35, CA: 15)**
Examination Time: 3 Hours **Pass Mark: 13**

Instructions to Practical Examiner
Question paper is to be set on the spot jointly by the external and internal examiners. Two copies of the same to be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar

List of Practicals (using any package)

1. Introduction to the computer package in the practicals.
2. Matrix operations: addition, multiplication, inverse. transpose, determinant of matrix.
3. Find Rank of matrix: Row Rank, Column Rank.
4. Find row reduced echelon form
5. Create the coefficient matrix A and vector b. Solve for x using the inverse, using the built- in function.
6. Solving a linear system, using Gauss elimination numerically.
7. Finding eigenvalues and eigenvectors, numerically.

Reference Books:-

1. S.S. Sastry, Engineering Mathematics - Volume I (4th Edition), PHI, 2008.
2. S.S. Sastry, Engineering Mathematics - Volume II (4th Edition), PHI, 2008.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title**: Chemistry (Inorganic Chemistry-I: Atomic structure and periodic table)**

Course code: BSNL-**1084** for Bachelor of Science (Non-Medical)

COURSE OUTCOMES

Students will be able to
CO1: Predict electronic properties of atoms using current models and theories in chemistry, sketch the probability density curves, identify the periodic trends in physical and chemical properties of elements, describe the arrangement of the elements in the Periodic Table& change from metallic to nonmetallic character.
CO2: Describe VBT, VSEPR theory and predicts the geometry of simple molecules & molecular orbital theory of homonuclear diatomic molecules, explain, predict & draw structures of simple ionic compounds.
CO3: Explains & compares the trends in atomic and physical properties of p-block elements, explain the atomic, physical and chemical properties of alkali metals and alkaline earth metals and concepts of Acids and Bases.
CO4: Detailed studies of Group 13 and 14 of p-block elements.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **Chemistry (Inorganic Chemistry-I: Atomic structure and periodic table)**

Course code: BSNL-**1084** for Bachelor of Science (Non-Medical)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setters: Eight questions of equal marks (Sixteen marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question will carry 14 marks

UNIT-I (15 Hrs.)

Atomic Structure- Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, Quantum numbers, Shapes of s, p, d and f orbitals. Aufbau's and Pauli's Exclusion principle, Hund's multiplicity rule. Electronic configurations of the elements and ions.
Periodic Properties- Position of elements in the periodic table; effective nuclear charge and its calculations. Details of atomic and ionic radii, ionization energy, electron affinity and electronegativity.

UNIT-II (15 Hrs.)

Ionic Solids: Concept of close packing, Ionic structures, radius ratio rule and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy and Born–Haber cycle. Fajan's rule, Weak Interactions –Hydrogen bonding, van der Waals forces.
Chemical Bonding-I: Covalent Bond–Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions, Valence shell electron pair repulsion (VSEPR) theory, homonuclear and heteronuclear diatomic molecules. Multicentre bonding in boranes, Percentage ionic character from dipole moment and electronegativity difference.

UNIT-III (15 Hrs.)

s- and p-block elements and their comparative study: General remarks about each group (I-VIII), trends in electronic configuration, atomic and ionic radii, ionization potential, electron affinity, electronegativity, oxidation states, Melting and boiling point, density, electropositive or metallic character, flame colouration. Lattice energies. Photoelectric effect, inert pair effect, catenation and hetero catenation. Anomalies in first and second row elements. Chemical properties in details.
Acids and Bases: Arrhenius, Bronsted-Lowry, the Lux-Flood, solvent system and Lewis concepts of acids and bases

UNIT-IV (15 Hrs.)

p-Block Elements: Group 13: General characteristics, Atomic and ionic radii, melting and boiling point, Ionisation energies, Oxidation states, Electropositive character, Tendency to form covalent compounds. Compounds of group 13: Hydrides, Oxides and hydroxides, Oxoacid; Structure and Properties of Boric acid, Preparation, properties and structure of Diborane, Borazine, Boron halides: Boron hydrides ($LiBH_4$, $NaBH_4$), Anomalous behaviour of Boron and its diagonal relationship with Silicon.
Group 14: General characteristics; Atomic radii, Ionisation energies, Melting and boiling point, oxidation state, metallic character, catenation, Allotropy, Tendency to form multiple bonding.

Compounds of group 14: Hydrides of silicon: preparation and properties, toxic nature of CO, Dioxide of carbon and silicon. Comparison of carbon tetrachloride and silicon tetrachloride. Chemistry of Fullerenes.

Books Suggested

1. Cotton, F.A., Wilkinson, G., Gaus, P.L., Basic Inorganic Chemistry; 3rd edition, Pubs: John Wiley Sons. 1995.
2. Lee, J.D., Concise Inorganic Chemistry; 4th edition, Pubs: Chapman Hall Ltd., 1991.
3. Shriver, D.E., Alkins, P.W., Langford, C.H., Inorganic Chemistry; 4th edition, Oxford Publisher: Oxford University Press, 2006.
4. Douglas, B. McDamiel, D., Alexander, J., Concepts and Models of Inorganic Chemistry; 3rd edition, Pubs: John Wiley and Sons Inc., 1994.
5. Miessler, G.L., Larr, D.A., Inorganic Chemistry; 3rd edition, Pubs: Pearson Education Inc., 2004.
6. Jolly, W.L., Modern Inorganic Chemistry; 2nd edition, Pubs: McGraw-Hill Publishing Company Limited, 1991.
7. Purcell, K.F., Kotz, J.C., Inorganic Chemistry; Pubs: W.B. Saunders Company, 1977.
8. Puri, B.R., Sharma, L.R., Kalia, K.C., Principles of Inorganic Chemistry; 30th edition, Pubs: Milestones Publisher, 2006-07.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **INORGANIC CHEMISTRY-I: Lab Qualitative Analysis (PRACTICAL)**

Course code: BSNP-**1084** for Bachelor of Science (Non-Medical)

Course outcomes

Students will be able

CO1: To develop technical skills relevant to quantitative analysis
CO2: To separate and identify the various ions present in the mixture
CO3: To understand and master the technique of volumetric analysis
CO4: To analyze an acidic and alkali content in different samples

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **INORGANIC CHEMISTRY-I: Lab Qualitative Analysis (PRACTICAL)**

Course code: BSNP-**1084** for Bachelor of Science (Non-Medical)
Credits: 0-0-2 **Max Marks: 50 (ESE Marks: 35, CA: 15)**
Examination Time: 3.5 Hours **Pass Mark: 13**

Semi Micro analysis. Cation analysis, Separation and identification of ions from groups I, II, III, IV, V, and VI. Anionic analysis. Four ions with no interference.

Volumetric titrations

1. Determination of strength of Na2CO3 solution by titrating it against a standard solution of HCl.
2. Determination of molarity of KMnO4 solution by titrating it against a standard solution of Oxalic acid.
3. Standardise the given K2Cr2O7 solution by titrating it against a standard solution Of Mohr's Salt.
4. Estimation of free alkali present in different soaps/detergents
5. Estimation of Cu(II) and K2Cr2O7 using sodium thiosulphate solution (Iodimetrically).
6. Estimation of available chlorine in bleaching powder iodometrically.

Books Suggested

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: Computer Science (Computer Fundamentals And Pc Software)

Course code: BCSL-1134 for Bachelor of Science (Computer Science)

Course Outcomes:

After passing this course the student will be able to:
CO1: comprehend about computer hardware, operating system concepts and various system software.
CO2: Identify various input, output and memory devices.
CO3: Apply office automation software to create professional and academic documents.
CO4: Apply skills to make effective presentations using associated application software.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **Computer Science (Computer Fundamentals And PC Software)**
Course code: BCSM-1134 for Bachelor of Science (Computer Science)

Credits: 3-0-1 **Max Marks: 100 [Theory 70 (ESE Marks: 40, CA: 30), Practical 30]**
Examination Time: 3 Hours **Pass Mark: 14**

Instructions for Paper Setter -
Eight questions of equal marks (12 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each question will carry 8 marks.

UNIT I

Fundamentals of Computer: Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU), type of Software, Translators (compiler, interpreter, assembler), Booting a System.

UNIT II

Input and Output Devices: Keyboards, Mouse, Joystick, Track Ball, Light Pen and Data Scanning devices (scanner, OCR, OMR, MICR, Barcode Reader, Card Reader), Monitor, Printers (laser printer, dot matrix printer, inkjet printer).
Memories: Primary Memory-RAM and ROM. Secondary Memory- Hard Disk.
Introduction to Windows based operating system and Desktop icons.

UNIT III

Word Processing: Introduction to word, Parts of window of word (Title bar, menu bar, status bar, and ruler), understanding the Ribbon, Use of Office Button and Quick Access Toolbar, Creation of new documents, opening document.
Page setup, margins, gutters, font properties, Alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document.
Creating a table, entering and editing, Text in tables. Changing format of table, height, width of row/column. Editing, deleting Rows, columns in table. Adding picture, page colors and Watermarks, Borders and shading, Templates, Mail Merge.

UNIT IV

PowerPoint Presentation: Introduction to PowerPoint, starting a new slide, saving presentation, moving/rearranging slides, printing slides.
Applying theme to presentation, Views (slide View, slide sorter, notes view, outline view), Formatting & enhancing text formatting.
Creating a graph, displaying slide shows, and adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds.

