FACULTY OF SCIENCES

SYLLABUS
for
BACHELOR OF SCIENCE (Non-Medical)
(Semester I-VI)

(Under Continuous Evaluation System)

Session: 2022-23

The Heritage Institution

KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Programme Specific Outcomes
BACHELOR OF SCIENCE (Non-Medical) (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.

PSO2: solve complex mathematical problems by critical understanding, analysis and synthesis. Student will also be able to provide a systematic understanding of the concepts and theories of mathematics and there 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 mathematics post graduate programme.

PSO3: demonstrate knowledge of mechanics, electromagnetism, quantum mechanics, optics & lasers, waves & vibrations, statistical physics, condensed matter physics, electronics, nuclear & particle physics and be able to apply this knowledge to analyse a variety of physical phenomena.

PSO4: demonstrate knowledge of organic, inorganic and physical chemistry and apply this knowledge to analyse a variety of chemical phenomena and will be able to interpret and analyse 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 i.e. able to communicate effectively by oral, written, computing and graphical means.

Session (2022-23)
Semester I
PUNJABI (COMPULSORY)
COURSE CODE- BSNL -1421

COURSE OUTCOMES

CO1ਦੋ ਰੰਗ(ਕਵਿਤਾਭਾਗ) ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਵਿਤਾ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਤਾਂ ਕਿ ਉਹ ਆਧੁਨਿਕ ਦੌਰ ਵਿਚ ਚੱਲ ਰਹੀਆਂ ਕਾਵਿਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂ ਬਾਰੇ ਗਿਆਨ ਹਾਸਿਲ ਕਰ ਸਕਣ।

CO2:ਇਸ ਦਾ ਹੋਰ ਮਨੋਰਥ ਕਵਿਤਾ ਦੀ ਵਿਆਖਿਆ, ਵਿਸ਼ਲੇਸ਼ਣ ਤੇ ਮੁਲੰਕਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਤੋਂ ਜਾਣੂ ਕਰਾਉਣਾ ਵੀ ਹੈ ਤਾਂ ਕਿ ਉਹ ਸਮਕਾਲੀ ਸਮਾਜ ਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਨੂੰ ਸਮਝ ਸਕਣ ਅਤੇ ਆਲੋਚਨਾਤਮਕ ਦ੍ਰਿਸ਼ਟੀ ਬਣਾ ਸਕਣ।

CO3:ਸੰਸਾਰ ਦੀਆਂ ਪ੍ਰਸਿਧ ਹਸਤੀਆਂ ਜੀਵਨੀ ਦੀ ਵਿਧਾ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਜੀਵਨੀ ਨੂੰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਜੀਵਨੀ ਜਗਤ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO4:ਪੈਰ੍ਹਾ ਰਚਨਾ ਅਤੇ ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ ਦੇਣ ਦਾ ਮਨਰੋਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

CO6:ਧੁਨੀ ਵਿਉਂਤ ਪੜ੍ਹਣ ਨਾਲ ਵਿਦਿਆਰਥੀ ਧੁਨੀਆਂ ਦੀ ਉਚਾਰਨ ਪ੍ਰਣਾਲੀ ਤੋਂ ਵਾਕਫ਼ ਹੋਣਗੇ।

3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।

4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

Session (2022-23)
BASIC PUNJABI
In lieu of Punjabi (Compulsory)
COURSE CODE -BSNL-1031

Course outcomes

CO1: ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨੂੰ ਸਿਖਾਉਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਵਿਚ ਪਾ ਕੇ ਇਕ ਹੋਰ ਭਾਸ਼ਾ ਸਿੱਖਣ ਦਾ ਮੌਕਾ ਪ੍ਰਦਾਨ ਕਰਨਾ ਹੈ।

CO2: ਇਸ ਵਿਚ ਵਿਦਿਆਰਥੀ ਨੂੰ ਬਾਰੀਕਬੀਨੀ ਨਾਲ ਭਾਸ਼ਾ ਦਾ ਅਧਿਐਨ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।

CO3: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ ਤੋਂ ਜਾਣੂ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।

CO4:ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ ਬਾਰੇ ਦੱਸਣਾ ਹੈ।

CO5: ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦਾ ਸ਼ਬਦ ਘੇਰਾ ਵਿਸ਼ਾਲ ਕਰਨਾ ਹੈ।

CO6: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਵਿਚ ਹਫ਼ਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕ ਤੋਂ ਸੌ ਤੱਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿਚ ਸਿਖਾਉਣਾ ਹੈ।

(Semester-I)
Session (2022-23)
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

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 & 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 times

Session (2022-23)
ENGLISH (COMPULSORY)
Course Code: BSNL -1212

COURSE OUTCOMES

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

CO1: appreciate the writings of various Indian and foreign story and prose writers and relate them to their socio-cultural milieu

CO2: comprehend the meaning of texts and answer questions related to situations, episodes, themes and characters depicted in them

CO3: understand fundamental grammatical rules governing tenses, the use of modal verbs and make correct usage in their language

CO4: develop an understanding of translation of written text from Hindi/Punjabi to English

CO5: independently write paragraphs on any given topic

BACHELOR OF SCIENCE (Non Medical) Semester–I
Session 2022-23
Course Title: Mathematics (Algebra)
Course Code: BSNM -1333(I)

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 real field. Solve system of linear equations.

CO 2: Obtain Eigen values, 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.

1.K.B. Dutta: Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi (2002).

2.Shanti Narayan and P.K. Mittal : Text Book of Matrices.

3.S. Hall and S.R. Knight: Higher Algebra, H.M. Publications, 1994.

Bachelor of Arts/ Bachelor of Science (Economics, Non-Medical, Computer Science)
Semester-I
Session: 2022-23
Course Title: Mathematics (Calculus and Trigonometry)
Course Code: BARM/ BECM/ BCSM/ BSNM-1333(II)

Course Outcomes

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

CO 1: Understand real number system, lub&glb of set of real numbers, limit of a function, basic properties of limit & to apply it in real world problem. Analyse continuous and discontinuous function, Apply concept of continuity in uniform continuity.

CO 2: Manage to solve problems related to successive differentiation, Leibnitz theorem, Taylor's & Maclaurin's theorem with various forms of remainders and to use these expansion to compute values of Sine, Cosine, tangent or log function.

CO 3: Understand the concept of De Moivre's theorem & its applications. Identify circular, hyperbolic function and their inverses.

CO 4: Demonstrate exponential and logarithmic function of complex numbers, and to solve Gregory's series and summation of series.

Bachelor of Science (Medical and Non-Medical) SEMESTER–I
(Session: 2022-23)
COURSE CODE: BSMM/BSNM-1084(I)
INORGANIC CHEMISTRY
(THEORY)

Course outcome:

Students will be able to

CO1: Predict electronic properties of atoms using current models and theories in chemistry, sketch the probability density curves, boundary surface diagrams and shapes of orbitals and write the electronic configuration of atoms.

