SHRI DAVARA UNIVERSITY

NAYA RAIPUR (C.G.)

PROGRAMME CURRICULUM

FOR

BECHELOR IN LIFE SCIENCES

(BIOTECHNOLOGY)

SEMESTER-II

AS PER NEW EDUCATION POLICY-2020

AND

NATIONAL EDUCATION POLICT-2025

FOUR YEAR UNDERGRADUATE PROGRAMME2024-25

(EFFECTIVE FROM THE SESSION-2024-2025)

INTRODUCTION OF THE DEPARTMENT:-

Department of Chemistry

Introduction

The Department of Chemistry is a vibrant community of scholars, researchers, and students dedicated to advancing our understanding of the chemical sciences. Our department offers undergraduate and postgraduate programs in chemistry, providing students with a comprehensive education in the principles and applications of chemistry.

Mission

Our mission is to provide students with a rigorous and well-rounded education in chemistry, preparing them for careers in research, industry, education, and beyond. We strive to create an inclusive and supportive environment that encourages collaboration, creativity, and intellectual curiosity.

Research Areas

Faculty and students in the Department of Chemistry engage in cutting-edge research in various areas, including:

1. Organic Chemistry: Synthesis and characterization of organic compounds.
2. Inorganic Chemistry: Study of inorganic compounds and their applications.
3. Physical Chemistry: Investigation of the physical principles underlying chemical phenomena.
4. Analytical Chemistry: Development and application of analytical techniques.

Department of Botany

Introduction

The Department of Botany is a dynamic community of plant biologists,

researchers, and students dedicated to exploring the fascinating world of plants. Our department offers undergraduate and postgraduate programs in botany, providing students with a comprehensive education in plant biology.

Mission

Our mission is to provide students with a rigorous and well-rounded education in botany, preparing them for careers in research, conservation, education, and beyond. We strive to create an inclusive and supportive environment that encourages collaboration, creativity, and intellectual curiosity.

Research Areas

Faculty and students in the Department of Botany engage in cutting-edge research in various areas, including:

1. Plant Systematics: Study of plant classification, evolution, and diversity.
2. Plant Physiology: Investigation of plant growth, development, and responses to environmental stimuli.
3. Plant Ecology: Study of plant interactions with their environment and other organisms.
4. Plant Biotechnology: Application of biotechnology to improve plant breeding, genetics, and agriculture.

Department of Biotechnology

Introduction

The Department of Biotechnology is a vibrant community of animal biologists, researchers, and students dedicated to exploring the fascinating world of animals. Our department offers undergraduate and postgraduate programs in biotechnology, providing students with a comprehensive education in animal biology.

Mission

Our mission is to provide students with a rigorous and well-rounded education in biotechnology, preparing them for careers in research,

conservation, education, and beyond. We strive to create an inclusive and supportive environment that encourages collaboration, creativity, and intellectual curiosity.

Research Areas

Faculty and students in the Department of Biotechnology engage in cutting-edge research in various areas, including:

1. Animal Systematics: Study of animal classification, evolution, and diversity.
2. Animal Physiology: Investigation of animal growth, development, and responses to environmental stimuli.
3. Animal Ecology: Study of animal interactions with their environment and other organisms.
4. Animal Behavior: Study of animal behavior, including social behavior, communication, and learning.

VISION OF DEPARTMENT: -

Department of Chemistry

Vision

To be a leading department of chemistry, recognized for its academic excellence, innovative research, and commitment to fostering a community of scholars who can address the complex chemical challenges of the 21st century.

Objectives

1. To provide students with a world-class education in chemistry, emphasizing both theoretical foundations and practical applications.
2. To conduct cutting-edge research in chemistry, focusing on areas of national and global importance.
3. To foster collaborations with other departments, institutions, and industries to promote interdisciplinary research and innovation.

4. To develop and maintain state-of-the-art research facilities and instrumentation.

Department of Botany

Vision

To be a premier department of botany, dedicated to advancing our understanding of plant biology and addressing the critical challenges facing our planet, including climate change, food security, and conservation.

Objectives

1. To provide students with a comprehensive education in botany, emphasizing both theoretical foundations and practical applications.
2. To conduct innovative research in plant biology, focusing on areas of national and global importance.
3. To develop and maintain a diverse collection of plant specimens and living collections.
4. To foster collaborations with other departments, institutions, and industries to promote interdisciplinary research and innovation.

Department of Biotechnology

Vision

To be a leading department of Biotechnology, recognized for its academic excellence, innovative research, and commitment to fostering a community of scholars who can address the complex challenges facing animal populations and ecosystems.

Objectives

1. To provide students with a world-class education in zoology, emphasizing both theoretical foundations and practical applications.
2. To conduct cutting-edge research in animal biology, focusing on areas of national and global importance.
3. To develop and maintain state-of-the-art research facilities and

instrumentation.

4. To foster collaborations with other departments, institutions, and industries to promote interdisciplinary research and innovation.

SCOPE OF DEPARTMENT: -

Department of Chemistry

Scope

1. Research and Development: Opportunities exist in various fields like medicinal chemistry, materials science, environmental chemistry, and analytical chemistry.

2. Industry and Manufacturing: Chemistry graduates can work in various industries like pharmaceuticals, petrochemicals, and materials manufacturing.

3. Environmental Conservation: Chemists can work in environmental monitoring, conservation, and sustainability.

4. Education and Academia: Chemistry graduates can pursue teaching and research careers in academic institutions.

5. Government and Policy: Chemists can work in government agencies, regulatory bodies, and policy-making institutions.

Department of Botany

Scope

1. Research and Development: Opportunities exist in various fields like plant breeding, genetic engineering, plant physiology, and plant ecology.

2. Agriculture and Horticulture: Botany graduates can work in agriculture, horticulture, and plant biotechnology industries.

3. Conservation and Environmental Science: Botanists can work in plant conservation, environmental monitoring, and sustainability.

4. Education and Academia: Botany graduates can pursue teaching and research careers in academic institutions.

5. Government and Policy: Botanists can work in government agencies, regulatory bodies, and policy-making institutions.

Department of Biotechnology

Scope

1. Research and Development: Opportunities exist in various fields like animal physiology, ecology, evolution, and conservation biology.

2. Wildlife Conservation and Management: Biotechnology graduates can work in wildlife conservation, management, and research institutions.

3. Animal Health and Veterinary Science: Biotechnologists can work in animal health, veterinary science, and animal biotechnology industries.

4. Education and Academia: Biotechnology graduates can pursue teaching and research careers in academic institutions.

5. Government and Policy: Biotechnologists can work in government agencies, regulatory bodies, and policy-making institutions.

PROGRAMME OUTCOME: -

1**. Knowledge and Understanding:** Demonstrate advanced knowledge and understanding of scientific principles, theories, and concepts in their chosen field.

2. **Critical Thinking and Analysis:** Apply critical thinking and analytical skills to evaluate scientific data, theories, and methodologies.