References:

1. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.
3.Joyce Cox, Joan Lambert and Curtis Frye, Microsoft Office Professional 2010 Step by Step, Microsoft Press, 2010.
4.V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.
5.P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.

Note: The latest editions of the books should be followed.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **Computer Science (Computer Fundamentals And PC Software)**

Course code: BCSP-1134 for Bachelor of Science (Computer Science)

COURSE OUTCOMES:

After passing this course, students will be able to:

CO1: Students will demonstrate the ability to conduct a specific experiment from a given list, applying theoretical knowledge and practical skills to accurately complete the procedure and obtain reliable results.

CO2: Students will be able to articulate the theoretical background and principles underlying the chosen experiment.

CO3: Students will demonstrate their understanding of the experiment through oral questioning and discussion.

CO4: Students will maintain a well-organized and accurate practical file documenting all experiments conducted.

Bachelor of Science (Semester System) (12+3+1 System of Education)

(Session-2024-25)

Bachelor of Science (SEMESTER–I)

Course Title: Physics (Electricity And Magnetism)

Course code: BSNL-1395 for Bachelor of Science (Non Medical)

BCSL-1395 for Bachelor of Science (Computer Science)

COURSE OUTCOMES:

After passing this course, students will be able to:

CO1: Understand vector calculus and vector algebra and its applications in electricity and magnetism. The students will be able to solve the electrostatic problems with the help of Gauss law and Coulomb's law.

CO2: understand the applications of scalar potential for the calculation of electric field and electric potential due to an arbitrary charge distribution.

CO3: They will be able to find the electric potential and electric field of various charge distributions with the help of methods of images. Students will understand the conduction of electric current in conductors by studying Ohm's law and equation of continuity.

CO4: They will be able to find the relationship between electric fields from two different inertial frames of reference. They will learn the origin of magnetism and properties of various kinds of magnetic materials.

Bachelor of Science (Semester System) (12+3+1 System of Education)

(Session-2024-25)

Bachelor of Science (SEMESTER–I)

Course Title: Physics (Electricity And Magnetism)

Course code: BSNL-1395 for Bachelor of Science (Non Medical)

BCSL-1395 for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**

Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setters:

Eight questions of equal marks (specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question carries 14 marks.

UNIT-I

Basic ideas of Vector Calculus Gradient, Divergence, curl and their physical significance. Laplacian in rectangular, cylindrical and spherical coordinates. Coulomb's Law for point charges and continuous distribution of charges. Electric field due to dipole, line charge and sheet of charge. Electric flux, Gauss's Law and its applications. Gauss's divergence theorem and differential form of Gauss's Law. Green's theorem.

UNIT-II

Work and potential difference. Potential difference as line integral of field. Electric potential due to a point charge, a group of point charges, dipole and quadrupole moments, long uniformly charged wire, charged disc. Stokes' Theorem and its applications in the Electrostatic field, curl E=0. Electric fields as gradient of scalar potential. Calculation of E due to a point charge and dipole from potential. Potential due to arbitrary charge distribution and multipole moments.

UNIT-III

Poisson and Laplace's equation and their solutions in Cartesian and spherical coordinates. Concept of electrical images. Calculation of electric potential and field due to a point charge placed near an infinitely conducting sheet. Current and current density, equation of continuity. Microscopic form of Ohm's Law ($J=\sigma E$) and conductivity, Failure of Ohm's Law.

UNIT-IV

Interaction between moving charges and force between parallel currents. Behaviour of various substances in the magnetic field. Definition of M and H and their relation to free and bound currents. Permeability and susceptibility and their interrelationship. Orbital motion of electrons and diamagnetism, Paramagnetism and Ferromagnetism, Maxwell's equations, boundary conditions, electromagnetic induction and applications.

Books Suggested:

1. Fundamentals of Electricity and Magnetism: Arthur F. Kipp.
2. Electricity and Magnetism, Berkeley Physics Course: Vol. II, E.M. Purcell.
3. Introduction to Classical Electrodynamics: David Griffith.
4. EM Waves and Radiating System: Edward C. Jordan and K.G. Balmain.
5. Fields and Waves Electromagnetic: David K. Cheng.

Bachelor of Science (Semester System) (12+3+1 System of Education)

SEMESTER–I

(Session-2024-25)

Course Title: Electricity and Magnetism Lab

Course Code: BSNP-1395 for Bachelor of Science (Non Medical)
BCSP-1395 for Bachelor of Science (Computer Science)

COURSE OUTCOMES:

After passing this course, students will be able to:

CO1: Students will demonstrate the ability to conduct a specific experiment from a given list, applying theoretical knowledge and practical skills to accurately complete the procedure and obtain reliable results.

CO2: Students will be able to articulate the theoretical background and principles underlying the chosen experiment.

CO3: Students will demonstrate their understanding of the experiment through oral questioning and discussion.

CO4: Students will maintain a well-organized and accurate practical file documenting all experiments conducted.

Bachelor of Science (Semester System) (12+3+1 System of Education)

SEMESTER–I

(Session-2024-25)

Course Title: Electricity and Magnetism Lab

Course code: BSNP-1395 for Bachelor of Science (Non Medical)

BCSP-1395 for Bachelor of Science (Computer Science)

Credits: 0-0-2 **Max Marks: 50 (ESE Marks: 35, CA: 15)**

Examination Time: 3 Hours **Pass Mark: 13**

Instructions to Practical Examiner

Question paper is to be set on the spot jointly by the external and internal examiners. Two copies of the same to be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar

General Guidelines for Practical Examination

The distribution of marks is as follows :

i) One experiment 15 Marks

ii) Brief Theory 7 Marks

iii) Viva–Voce 7 Marks

iv) Record (Practical file) 6 Marks

II. There will be one session of 2 hours duration. The paper will have one session. Paper will consist of 8 experiments, out of which an examinee will mark 6 experiments and one of these is to be allotted by the external examiner.

III. The number of candidates in a group for practical examination should not exceed 12.

IV. In a single group, no experiment should be allotted to more than three examinees.

LIST OF EXPERIMENTS

1. To determine low resistance with Carey-Foster's Bridge.
2. To study the magnetic field produced by a current carrying solenoid using a search coil and calculate permeability of air.
3. To study the induced e.m.f. as a function of the velocity of the magnet.
4. Study of phase relationships using impedance triangle for LCR circuit and calculate impedance.
5. Resonance in a series LCR circuits for different R–value and calculate Q–value.
6. Resonance in parallel LCR circuits for different R-value and calculate Q-value.
7. Capacitance by flashing and quenching a neon lamp.
8. To compare capacitance of two capacitors by de–Sauty's bridge.
9. To determine L using Anderson Bridge.
10. To find the value of BH, the horizontal component of earth's magnetic field in the lab using a deflection & vibration magnetometer.
11. To study the variation of the magnetic field with distance along the axis of a coil carrying current by plotting a graph.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **FOUNDATION COURSE**
Course code: VACF-1491 for Bachelor of Science (Non-Medical)
& Bachelor of Science (Computer Science)

COURSE OUTCOMES

After the completion of this Audit course, students will be able to

- learn how past societies, systems, ideologies, governments, cultures and technologies were built, how they operated, and how they have changed
- understand how the rich history of the world helps us to paint a detailed picture of where we stand today
- understand the Vedic theism, Upanishads Philosophy and doctrines of Jainism, Buddhism and Sikhism
- acquire knowledge of women rights and courage to face day to day challenges
- acknowledge the changes in society, religion and literature in the renaissance period and the importance of empathy and compassion for humanity
- learn about the prominent Indians (Men and Women) who contributed significantly in freedom struggle, education, economic development and in the formation and evolution of our nation
- understand meaning of race and how that concept has been used to justify exclusion, inequality, and violence throughout history and the origin of civil right movements to fight for equality, liberty and fraternity
- critically evaluate the socio-political and economic issues at global level and its implications in the present
- upgrade and enhance learning technological skills and striking a balance between technology and their well being
- take pride in learning the saga of Indian Past Culture and Heritage
- understand the rich legacy of KMV and its progressive endeavours

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **FOUNDATION COURSE**
Course code: VACF-1491 for Bachelor of Science (Non-Medical)
& Bachelor of Science (Computer Science)

Credits: 2-0-0 **Max Marks: 50 (ESE Marks: 35, CA: 15)**
Examination Time: 3 Hours **Pass Mark: 13**

SYLLABUS

Module I Being a Human: Introduction & Initial Assessment
- Introduction to the programme
- Initial Assessment of the students through written answers to a couple of questions

Module 2 The Human Story
- Comprehensive overview of human intellectual growth right from the birth of human history
- The wisdom of the Ancients
- Dark Middle Ages
- Revolutionary Renaissance
- Progressive modern times
- Most momentous turning points, inventions and discoveries

Module 3 *The Vedas* and the Indian Philosophy
- Origin, teachings and significance of *The Vedas*
- Upnishads and Puranas
- Karma Theory of *The Bhagwad Gita*
- Main tenets of Buddhism & Jainism
- Teachings of Guru Granth Sahib

Module 4 Changing Paradigms in Society, Religion & Literature
- Renaissance: The Age of Rebirth
- Transformation in human thought
- Importance of humanism
- Geocentricism to heliocentrism
- Copernicus, Galileo, Columbus, Darwin and Saint Joan
- Empathy and Compassion

Module 5 Woman: A Journey through the Ages
- Status of women in pre-vedic times
- Women in ancient Greek and Roman civilizations
- Women in vedic and ancient India
- Status of women in the Muslim world
- Women in the modern world
- Crimes against women
- Women labour workforce participation
- Women in politics
- Status of women- our dream

Module 6 Makers of Modern India
- Early engagement of foreigners with India
- Education: The first step to modernization
- Railways: The lifeline of India
- Raja Ram Mohan Roy, Gandhi, Nehru, Vivekanand, Sardar Patel etc.
- Indira Gandhi, Mother Teresa, Homai Vyarawala etc.