CO2: 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.

CO3: describeVBT, VSEPR theory and predicts the geometry of simple molecules&molecular orbital theory of homonuclear diatomic molecules

CO4: explain, predict & draw structures of simple ionic compounds.

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Bachelor of Science (Medical and Non Medical) SEMESTER–I
(Session: 2022-23)
COURSE CODE: BSMM/BSNM-1084(II)
ORGANIC CHEMISTRY
(THEORY)

Course outcome:

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: compare the reactivities of various alkyl and aryl halide, stability of various cycloalkanes

CO4: differentiate between aromatic, anti-aromatic and non-aromatic compounds, explain the effect of various substituents on the reactivity of aromatic compounds

Bachelor of Science (Medical and Non-Medical) SEMESTER–I
(Session: 2022-23)
COURSE CODE: BSMM/BSNM-1084(P)
CHEMISTRY PRACTICAL

Course outcome:

Students will be able to

CO1: separate and identify the various ions present in the mixture

CO2: accurately note down the melting point of organic compounds

CO3: accurately note down the boiling point of organic compounds.

CO4: Differentiate between pure & impure compounds.

SEMESTER–I
(**Session-2022-23)**
PHYSICS
ELECTRICITY AND MAGNETISM
(THEORY)
Course code: BSNM-1395 (II) for B.Sc. (Non Medical)
BCSM-1395 (II) for B.Sc. (Computer Science)

Course Outcomes: Electricity and magnetism

After passing this course the students will be able to:

CO1: understand the 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 method 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 field from two different inertial frames of reference. They will be learn the origin of magnetism and properties of various kinds of magnetic materials.

SEMESTER–I
PHYSICS
(**Session-2022-23)**
PHYSICS PRACTICAL
Course code:BSNM-1395 (P) for B.Sc. (Non Medical)
BCSM-1395 (P) for B.Sc. (Computer Science)

Course Outcomes : Physics Lab Sem I

CO1: Students will be able to find the value of acceleration due to gravity using pendulums.

CO2 : It will give understanding of collisions In 1-Dimension.

CO3: It helps to study the moment of inertia of a body & on what factors its depends.

SEMESTER – I

Drug Abuse: Problem, Management and Prevention

Session 2022-23
Course Code: AECD-1161
(Theory)

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

CO3. 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.

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

SEMESTER II

Session 2022-23
BACHELOR OF SCIENCE (Non Medical)
(Semester II)
PUNJABI (COMPULSORY)
COURSE CODE- BSNL -2421

COURSE OUTCOMES

CO1:ਦੋ ਰੰਗ (ਕਹਾਣੀ ਭਾਗ) ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਵਿਤਾ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਤਾਂ ਕਿ ਉਹ ਆਧੁਨਿਕ ਦੌਰ ਵਿਚ ਚੱਲ ਰਹੀਆਂ ਕਾਵਿ ਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂ ਬਾਰੇ ਗਿਆਨ ਹਾਸਿਲ ਕਰ ਸਕਣ।

CO2:ਇਸ ਦਾ ਹੋਰ ਮਨੋਰਥ ਕਵਿਤਾ ਦੀ ਵਿਆਖਿਆ, ਵਿਸ਼ਲੇਸ਼ਣ ਤੇ ਮੁਲੰਕਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਤੋਂ ਜਾਣੂ ਕਰਾਉਣਾ ਵੀ ਹੈ ਤਾਂ ਕਿ ਉਹ ਸਮਕਾਲੀ ਸਮਾਜ ਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਨੂੰ ਸਮਝ ਸਕਣ ਅਤੇ ਆਲੋਚਨਾਤਮਕ ਦ੍ਰਿਸ਼ਟੀ ਬਣਾ ਸਕਣ।

CO3:ਸੰਸਾਰ ਦੀਆਂ ਪ੍ਰਸਿਧ ਹਸਤੀਆਂ ਜੀਵਨੀ ਦੀ ਵਿਧਾ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਜੀਵਨੀ ਨੂੰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਜੀਵਨੀ ਜਗਤ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO4:ਸ਼ਬਦ ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ ਪੜ੍ਹਣ ਨਾਲ ਵਿਦਿਆਰਥੀ ਇਸਦੇ ਮੁੱਢਲੇ ਸੰਕਲਪਾਂ ਨੂੰ ਆਧਾਰ ਬਣਾ ਕੇ ਇਹਨਾਂ ਸੰਕਲਪਾਂ ਤੋਂ ਜਾਣੂ ਹੋਣਗੇ ।

CO5:ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

CO6:ਮੁਹਾਵਰਿਆਂ ਦੀ ਵਰਤੋਂ ਨਾਲ ਗੱਲਬਾਤ ਵਿਚ ਪਰਪੱਕਤਾ ਆਉਂਦੀ ਹੈ।ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਗੱਲਬਾਤ ਵਿਚ ਨਿਖਾਰ ਲਿਆਉਣ ਦਾ ਕੰਮ ਕਰਨਗੇ।

Session 2022-23

BACHELOR OF SCIENCE (Non Medical)

(Semester II)

PUNJABI (COMPULSORY)

COURSE CODE- BSNL -2421

ਸਮਾਂ: 3 ਘੰਟੇ **Maximum Marks: 50**

Theory: 40

CA: 10

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਯੂਨਿਟ-I

ਦੋ ਰੰਗ (ਕਹਾਣੀ ਭਾਗ) (ਸੰਪਾ.ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿਲੋਂ ਅਤੇ ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ),ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

(ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ) 8 ਅੰਕ

ਯੂਨਿਟ-II

ਸੰਸਾਰ ਦੀਆਂ ਪ੍ਰਸਿੱਧ ਹਸਤੀਆਂ (ਜੀਵਨੀ ਨੰ: 10 ਤੋਂ18 ਤਕ)(ਸੰਪਾ.ਪ੍ਰਿੰ. ਤੇਜਾ ਸਿੰਘ, ਹਰਨਾਮ ਸਿੰਘ ਸ਼ਾਮ),

ਯੂਨਿਟ-III

ਪੈਰ੍ਹਾ ਰਚਨਾ

ਅਖਾਣ (ਅਖਾਣਾਂ ਦੀ ਲਿਸਟ ਨਾਲ ਨੱਥੀ ਹੈ) **08 ਅੰਕ**

ਯੂਨਿਟ-IV

ਚਿੱਠੀ ਪੱਤਰ (ਘਰੇਲੂ ਅਤੇ ਦਫ਼ਤਰੀ)

ਮੁਹਾਵਰੇ (ਮੁਹਾਵਰਿਆਂ ਦੀ ਲਿਸਟ ਨਾਲ ਨੱਥੀ ਹੈ) **08 ਅੰਕ**

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. **ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।**
2. **ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।**
3. **ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।**
4. **ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।**

BACHELOR OF SCIENCE (Non Medical) (Semester-II)
Session 2022-23
Course Title: Punjab History and Culture (C. 320 to 1000 B.C.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Course Code: BSNL-2431

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

CO 1 (a): To understand the 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 (Non Medical) (Semester-II)
Session 2022-23
Course Title: Punjab History and Culture (C. 320 to 1000 B.C.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code- BSNL-2431

Examination Time: 3 Hours **Max. Marks: 50**
Theory: 40, CA: 10

Instructions for the Paper Setter:

5. **Question paper shall consist of four Units**
6. **Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.**
7. **Candidates shall attempt 5 questions in 600 words, by at least selecting One Question from each Unit and the 5th question may be attempted from any of the four Units.**
8. **Each question will carry 8 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 .