3. **Research and Problem-Solving:** Design, conduct, and analyze research experiments, and apply scientific principles to solve complex problems.

4. **Communication and Collaboration:** Communicate complex scientific ideas effectively to various audiences, and collaborate with others in a research or professional setting.

5. **Scientific Literacy and Critical Evaluation:** Evaluate the scientific literature, identify gaps in knowledge, and propose new research directions.

6. **Professional Development and Leadership:** Demonstrate leadership skills, manage projects, and develop a professional network in their chosen field.

7. **Knowledge and Understanding:** Demonstrate a solid understanding of scientific principles, theories, and concepts in their chosen field.

8. **Critical Thinking and Analysis:** Apply critical thinking and analytical skills to evaluate scientific data and theories.

9. **Scientific Literacy and Communication:** Communicate scientific ideas effectively to various audiences, and demonstrate an understanding of the scientific method.

10. **Problem-Solving and Laboratory Skills:** Apply scientific principles to solve problems, and demonstrate laboratory skills and safety protocols.

11. **Teamwork and Collaboration:** Collaborate with others in a laboratory or project setting, and demonstrate an understanding of the importance of teamwork in science.

12. **Preparation for Further Study or Employment:** Demonstrate preparation for further study or employment in a scientific field, and exhibit a commitment to lifelong learning.

COURSE OUTCOME: -

Department of Chemistry

Course Outcomes

1**. Knowledge of Chemical Principles:** Understand and apply fundamental chemical principles, theories, and concepts.

2. **Laboratory Skills:** Develop laboratory skills, including experimentation, data analysis, and safety protocols.

3. **Analytical and Problem-Solving Skills:** Apply analytical and problem-solving skills to solve chemical problems and analyze data.

4. **Communication Skills:** Communicate chemical concepts and research findings effectively through written and oral presentations.

5. Critical Thinking and Scientific Literacy: Evaluate scientific literature, identify gaps in knowledge, and propose new research directions.

Department of Botany

Course Outcomes

1. **Knowledge of Plant Biology:** Understand and apply fundamental principles of plant biology, including morphology, anatomy, physiology, and ecology.

2. **Plant Identification and Classification:** Identify and classify plants using morphological, anatomical, and molecular characteristics.

3. **Laboratory and Field Skills:** Develop laboratory and field skills, including plant collection, preservation, and experimentation.

4. Ecological and Environmental Awareness: Understand the importance of plants in ecosystems and the impact of human activities on plant diversity and ecology.

5. **Communication and Critical Thinking:** Communicate botanical concepts and research findings effectively and critically evaluate scientific literature.

Department of Biotechnology

Course Outcomes

1. **Knowledge of Animal Biology:** Understand and apply fundamental principles of animal biology, including morphology, anatomy, physiology, and ecology.

2. **Animal Identification and Classification:** Identify and classify animals using morphological, anatomical, and molecular characteristics.

3. **Laboratory and Field Skills:** Develop laboratory and field skills, including animal collection, preservation, and experimentation.

4. **Ecological and Environmental Awareness:** Understand the importance of animals in ecosystems and the impact of human activities on animal diversity and ecology.

5. **Communication and Critical Thinking:** Communicate zoological concepts and research findings effectively and critically evaluate scientific literature.

UNIT OUTCOME: -

Department of Chemistry

Unit 1: Atomic Structure and Chemical Bonding

1. Explain the structure of atoms and molecules.

2. Describe the types of chemical bonds and their properties.

3. Apply knowledge of atomic structure and chemical bonding to predict chemical behavior.

Unit 2: Thermodynamics and Kinetics

1. Understand the laws of thermodynamics and their applications.
2. Explain the principles of chemical kinetics and reaction mechanisms.
3. Apply thermodynamic and kinetic principles to solve chemical problems.

Unit 3: Organic Chemistry

1. Identify and classify organic compounds.
2. Explain the mechanisms of organic reactions.
3. Apply knowledge of organic chemistry to synthesize and analyze organic compounds.

Unit 4: Analytical Chemistry

1. Understand the principles of analytical chemistry techniques.
2. Apply analytical techniques to analyze and identify chemical substances.
3. Interpret analytical data to solve chemical problems.

Department of Botany

Unit 1: Plant Morphology and Anatomy

1. Identify and describe plant morphological and anatomical features.
2. Explain the functions of plant tissues and organs.
3. Apply knowledge of plant morphology and anatomy to understand plant development and evolution.

Unit 2: Plant Physiology

1. Understand the principles of plant physiology, including photosynthesis and respiration.
2. Explain the mechanisms of plant growth and development.
3. Apply knowledge of plant physiology to solve problems in agriculture and horticulture.

Unit 3: Plant Ecology

1. Understand the principles of plant ecology, including community structure and ecosystem function.

2. Explain the interactions between plants and their environment.

3. Apply knowledge of plant ecology to understand and manage ecosystems.

Unit 4: Plant Genetics and Evolution

1. Understand the principles of plant genetics and evolution.

2. Explain the mechanisms of plant genetic variation and evolution.

3. Apply knowledge of plant genetics and evolution to understand plant diversity and adaptation.

Department of Biotechnology

Unit 1: Animal Morphology and Anatomy

1. Identify and describe animal morphological and anatomical features.

2. Explain the functions of animal tissues and organs.

3. Apply knowledge of animal morphology and anatomy to understand animal development and evolution.

Unit 2: Animal Physiology

1. Understand the principles of animal physiology, including nervous and circulatory systems.

2. Explain the mechanisms of animal growth and development.

3. Apply knowledge of animal physiology to solve problems in animal health and welfare.

Unit 3: Animal Ecology

1. Understand the principles of animal ecology, including population

dynamics and community structure.

2. Explain the interactions between animals and their environment.

3. Apply knowledge of animal ecology to understand and manage ecosystems.

Unit 4: Animal Genetics and Evolution

1. Understand the principles of animal genetics and evolution.

2. Explain the mechanisms of animal genetic variation and evolution.

3. Apply knowledge of animal genetics and evolution to understand animal diversity and adaptation.

SEMESTER II

S.NO	COURSE CODE	COURSE TITLE	TEACHING HOURS PER WEEK				EXAMINATION SCHEME				
DISCIPLINE SPECIFIC COURSE (DSC)			L	T	P	C	THEORY		PRACTICAL		TOTAL MARKS
							EX	IN	EX	IN	
1.	CHSC-02T	Fundamental Chemistry-II	2	1	0	3	70	30	-	-	100
2.	BOSC-O2T	Microbes and Thallophyta	2	1	0	3	70	30	-	-	100
3.	BTSC-02T	Microbiology & Molecular Biology	2	1	0	3	70	30	-	-	100
GENERAL ELECTIVE (GE)											
4.	SCGE-02	Constitutional Government in India	3	1	0	4	70	30	-	-	100
ABILITY ENHANCEMENT COURSE (AEC)											
5.	AEC-02	Hindi Language	2	0	0	2	35	15	-	-	50
VALUE ADDITION COURSE (VAC)											
6.	SEC-02	Chemistry Lab Skills -II	1	1	0	2	35	15	-	-	50
PRACTICALS (LAB)											
7.	CHSC-02P	Fundamental Chemistry-II	0	0	2	1	-	-	35	15	50
8.	BOSC-O2P	Microbes and Thallophyta-LAB	0	0	2	1	-	-	35	15	50
9.	BTSC-02P	Microbiology & Molecular Biology-LAB	0	0	2	1	-	-	35	15	50
Total Contact hours Per Week:30		Total credit:				20	Total mark				650