- The Way Ahead

Module 7 Racism: Story of the West

- European beginnings of racism
- Racism in the USA - Jim Crow Laws
- Martin Luther King Jr. and the battle against racism
- Apartheid and Nelson Mandela
- Changing face of racism in the modern world

Module 8 Modern World at a Glance: Political & Economic Perspective

- Changing world order
- World War I & II
- UNO and The Commonwealth
- Nuclear Powers; Terrorism
- Economic Scenario: IMF, World Bank
- International Regional Economic Integration

Module 9 Technology Vis a Vis Human Life

- Impact of technology on modern life
- Technological gadgets and their role in our lives
- Technology and environment
- Consumerism and materialism
- Psychological and emotional consequences of technology
- Harmonizing technology with ethics and humaneness

Module 10 My Nation My Pride

- Indian Past Culture and Heritage
- Major Discoveries (Medicinal and Scientific)
- Vedic Age
- Prominent Achievements
- Art, Architecture and Literature

Module 11 The KMV Experience

- Rich Legacy of KMV
- Pioneering role in women emancipation and empowerment
- KMV Contribution in the Indian Freedom Struggle
- Moral, cultural and intellectual heritage of KMV
- Landmark achievements
- Innovative initiatives; international endeavours
- Vision, mission and focus
- Conduct guidelines for students

Module 12 Final Assessment, Feedback & Closure

- Final multiple choice quiz
- Assessment through the same questions asked in the beginning
- Feedback about the programme from the students
- Closure of the programme

PRESCRIBED READING

- ***The Human Story*** published by Dawn Publications

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **PUNJABI (COMPULSORY)**
Course code: BSNL-**2421** for Bachelor of Science (Non-Medical)
BCSL-**2421** for Bachelor of Science (Computer Science)

COURSE OUTCOMES

CO1: ‘d' ozr’ (ejkDh Gkr) Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo ejkDh gqsh fdbu;gh, ;{M Bz{ g?dk eoBk j? .fJ; dk j'o wB'oE ejkDh dh ftPb/PD s/ w[bzeD dh gqfefonk s'A ikD{ eokT[Dk th j? sK fe T[j ;wekbh ;wki dhnK ;wZf;nktK Bz{ ;wM ;eD ns/ nkb'uBkswe fdqPNh pDk ;eD.

CO2: ‘;z;ko dhnK gqf;X j;shnK’ ihtBh dh ftXk Bz{ f;b/p; ftu Pkfwb eo e/ ftfdnkoEhnK nzdo ihtBh Bz{ gVQD dh o[uh Bz{ g?dk eoBk j? ns/ ihtBh irs Bkb i'VDk j?.

CO3: Ppd pDso ns/ Ppd ouBk gVQD Bkb ftfdnkoEh fJ;d/ w[ZYb/ ;zebgK B{z nkXko pDk e/ fJjBK ;zebgK s'A ikD{ j'Dr/.Ppd Pq/DhnK Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo gzikph GkPk dh nwhoh dk ns/ pkohehnK Bz{ ;wMD bJh tZyo/ -tZyo/ f;XKsK dk ftek; eoBk j?.

CO4: d|soh fuZmh gZso fbyD dk wB'oE ftfdnkoEhnK B{z fJ; ebk ftu fBg[zB eoBk j? I w[jkto//nykD dh tos'A Bkb rZbpks ftu gogZesk nkT[Adh j?.fJj ftfdnkoEhnK dh rZbpks ftu fByko fbnkT[D dk ezw eoBr/.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **PUNJABI (COMPULSORY)**
Course code: BSNL-**2421** for Bachelor of Science (Non-Medical)
BCSL-**2421** for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ e[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB eoBk bklwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 14 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw ns/ gkm g[;seK

:{fBN-I

d' ozr (ejkDh Gkr) (;zgkHjofizdo f;zx fYb'A ns/ gqhsw f;zx ;or'Xhnk),r[o{ BkBe d/t :{Bhtof;Nh, nzfwqs;o.

(ਵਿਸ਼ਾ-ਵਸਤੂ/ gkso fusoB / ;ko) **14 nze**

:{fBN-II

;z;ko dhnK gqf;ZX j;shnK (ihtBh BzL 10 s'A 18 se) (;zgkHfgqzH s/ik f;zx, joBkw f;zx Pkw), gzikph ;kfjs gqekPB, nzfwqs;o.

(ਵਿਸ਼ਾ-ਵਸਤੂ/ BkfJe fpzp/ ;ko) **14 nze**

:{fBN-III

(T) Ppd pDso ns/ Ppd ouBk L gfoGkPk, w[ZYb/ ;zebg.

(n) Ppd Pq/DhnK **14 nze**

:{fBN-IV

(T) d|soh fuZmh gZso

(n) w[jkto//nykD **14nze**

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **BASIC PUNJABI**
Course code: BSNL-**2031** for Bachelor of Science (Non-Medical)
BCSL-**2031** for Bachelor of Science (Computer Science)

Course outcomes

CO1: Ppd P/qDhnK L gSkD ns/ tos'A (BKt, gVBKt, fefonk, ftP/PD, fefonk ftP/PD, ;pzXe, :'ie ns/ ft;fwe) Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo gzikph GkPk dh nwhoh dk ns/ pkohehnK Bz{ ;wMD bJh tZyo/ -tZyo/ f;XKsK dk ftek; eoBk j?/.

CO2: ftfdnkoEh gzikph tke pDso (;kXkoB tke, ;z:[es tke, fwPos tke, fpnkBhnk tke, gqPB tkue tke ns/ j[ewh tke) dh gfoGkPk ns/ fJ; dh pDso s'A ikD{ j'Dr/ ns/ T[BQK dh GkPk s/ geV wip{s j't/rh.

CO3: g?oQk ouBk ns/ ;zy/g ouBk dk wB'oE ftfdnkoEhnK dh p[ZXh B{z shyD eofdnK T[BK dh fbyD gqfsGk B{z T[ikro eoBk j?.

CO4: xo/b{ ns/ d|soh fuZmh gZso fbyD dk wB'oE ftfdnkoEhnK B{z fJ; ebk ftu fBg[zB eoBk j? ı nykD ns/ w[jkto/ dh tos'A Bkb rZbpks ftu gogZesk nkT[Adh j?.fJj ftfdnkoEhnK dh rZbpks ftu fByko fbnkT[D dk ezw eoBr/.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **BASIC PUNJABI**
Course code: BSNL-**2031** for Bachelor of Science (Non-Medical)
BCSL-**2031** for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

nze tzv ns/ gohfyne bJh jdkfJsK
1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.
2H ftfdnkoEh B/ eZ[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB eoBk bkIwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.
3H jo/e gqPB d/ 16 nze jB.
4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw

:{fBN-I

Ppd P/qDhnK L gSkD ns/ tos'A (BKt, gVBKt, fefonk, ftP/PD, fefonk ftP/PD, ;pzXe, :'ie ns/ ft;fwe) 14 nze

:{fBN-II

gzikph tke pDso L w[ZYbh ikD gSkD
(T) ;kXkoB tke, ;z:[es tke ns/ fwPos tke (gSkD ns/ tos'A)
(n) fpnkBhnk tke, gqPB tkue tke ns/ j[ewh tke (gSkD ns/ tos'A) 14 nze