Linear differential equations with constant and variable coefficients. Variation of Parameters method, reduction method, series solutions of differential equations. Power series method, Bessel and Legendre equations (only series solution).

Text Books:

1.Om P.Chug, Parmanand Gupta, R.S.Dahiya: Topics in Mathematics: Calculus and Differential Equations, Laxmi Publications Private Ltd.

Reference Books:

1. D.A. Murray: Introductory Course in Differential Equations. Orient Longman (India), 1967.
2. G.F. Simmons: Differential Equations, Tata McGraw Hill, 1972.
3. Gorakh Prasad: Integral Calculus, PothishalaPvt. Ltd., Allahabad.
4. Erwin Kreyszig: Advanced Engineering Mathematics, John Wiley and Sons, 1999. 52

BACHELOR OF SCIENCE (Non Medical) SEMESTER–II
SESSION 2022-23
Course Title: MATHEMATICS(Calculus)
Course Code: BSNM-2333 (II)

Course Outcomes

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

CO 1: Differentiate between limit and continuity of function of two variables and apply this concept in partial derivatives & differentiability of real valued function of two variables. Application of inverse & implicit function theorems.

CO 2: Manage to solve problems related to Maxima, Minima & Saddle points of functions of two variables. Classify Envelopes & Evolutes.

CO 3: Understand the concept of Double and Triple integrals.

CO 4: Apply double and triple integral to evaluation of areas, volumes, surfaces of solid of revolution and to find out area and volume of plane and solid figure.

Bachelor of Science (Medical and Non Medical) SEMESTER–II
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-2084(I)
COURSE TITLE: INORGANIC CHEMISTRY (I)(THEORY)

Course outcomes:

Students will be able to

CO1: explains & compares the trends in atomic and physical properties of group 13, 14, 15, 16, 17 elements

CO2: explain the atomic, physical and chemical properties of alkali metals and alkaline earth metals.

CO3: Interpret the properties of carbides, silicates, interhalogen compounds.

CO4: Exhaustive understanding of d–block elements belonging to 4th, 5th and 6th period.

Bachelor of Science (Medical and Non Medical) SEMESTER–II
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-2084(II)
COURSE TITLE: PHYSICAL CHEMISTRY (II)(THEORY)

Course outcomes:

Students will be able to

CO1: explain various gaseous laws and their applications.

CO2: acquire the knowledge of structure and intermolecular forces present between solids, liquids and gases, Discuss liquid crystals& its types.

CO3: understand& apply the basic concepts of colloidal state of matter and applications of colloids.

CO4: demonstrate an understanding of basic principles of colligative properties of dilute solutions.

Bachelor of Science (Medical and Non Medical) SEMESTER–II
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-2084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Course outcomes:

Students will be able to

CO1: understand & apply the technique of crystallization.

CO2: determine the rate of the reactions

CO3: compare& analyze the viscosity and surface tension of different liquids and solutions

CO4: application of calorimeter in various thermochemistry experiments.

SEMESTER–II
PHYSICS
(**Session-2022-23)**
RELATIVITY AND ELECTROMAGNETISM
(THEORY)
Course code: BSNM-2395 (I) for B.Sc. (Non Medical)
BCSM-2395 (I) for B.Sc. (Computer Science)

Course Outcomes: Relativity & Electromagnetism -Paper (I)

After passing this course, students will be able to:

CO1: understand special theory of relativity and related basic concepts and applications.

CO2: derive Maxwell equations and their applications in propagation of e.m. waves in conductors and insulators.

CO3: apply the BiotSavart's Law and Ampere's circuital law in different situations and frames.

CO4: understandthe Faraday's Law of electromagnetic induction and LCR circuits.

SEMESTER–II
PHYSICS
VIBRATION AND WAVES
(THEORY)
(**Session-2022-23)**

Course code: BSNM-2395 (II) for B.Sc. (Non Medical)
BCSM-2395 (II) for B.Sc. (Computer Science)

After passing this course the student will be able to:

CO1: demonstrate Lissajous figures by mechanical and analytical method with different cases.

CO2: understand Free, damped and resonance oscillations, both mechanical and electric using differential equations.

CO3: solve differential equation of forced oscillations &to obtain related quantities.

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

SEMESTER–II
PHYSICS PRACTICAL
(Session-2022-23)

Course code: BSNM-2395 (P) for B.Sc. (Non Medical)
BCSM-2395 (P) for B.Sc. (Computer Science)

COURSE OUTCOMES

CO1: Students will be able to study resonance in series & parallel LCR circuit.

CO2: At the end of this course, students will be able to find the value of capacitor, coefficient of self inductance, permeability & permittivity of air.

CO3: Students will be able to study the variation of magnetic field on the axis of coil & can find the value of horizontal component of magnetic field.

SEMESTER III

BACHELOR OF SCIENCE (Non Medical)
SESSION 2022-23
Semester III
PUNJABI (COMPULSORY)
COURSE CODE- BSNL -3421

COURSE OUTCOMES

COURSE OUTCOMES

CO1:ਚੋਣਵੇ ਪੰਜਾਬੀ ਨਿਬੰਧ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਵਾਰਤਕ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।

CO2: 'ਸਮਾਂ ਮੰਗ ਕਰਦਾ ਹੈ' ਇਕਾਂਗੀ ਸੰਗ੍ਰਹਿ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਇਕਾਂਗੀ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਇਸ ਸਾਹਿਤ ਰੂਪ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO3:ਸੰਖੇਪ ਰਚਨਾ ਕਰਨ ਨਾਲ ਵਿਦਿਆਰਥੀ ਆਪਣੀ ਗੱਲ ਨੂੰ ਸੰਖੇਪ ਵਿਚ ਕਹਿਣ ਦੀ ਜਾਚ ਸਿੱਖਣਗੇ ਅਤੇ ਇਹ ਦਿਮਾਗੀ ਕਸਰਤ ਵਿਚ ਸਹਾਈ ਹੋਵੇਗੀ।

CO4: ਲੇਖ ਰਚਨਾ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

CO5:ਮੂਲ ਵਿਆਕਰਣਕ ਇਕਾਈਆਂ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵੰਨਗੀਆਂ (ਭਾਵੰਸ਼, ਸ਼ਬਦ, ਵਾਕੰਸ਼, ਉਪਵਾਕ ਅਤੇ ਵਾਕ)ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (Non Medical)
(Semester III)
SESSION 2022-23
COURSE TITLE: PUNJAB HISTORY AND CULTURE (FROM 1000-1605 A. D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

COURSE CODE: BSNL-3431

After completing the paper the students will have a thorough insight into the origin of Sikh faith and its major institutions in Punjab. They will be able to

CO 1: Understand the society and culture of Medieval Punjab.