SHRI DAVARA UNIVERSITY NAYA RAIPUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

PART-A: Introduction			
Programme: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-II**	**Session: 2024-2025**
Course Code	**CHSC-02T**		
Course Title	**FUNDAMENTAL CHEMISTRY-II**		
Course Type	**Discipline Specific course (DSC)**		
Pre-requisite (if any)	**As per program**		
Course Learning. Outcomes (CLO)	**At the end of this course, the students will be able to** ➢ **To understand different acid-base theories and solvent system.** ➢ **To learn the preparation, bonding, and reactions of C-C σ- & π-bonded compounds.** ➢ **To understand the concept and chemistry of aromatic compounds and their reactions.** ➢ **To learn the basic concepts of various states of matter & understand the basic concepts of surface chemistry and chemical kinetics.**		
Credit Value	**3 Credits**	**Credit =15 Hours-learning & Observation**	
Total Marks	**Max. Marks:=100**	**Min Passing Marks: 40**	
PART -B: Content of the Course			
Total No. of Teaching-learning Periods (01 Hr. per period) -45 Periods (45 Hours)			
Unit	Topics (Course contents)		
I	**Acid, Base and Solvent System** **Theories of acids and bases: Arrhenius, Bronsted-Lowry, conjugate acids and bases relative strengths of acids and bases, the Lux-flood, solvent system and Lewis concepts of acids and bases.** **HSAB concept:** Classification of Acids and Bases According to HSAB Theory (Hard, Borderline, Soft). Applications of HSAB Theory in Inorganic Reactions – Solubility, Selectivity, Redox Reaction. Non-aqueous solvents: Physical properties of a solvent, types of solvents and their general characteristics, Liquid ammonia as a solvent. Acid-base, precipitation and complex, formation reactions. Solutions of alkali and alkaline earth metals in ammonia-application)		12
II	**CHEMISTRY OF C-C σ-BONDING** Alkanes: Preparation (Wurtz reaction, reduction/hydrogenation of alkenes, Corey-House method). Reactions (mechanisms): halogenation, free radical substitution. Cyclalkanes: Preparation (Dieckmanns ring closure, reduction of aromatic hydrocarbons), Reactions (mechanisms): substitution and ring-opening reactions.		11

	tability of cycloalkanes – Baeyer's strain theory, Sachse and Mohr predictions, Conformational structures of ethane, n-butane and cyclohexane. **'HEMISTRY OF C-C π- BONDING** lkenes: Preparation methods (dehydration, dehydrohalogenation, dehydrogenation, Holffmann and Saytzeff rules, cis and trans eliminations). Reactions (mechanisms): electrophilic and free radical addition (hydrogen, halogen, hydrogen halide, hydrogen bromide, water, hydroboration, ozonolysis, dihydroxylation with $KMnO_4$). ienes: 1,2 and 1,4-additions, Diels-Alder reactions. lkynes: Preparation (dehdrohalogenation, dehydrogenation), Reactions: Acidity, formation of acetylides, addition of water, hydrogen halides and halogens, oxidation, zonolysis, hydroboration/oxidation. **romatic Hydrocarbons** romatic hydrocarbons: Aromaticity: Huckel's rule, aromatic character of arenes, cyclic carbocations/ carnanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Craft's alkylation/acylation with their mechanism. Directive effects of the groups.	
III	**Behaviour of ideal gases:** Kinetic theory of gases – postulates and derivation of the equation, $PV=1/3\ mne^2$ and derivation of the gas laws-Maxwell's distribution of molecular velocatities-effects of temperature-types of molecular velocities-degrees of freedom-Principle of equipartition of energy. **Behaviour of Real gases:** Deviation from ideal behaviour, derivation of van der Waals, equation of state and critical constants. Liquid state chemistry: structure of liquids (Eyring Theory), Properties of liquids, viscosity and surface tension. **Solid state chemistry:** Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, Crystal defects.	11
IV	**A. Colloids and surface chemistry:** Classification, Optical, Kinetic and Electrical Properties of colloids, Coagulation, HrdySchuize law, flocculation value, Protection, Gold number, Emulsion, micelles and types, Gel, Syneresis and thixotropy, Physical adsorption, chemisorption, **B.** Chemical kinetics: Rate of reaction, Factors influencing rate of reaction rate law, rate constant, Order and molecularity of reactions, rate determining step, Zero, First and Second order reactions, Rate and Rate Law, methods of determining order of reaction, Chain reactions. Temperature dependence of Reaction rate, Arrhenius theory, Physical	11

	significance of Activation energy, collision theory, demerits of collision theory, non-mathematical concept of transition state theory. Catalysis: Homogeneous and Heterogeneous Catalysis, types of catalyst, characteristics of catalyst, Enzyme catalysed reactions, Industrial applications of catalysis.	
Keywords	***Acid & bases, Alkanes, Cycloalkanes, alkenes, Dienes, alkynes, Aromatic Hydrocarbons, Kinetic theory of gases, Real gases, Intermolecular forces, Crystal structure, Chemical kinetics.***	
Signature of Convener & Members (CBoS)		

SHRI DAVARA UNIVERSITY NAYA RAIPUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

PART-C: Learning Resources

- Text Books, Reference Books and Others Paula, B. Y. (2014). Organic Chemistry (7th Ed.). Pearson Education, Inc. (Singapore).
- Solomons, T. W. G. (2017). Organic Chemistry (Global Ed.). John Wiley & Sons.
- Morrison, R. T., & Boyd, R. N. (2010). Organic Chemistry (7th Ed.). Prentice-Hall Of India Limited.
- Laidler, K. J., & Meiser, J. H. (2006). Physical Chemistry (2nd Indian Ed.). CBS Publishers.
- . Atkins, P. W., & De Paula, J. (2006). Physical Chemistry (8th Ed.). Oxford University Press.
- . Dogra, S., & Dogra, S. (2006). Physical Chemistry through Problems (2nd Ed.). New Age International.