:{[fBN-III

g?oQk ouBk
;zy/g ouBk 14 nze

:{fBN-IV

fuZmh gZso (xo/b{ ns/ d|soh)
nykD ns/ w[jkto/ (fb;N Bkb BZEh j?) 14 nze

nykD

T[m/ sk T[Zm BjhA o/s/ dh w[Zm ,ਉੱਦਮ ਅੱਗੇ ਲੱਛਮੀ ਪੱਖੇ ਅੱਗੇ ਪੈਣ ,ਉਹ ਦਿਨ ਡੁੱਬਾ ਜਦੋਂ ਘੋੜੀ ਚੜ੍ਹਿਆ ਕੁੱਬਾ ,ਉੱਚੀ ਦੁਕਾਨ ਫਿੱਕਾ ਪਕਵਾਨ ,ਉਲਟੀ ਵਾੜ ਖੇਤ ਨੂੰ ਖਾਏ ,ਉੱਚਾ ਲੰਮਾ ਗੱਭਰੂ ਪੱਲੇ ਠੀਕਰੀਆਂ , nPo|hnK dh b[ZN s/ e'fbnK s/ w[joK, nZr/ ;Zg fgZS/ PhAj, nkdo s/oh ukdo B{z pfjDk s/o/ rfjD/ B{z, nkg/ ckEVhJ/ s?B{z e"D S[vkJ/, nkgD/ jZEhA nkgDk nkg/ jh eki ;tkohn?, nkoh B{z fJZe gk;/ dzd/ ijkB B{z d'jhA gk;hA,ਅੱਖੀਂ ਵੇਖ ਕੇ ਮੱਖੀ ਨਹੀਂ ਨਿਗਲੀ ਜਾਂਦੀ ,ਅੰਦਰ ਹੋਵੇ ਸੱਚ ਤਾਂ ਕੋਠੇ ਚੜ੍ਹ ਕੇ ਨੱਚ ,ਆਪੇ ਮੈਂ ਰੱਜੀ ਪੁੱਜੀ ਆਪੇ ਮੇਰੇ ਬੱਚੇ ਜਿਉਣ ,ਆਪ ਕੁਚੱਜੀ ਵਿਹੜੇ ਨੂੰ ਦੋਸ਼ ,ਅੰਨ੍ਹਾ ਵੰਡੇ ਰਿਉੜੀਆਂ ਮੁੜ ਮੁੜ ਆਪਣਿਆਂ ਨੂੰ ,ਅਕਲ ਵੱਡੀ ਕੇ ਮੱਝ ,ਅੰਨ੍ਹਿਆਂ ਵਿੱਚ ਕਾਣਾ ਰਾਜਾ ,ਆਪਣੀ ਪੀੜ੍ਹੀ ਹੇਠ ਸੋਟਾ ਫੇਰਨਾ ,ਇਕ ਅਨਾਰ ਸੌ ਬਿਮਾਰ ,ਇਕ ਹੱਥ ਨਾਲ ਤਾੜੀ ਨਹੀਂ ਵੱਜਦੀ ,ਇੱਕ ਚੁੱਪ ਸੌ ਸੁੱਖ ਝੱਟ ਮੰਗਣੀ ਪੱਟ ਵਿਆਹ ,ਸਹਿਜ ਪੱਕੇ ਸੋ ਮੀਠਾ ਹੋਵੇ ,ਦਾਲ ਵਿੱਚ ਕਾਲਾ ਹੋਣਾ , ;zr sko/ e[;zr v'p, ਸੱਦੀ ਨਾ ਬੁਲਾਈ ਮੈਂ ਲਾੜੇ ਦੀ ਤਾਈਂ ,ਸਵੈ ਭਰੋਸਾ ਵੱਡਾ ਤੋਸਾ,ਸੌ ਦਿਨ ਚੋਰ ਦੇ ਇਕ ਦਿਨ ਸਾਧ ਦਾ ,ਸੱਪ ਦਾ ਬੱਚਾ ਸਪੋਲੀਆ ,ਸੱਪ ਮਰ ਜਾਵੇ ਲਾਠੀ ਵੀ ਨਾ ਟੁੱਟੇ ,ਸਾਈਆਂ ਕਿਤੇ ਵਧਾਈਆਂ ਕਿਤੇ ,ਹੰਕਾਰਿਆ ਸੋ ਮਾਰਿਆ , jZE B{z jZE X'Adk j?, ਹਾਥੀ ਲੰਘ ਗਿਆ ਪੂਛ ਰਹਿ ਗਈ, e'j Bk uZbh pkpk fsjkJh,ਕੁੱਛੜ ਕੁਵਹ ਸ਼ਹਿਰ ਢੰਡੋਰਾ ,ਕੋਲਿਆਂ ਦੀ ਦਲਾਲੀ ਵਿੱਚ ਮੂੰਹ ਕਾਲਾ ,ਕਰੇ ਕੋਈ ਭਰੇ ਕੋਈ , fyZd' |o'fbnK bhoK jh fBebdhnK jB, ਖ਼ਵਾਜੇ ਦਾ ਗਵਾਹ ਡੱਡੂ ,ਖੇਤੀ ਖਸਮਾਂ ਸੇਤੀ , yop{l/ B{z d/y e/ yop{lk ozr pdbdk j?,ਖੂਹ ਪੁੱਟਦੇ ਨੂੰ ਖਾਤਾ ਤਿਆਰ , xV/ B{z jZE bkfJnk ;kok NZpo fsjkfJnk,ਘਰ ਦਾ ਭੇਤੀ ਲੰਕਾ ਢਾਹੇ ,ਘਰ ਦੀ ਕੁੱਕੜੀ ਦਾਲ ਬਰਾਬਰ ,ਚਿੰਤਾ ਚਿਖਾ ਬਰਾਬਰ , ਛੱਜ ਤਾਂ ਬੋਲੇ ਛਾਣਨੀ ਵੀ ਬੋਲੇ,ਛੋਟੀ ਮੂੰਹ ਵੱਡੀ ਗੱਲ , i' okshA ikrD ekbhnK ;' jh ykD ;[ykbhnK ,ਜਾਂਦੇ ਚੋਰ ਦੀ ਲੰਗੋਟੀ ਹੀ ਸਹੀ ,ਜਿਸ ਦੀ ਕੋਠੀ ਦਾਣੇ ਉਹਦੇ ਕਮਲੇ ਵੀ ਸਿਆਣੇ ,ਜਿਹੜੇ ਗੱਜਦੇ ਨੇ ਉਹ ਵਰ੍ਹਦੇ ਨਹੀਂ , ਝੱਟ ਮੰਗਣੀ ਪੱਟ ਵਿਆਹ , BtK B" fdB g[okDk ;" fdB, gkDh ftZu ;'Nk wkfonK gkDh d' BjhA j' iKd/, ftZfdnk ftukoh sK goT[Zgekoh, t/b/

dh BwkI e[t/b/ dhnK NZeoK, fJe do pzd ;" do yZ[bQk, fpZbh d/ f;oQkD/ d[ZX BjhA izwdk,ਰੱਸੀ ਸੜ ਗਈ ਵੱਟ ਨੂੰ ਗਿਆ

w[jkto/

ਉਸਤਾਦੀ ਕਰਨੀ, ਉਂਗਲ ਕਰਨੀ, ਉੱਲੂ ਬਣਾਉਣਾ ,ਉੱਚਾ ਸਾਹ ਨਾ ਕੱਢਣਾ, ਉੱਡਦੇ ਫਿਰਨਾ ,ਉੱਘ ਸੁੱਘ ਮਿਲਣੀ,ਅੱਖਾਂ ਵਿਚ ਰੜਕਣਾ , T[ArbK s/ BukT[Dk, T[XV^Xz[wh wukT[Dk, T{m d/ w{zj ftZu Ihok d/Dk, ਅੱਗ ਲਾਉਣਾ ,ਆਵਾ ਊਤ ਜਾਣਾ ,ਅਸਮਾਨ ਨੂੰ ਟਾਕੀਆਂ ਲਾਉਣਾ, ਅੱਖਾਂ ਵਿੱਚ ਲਾਲੀ ਉਤਰਨੀ ,ਅਕਲ ਤੇ ਪਰਦਾ ਪੈਣਾ, nZyK nZr/ y'g/ ukV d/D/, nZyK T[Zs/ fpmkT[Dk, nZb/ cZNK s/ b{D fSVeDk, nkgD/ nZr/ ezv/ phiDk, nkgD/ soeP ftZu sho j'Dk, f;o uVQBk, ਈਨ ਮੰਨਣੀ, ਈਦ ਦਾ ਚੰਨ ਹੋਣਾ, ਇੱਟ ਨਾਲ ਇੱਟ ਖੜਕਾਉਣk,ਸਿਰ ਫਿਰਨਾ, ਸਿਰ ਤੇ ਚੜ੍ਹਨਾ ,ਸਬਰ ਦਾ ਘੁੱਟ ਭਰਨਾ, ਸਿਰ ਪੈਰ ਨਾ ਹੋਣਾ, f;o y[oeD dh t/jb Bk j'Dk, ;Zmh d/ u"b y[nkD/, ਹੱਥ ਧੋ ਕੇ ਪਿੱਛੇ ਪੈਣਾ, ਹੱਥੀਂ ਛਾਂਵਾਂ ਕਰਨੀਆਂ, ਹੱਡ ਭੰਨਣੇ, ਹੱਥ ਤੰਗ ਹੋਣਾ ,ਹੱਥ ਮਲਣਾ,ਹੱਥ ਪੈਰ ਮਾਰਨਾ, jZE T[Zs/ jZE Xo e/ p?mDk, jZE tNkT[Dk, jtk d/ x'V/ ;tko j'Dk, ਕੰਨੀਂ ਕਤਰਾਉਣਾ, ਕੰਨ ਤੇ ਜੂੰ ਨਾ ਸਰਕਣਾ, ਕੰਨ ਘੇਸਲ ਮਾਰਨੀ, eDe Bkb x[D th fg;Dk, eZy GzB e/ d{joK Bk eoBk, ebw d/ XBh j'Dk, feskph ehVk j'Dk, ਖ਼ਾਨਾ ਖ਼ਰਾਬ ਹੋਣਾ, ਖਾਨਿਓ ਜਾਣਾ, y{j fBy[ZN ikDk, ਗੁੱਡੀ ਚੜ੍ਹਨੀ, ਗਲ ਪੈਣਾ ,ਗੰਗਾ ਨਹਾਉਣਾ ,ਚੜ੍ਹ ਮੱਚਣੀ, ਚੰਦ ਚਾੜ੍ਹਨਾ, ਚਾਦਰ ਵੇਖ ਕੇ ਪੈਰ ਪਸਾਰਨਾ ,ਚਕਮਾ ਦੇਣਾ ,ਛੱਕੇ ਛੜਾਉਣਾ ,ਛਾਪਾ ਮਾਰਨਾ, ਛਿੱਲ ਲਾਉਣੀ ,ਛਿੱਕੇ ਟੰਗਣਾ