CO 2: Understand the growth of various sects during the Bhakti Movement in Punjab.

CO 3: Comprehend and analyse the teachings of Guru Nanak Dev and its relevance today

CO 4: Make a comparison between the philosophy and teachings of first five Sikh Gurus and their relevance in the present scenario.

CO4 (a): Understand and analyze the institutions started by Sikh Gurus and their implications till date

BACHELOR OF SCIENCE (Non Medical) Semester III
SESSION 2022-23
ENGLISH (COMPULSORY)
Course Code: BSNL -3212

COURSE OUTCOMES

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

CO 1: develop an understanding of the poems taught, relate to the socio-cultural background of England and be able to answer questions regarding tone, style and central idea

CO 2: comprehend the basics of grammatical rules governing relative clauses, adjectives, adverbs, conjunctions and prepositions

CO 3: enhance their reading and analysing power of texts through guided reading

CO 4: enrich their vocabulary and use new words in their spoken and written language

CO 5: develop skills to write an essay on a given topic

BACHELOR OF SCIENCE (Non Medical) Semester–III
SESSION 2022-23
Course Title: Mathematics (Analysis)
Course Code: BSNM -3333(I)

Course Outcomes

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

CO 1: Demonstrate an understanding of limits and how they are used in sequences.

CO 2: Understanding how limits are used in series and apply various test on series.

CO 3: To understand the concepts of Riemann sum, partitions, upper and lower sums, Riemann Integrability of continuous functions and of monotone functions. Distinguish between the absolute convergence and conditional convergence.

CO 4: To know and describe the converging behaviour of improper integrals and Beta , Gamma functions. To find the relation between Beta and Gamma functions.

Bachelor of Science (Non-Medical) SEMESTER–III
SESSION 2022-23
Course Title: Mathematics (Analytical Geometry)
Course Code: BSNM-3333(II)

Course Outcomes

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

CO 1: Understand the concept of the geometry of lines, shifting of origin and rotation of axis in the Euclidian plane.

CO 2: Develop geometry with a degree of confidence and will gain fluency in the basics of parabola in Euclidian geometry.

CO 3: Demonstrate the concept of ellipse and hyperbola in general quadratic equation.

CO 4: Understand the concept of geometry and real time characteristics of plain and spheres.

Intersection of three planes, condition for three planes to intersect in a point or along a line or to form a prism. Sphere: Section of a sphere by a plane, spheres of a given circle. Intersection of a line and a sphere. Tangent line, tangent plane, power of a point with respect to a sphere, radical planes.

Text Book:

S.L. Loney: The Elements of Coordinate Geometry, Macmillan and Company, London.

Reference Books:

1. Gorakh Prasad and H.C. Gupta: Text Book on Coordinate Geometry.
2. Narayan, S and P.K.Mittal.: Analytical Solid Geometry, Sultan Chand & Sons (2005).
3. Kreyszig, E.: Advanced Engineering Mathematics.
4. Thomos, G.B. and Finney, R.L.: Calculus and Analytic Geometry.

Bachelor of Science (Med & Non-Medical) SEMESTER–III
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-3084
ORGANIC CHEMISTRY–I
(THEORY)

Course outcomes:

Students will be able to

CO1: to resolve the different enantiomers and differentiate between dextrorotatory-leavorotatory chiral and achiral compounds, understand the concept of isomerism, axial and equatorial bonds.

CO2: understand the methods of formation, chemical reactions, acidic character of alcohols

CO3: preparation of understand structure and bonding phenols, acidic character of phenols

CO4: compare reactivity of aliphatic and aromatic aldehydes and ketones, to understand the various reactions given by carbonyl compounds

Bachelor of Science (Med & Non-Medical) SEMESTER–III
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-3084
PHYSICALCHEMISTRY–II
(THEORY)

Course outcomes:

Students will be able to

CO1: understand and evaluate thermodynamic property of any system and its applications to various systems, acquire the knowledge of phase equilibria of various systems

CO2: demonstrate the carnot cycle, understand the concept of Entropy

CO3: understand the concept of Residual entropy, demonstrate Clausius-Clapeyron equation, CO4: understand concept of spontaneity of a reaction in terms of free energy change.

CO4: understand and demonstrate the concept of phase equilibria of one component system, two component system

3. Barrow, G.M., Physical Chemistry; 6th edition, Pubs: McGraw Hill Inc, 1996.
4. Rao, C.N.R., University General Chemistry; Pubs: Macmillan India, 1985.
5. Berry, R.S., Rice, S.A., Ross, J., Physical Chemistry; 2nd edition, Pubs: Oxford University Press, 2000.
6. Albert, R.A., Silbey, R.J., Physical Chemistry; 1st edition, Pubs: John Wiley & Sons Inc., 1992.
7. Dogra, S.K., Dogra, S., Physical Chemistry Through Problems; Pubs:Wiley Eastern Limited, 1991.
8. Levine, I.N., Physical Chemistry; 5th edition, Pubs: Tata McGraw Hill Publishing Co. Ltd., 2002.
9. Moore, W. J., Basic Physical Chemistry; Pubs: Prentice Hall of India Pvt. Ltd, 1983.
10. Metz, C.R., Theory and Problems of Physical Chemistry; Schaum's outline series, 2nd edition, Pubs: McGraw-Hall Book company, 1989.

Bachelor of Science (Med & Non-Medical) SEMESTER–III
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-3084(P)
CHEMISTRY PRACTICAL

Course outcomes:

Students will be able to

Students will be able to

CO1: understand and master the technique of volumetric analysis, analyze an acidic and alkali content in different samples,

CO2: To analyze calcium content in various samples permanganometricall, understand the concept of hardness of water and its analysis by EDTA method

CO3: understand and master the technique of gravimetric analysis

CO4: to understand the concept of TLC and its applications

(**Session-2022-23)**

Course Outcomes: PHY-Statistical Physics and Thermodynamics
Course code: BSNM-3395 (I)

After passing this programme the students will be able to:

CO1: Understand the basic ideas and scope of probability as well as distribution of n particles in different compartments.

CO2: Concept of different types of Statistics and the need for Quantum Statistics.

CO3: Understand the concept of entropy, Laws of Thermodynamics and applications to thermoelectric effect.

CO4: Understand the Maxwell Thermodynamics relations, Change of state and Claypron equation.