Text Books Recommended-

- Bahl, A., & Bahl, B. S. (2014). Organic Chemistry (22nd Ed.). S. Chand & Sons.
- Ahhuwalia, V. K., & Goyal, M. (2001). A Textbook of Organic Chemistry. Narosa Publishing House.
- . Jain, M. K., & Sharma, S. C. (2017). Modern Organic Chemistry. Vishal Publishing Company. Puri, B. R., Sharma, L. R., & Pathania, M. S. (2013). Principles of Physical Chemistry (46th Ed.).
- .Shoban Lal Nagin Chand And Co. 5. Bahl, B. S. A., & Tuli, G. D. (2009). Essentials of Physical Chemistry (Multicolour Ed.). S. Chand & Company Pvt Ltd. 6. Puri, B. R., Sharma, L. R., & Kalia, K. C. (2018). Principles of Inorganic Chemistry. Nagin Chand and Co., New Delhi,

Online Resources-

- e-books and e-learning portals
- https://bit.lv/3AvV3mZ
- https://bit.ly/30V85z
- https://bit.ly/3C9PXPS
- https://bit.ly/301p9rZ
- https://bit.ly/BPnwqe

Online Resources-
e-sources/e-books and e-learning portals

ART -D: Assessment and Evaluation

SHRI DAVARA UNIVERSITY NAYA RAIPUR

Suggested Continuous Evaluation Methods: Maximum Marks: 100 Marks Continuous Internal Assessment (CIA): 30 Marks End Semester Exam (ESE): 70 Marks		
Continuous Internal Assessment (CIA): 30 (By Course Teacher)	Internal Test/Quiz:20+20 Assignment/ Semenar-10 Total Marks-30	Better marks out of the two Tot Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):70	Two section A&B Section A :Q1 Objective 10∗1=10 Marks Q2 Short answer type-5*4=20 Section B : Descriptive answer type qts 1 out of 2frm each- 4*10=40 Marks	
Signature of Convener & Members (CBoS)		

SHRI DAVARA UNIVERSITY NAYA RAIPUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Life Sciences **(Certificate/Diploma/Degree/Honors**		**Semester-II**	**Session: 2024-2025**
Course Code	**CHSC-02P**		
Course Title	**Lab. Course -01 (FUNDAMENTAL CHEMISTRYII)**		
Course Type	**Laboratory course**		
Pre-requisite(if any)	**As per program**		
Course Learning. Outcomes (CLO)	**At the end of this course, the students will be able to** ➢ Demonstrating and using common glassware for accurate measurements. ➢ Studying the functional group analysis organic compounds. ➢ points to assess compound purity and employing distillation and sublimation techniques to establish boiling points. ➢ Equipping with essential skills in measuring liquid surface tension and solution viscosity.		
Credits Value	**1 Credits**	**Credit =30 Hours Laboratory or Field learning/Training**	
Total Marks	**Max. Marks:50**	**Min Passing Marks: 20**	

PART-B: Content of the Course		
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)		
Module	Topics (Course contents)	No. of Period
Lab/ field Training/ Experiment Content of Course	**Basic Laboratory Techniques:** Demonstration 80-82 ˚of Laboratory Glassware and Equipment , Calibration of Thermometer : (Naphthalene), 113.5 ˚- 114 ˚C (Acetanilide), 132.5 ˚C – 133 ˚C (Urea), 100 ˚C (Distilled Water) **Functional group analysis of Organic Compounds,** Detection of elements (N,S and halogens) and Functional groups. **Physical Chemistry** Surface tension measurements: Determine the surface tensionby (i) drop number (ii) drop weight method. Surface tension composition curve for a binary liquid mixture. Viscosity measurement using Ostwald's viscometer, Determination of viscosity of aqueous solutions of (i) sugar (ii) ethanol at room temperature. Study of the variation of viscosity of surface solution with th concentration of solute. Viscosity Composition curve for a binary liquid mixture.	30
Keywords	**Basic laboratory techniques ,Equipments, Calibration, Melting points, Qualitative analysis, physical chemistry, Surface tension, Viscosity.**	
Signature of Convener & Members (CBoS)		

SHRI DAVARA UNIVERSITY NAYA RAIPUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended-

1. Gurtu, J. N., & Kapoor, R. (1987). Experimental Chemistry. S. Chand & Co
2. Bajpai, D. N., Pandey, O. P., & Giri, S. (2013). Practical Chemistry. S. Chand & Co.
3. 3. Ahluwalia, V. K., Dhingra, S., & Dhingram, S. (2005). College Practical Chemistry. Universities.
4. Kamboj, P. C. (2014). Advanced University Practical Chemistry (Part 1). Vishal Publishing Co. 5. Fultariya, C., & Harsora, J. (2017). Volumetric Analysis: Conceptt and Experiments.

Reference Books Recommended-

1. Mcpherson, P. A. (2015). Practical Volumetric Analysis. Royal Society Of Chemistry.
2. Shobha, R., & Banani, M. (2017). Essentials of Analytical Chemistry. Pearson.
3. Venkateswaran, V., Veeraswamy, R., & Kulandaivelu, A. R. (2004). Basic Principles Of Practical Chemistry (2nd Ed.). S. Chand Publications.
4. Sundaram, S., & Raghavan, K. (1996), Practical Chemistry. S. Viswanathan Co. Pvt. 5. Svehla, G. (2011). Vogel's Textbook of Inorganic Qualitative Analysis (7th Ed.). Pearson Education

Online Resources-

- E-resources/e-books and e-learning portals
- http://www.swayam.ac.in
- http://www.ignou.ac.in
- www.egyankosh.ac.in
- www.litm.ac.in
- www.eskillindia.org
- www.eshiksha.mp.gov.in
- www.vlab.co.in

Online Resources-

e-sources/e-books and e-learning portals

- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5871155/
- https://cms.botany.org/home/careers-jobs/careers-in-botany/arcas-of-specialization- in-botany.html

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks:	50 Marks
Continuous Internal Assessment (CIA):	15 Marks
End Semester Exam (ESE):	35 Marks

Continuous Internal Assessment (CIA): 15 (By Course Teacher)	Internal Test/Quiz:10+10 Assignment/ Semenar-05 Total Marks-15	Better marks out of the two Tot Quiz + obtained marks in Assignment shall be considered against 15 Marks

End Semester Exam (ESE):35	Laboratory/Field Skill Performance: On spot Assessment Section A : Performed the Task based on lab, work 20∗1=20 Marks B: Performed the Task based on lab, work (written) 10*1=10Marks Section B : Viva-voce (based on principle/technology) - 5*1=05 Marks

Signature of Convener & Members (CBoS)

SHRI DAVARA UNIVERSITY NAYA RAIPUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF BOTANY

COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-II**	**Session: 2024-2025**
Course Code	**BOSC-21T**		
Course Title	**Microbes and Thallophyta**		
Course Type	**Discipline Specific course (DSC)**		
Pre-requisite(if any)	**As per program**		
Course Learning. Outcomes (CLO)	**At the end of this course, the students will be able to** ➢ Understand about the Microbes and their Importance. ➢ Identify edible mushrooms and learn cultivation techniques ➢ Learn about bio-fertilizers and their uses ➢ Understand life cycles of different algae and fungi.		
Credit Value	**3 Credits**	**Credit =15 Hours-learning & Observation**	
Total Marks	**Max. Marks:=100**	**Min Passing Marks: 40**	