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)

Bachelor of Science (SEMESTER–II)

Course Title: **Punjab History and Culture (C. 320 to 1000 A.D.)**

(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Course code: BSNL-**2431** for Bachelor of Science (Non-Medical)
BCSL-**2431** for Bachelor of Science (Computer Science)

COURSE OUTCOMES

After completing Semester II and course on Ancient History of Punjab students will be able to understand:

CO 1: The reasons and impact of Alexander's invasions and to comprehend various factors leading to rise and fall of empires and emergence of new dynasties and their administration specifically of Maurya rule in general and Ashok in particular

CO 2: art and architecture of Gupta period and the Indo-Greek style of architecture under Gandhara School

CO 3: To have an insight into the socio-cultural history under Harshvardhan and punjab under the stated period

CO 4: To enable students to have thorough insight into the various forms/styles of Architecture and synthesis of Indo - Greek Art and Architecture in Punjab

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)

Bachelor of Science (SEMESTER–II)

Course Title: **Punjab History and Culture (C. 320 to 1000 A.D.)**
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Course code: BSNL-**2431** for Bachelor of Science (Non-Medical)
BCSL-**2431** for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setter:

1. Question paper shall consist of four Units
2. Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.
3. Candidates shall attempt 5 questions in 1000 words, by at least selecting One Question from each Unit and the 5th question may be attempted from any of the four Units.
4. Each question will carry 14 marks

UNIT-I

1. Alexander's Invasion's and Impact
2. Administration of Chandragupta Maurya with special reference to reforms introduced by Ashok

UNIT-II

3. The Kushans: Gandhar School of Art
4. Gupta Empire: Golden Period-Social and cultural life, Art and Architecture)

UNIT-III

5. The Punjab under Harshvardhana-Society and Religion During the time of Harshvardhana
6. Socio-cultural History of Punjab from 7th to 1000 A.D.

UNIT IV

7. Development of Languages and Education with Special reference to Taxila
8. Development to Art and Architecture

Suggested Readings

· B.N. Sharma: *Life in Northern India*, Delhi. 1966
· Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983.
· L. M Joshi (ed), *History and Culture of the Punjab*, Art-I, Punjabi University, Patiala, 1989 (3rd edition)
· L.M. Joshi and Fauja Singh (ed.), *History of Punjab*, Vol.I, Punjabi University, Patiala, 1977.

Bachelor of Science (Semester System) (12+3+1 System of Education)

(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **ENGLISH LANGUAGE AND LITERATURE-1**
Course code: BSNL-**2212** for Bachelor of Science (Non-Medical)
BCSL-**2212** for Bachelor of Science (Computer Science)

COURSE OUTCOMES

After passing this course, the students will be able to:

CO 1: change the narration and voice of sentences after understanding fundamental grammatical rules governing them through the study of "English Grammar in Use" by Raymond Murphy

CO 2: to learn to write personal letters and enhance the writing skills

CO 3: comprehend the meaning of texts and answer questions related to situations, episodes, themes and characters depicted in them through the study of the stories in the text "Tales of Life".

CO 4: appreciate the writings of various Indian and foreign story and Short - Story writers and relate them to their socio-cultural milieu through the study of the stories in the text "Tales of Life".

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **ENGLISH LANGUAGE AND LITERATURE-1**
Course code: BSNL-**2212** for Bachelor of Science (Non-Medical)
BCSL-**2212** for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question will carry 14 marks.

The syllabus is divided in four units as mentioned below.

UNIT–I

English Grammar in Use, 5th Edition by Raymond Murphy, CUP (Units: 49-81)

UNIT–II

Personal letter Writing and English Grammar in Use (Units: 82-97)

UNIT–III

Tales of Life (Guru Nanak Dev University, Amritsar): Stories at Sr. No. 1, 2, 3, 5 and 6

UNIT–IV

Tales of Life (Guru Nanak Dev University, Amritsar): Stories ar Sr. No. 7, 9, 10, 11, 12

Texts Prescribed:

1. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP
2. *The Students' Companion* by Wilfred D. Best
3. *Tales of Life* (Guru Nanak Dev University, Amritsar)
4. *Prose for Young Learners* (Guru Nanak Dev University, Amritsar)

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **Mathematics** (**Calculus)**
Course code: BSNL-**2333** for Bachelor of Science (Non-Medical)
BCSL-**2333** for Bachelor of Science (Computer Science)

Course Outcomes

After passing this course, the students will be able to:
CO 1: Understand real number system, limit of a function, basic properties of limit, continuity, and classification of discontinuities & to apply it in real world problems.
CO 2: To Classify the difference between Hyperbolic and Inverse Hyperbolic functions and understand the concept of Taylor's and Maclaurin theorem with its applications.
CO 3: Demonstrate Asymptotes and De Moivre's theorem (for integer and Rational index) and its applications, primitive nth roots of unity.
CO 4: To understand the concepts of definite integrals and their properties and Reduction Formulae & to apply in a wide variety of disciplines like Bio, Eco, Physics & Engineering.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **Mathematics (Calculus)**
Course code: BSNL-**2333** for Bachelor of Science (Non-Medical)
BCSL-**2333** for Bachelor of Science (Computer Science)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setter: Eight questions of equal marks (14 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit-I

Real number system and its order properties: lub, glb of sets of real numbers, Completeness property, Archimedean property, Dense property of Rational numbers, Limit of a function of real variable, Properties of Limits, Squeeze Theorem, Continuous function and classification of discontinuities, Differentiability of a function of real variable, Concavity and Convexity of function, Point of inflexion.

Unit-II

Derivatives of Hyperbolic and Inverse Hyperbolic functions, nth order derivatives, Leibnitz theorem on nth derivative and its applications, Taylor's and Maclaurin theorem with Lagrange form of remainder, Application of Taylor's theorem in error estimation; Taylor's series expansions of etc. Indeterminate forms and L'Hopital rule.

Unit-III

Asymptotes, Horizontal Asymptotes, Vertical Asymptotes, Oblique Asymptotes, Asymptotes of general Rational Algebraic Curve with illustrations, Intersection of curve and its Asymptotes, de Moivre's theorem (for integer and Rational index) and its applications, primitive nth roots of unity.

Unit-IV

Integration of hyperbolic functions, Properties of definite integral, Reduction formulae of type
Reduction formulae of using rule of smaller index +1 of type

Text Books:-

1. S. Narayan and P.K.Mittal: Integral Calculus.Sultan Chand & Sons.
2. Gorakh Prasad, Differential Calculus (19th ed.). Pothishala Pvt. Ltd. Allahabad,2016.

Reference Books:-

1. Tom M.A postol, Calculus: An Indian Adaptation, Wiley India,2023.
2. MurrayR.Spiegel, Theory and Problems of Advanced Calculus, Schaum' soutlineseries, Schaum Publishing Co.NewYork.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **CALCULUS LABORATORY**
Course code: BSNP-**2333** for Bachelor of Science (Non-Medical)
BCSP-**2333** for Bachelor of Science (Computer Science)

COURSE OUTCOMES:

After passing this course, students will be able to:

CO1: Students will demonstrate the ability to conduct a specific experiment from a given list, applying theoretical knowledge and practical skills to accurately complete the procedure and obtain reliable results.

CO2: Students will be able to articulate the theoretical background and principles underlying the chosen experiment.

CO3: Students will demonstrate their understanding of the experiment through oral questioning and discussion.

CO4: Students will maintain a well-organized and accurate practical file documenting all experiments conducted.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–I)
Course Title: **CALCULUS LABORATORY**
Course code: BSNP-**2333** for Bachelor of Science (Non-Medical)
BCSP-**2333** for Bachelor of Science (Computer Science)

Credits: 0-0-1 **Max Marks: 50 (ESE Marks: 35, CA: 15)**
Examination Time: 3 Hours **Pass Mark: 13**

Instructions to Practical Examiner
Question paper is to be set on the spot jointly by the external and internal examiners. Two copies of the same to be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar

1. Plotting graphs of elementary functions eax+b sin(bx+c) , log(ax+b), 1/(ax+b), sin(ax+b), cos(ax+b), |ax+b| and to illustrate the effect of a and b on the graphs.
2. Plotting the graphs of the polynomial of degree 4 and 5, the derivative graph, the second derivative graph
3. Tracing of conics in Cartesian coordinates and using the general equation of second degree in x and y.
4. Tracing of conicoids: Ellipsoid, Hyperbolic paraboloid, Elliptic paraboloid, Hyperboloid of one and two sheets etc.
5. Graphs of hyperbolic functions.
6. Approximation of limit.
7. Approximations of derivatives.