Course Outcomes: PHY-OPTICS AND LASER

(**Session-2022-23)**
Course code: BSNM-3395 (II)

After passing this programme the students will be able to:

CO1: understand the concept of interference of waves by division of wave front andby division of Amplitude, its different methods and interferometers.

CO2: understand the Huygen's Fresnel theory and diffraction, Fraunhoffer diffraction due to single slit, double slit and n slits, the concept of resolving power.

CO3: understand the concept the polarization of light and types of polarisers.

CO4: understand the fundamentals of lasers and its processes. The knowledge of different components and types of lasers and its applications

Course Outcomes: SEMESTER–III PHYSICS (PRACTICAL)

(**Session-2022-23)**

Course code: BSNM-3395 (P)

After passing this programme the students will be able to:

CO1: use spectrometer to determine the refractive index of different transparent materials wills dispersive power and resolving power of different transparent prisms and liquids using spectrometer.

CO2: use diffraction grating and apply it to determine dispersive power, resolving power, the wavelengths of Hg source and the Cauchy's constants.

CO3: to measure an accessible (Horizontal and vertical) and inaccessible heights using sextant.

CO4: set up of Newton's rings to determine wavelength of sodium light.

CO5: demonstrate the verification of laws of probability distribution.

SEMESTER IV

SESSION 2022-23
BACHELOR OF SCIENCE (Non Medical) (Semester IV)
Punjabi (Compulsory)
COURSE CODE- BSNL -4421

COURSE OUTCOMES

CO1: 'ਪਗਡੰਡੀਆਂ' (ਸਵੈਜੀਵਨੀ) ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਵੈ ਜੀਵਨੀ ਇਸ ਸਾਹਿਤ ਰੂਪ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।

CO2: 'ਫ਼ਾਸਲੇ' (ਨਾਟਕ) ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਨਾਟਕ ਨੂੰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਨਾਟਕ ਜਗਤ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO3: ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ ਲਿਖਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂਨੂੰ ਇਸ ਕਲਾ ਵਿਚ ਨਿਪੁੰਨ ਕਰਨਾ ਹੈ।

CO4: ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰਨ ਦਾ ਮਕਸਦ ਵਿਦਿਆਰਥੀਆਂ ਦੁਆਰਾ ਲਿਖ਼ਤ ਵਿਚ ਕੀਤੀਆਂ ਜਾਣ ਵਾਲੀਆਂ ਗਲਤੀਆਂ ਨੂੰ ਸੁਧਾਰਨਾ ਹੈ।

CO5: ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (Non Medical) SESSION 2022-23
Semester IV
COURSE CODE: BSNL-4431
PUNJAB HISTORY & CULTURE (From 1605 to 1849 A.D.)

After completing the paper the students will have a thorough insight into the origin of Sikh faith and its major institutions in Punjab

CO 1:- understand the adoption of new policy by Guru Hargobind and martyrdom of Guru Tegh Bahadur

CO 2: To understand the factors leading to the establishment of Khalsa Panth and its impact .

CO 3: Have deep insight into the conflict with Mughals and the rise of Banda Singh Bahadur and aftermath.

CO 4: Understand the administration under Maharaja Ranjit Singh , also the fairs, festivals and folk music of Punjab.

6. Rise of Misls.

UNIT IV

7. Maharaja Ranjit Singh:- Civil, Military and Land Revenue Administration.
8. Fair, Festivals and Folk Music in the Punjab during the medieval period (Jarag, Baisakhi and Diwali)

Suggested Readings

1. Chopra P.N., Puri, B.N., & Das, M.N.(1974), *A Social, Cultural & Economic History of India.*Vol.II, Macmillan India Limited, New Delhi.
2. Grewal, J.S. (1994). *The Sikhs of the Punjab*, Cambridge University Press, New Delhi.
3. Singh, Fauja (1972). *A History of the Sikhs*, Vol. III, Patiala: Punjabi University.
4. Singh, Kushwant (2011). *A History of the Sikhs*- Vol. I (1469-1839). New Delhi: Oxford University Press.
5. Singh,Kirpal (1990). *History and Culture of the Punjab*-Part II (Medieval Period).

BACHELOR OF SCIENCE (Non Medical) Semester IV

SESSION 2022-23

Course Title: MATHEMATICS (Statics and Vector Calculus)

Course Code: BSNM-4333(I)

Course Outcomes

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

CO 1: To apply parallelogram law of forces, triangle law of forces, Lami's theorem to real life problems and also understand that how one can resolve number of coplanar forces, parallel forces and concurrent forces acting at a body.

CO 2: To find the applications of CG of a rod, triangular lamina, solid hemisphere, hollow hemisphere, solid cone and hollow cone.

CO 3: To find the values of gradient, divergence and curl operator of given vectors

CO 4: To find the application of Gauss theorem, Green's theorem and Stokes's theorem in real life problems.

BACHELOR OF SCIENCE (Non Medical) Semester IV
SESSION 2022-23
Course Title: MATHEMATICS (Solid Geometry)
Course Code: BSNM-4333(II)

Course Outcomes

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

CO 1: Understand the concept of cylinder, enveloping cylinder and its limiting form.

CO 2: Demonstrate the concept of cone, classification of cone, intersection of line and cone, reciprocal cone.

CO 3: Describe the concept of conicoids or quadratic surface, its classification, trace different types of conicoids and hence find surface of revolution.

CO 4: Describe the concept of tangent and normal plane to the conicoid and Identify the conicoids, representing it in the form of hyperboloid, ellipsoid, paraboloid.

Bachelor of Science (Medical and Non- Medical) SEMESTER–IV
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-4084(I)
COURSE TITLE: INORGANIC CHEMISTRY-I (THEORY)

Course outcomes:

Students will be able to

CO1: understand the key features of coordination compounds viz. Nomenclature, Isomerism and electronic configurations of coordination compounds, have general knowledge of Chelates, Postulates of VBT

CO2: understand theproperties and reactions of non-aqueous solvents.

CO3: write both reduction and oxidation half reactions for a simple redox reaction , Frost and understand the Latimer Pourbaix diagram.

CO4: understand the positions,electronic configurations,relative stability,preparation, properties, structures and characteristics of the f-block elements in the periodic table

CO5: understand the role of metal ions and other inorganic elements in biological systems

Bachelor of Science (Medical and Non- Medical)SEMESTER–IV
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-4084(II)
COURSE TITLE: ORGANIC CHEMISTRY-II(THEORY)

Course outcomes:

Students will be able to

CO1: understand structure and bonding in carboxylic acids and carboxylic acid derivatives, Compare the acidity of alcohols,phenols and acids

CO2: understand preparations and reactions of ethers and epoxides, understand cleavages in ethers, the ring opening reactions of epoxides

CO3:understand preparation and reactions of nitroalkanes and nitroarenes, differentiate between primary, secondary and tertiary amines, basicity of amines

CO 4:understand nomenclature, structural features, methods of formation and chemical reactions of Organomagnesium, Organolithium, Organozinc and Organocopper compounds.