PART -B: Content of the Course		
Total No. of Teaching-learning Periods (01 Hr. per period) -45 Periods (45 Hours)		
Unit	Topics (Course contents)	
I	**Viruses:-** general characteristics,nature ,structure and nomenclature,Bacteriophages and TMV Lytic and Lysogenic cycles,transmission and replication of viruses,Symptoms of viral diseases on plants ,important plant diseases,viroid,prions. **Actinomycetes:**general characteristics Structure,reproduction and economic importance. **Mycoplasma,Phytoplasma:**general characteristics,structure,reproduction and their economic uses.	12
II	**Bacteria:**History,general character,classification and morphology,Gram positive and Gram-negative bacteria,structure of bacteria shape,size flagella and ultra structure of bacterial cell Bacterial Growth curve,factors affecting growth of microbes;sporulation,reproduction,recombination in bacteria-Transformation Conjugation and Transduction,and Economic importance. **Cyanobacteria:**General characteristics,morphology,Heterocyst,cell structure of Cyanobacteria,reproduction and economic importance of Bacteria.	11
III	**Phycology:**General characteristic features of Algae.Algae in diversified habitat,Salient features,occurrence,classification and range of thallus organization.Prominent pigments found in Algae.Reproduction classification,general character and life cycle of -Volvox,Oedogonium,Chara,Vaucheria,EctocarpusandPolysiphonia.Economic importance of algae -Role of algae in soil fertility, algae as biofertilizer, blue green algae and nitrogen fixation. Symbiosis ;algal products -Agar, biofuel	11

IV	**Mycology,Mushroom Cultivation,Lichenology&Mycorrhiza:**General characteristic features of Fungi,Economic importance and Classification of Fungi,Nutrition,Heterothallism, Physiological specialization,Heterokaryosis &Parasexuality in Fungi.Fungi as biocontrol agent Classification,general character and life cycle of - Mucor,PhytophthoraPenicillium,Peziza.Ustilago,Puccinia,Agaricus;Colletotrichum,Alternaria.Edible Mushroom-Button and Oyster ,mushroom and their cultivation.General account of lichens.General account of Myccorrhiza	11
Keywords	**Mycoplasma, Transduction, Biofertilizer, Para sexuality.**	
Signature of Convener & Members (CBoS)		

SHRI DAVARA UNIVERSITY NAYA RAIPUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF BOTANY

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

1.Kumar,H.D.(1999).Introductory Phycology.Affiliated East-West.Press Pvt.Ltd.Delhi.2nd edition.

2.Tortora,G.J.,Funke,B.R.,Case,C.L.(2010).Microbiology:An Introduction,Pearson Benjamin Cummings, U.S.A.10th edition.

3.Sethi,I.K.and Walia,S.K.(2011).Text book of Fungi &Their Allies,MacMillan Publishers Pvt.Ltd.,Delhi.

4.Aggarwal,S.K.2009.Foundation Course in Biology,A one books Pvt.Ltd.,New Delhi.

5.Aneja,K.R.1993.Experiments in Microbiology,Pathology and Tissue Culture,VishwaPrakashan,NewDelhi.

6..Annie Ragland,2012.Algae and Bryophytes,Saras Publication,Kanyakumari,India

7.Basu,A.N.1993.Essentials of Plant Viruses,Vectors and Plant diseases,New Age International,New Delhi.

8.Chopra.G.L.1984.A text book of Algae,Rastogi publications,Meerut,India

9.Dubey,R.C.and Maheshwari.D.K.2012.Practical Microbiology,S.Chand &Company,Pvt.Ltd.,NewDelhi.

10.Fritsch,R.E.1977.Structure and Reproduction of Algae,Cambridge University Press,London.

11.Sharma,P.D.(2011).Plant Pathology.Meerut,U.P:Rastogi Publication.

12.Pandey B.P.2001.College Botany Volume 1,S Chand &Company Pvt.Ltd,New Delhi.

Text Books Recommended-

1.Webster,J.,Weber,R.(2007).Introduction to Fungi,3rd edition.Cambridge,U.K:Cambridge University Press

2.Pelzar,1963.Microbiology,Tata McGraw Hill,New Delhi

3.Rangaswamy,G.2009,Disease of Crop Plants in India,Prientice Hall of India,New Delhi.

4.Microbiology Fundamental and Applications (hindi)(pb)9.ISBN:9788188826230 Edition:03Year: 2016Author:Dr.Purohit SS,Dr.Deo Publisher:Student Edition Language:Hind

5.Modern Microbiology (hindi)(hb)ISBN:9788177543599Edition:1Year:2018Author:Dr.Purohit SS, Dr.Singh T Publisher:Agrobios (India

6.Plant pathology by R.S.Mehrotra,Tata McGraw-Hill Publication

SHRI DAVARA UNIVERSITY NAYA RAIPUR

Online Resources-

- e-books and e-learning portals
- http://www.swayam.ac.in
- http://www.ignou.ac.in
- http://www.egvankosh.ac.in
- http://www.itm.sc.in
- http://www.eskillindia.org
- http://www.eshiksha.mp.gov.in
- http://www.viah.co.in
- http://www.internshala.com

Online Resources-
e-sources/e-books and e-learning portals

- https://www.pbs.org/video/botany-basics-iuu2bl/
- https://efaidohmannibpcapcalclefindorkaj/https://www2.ca.uky.edu/apcom/pubs/ho/ho96/ho96.pdf
- https://www.botanytoday.com/brunches-of-botany

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 100 Marks
Continuous Internal Assessment (CIA): 30 Marks
End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): 30 (By Course Teacher)	Internal Test/Quiz:20+20 Assignment/ Semenar-10 Total Marks-30	Better marks out of the two Tot Quiz + obtained marks in Assignment shall be considered against 15 Marks

End Semester Exam (ESE):70	Two section A&B Section A :Q1 Objective 10*1=10 Marks, Q2 Short answer type-5*4=20 Section B : Descriptive answer type qts 1 out of 2frm each- 4*10=40 Marks

Signature of Convener & Members (CBoS)