Reference Books:-

1. S.S. Sastry, Engineering Mathematics -Volume I (4^{th} Edition), PHI, 2008.
2. S.S. Sastry, Engineering Mathematics -Volume II (4^{th} Edition), PHI, 2008.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **Chemistry (Organic Chemistry-I: Hydrocarbons And Alkyl Halides)**

Course code: BSNL-**2084** for Bachelor of Science (Non-Medical)

Course outcomes:
Students will be able to
CO1: interpret the bonding, hybridization between different organic compounds, explain the various reaction mechanisms and different electron displacement effects
CO2: interpret the reactions and properties of alkanes, alkenes & alkynes, derive the electrophilic, nucleophilic addition reactions, free radical mechanisms of halogenation of alkanes.
CO3: differentiate between aromatic, anti-aromatic and non-aromatic compounds, explain the effect of various substituents on the reactivity of aromatic compounds
CO4: learn about the basic chemistry of organic compounds along with methods of formation and reactions of alkyl halides and their derivatives.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **Chemistry (Organic Chemistry-I: Hydrocarbons And Alkyl Halides)**
Course code: BSNL-**2084** for Bachelor of Science (Non-Medical)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setter: Eight questions of equal marks (14 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Hybridization, Use of arrows, Types of reagents, Reactive Intermediates: Carbocations, Carbanions, Free radicals Carbenes, arenes and Nitrenes. Stereochemistry: Fischer Projection, Newmann and Sawhorse Projection formulae and their interconversions, Geometrical isomerism, E/Z notations with C.I.P rules, Optical Activity, enantiomeric and diastereomeric excess, Chirality/Asymmetry, Enantiomers, Diastereoisomers, Racemic mixture and resolution, optical activity in absence of chiral carbon, Relative and absolute configuration: D/L and R/S designations

UNIT-II

Chemistry of alkanes: methods of formation of alkanes, Free radical substitutions: Halogenation -relative reactivity and selectivity. Cycloalkanes and Conformational Analysis: Baeyer strain theory, Conformation analysis, relative stability and energy diagrams of ethane, propane, butane, cyclohexane and Chair, Boat and Twist boat forms of cyclohexane.
Chemistry of alkenes/alkynes: Nomenclature and Formation of alkenes and alkynes, Mechanism of E1 and E2 reactions, Saytzeff and Hofmann eliminations. Mechanisms and Reactions of alkenes, reduction, syn and anti-hydroxylation (oxidation), 1, 2- and 1,4- addition reactions in conjugated dienes and Diels-Alder reaction, mechanism of allylic and benzylic bromination. Reactions of alkynes.

UNIT-III

Aromaticity: Huckel's rule, Structure of benzene: Molecular formula and Kekule structure. Stability and C-C bond lengths of benzene, resonance structure. Aromatic electrophilic substitution–general pattern of the mechanism, role of σ and π complexes. Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, reactivity and orientation of disubstitution. Side chain reactions of benzene derivatives. Methods of formation and chemical reactions of alkylbenzenes.

UNIT-IV

Alkyl halides: Methods of preparation, details of nucleophilic substitution reactions – SN1, SN2 and SNi mechanisms with stereochemical aspects and effect of solvent, nucleophilic substitution vs. elimination. Aryl halides: Preparation, including preparation from diazonium salts, nucleophilic aromatic substitution in details; SNAr, Benzyne mechanism. Relative reactivity and mechanism of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions in detail.

Books suggested

1. Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

2. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
3. Solomons, T. W., Fryhle, C.B., Organic Chemistry; 9th edition, Pubs: Wiley India, 2007.
4. Wade Jr., L.G., Singh, M.S., Organic Chemistry; 6th edition, Pubs: Pearson Education, 2008.
5. Fundamentals of Organic Chemistry, Solomons, John Wiley.
6. Introduction to Organic Chemistry, Sireitwieser, Heathcock and Kosover, Macmilan.
7. Kalsi, P. S. Stereochemistry Conformation and Mechanism, New Age International, 2005.
8. McMurry, J. E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013.
9. Eliel, E. L. & Wilen, S. H. Stereochemistry of Organic Compounds, Wiley: London, 1994.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **ORGANIC CHEMISTRY-I: LAB FUNCTIONAL GROUP ANALYSIS (PRACTICAL)**

Course code: BSNP-**2084** for Bachelor of Science (Non-Medical)

Course outcomes:
Students will be able to analyze the given organic compound through
CO1: understand the basics of Qualitative analysis
CO2: detection of elements (N, S and halogens) in organic compounds.
CO3: detection of functional groups (phenolic, carboxylic, carbonyl, esters, carbohydrates, amines,amides, nitro and anilide) in simple organic compounds
CO4: preparation of their derivatives

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **ORGANIC CHEMISTRY-I: Lab Functional Group Analysis (PRACTICAL)**

Course code: BSNP-**2084** for Bachelor of Science (Non-Medical)

Credits: 0-0-2 **Max Marks: 50 (ESE Marks: 35, CA: 15)**
Examination Time: 3.5 Hours **Pass Mark: 13**

Basic techniques on purification of organic compounds. Determination of melting point and boiling point of organic compounds. Detection of nitrogen, halogens and sulphur in organic compounds. Qualitative analysis of unknown organic compounds containing simple functional groups.

Books Suggested

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5 th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **PROGRAMMING IN C**
Course code: BCSM-**2134** for Bachelor of Science (Computer Science)

Course Outcomes:

After passing this course the student will be able to:
CO1: Comprehend the working of various programming constructs involved in C Programming.
CO2: Apply various operators and control sequence of programs using various control statements.
CO3: Apply programming concepts such as arrays, functions and strings to provide solutions in different problem domains.
CO4: Work with pointers, structures and union.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **Computer Science (Programming in C)**

Course code: BCSM-**2134** for Bachelor of Science (Computer Science)
Credits: 3-0-1 **Max Marks: 100 [Theory 70 (ESE Marks: 40, CA: 30), Practical 30]**
Examination Time: 3 Hours **Pass Mark: 14**

Instructions for Paper Setter -
Eight questions of equal marks (12 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each question carries 8 marks.

UNIT–I

Data Representation, Introduction to Number Systems and Character Set, Decision tables, Decision Trees, Flow Charts, pseudo codes and, algorithms.
Programming Using C: Introduction to C, Applications and Advantages of C, Tokens, Types of Errors Data Types: Basic & Derived Data Types, User Defined Data Types, Declaring and initializing variables.

UNIT–II

Operators and Expressions: Types of operators (Unary, Binary, Ternary), Precedence and Associativity.
Data I/O Functions: Types of I/O function, Formatted & Unformatted console I/O Functions.
Control Statements: Jumping, Branching and Looping–Entry controlled and exit controlled, difference between for, while and do–while.

UNIT–III

Arrays: Types of Arrays, One Dimensional and Two-Dimensional Arrays.
Strings: Introduction to Strings and String functions, array of strings.
Functions: User Defined & Library Function, Function (Prototype, Declaration, Definition), Methods of passing arguments, local and global functions, Recursion.

UNIT-IV

Storage Classes: Introduction to various storage classes, scope and lifetime of a variable, advantages and disadvantages.
Pointers: Introduction, Uses of pointers, Limitations of pointers, Difference between void pointer and Null pointer, Pointer arithmetic, operators not allowed on pointers, Types of Pointer, Passing Pointers to function, concept of pointer to pointer.
Structure and Union: Introduction to structure and union, pointers with structure.

References:

1. E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill (2002), 5th edition.
2. Stephen G. Kochan, Programming in C, Pearson Education (2015), 4th edition.
3. Rachhpal Singh K.S. Kahlon, Gurvinder Singh, Programming in C, Kalyani Publishers (2011).
4. YashwantKanetkar, Let us C, BPB Publications (2020), 17th edition.
5. R.S. Salari, Application Programming in C, Khanna Book Publishing (2012), 4th edition.
6. Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th edition.

r to pointer. Structure and Union: Introduction to structure and union, pointers with structure.

Bachelor of Science (Semester System) (12+3+1 System of Education)

Bachelor of Science (Semester System) (12+3+1 System of Education)

SEMESTER-II

(Session-2024-25)

Course code: BSNL-2395 for Bachelor of Science (Non-Medical)

BCSL-2395 for Bachelor of Science (Computer Science)

COURSE TITLE: PHYSICS (MECHANICS)

COURSE OUTCOMES:

After passing this course, students will be able to:

CO1: Understand the various coordinate systems and their applications. Students will be able to know the conservation laws and the symmetries of space & time. To understand the motion of an object under central forces, the nature of its trajectory, turning points. Students will understand planetary motion by solving differential equations of orbits and studying Kepler's laws.

CO2: They will understand the Galilean transformations and origin of fictitious forces in non-inertial frames and their consequences on acceleration due to gravity, the motion of a particle on earth. They will understand the elastic scattering in the lab and center of mass systems. They will understand the physics of the rotational motion of a body by studying Euler's equations and the Moment of inertia tensor.

CO3: Learn the various experiments to understand the origin of the special theory of relativity and the relativistic phenomena such as Length contraction, Relativity of simultaneity, Synchronization and time dilation; Doppler effect of light and Twin paradox.

CO4: understand relativity as a bridge between electricity and magnetism. They will learn the concept of four-dimensional Minkowski space and Four vectors.

Bachelor of Science (Semester System) (12+3+1 System of Education)
SEMESTER-II
(Session-2024-25)
Course code: BSNL-2395 for Bachelor of Science (Non-Medical)
BCSL-2395 for Bachelor of Science (Computer Science)
COURSE TITLE: PHYSICS (MECHANICS)

Credits: 4-0-0 **Max Marks: 100 (ESE Marks: 70, CA: 30)**
Examination Time: 3 Hours **Pass Mark: 25**

Instructions for the Paper Setters:
Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section. Each question carries 14 marks. There should be 20% numerical in each paper.
Note: There should be 20% numerical in each paper. Students can use Non-Scientific calculators or logarithmic tables.