CO 5: know the various methods of synthesis and compare electrophilic substitution, basicity, reactions of pyrrole, furan, thiophene and nucleophilic substitution reactions of pyridine.

Bachelor of Science (Medical and Non- Medical) SEMESTER–IV
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-4084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Course outcomes:

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

Course Outcomes: Quantum Mechanics (Paper I)
(**Session-2022-23)**
Course code: BSNM-4395 (I)

After completing this course

CO1: Students will be familiar with the main aspects of the historical development of quantum mechanics

CO2: Students will understand the central concepts and principles in quantum mechanics

CO3: Students will be able to find the solution of Schrödinger wave equation for simple systems in one dimension and for Hydrogen atom.

CO4: Students will be able to find the solution of Schrödinger wave equation for simple systems in three dimensions and for Hydrogen atom in spherical coordinates.

Course Outcomes: PHY- ATOMIC AND MOLECULAR SPECTRA
(Session-2022-23)
Course Code: BSNM-4395 (II)

CO1: understand fine and hyperfine spectrum of hydrogen atom and the concept of spin and magnetic moment of an electron

CO2: understand spectra of alkali atoms and Zeeman effect

CO3: demonstrate understanding of exchange symmetry of wave function, different coupling schemes and spectra of atoms with more than one electron.

CO4: Students will understand concept of X rays spectra and molecular spectra including rotational, vibrational and Raman Spectra

SEMESTER–IV
(Session-2022-23)
PHYSICS
Course Outcomes: PHY Lab Sem IV

Course code: BSNM-4395 (P)

CO1: The exercises included in this laboratory course are aimed at training the students to handle different type of equipment for verification of some of the laws and concepts studied in theory like concepts of thermodynamics, photoelectric effect and for carrying out precise measurements so that they develop confidence to use later the sophisticated instruments in their respective fields.

CO2: After the completion of this course students will be able to use spectrometer and hence will be able to study absorption spectra of iodine.

CO3: At the end of this course students will be able to prepare cane sugar solution and hence will be able to find its specific rotation by using polarimeter.

BACHELOR OF SCIENCE (Non Medical)

SESSION 2022-23

Semester V

PUNJABI (COMPULSORY)

COURSE CODE- BSNL -5421

COURSE OUTCOMES

CO1: ਚੋਣਵੀਆਂ ਪੰਜਾਬੀ ਕਹਾਣੀਆਂ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਹਾਣੀਆਂ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।

CO2: ਨਾਵਲ ਏਹੁ ਹਮਾਰਾ ਜੀਵਣਾ (ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ) ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਨਾਵਲ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਇਸ ਸਾਹਿਤ ਰੂਪ ਨਾਲ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO3: ਪੈਰ੍ਹਾ ਰਚਨਾ ਕਰਨ ਨਾਲ ਵਿਦਿਆਰਥੀ ਆਪਣੀ ਗੱਲ ਨੂੰ ਕਹਿਣ ਦੀ ਜਾਚ ਸਿੱਖਣਗੇ ਅਤੇ ਇਹ ਦਿਮਾਗੀ ਕਸਰਤ ਵਿਚ ਸਹਾਈ ਹੋਵੇਗੀ।

CO4: ਸਰਲ ਅੰਗਰੇਜ਼ੀ ਪੈਰ੍ਹੇ ਦਾ ਪੰਜਾਬੀ ਵਿਚ ਅਨੁਵਾਦ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

CO5: ਵਾਕਾਤਮਕ ਜੁਗਤਾਂ : ਮੇਲ ਤੇ ਅਧਿਕਾਰ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (Non Medical)
SESSION 2022-23
SEMESTER–V
Basic Punjabi (In lieu of Punjabi Compulsory)
COURSE CODE- BSNL -5031

COURSE OUTCOMES

CO1:ਇਹ ਪਰਚਾ ਵੀ ਸਿਧਾਂਤਕ ਤੇ ਵਿਹਾਰਕ ਗਿਆਨ ਦਾ ਸੁਮੇਲ ਹੈ।

CO2:ਇਸ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੁਰਾਤਨ ਪੰਜਾਬੀ ਲੋਕ ਨਾਚ,ਲੋਕ ਕਲਾਵਾਂ, ਲੋਕ ਗੀਤਾਂ ਨੂੰ ਸਮਝਣ ਦੇ ਕਾਬਲ ਬਣਾਉਣ ਦਾ ਯਤਨ ਹੈ ।

CO3:ਇਨ੍ਹਾਂ ਦੇ ਅਧਿਐਨ ਦੇ ਮਾਧਿਅਮ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀ ਪੁਰਾਤਨ ਲੋਕਾਂ ਦੇ ਜੀਵਨ ਨੂੰ ਸਮਝ ਸਕਣਗੇ ਕਿਉਂਕਿ ਆਪਣੀਆਂ ਜੜ੍ਹਾਂ ਦੀ ਪਛਾਣ ਕਰ ਸਕਣ ਦੇ ਬਗੈਰ ਕੋਈ ਵੀ ਕੌਮ ਜਾਂ ਲੋਕ ਆਪਣਾ ਵਰਤਮਾਨ ਜੀਵਨ ਚੰਗੀ ਤਰ੍ਹਾਂ ਬਿਤਾ ਸਕਣ ਦੇ ਸਮਰੱਥ ਨਹੀਂ ਹੋ ਸਕਦੇ।

BACHELOR OF SCIENCE (Non Medical) (Semester-V)
SESSION 2022-23

Course Title: Punjab History and Culture (From 1849-1947 A.D)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

COURSE CODE: BSNL-5431

COURSE OUTCOMES:-

After completing the course students will be able to understand:

CO 1:- the causes that led to war between the British and Sikhs that led to the annexation of the Punjab and how the region was put under the control of Board of Administration

CO 2:-various agrarian, industrial and educational policies introduced by the British in Punjab

CO 3:- analyse and evaluate the socio-religious reforms movements of Punjab

BACHELOR OF SCIENCE (Non Medical) Semester V
SESSION 2022-23
ENGLISH (COMPULSORY)
Course Code: BSNL -5212

COURSE OUTCOMES

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

CO 1: widen their knowledge about various literary devices used in poetry such as tone, style, imagery, figures of speech, symbolism etc.

CO 2: develop power of imagination and appreciate the beauty, rhyme, and style of a poem

CO 3: analyze and appreciate the dramatic technique, plot development and art of characterisation in the prescribed play

CO 4: develop an understanding of the insights, genres, conventions and experimentations associated with English Drama

CO 5: develop the knowledge, skills and capabilities for effective business writing such as letter writing and resume writing

Bachelor of Science (Non Medical) Semester–V
SESSION 2022-23
Course Title: Mathematics (Dynamics)
Course Code: BSNM-5333(I)

Course Outcomes

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

CO 1: Demonstrate the basic relations between distance, time, velocity and acceleration, manage to solve the problems of Newton's Laws of Motion and the motion of particles connected by a string.