SHRI DAVARA UNIVERSITY NAYA RAIPUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF BOTANY

COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Life Sciences **(Certificate/Diploma/Degree/Honors**		**Semester-II**	**Session: 2024-2025**
Course Code	**BOSC-02P**		
Course Title	**Lab.Course-02 (Microbes and Thallophyta)**		
Course Type	**Laboratory course**		
Pre-requisite(if any)	**As per program**		
Course Learning. Outcomes (CLO)	**At the end of this course, the students will be able to** ➢ Understand the Viruses,Bacteria,Phycology,Mycology and Plant ➢ pathology ➢ Learn microbial techniques which will be beneficial for agriculture and industry. ➢ Learn life cycles of selected genera of different groups Understand etiology of plant diseases ➢ Apply their knowledge in the crop fields to eradicate or avoid the diseases		
Credits Value	**1 Credits**	**Credit =30 Hours Laboratory or Field learning/Training**	
Total Marks	**Max. Marks:50**	**Min Passing Marks: 20**	
PART-B:	**Content of the Course**		
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab/ field Training/ Experiment Content of Course	1.Collection of viral/Bactrial /fungal infected plants 2.Study of plant disease symptoms caused by viral/Bactrial /fungal/ Mycoplasma **3.BACTERIAL IDENTIFICATION:** Isolation of bacteria Staining techniques:Gram's,staining 4.Study/Slide preparation of available Cyanobacteria **5.PHYCOLOGY:**Study/Slide preparation and Staining of algae-Volvox Oedogonium and Chara;Vaucheria;Ectocarpus Polysiphonia **6.MYCOLOGY:** Study/Slide preparation and.Staining of fungi.Mucor,Phytophthora Penicillium,Peziza,Ustilago,Puccinia;Agaricus,colletotrichum,Alternaria Study of Button and Oyster Mushroom		30

SHRI DAVARA UNIVERSITY NAYA RAIPUR

	Lichens:crustose,foliose and fruticose specimens Study of VAM fungi	
Keywords	**Infected P lants, VAM, Algae, Fungi**	
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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF BOTANY

COURSE CURRICULUM

PART-C: Learning Resources

1.Practical Botany (Part I)ISBN #:81-301-0008-8 Sunil D Purohit,Gotam K Kukda &Anamika Singhvi Edition:2013 Apex Publishing House Durga Nursery Road,Udaipur,Rajasthan (bilingual).

2.Pandey S.K.(2012).Quick Concept of Botany.Publisher LAP LAMBERT Academic Publishing GmbH&Co.KG,Germany (ISBN:978-3-8484-3104-5).

3.Dubey,R.C.and Maheshwari.D.K.2012.Practical Microbiology,S.Chand &Company,Pvt. Ltd.,New Delhi.

4.Pandey.B.P.2014 Modern Practical Botany,(Vol-I)S.Chand and Company Pvt.Ltd.,New Delhi.

Text Books Recommended-

Reference Books Recommended-

1. Charak Samhita 1
2. "Medicinal Plants of India" by C.P. Khare

Online Resources-

- E-resources/e-books and e-learning portals
- http://www.swayam.ac.in
- http://www.ignou.ac.in
- www.egyankosh.ac.in
- www.litm.ac.in
- www.eskillindia.org
- www.eshiksha.mp.gov.in
- www.vlab.co.in

Online Resources-
e-sources/e-books and e-learning portals

- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5871155/
- https://cms.botany.org/home/careers-jobs/careers-in-botany/arcas-of-specialization- in-botany.html

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 50 Marks
Continuous Internal Assessment (CIA): 15 Marks
End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): 15 (By Course Teacher)	Internal Test/Quiz:10+10 Assignment/ Semenar-05 Total Marks-15	Better marks out of the two Tot Quiz + obtained marks in Assignment shall be considered against 15 Marks

End Semester Exam (ESE):35	Laboratory/Field Skill Performance: On spot Assessment Section A : Performed the Task based on lab, work 20*1=20 Marks B: Sporting based on lab, work (written) 10*1=10Marks Section B : Viva-voce (based on principle/technology) - 5*1=05 Marks

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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF BIOTECHNOLOGY

COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-II**	**Session: 2024-2025**
Course Code	**BTSC-02T**		
Course Title	**Microbiology & Molecular Biology**		
Course Type	**Discipline Specific course (DSC)**		
Pre-requisite(if any)	**As per program**		
Course Learning. Outcomes (CLO)	**After successfully completing this course, the students will be able to –** ➢ Understand various categories of microbes in the living world ➢ Develop the capability to culture and maintenance of microbes ➢ Understand the regulatory mechanism for the precursor of life-DNA ➢ Understand the mechanism of genetic expression for the regulation of life.		
Credit Value	**3 Credits**	**Credit =15 Hours-learning & Observation**	
Total Marks	**Max. Marks:=100**	**Min Passing Marks: 40**	
PART -B: Content of the Course			
Total No. of Teaching-learning Periods (01 Hr. per period) -45 Periods (45 Hours)			
Unit	Topics (Course contents)		
I	**Maintenance of microbes** 1.Classification of microorganisms and taxonomy. 2.Molecular basis of microbial taxonomy. 3.Growth media for culture of bacterial,viral,and fungal microbes; sterilization 4.Isolation, purification, and culture methods of microbes (bacteria ,virus, and fungi)		12
II	**Microbial life** 1.Bacterial reproduction-Conjugation,transduction,and transformation. 2.Mycoplasma-Classification,structure,and pathogenesis. 3.Virus- Structure,classification,multiplication,pathogenesis and bacteriophages 4.Food and water microbes.		11
III	**Nuclear maintenance and expression**		

	1.DNA replication. 2.DNA damage and repair. 3.Transcription in prokaryotes and eukaryotes. 4.Processing of RNA-Capping, polyadenylation, and splicing	11
IV	**Genetic expression** 1.Genetic code. 2.Translation in prokaryotes and eukaryotes. 3.Operon concept. 4.Recombination.	11
Keywords	**Microbial taxonomy, RNA, DNA, operon.**	
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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF BIOTECHNOLOGY

COURSE CURRICULUM

PART-C: Learning Resources		
Text Books, Reference Books and Others ➢ Textbook of Microbiology-A K Kushwaha. ➢ Microbiology-Dr.Preeti Sharma ➢ Introduction To Medical Microbiology-Ananthnarayana's ➢ Cell and Molecular Biology-P K Gupta		
Reference Books Recommended- ➢ Molecular Biology;Watson. ➢ Gene VIII;Benjamin Lewin. ➢ The Cell,A molecular Approach;Geoffrey M.Cooper. ➢ Molecular Biology of the Cell;Alberts ➢ Cell and Molecular Biology;Lodish ➢ Microbiology-Prescott ➢ Microbiology-Pelczar&Pelczar ➢ General Microbiology I and II-Powar and Daginawala ➢ Microbiology-Tortora.		
Online Resources- ➢ e-books and e-learning portals ➢ https://www.coursera.org/lecture/emergence-of-life/4-5-invertebrates-successes-of-life-http://www.ignou.ac.in ➢ https://www.shiksha.com/online-courses/introduction-to-biology-biodiversity-course-http://www.itm.sc.in ➢ https://www.youtube.com/watch?v=uK-XYhttp://www.eshiksha.mp.gov.in ➢ https://www.youtube.com/watch?v=WxMSckEcio4http://www.internshala.com		
Online Resources- e-sources/e-books and e-learning portals ➢ https://www.pbs.org/video/botany-basics-iuu2bl/ ➢ https://efaidohmannibpcapcalclefindorkaj/https://www2.ca.uky.edu/apcom/pubs/ho/ho96/ho96.pdf ➢ https://www.botanytoday.com/brunches-of-botany		
PART -D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: 100 Marks Continuous Internal Assessment (CIA): 30 Marks End Semester Exam (ESE): 70 Marks		
Continuous Internal Assessment (CIA): 30 (By Course Teacher)	Internal Test/Quiz:20+20 Assignment/ Semenar-10 Total Marks-30	Better marks out of the two Tot Quiz + obtained marks in Assignment shall be considered against 15 Marks