Unit I

Cartesian and spherical polar co–ordinate systems, area, volume, velocity and acceleration in these systems. Solid angle, Relationship of conservation laws and symmetries of space and time.
Various forces in Nature (Brief introduction) centre of mass, equivalent one-body problem, central forces, equation of motion under a central force, equation of orbit and turning points. Kepler Laws.

Unit-II

Inertial frame of reference. Galilean transformation and Invariance. Non-Inertial frames, Coriolis force and its applications. Variation of acceleration due to gravity with latitude. Focault pendulum, Elastic collision in Lab and C.M. system, velocities, angles and energies, cross-section of elastic scattering, Rutherford scattering. Rigid Body Motion; Rotational motion, principal moments and Axes. Euler's equations, precession and elementary gyroscope.

Unit-III

The Lorentz Transformations: Newtonian relativity; Instances of its failure in electromagnetism; Attempts to locate the absolute frame of reference; Fizeau's experiment; Michelson-Morley experiment & Ether Drag Hypothesis; Lorentz-Fitzgerald contraction; Einstein's basic postulates of relativity and geometric derivation of Lorentz transformations; Length contraction; Relativity of simultaneity; Synchronization and time dilation; Einstein's velocity addition rule; Transformation of acceleration; Aberration (relativistic) of starlight and Relativistic Doppler effect; Twin paradox and its resolution.

Unit -IV

Relativistic Dynamics: Variation of mass with velocity; Mass energy equivalence; Relativistic formulae for momentum and energy; Transformation of momentum, energy and force; Transformation of electromagnetic fields; Magnetism as a relativistic phenomenon; Illustrative examples. Structure of Space-time and Principle of Equivalence: Concept of Minkowski space; Geometrical interpretation of Lorentz transformations of space & time; Geometrical representation of simultaneity, contraction and dilation; Space-like, time and light-like intervals; Four vectors; Concept of world lines.

Books Suggested

1. Mechanics-Berkeley Physics Course, by C. Kittel, W. D. Knight, M. A. Ruderman, C. A. Helmholtz and R. J. Moyer-Tata Mc Graw Hill Publishing Company.Vol-I (second edition).
2. Fundamentals of Physics by D. Halliday, R. Resnick and J. Walker (sixth edition)-Wiley India Pvt. Ltd., New Delhi, 2004.
3. Concepts of Modern Physics by Arthur Bieser, Tata Mc Graw Hill Publishing Company Ltd., 2003
4. An introduction to Mechanics, D. Kleppner, R.J. Kolenkow, 2012, McGraw-Hill.
5. Analytical Mechanics by S. K. Gupta, Modern Publishers.
6. Theoretical Mechanics, M.R. Spiegel, 2006, Tata McGraw Hill.
7. Mechanics, H.S. Hans & S.P. Puri.

Bachelor of Science (Semester System) (12+3+1 System of Education)

SEMESTER–II

(Session-2024-25)

COURSE TITLE: Mechanics Lab

Course code: BSNP-2395 for Bachelor of Science (Non Medical)
BCSP-2395 for Bachelor of Science (Computer Science)

COURSE OUTCOMES:

After passing this course, students will be able to:

CO1: Students will demonstrate the ability to conduct a specific experiment from a given list, applying theoretical knowledge and practical skills to accurately complete the procedure and obtain reliable results.

CO2: Students will be able to articulate the theoretical background and principles underlying the chosen experiment.

CO3: Students will demonstrate their understanding of the experiment through oral questioning and discussion.

CO4: Students will maintain a well-organized and accurate practical file documenting all experiments conducted.

Bachelor of Science (Semester System) (12+3+1 System of Education)

SEMESTER–II

(Session-2024-25)

COURSE TITLE: Mechanics Lab

Course code: BSNP-2395 for Bachelor of Science (Non Medical)
BCSP-2395 for Bachelor of Science (Computer Science)

Credits: 0-0-2 **Max Marks: 50 (ESE Marks: 35, CA: 15)**
Examination Time: 3 Hours **Pass Mark: 13**

Instructions to Practical Examiner

Question paper is to be set on the spot jointly by the external and internal examiners. Two copies of the same to be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar

General Guidelines for Practical Examination

The distribution of marks is as follows :

i) One experiment 15 Marks
ii) Brief Theory 7 Marks
iii) Viva–Voce 7 Marks
iv) Record (Practical file) 6 Marks

II. There will be one session of 2 hours duration. The paper will have one session. Paper will consist of 8 experiments, out of which an examinee will mark 6 experiments and one of these is to be allotted by the external examiner.

III. The number of candidates in a group for practical examination should not exceed 12.

IV. In a single group, no experiment should be allotted to more than three examinees.

LIST OF EXPERIMENTS

1. To study the dependence of moment of inertia on distribution of mass (by noting time periods of oscillations using objects of various geometrical shapes but of same mass).
2. To establish a relationship between torque and angular acceleration using a flywheel.
3. To find the moment of inertia of a flywheel.
4. Study of bending of beams and determination of Young's modulus.
5. Determination of Poisson's ratio for rubber.
6. To determine energy transfer, coefficient of restitution and verify laws of conservation of linear momentum and kinetic energy in elastic collisions using one dimensional collisions of hanging spheres.
7. To verify the laws of vibrating strings by Melde's experiment.
8. Measure time period as a function of distance of center of suspension (oscillation) from center of mass, plot relevant graphs, determine radius of gyration and acceleration due to gravity.
9. Find the value of 'g' by Kater's pendulum.
10. Measure time period of oscillation of a Maxwell needle and determine modulus of rigidity of the material of a given wire.
11. To measure logarithmic decrement, coefficient of damping, relaxation time, and quality factor of a damped simple pendulum.

Skill Enhancement Course (SEC -1)

Bachelor of Science (Semester System) (12+3+1 System of Education)

(Session-2024-25)

SEMESTER–II

Course Title: VIBRATION AND WAVES

Course code: BSNM-2390 for Bachelor of Science (Non Medical)

BCSM-2390 for Bachelor of Science (Computer Science)

COURSE OUTCOMES:

After passing this course, students will be able to:

CO1: Impart a strong foundation in the principles of vibrations and waves.

CO2: Develop problem solving and analytical skills in the context of wave phenomenon

CO3: attain practical knowledge and skills for potential job roles in related fields

CO4: understand the concept of coupled oscillators and wave motion. Students will also be able to apply the concept of waves and oscillations to any type of waves like e. m. waves, mechanical waves.

Bachelor of Science (Semester System) (12+3+1 System of Education)

(Session-2024-25)

SEMESTER–II

Course Title: VIBRATION AND WAVES

Course code: BSNM-2390 for Bachelor of Science (Non Medical)

BCSM-2390 for Bachelor of Science (Computer Science)

Credits: 2-0-1 **Max Marks: 100 [Theory 70 (ESE Marks: 40, CA: 30), Practical 30]**

Examination Time: 3 Hours **Pass Mark: 14**

Instructions for the Paper Setters:

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section. Each question carries **8 marks.**

Note: There should be 20% numerical in each paper. Students can use Non-Scientific calculators or logarithmic tables.

UNIT–I

Simple harmonic motion, energy of a SHO. Compound pendulum. Torsional pendulum Electrical Oscillations Transverse Vibrations of a mass on string, composition of two Perpendicular SHM of same period and of period in ratio 1:2, energy considerations, phase and frequency in SHO

UNIT–II

Decay of free Vibrations due to damping. Differential equation of motion, types of motion, types of damping. Determination of damping co–efficient– Logarithmic decrement, relaxation time and Q–Factor. Electromagnetic damping (Electrical oscillator).

UNIT–III

Differential equation for forced mechanical and electrical oscillators. Transient and steady state behaviour. Displacement and velocity variation with driving force frequency, variation of phase with frequency, resonance. Power supplied to an oscillator and its variation with frequency. Q–value and band width. Q–value as an amplification factor. Stiffness coupled oscillators, Normal co–ordinates and normal modes of vibration. Inductance coupling of electrical oscillators.

UNIT–IV

Types of waves, wave equation (transverse) and its solution characteristic impedance of a string. Impedance matching. Reflection and Transmission of waves at boundary. Reflection and transmission of energy. Reflected and transmitted energy coefficients. Standing waves on a string of fixed length. Energy of vibration string. Wave and group velocity.

Recommended Books:

1. Fundamentals of Vibrations and Waves by S.P. Puri.
2. Physics of Vibrations and Waves by H.J. Pain.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
SEMESTER–II
Course Title: VIBRATION AND WAVES (PRACTICAL)

Course code: BSNM-2390 for Bachelor of Science (Non Medical)
BCSM-2390 for Bachelor of Science (Computer Science)

COURSE OUTCOMES:
After passing this course, students will be able to:
CO1: Students will demonstrate the ability to conduct a specific experiment from a given list, applying theoretical knowledge and practical skills to accurately complete the procedure and obtain reliable results.
CO2: Students will be able to articulate the theoretical background and principles underlying the chosen experiment.
CO3: Students will demonstrate their understanding of the experiment through oral questioning and discussion.
CO4: Students will maintain a well-organized and accurate practical file documenting all experiments conducted.