CO 2: Illustrate motion along a smooth inclined plane. Solve different types of problems with Variable Acceleration. Discuss Simple Harmonic Motion .

CO 3: Understand the concept of projectile, oscillating system.

may be attempted from any Section. 30% of the questions in the question paper must be theoretical (theorem based).

Unit-I

Rectilinear motion in a straight line with uniform acceleration, Newton's laws of motion. Motion of two particles connected by a string.

Unit-II

Motion along a smooth inclined plane. Variable acceleration. Simple Harmonic Motion.

Unit-III

Curvilinear motion of particle in a plane, Definition of velocity and acceleration, projectiles, velocity and direction of motion of a projectile after a given time, projectiles on an inclined plane. Oscillations: Free Vibrations, Simple Pendulum, Conical Pendulum.

Unit-IV

Work, Power and Energy: Kinetic and Potential energy, Conservative forces. Theorem of conservation of energy. Work done against gravity.

Text Book:

S.R.Gupta: A text book of Dynamics

Reference Books:

1. F. Chorlton: Dynamics

.2. S.L. Loney: An Elementary Treatise on the Dynamics of a Practice and of Rigid Bodies, Cambridge University Press, 1956.

Bachelor of Science (Non Medical) Semester–V
SESSION 2022-23
Course Title: Mathematics (Number Theory)
Course Code: BSNM-5333(II)

Course Outcomes

Successful completion of this course will enable the students to:

CO 1: Prove results involving divisibility and greatest common divisors.

CO 2: Find solutions of specified linear Diophantine equation, basic properties of Congruences.

CO 3: Solve system of linear congruences. Apply Fermat's and Wilson's theorem to solve numerical problems.

CO 4: Apply Euler's theorem and apply properties of phi functions in real world problems. Understand application of important arithmetic functions.

Bachelor of Science (Non Medical) Semester–V
SESSION 2022-23
Course Title: Mathematics (Number Theory)
Course Code: BSNM-5333(II)

Examination Time: 3 hrs. Max.Marks: 50

Theory: 40
CA:10

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

CO1: use Crystal Field Theory to understand the structure, hybridisation, geometry and predict the colour of the complexes.

CO2: to describe the magnetic properties of coordination compounds.

CO3: describe the stability of metal complexes by the use of formation constants and to calculate thermodynamic parameters from them.

CO4: to draw Orgel diagrams for d^1 to d^{10} systems and predict the possible transitions and to calculate number of microstate and ground state term symbols

CO5: understand preparations, properties and applications of alkyls aryls of lithium and aluminium, bonding in metal-ethylenic complexes, mechanism of homogeneous hydrogenation.

Bachelor of Science (Medical & Non-Medical) SEMESTER–V
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-5084
INORGANIC CHEMISTRY–I

(THEORY)

Time: 3 Hrs. Max. Marks: 30

Instructions for the Paper Setters:

CO1: understand conductance and its types, applications of conductivity measurements, conductometric titrations, transport numbers

CO2: acquire knowledge about electrodes, reversible and irreversible cells, concentration cells, E.M.F, potentiometric titrations

CO3: understand radioactivity, laws of radioactive decay, nuclear reactions, applications of radioactivity

CO4: characterise the molecules with the help of various spectroscopic techniques such as vibrational, rotational, raman and electronic spectroscopy

Bachelor of Science (Medical & Non-Medical) SEMESTER–V
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-5084(P)
CHEMISTRY PRACTICAL

Course outcomes:

Students will be able to

CO1: synthesize and analyse the coordination compounds

CO2: determine the end point of various conductometric titrations

CO3: know the principle and working of Abbe's Refractometer

CO4: determine the composition of unknown mixture of two liquids by refractive index measurements.

CO5: learn the technique of Rast's methods

CO6: learn phenomenon of adsorption of acetic acid and oxalic acid on charcoal

CO7: learn distribution coefficient of of iodine between CCl_4 and water

Bachelor of Science (Semester System) (12+3 System of Education)
(Semester–V)
(**Session-2022-23))**
PHYSICS (CONDENSED MATTER PHYSICS)
(THEORY)
Course code: BSNM-5395 (I) for B.Sc. (Non Medical)
BCSM-5395 (I) for B.Sc. (Computer Science)

Course Outcomes

After passing this course, students will be able to:

CO 1. Understand basics about crystal structures in solids, various types of crystal structure, unit cells and symmetry operations.

CO 2. Understand the experimental methods to determine crystal structures, reciprocal lattice, Brillioun zones and form factor.

CO 3. Understand the concept of lattice vibrations and role of phonons in determining specific heat of solids at low temperatures and models of specific heat.

CO 4. Build concept from free electron model to Kronig Penny model and its application to band theory to differentiate insulators, semiconductors and conductors.

Bachelor of Science (Semester System) (12+3 System of Education)
(Semester–V)
(Session 2022-23)
PHYSICS (ELECTRONICS)
Course code: BSNM-5395 (II) for B.Sc. (Non Medical)
BCSM-5395 (II) for B.Sc. (Computer Science)

Course Outcomes-After completing this course a student will be able to

CO1: understand, concept of voltage and current sources, working of a p-n junction diode, zener diode, and their use in basic gates, photonic devices, rectification and voltage regulation.

CO2: understand the characteristics, biasing and working of BJT and FETs.

CO3: able to understand h-parameters, amplifiers using BJT & FETs and types of feedbacks and practical example of negative feedback (emitter follower).

CO4: understand LC and RC oscillators and their comparison.

Bachelor of Science (Semester System) (12+3 System of Education)
(Semester–V)
(Session 2022-23)
PHYSICS PRACTICAL
Course code: BSNM-5395 (P) for B.Sc. (Non Medical)
BCSM-5395 (P) for B.Sc. (Computer Science)

Course Outcomes : Physics Lab Sem V

CO 1. Students will be able to characterize p-n junction, zener diode, and their use as rectifier, filters, clipping element and to find energy gap.

CO 2. Student will be able to use CRO for AC voltage and frequency.

CO 3. Students will be able to characterize Common base and common emitter transistors and their use as amplifier.

CO 4. Students will be able to use diodes as basic gates.