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End Semester Exam (ESE):70	Two section A&B Section A :Q1 Objective 10*1=10 Marks Q2 Short answer type-5*4=20 Section B : Descriptive answer type qts 1 out of 2frm each- 4*10=40 Marks
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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF BIOTECHNOLOGY

COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Life Sciences **(Certificate/Diploma/Degree/Honors**		**Semester-II**	**Session: 2024-2025**
Course Code	**MBSC-02P**		
Course Title	**Lab. Course -03 Microbiology & Molecular Biology**		
Course Type	**Laboratory course**		
Pre-requisite(if any)	**As per program**		
Course Learning. Outcomes (CLO)	**After successfully completing this course, the students will be able to –** ➢ Maintenance of microbes. ➢ Identification of microbes. ➢ Isolation of nucleic acid from microbes ➢ Elucidations of nucleic adis of microbes		
Credits Value	**1 Credits**	**Credit =30 Hours Laboratory or Field learning/Training**	
Total Marks	**Max. Marks:50**	**Min Passing Marks: 20**	
PART-B:	**Content of the Course**		
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab/ field Training/ Experiment Content of Course	1.Various techniques for sterilization 2.Preparation of microbial media 3.Isolation and culture of microbes from air,soil,and water 4.Determination of Gram-positive and Gram-negative bacteria 5.Streak plate method for culturing of microbes 6.Pour plate method for culturing of microbes 7.Spread plate method for culturing of microbes. 8.Broth culture method for culturing of microbes 9.Determination of bacterial growth curve. 10.Isolation of DNA from bacteria. 11.Estimation of DNA. 12.Estimation of RNA. 13.Elucidation of DNA bands by electrophoresis.		30

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Keywords	Microbes, sterilization, RNA, DNA.
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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF BIOTECHNOLOGY

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended-

- Textbook of Microbiology-A K Kushwaha
- Microbiology-Dr.Preeti Sharma.
- Introduction To Medical Microbiology-Ananthnarayana's
- Cell and Molecular Biology-P K Gupta

Reference Books Recommended-

- Molecular Biology;Watson.
- Gene VIII;Benjamin Lewin The Cell,A molecular Approach;Geoffrey M.Cooper
- Molecular Biology of the Cell;Alberts
- Cell and Molecular Biology;Lodish.
- Microbiology-Prescott
- Microbiology-Pelczar&Pelczar
- General Microbiology I and II-Powar and Daginawala
- Microbiology-Tortora

Online Resources-

- E-resources/e-books and e-learning portals
- http://ndi.ätkgp.ac.in/he/document/swayamprabha/swayam
- http://www.swayam.ac.in
- http://www.ignou.ac.in
- www.egyankosh.ac.in
- www.litm.ac.in
- www.eskillindia.org
- www.eshiksha.mp.gov.in

Online Resources-

e-sources/e-books and e-learning portals

- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5871155/
- https://cms.botany.org/home/careers-jobs/careers-in-botany/arcas-of-specialization- in-botany.html

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks:	50 Marks
Continuous Internal Assessment (CIA):	15 Marks
End Semester Exam (ESE):	35 Marks

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Continuous Internal Assessment (CIA): 15 (By Course Teacher)	Internal Test/Quiz:10+10 Assignment/ Semenar-05 Total Marks-15	Better marks out of the two Tot Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):35	Laboratory/Field Skill Performance: On spot Assessment Section A : Performed the Task based on lab, work 20∗1=20 Marks B: Spotting frased on tools & technology (written) 10*1=10Marks Section B : Viva-voce (based on principle/technology) - 5*1=05 Marks	
Signature of Convener & Members (CBoS)		

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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF POLITICAL SCIENCES

COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-II**	**Session: 2024-2025**
Course Code	**PSGE-02**		
Course Title	**Constitutional Government in India**		
Course Type	**Discipline General Elective course (GE)**		
Pre-requisite(if any)	**As per program**		
Course Learning. Outcomes (CLO)	**After completion of the course, the student shall be able to..** ➢ **Construct the political ideals mentioned in the preamble of the constitution.** ➢ **Assess the provisions of citizenship, fundamental rights and duties and their correlation.** ➢ **Examine the role of president and the functioning of union executive.** ➢ **Interpret the provisions and functioning of the union legislature and constitutional bodies of functional democracy, like election commission, finance commission and C&AG.**		
Credit Value	**4 Credits**	**Credit =60 Hours-learning & Observation**	
Total Marks	**Max. Marks:=100**	**Min Passing Marks: 40**	

PART -B: Content of the Course		
Total No. of Teaching-learning Periods (01 Hr. per period) -45 Periods (45 Hours)		
Unit	Topics (Course contents)	
I	**Constitution Citizenship and Rights** Making of Indian Constitution: Cabinet mission plan and Constituent assembly. Preamble, features, Sources. Schedules, citizenship. Fundamental Rights and Duties, Directive Principles of State Policy. Constitution Amendment Process.	12
II	**Union** President, Vice President, Council of Ministers and Prime Minister. Federal Parliament Lok Sabha and Rajya Sabha. Supreme court Organization Functions, Powers, Judicial Review.	11
III	**Union and Federal administration** controller and auditor general Centre State Relations: Legislative, Financial, Administrative. Union and state public service commission, Election Commission, Finance Commission.	11
IV	**State and Local self government** Legislature, Executive: Governor, Council of Ministers and Chief Minister. State High Court-Organization. Functions, Rights.	11

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Keywords	Political theory, sate, sovereignty, right, they, democracy, constitution, party.
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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF POLITICAL SCIENCE

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended-

1. Ambadatt Pant Harimohan Jain Madan Gopal (1985) Fundamentals of Political Science, Central Publishing House Allahabad. U.P.
2. Sandhu Man Singh (1956) Political Theory Hindi Medium Implementation Directorate, Delhi University, New Delhi
3. Johari JC 1916) Basic principles of political science, Sahitya Bhavan, Agra.
4. Rajeev and Ashok Acharya (Eds) Political Theory A Flag, Dilsey Pearson, 2008