Bachelor of Science (Semester System) (12+3+1 System of Education)

(Session-2024-25)

SEMESTER–II

Course Title: VIBRATION AND WAVES (PRACTICAL)

Course code: BSNM-2390 for Bachelor of Science (Non Medical)

BCSM-2390 for Bachelor of Science (Computer Science)

Time: 3 Hours **Max Marks: 30** **Pass Mark: 11**

Instructions to Practical Examiner

Question paper is to be set on the spot jointly by the external and internal examiners. Two copies of the same to be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar

General Guidelines for Practical Examination:

I. The distribution of marks is as follows: **Marks: 30**

i) One experiment **15 Marks**

ii) Brief Theory **6 Marks**

iii) Viva–Voce **6 Marks**

iv) Record (Practical file) **3 Marks**

II. There will be one session of 3 hours duration. The paper will have one session.

Paper will consist of 5 experiments out of which an examinee will mark 4 experiments and one of these is to be allotted by the external examiner.

III. Number of candidates in a group for practical examination should not exceed 12.

IV. In a single group no experiment is to be allotted to more than three examinees in any group.

LIST OF EXPERIMENTS

1. To determine the moment of inertia of a rectangular bar about an axis through its C.G. by the method of coincidence
2. To study one dimensional elastic collision using two hanging spheres.
3. To determine the frequency of a tuning fork using a sonometer.
4. To verify the laws of transverse vibrations of stretched strings using a sonometer.
5. To determine the frequency of AC mains using a sonometer and electro-magnet.
6. To determine the velocity of ultrasonic waves in a given liquid (say Kerosene).

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **Statistical Analysis using Excel**
Course code: BSNM-**2330** for Bachelor of Science (Non-Medical)
BCSM-**2330** for Bachelor of Science (Computer Science)

Credits: 2-0-1 **Max Marks: 100 [Theory 70 (ESE Marks: 40, CA: 30), Practical 30]**
Examination Time: 3 Hours **Pass Mark: 14**

Instructions for Paper Setters:
Eight questions of equal marks (8 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions.

UNIT-I

Introduction to statistics, functions of statistics, collection of data, presentation of data, tabulation of data, charting of data, introduction to excel/spss, graphs in excel, measures of central tendency-, mean, median - meaning and computation, mode- meaning and computation, weighted average mean, geometric mean and harmonic mean.

UNIT-II

Measures of dispersion, types of dispersion- range, quartile deviation, mean deviation, standard deviation, coefficient of variation. Skewness- Karl Pearson coefficient of skewness, Bowley's co-efficient of skewness and Kurtosis.

UNIT-III

Correlation, Types of correlation, positive, negative, linear. methods of correlations – Karl Pearson's Coefficient of correlation, rank correlation coefficient.

UNIT-IV

Regression analysis- Linear Regression, regression Y on X, regression X on Y, Regression Coefficient, Relations between regression coefficients and correlation coefficients, Difference between regression and Correlation, Calculation of these using MS excel.

Reference Books: -

1. SC Gupta, Fundamentals of Mathematical Statistics, Himalaya Publication.
2. Data Analysis with Microsoft Excel by K. Berk, Partrick Carey.

LIST OF PRACTICALS (USING EXCEL)

1. Introduction of basics of excel and functions such as 'sum', 'count', 'countif', 'max', 'min', 'sort' etc.
2. To prepare results from the data on marks and number of credits in a given number of courses of a class based on total marks, marks obtained, percentage of marks obtained, grades, and determine SGPA for each student.
3. Create frequency distribution table; plot histogram, bar chart, pie chart, etc.
4. Plotting two dimensional graphs.
5. To find measures of central tendency for a given data.
6. To find measures of dispersion for a given data.
7. To find measures of skewness and kurtosis for a given data.
8. To find Karl Pearson Coefficient of correlation and rank correlation coefficient for a given data.
9. To find a regression coefficient for bivariate data and plotting regression lines.

Reference Books:-

1. S. C. Gupta, Fundamentals of Mathematical Statistics, Himalaya Publication.
2. K. Berk, Partrick Carey, Data Analysis with Microsoft Excel.

Bachelor of Science (Semester System) (12+3+1 System of Education)

(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **Introduction to the Internet**
Course code: BCSM-2130 for Bachelor of Science (Computer Science)

Bachelor of Science (Semester System) (12+3+1 System of Education)

(Session-2024-25)

SEMESTER–II

Course Title: From Molecules to Markets: Entrepreneurship in Chemistry

Course code: BSNM-2080 for Bachelor of Science (Non Medical)

BCSM-2080 for Bachelor of Science (Computer Science)

COURSE OUTCOMES

Upon Completion of this course, the student will be able:

CO1: To understand the importance of chemistry in daily life.

CO2: To develop better understanding and reasoning of facts.

CO3: To skill up various laboratory techniques used in pharmaceutical and chemical industries

CO4: Hands on experience for manufacturing industries.

Bachelor of Science (Semester System) (12+3+1 System of Education)

(Session-2024-25)

SEMESTER–II

Course Title: FROM MOLECULES TO MARKETS: ENTREPRENEURSHIP IN CHEMISTRY

Course code: BSNM-2080 for Bachelor of Science (Non Medical)

BCSM-2080 for Bachelor of Science (Computer Science)

Credits: 2-0-1 **Max Marks: 100 [Theory 70 (ESE Marks: 40, CA: 30), Practical 30]**

Examination Time: 3 Hours **Pass Mark: 14**

Instructions for the Paper Setters: Eight questions of equal marks (Eight marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

UNIT-I

Cleaning agents

Soaps and detergents: Types (cationic and anionic), physical and chemical characteristics, advantages and disadvantages. Examples of Commercially available cleaning agents (shampoo, hand wash, face-wash)

UNIT-II

Disinfectants

Introduction, types, physical and chemical properties, classification (acids, alcohols, aldehydes, alkalis, halogens, phenols)

Sanitizers

Sanitizers-Introduction, types, raw material used in making professional hand sanitizer with properties, WHO recommendations for hand sanitizers.

UNIT-III

Cosmetics

Oils, fats, and waxes - Introduction, physical and chemical properties, their use in cosmetics, Preservatives-Introduction, properties, types and their significance.

UNIT-IV

Transition to Greener approach

Importance and Principles of Green Chemistry, bio-enzymes as disinfectants, green cosmetics-make up, shampoo, face pack, face mask, lipsticks.

PRACTICALS:

1. Preparation of Soaps.
2. Preparation of liquid detergent using animal fat.
3. Preparation of Hand-Sanitizers.
4. Preparation of Disinfectants.
5. Preparation of cleaning agents using bio-enzymes.

Books Suggested :

New Cosmetic Science by Takeo Mitsui

Cosmetic Science and Technology by Sargin C.B

Surfactants in personal care products and decorative cosmetics-Third edition by Linda D. Rhein, Anthony O'Lenick.

Handbook on Synthetic detergents by B.P. Sen.

Liquid Detergents, 2nd Edition by Kuo-Yann Lai.

Soap-Making Manual A Practical Handbook on the Raw Materials, Their Manipulation, Analysis and Control in the Modern Soap Plant (E-Book) by Mylene Stedmen.

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: **DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION**
Course code: VACD-**2161**

COURSE OUTCOMES

After completing the course the students will be able to:

CO1. Learn how to include factual data about what substance abuse is; warning signs of addiction; information about how alcohol and specific drugs affect the mind and body;

CO 2. Focus on substance abuse education- is teaching individuals about drug and alcohol abuse and how to avoid, stop, or get help for substance use disorders.

CO3. Learn how to be supportive during the detoxification and rehabilitation process

CO 4. Understand that substance abuse education is important for students alike; there are many misconceptions about commonly used legal and illegal substances, such as alcohol and marijuana

Bachelor of Science (Semester System) (12+3+1 System of Education)
(Session-2024-25)
Bachelor of Science (SEMESTER–II)
Course Title: Drug Abuse: Problem, Management and Prevention
Course code: VACD-**2161**

Credits: 2-0-1 **Max Marks: 50 (ESE Marks: 35, CA: 15)**
Examination Time: 3 Hours **Pass Mark: 14**

Instructions for the Paper Setter:
Eight questions of equal marks (8 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Meaning of Drug Abuse:
(i)Meaning, Nature, Types and Extent of Drug Abuse in India and Punjab.
(ii)Consequences of Drug Abuse for:
Individual: Education, Employment, Income.
Family: Violence.
Society: Crime, Social Disorganization

UNIT-II

MANAGEMENT OF DRUG ABUSE:
Medical management: medication for treatment and to withdrawal effects.
Psychiatric Management: Counseling, Behavioral and Cognitive therapy.

UNIT-III

Prevention of Drug abuse:
(i) Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
(ii) School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students

UNIT-IV

Controlling Drug Abuse:
(i) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials

Suggested Readings:

1.Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.
2 Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India,2004.
3.Inciardi, J.A. 1981. *The Drug Crime Connection.*Beverly Hills: SagePublications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5.Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
6.National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences,2004.
7.Sain, Bhim 1991, *Drug Addiction Alcoholism,* Smoking obscenity New Delhi: Mittal Publications.
8.Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab*: A Sociological Study. Amritsar: Guru Nanak Dev University.
9.Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
10.Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation,*Cambridge University Press.