BACHELOR OF SCIENCE (Non Medical) Semester VI
SESSION: 2022-23
PUNJABI (COMPULSORY)
COURSE CODE- BSNL -6421

COURSE OUTCOMES

CO1: ਕਾਵਿ ਗੌਰਵ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਵਿਤਾਵਾਂ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।

CO2: ਧਰਤੀਆਂ ਦੇ ਗੀਤ(ਸਫ਼ਰਨਾਮਾ)ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਫ਼ਰਨਾਮਾ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਇਸ ਸਾਹਿਤ ਰੂਪ ਨਾਲ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO3: ਲੇਖ ਰਚਨਾ ਅਤੇ ਸੰਖੇਪ ਰਚਨਾ ਕਰਨ ਨਾਲ ਵਿਦਿਆਰਥੀ ਆਪਣੀ ਗੱਲ ਨੂੰ ਕਹਿਣ ਦੀ ਜਾਚ ਸਿੱਖਣਗੇ ਅਤੇ ਇਹ ਦਿਮਾਗੀ ਕਸਰਤ ਵਿਚ ਸਹਾਈ ਹੋਵੇਗੀ।

CO4: ਵਿਆਕਰਨਕ ਸ਼੍ਰੇਣੀਆਂ : ਲਿੰਗ, ਵਚਨ,ਕਾਰਕ ਕਿਰਿਆ ਵਾਕੰਸ਼ : ਪਰਿਭਾਸ਼ਾ, ਬਣਤਰ ਤੇ ਪ੍ਰਕਾਰ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।

3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕਹਨ।

4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

Punjab History & Culture (1947- 2000 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

SESSION: 2022-23

SEMESTER-VI

COURSE OUTCOMES:-

After completing this paper the students will be able to

CO 1:-comprehend Punjab's contribution in the freedom struggle, the exodus and Rehabilitation

CO 1 (a):- understand the history of Punjab from independence with special reference to partition

CO 2:- comprehend the causes that led to the formation of New Punjab in 1966 and outcomes of Green Revolution in the Punjab

CO 3:- understand nature of diaspora and growth of education in Punjab Punjabi literature and Drama in the Punjab after Independence

CO 4: understand the drug abuse problem, management and prevention in the Punjab

CO 4 (a) understand the problem of drug addiction and Female Foeticide in context to the Punjab

Bachelor of Arts/Bachelor of Science (Economics/Computer Science/Non-Medical)
Semester–VI
Session- 2021-22
Course Title: Mathematics (Linear Algebra)
Course Code:BARM/BECM/BCSM/BSNM-6333(I)

Course Outcomes

After the completion of this course, students should be able to:

CO 1: Express the algebraic concepts such as binary operation, groups, rings and fields. Define a vector space and subspace of a vector space and check the linear dependence and linear independence of vectors.

CO 2: Describe the concepts of basis and dimension of vector spaces.

CO 3: Investigate properties of vector spaces and subspaces using linear transformation.

CO 4: Find the matrix representing a linear transformation.

Bachelor of Arts/Bachelor of Science (Economics/Computer Science/Non-Medical)
Semester–VI
Session: 2021-22
Course Title: Mathematics (Numerical Analysis)
Course Code: BARM/BECM/ BCSM/BSNM-6333(II)

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

CO 1. Know how to find the roots of transcendental and polynomial equations.

CO 2. Perform computation for solving a system of equations.

CO 3. Learn how to interpolate the given set of values.

CO 4. Learn numerical solution of differential equations & compute numerical integration and differentiation, numerical solution of ordinary differential equations.

Bachelor of Science (Medical and Non- Medical) SEMESTER-VI
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-6084(I)
COURSE TITLE: MOLECULAR SPECTROSCOPY

Course outcomes:

Students will be able to

CO1: understand the principle and applications of ultraviolet and apply Woodward Fisher Rule to calculate λ_{max}

CO2: understand the concepts of Vibrational spectroscopy, Vibrational coupling overtones and Fermi resonance and its application in Organic Chemistry

CO3: know about the Nuclear magnetic resonance spectroscopy. Proton chemical shift, spin-spin coupling, coupling constants and its applications to determine organic structures

CO4: to understand different cleavage patterns of organic compounds in Mass spectrometry and apply the knowledge for interpretation of the spectrum of an unknown compound.

Bachelor of Science (Medical and Non- Medical) SEMESTER–VI
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-6084(II)
COURSE TITLE: PHYSICAL CHEMISTRY–II(THEORY)

Course outcomes:

Students will be able to

CO1: understand schrodinger wave equation (S.W.E) and its applications to partical in one, two and three dimensional boxes.

CO2: understand the applications of S.W.E to rigid rotator, harmonic oscillators, hydrogen and hydrogen like atoms, quantum numbers

CO3: acquire knowledge about unit cell,space lattice, miller indices, symmetry operations, Bragg equation, powder method

CO4: understand photophysical, photo chemical, radioative and non-radiative processes, quantum yield, energy transfer processes

Bachelor of Science (Medical and Non- Medical) SEMESTER–VI
SESSION: 2022-23
COURSE CODE: BSMM/BSNM-6084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Course outcomes:

Students will be able to

CO1:separate the various mixtures by Column Chromatography technique

CO2:synthesize different Organic Compounds

CO3:synthesise the different compounds by Green Approach

CO4:prepare the different dyes

Bachelor of Science (Semester System) (12+3 System of Education)
(Semester–VI)
(Session 2022-23)
PHYSICS (NUCLEAR PHYSICS)
(THEORY)
Course code: BSNM-6395 (I) for B.Sc. (Non Medical)
BCSM-6395 (I) for B.Sc. (Computer Science)

Course Outcomes

After passing this course, students will be able to:

CO 1. Understand basic properties of nucleus and nuclear forces.
CO 2. Understand about radioactivity, theories of alpha, beta and gamma decay, neutrino hypothesis.
CO 3. Understand concepts and types about nuclear reactions, reactions cross section and compound nucleus.
CO 4. Understand nuclear models (Liquid drop and Shell model) and their failures and successes.

Bachelor of Science (Semester System) (12+3 System of Education)
(Semester–VI) (Session 2022-23)
PHYSICS (RADIATION AND PARTICLE PHYSICS)
Course code:BSNM-6395 (II) for B.Sc. (Non Medical)
BCSM-6395 (II) for B.Sc. (Computer Science)

Course Outcome:

After successfully completing this course a student will be able to:

CO1: understand interaction of radiation and charged particles with matter.

CO2: understand theory and working of various types of nuclear detectors like gas filled, semiconductor, solid state track detectors and nucleus emulsions.

CO3: understand theory and working of various particle accelerators, linear and cyclic and phase stability conditions.

CO4: understand about elementary particles, different types of interactions and quark model.

Bachelor of Science (Semester System) (12+3 System of Education)
(Semester–VI)
(Session 2022-23)
PHYSICS PRACTICAL
Course code: BSNM-6395 (P) for B.Sc. (Non Medical)
BCSM-6395 (P) for B.Sc. (Computer Science)

Course Outcome: After successfully completing this course a student will be able to:

CO1: understand magnetic parameters and phenomenon of hysteresis and tracing of B-H curve.

CO2: understand application of zener diode as voltage regulators.

CO3: understand the characteristics and working of FET& LDR and response of RC circuits.

CO4: use of GM counter to understand the concepts of dead time and absorption coefficient and statistical fluctuations.