Reference Books Recommended-

1 umar, Sanjeev (Ed. Understanding of Political Theory, Delhi: Orient Book Swan, 2019
2 Hussain Shakeel (2018) Conceptual Introduction to Political Theory. Chhattisgarh State Hindi Forest Academy, Rampur.
3 K.K. Mishra (2010) Political Theory, 5. Chand Publishing Delhi
4 OP Gouba (2014) An Introduction to Political Theory, MacMillan Publishers, Delhi

Online Resources-

- e-books and e-learning portals
- https://www.coursera.org/lecture/emergence-of-life/-http://www.ignou.ac.in
- https://www.shiksha.com/online-courses/-http://www.itm.sc.in
- https://www.youtube.com/watch?v=uK-XYhttp://www.eshiksha.mp.gov.in
- https://www.youtube.com/watch?v=WxMSckEcio4http://www.internshala.com

Online Resources-
e-sources/e-books and e-learning portals

- https://www.pbs.org/video/political-basics-iuu2bl/
- https://efaidohmannibpcapcalclefindorkaj/https://www2.ca.uky.edu/apcom/pubs/ho/ho96/ho96.pdf
- https://www.botanytoday.com/brunches-of-botany

RT -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks:	100 Marks
Continuous Internal Assessment (CIA):	30 Marks
End Semester Exam (ESE):	70 Marks

Continuous Internal Assessment (CIA): 30 (By Course Teacher)	Internal Test/Quiz:20+20 Assignment/ Semenar-10 Total Marks-30	Better marks out of the two Tot Quiz + obtained marks in Assignment shall be considered against 15 Marks

End Semester Exam (ESE):70	Two section A&B Section A :Q1 Objective 10*1=10 Marks Q2 Short answer type-5*4=20 Section B : Descriptive answer type qts 1 out of 2frm each- 4*10=40 Marks

Signature of Convener & Members (CBoS)

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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF HINDI

COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-II**	**Session: 2024-2025**
Course Code	**AEC-02**		
Course Title	**Hindi Language**		
Course Type	**Ability Enhancement Course**		
Pre-requisite(if any)	**As per program**		
Course Learning. Outcomes (CLO)	**After the completion of this course, the students will be able to-** ➢ विद्यार्थी हिन्दीभाषा एव ंव्याकरण संबंधीज्ञान से समृद्ध होंगे। ➢ भाषा ज्ञान के माध्यम से भारतीय संस्कृति एवं भावनात्मक एकता के महत्व को समझने की क्षमता विकसित हो सकेगी। ➢ मुहावरे एव ंलोकोक्तियाँ का महत्व समझ सकेंगे। व्यंग्य, निबंध एवं कविता विद्या से परिचित होंगे। ➢ निबंध लेखन एवं अपठित गद्यांश के माध्यम से विद्यार्थियों ंका बौद्धिक विकास हो सकेगा।		
Credit Value	**2 Credits**	**Credit =30 Periods -learning & Observation**	
Total Marks	**Max. Marks:=50**	**Min Passing Marks: 20**	

PART -B: Content of the Course		
Total No. of Teaching-learning Periods (45 Min. per period) -30 Periods		
Unit	Topics (Course contents)	
I	रचनाएं. भारत वंदना–सूर्यकांत त्रिपाठी 'निराला' (कविता) जीव–हरिशंकर परसाई (व्यंग्य) चोरी और प्रायश्चित–महात्मागांधी (निबंध)	08
II	हिन्दी व्याकरण एवं शब्द रचना प्रत्यय, संधि समास पर्यायवाची शब्द, विलोम शब्द, अनेकार्थी शब्द, समश्रुत शब्द, अनेक शब्दों के लिए एक शब्द	07
III	हिन्दी व्याकरण एवं रचनापक्ष मुहावरे एवं लोकोक्तियां परिभाशिक षब्दावली एवं हिन्दी में पदनाम, षब्द षुद्धि, वाक्य षुद्धि	08
IV	रचनात्मक लेखन निबंध लेखन अपठित गद्यांश	07

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	(नोट– विद्यार्थी को किसी एक विषय पर निबंध व प्रदत्त गद्यांश का शिर्षक तथा सारांश लिखना होगा।)	
Keywords	रचनात्मक लेखन निबंध लेखन हिन्दी व्याकरण एवं रचना पक्ष	
Signature of Convener & Members (CBoS)		

SHRI DAVARA UNIVERSITY NAYA RAIPUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF HINDI

COURSE CURRICULUM

PART-C: Learning Resources		
Text Books, Reference Books and Others		
Text Books Recommended-		
1- भारतीयता के अमर स्वर– डॉ. धनंजय वर्मा, मध्यप्रदेश हिन्दी अकादमी 2- आधुनिक हिन्दी व्याकरण और रचना– डॉ वासुदेव नंदन 3- हिन्दी भाषा और व्यवहार– डॉ. गंगा चरण त्रिपाठी 4- हिन्दी व्याकरण माला– डॉ. के.आर. गहिया, डॉ विमलेश शर्मा 5- हिन्दी व्याकरण– कामता प्रसाद गुरू		
Online Resources- ➢ https://www.youtube.com/watch?v=WxMSckEcio4http://www.internshala.com ➢ https://archive.org/details/personality-development-book/mode/lup ➢ https://www.coursera.org/articles/presentation-skills ➢ https://www.cbs.de/en/blog/15-effective-presentation-tips-to-improve-presentation-skills/ ➢ https://benjaminball.com/blog/good-body-language-best-visual-aid-talks/ ➢		
Online Resources- ➢ e-sources/e-books and e-learning portals https://blog.moderngov.com/importance-of-body-language-in-presentations-good-bad- ➢ https://efaidohmannibpcapcalclefindorkaj/https://www2.ca.uky.edu/apcom/pubs/ho/ho96/ho96.pdf ➢ https://www.botanytoday.com/brunches-of-botany		
PART -D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: 50 Marks Continuous Internal Assessment (CIA): 15 Marks End Semester Exam (ESE): 35 Marks		
Continuous Internal Assessment (CIA): 15 (By Course Teacher)	Internal Test/Quiz:10+10 Assignment/ Semenar-05 Total Marks-15	Better marks out of the two Tot Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):70	Two section A&B Section A :Q1 Objective 1*5=5 Marks Q2 Short answer type-2*5=10 (I. Vocabulary, II Unseen passage Section B : Descriptive answer type qts 1 out of 2frm each- 5*4=20 Marks	
Signature of Convener & Members (CBoS)		

SHRI DAVARA UNIVERSITY NAYA RAIPUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-II**	**Session: 2024-2025**
Course Code	**VAC-01**		
Course Title	**Chemistry Lab Skills-II**		
Course Type	**Value Additional Course**		
Pre-requisite(if any)	**As per program**		
Course Learning. Outcomes (CLO)	**Completing this course, students will be able to: -** ➢ **To understand different acid-base theories and solvent system.** ➢ **To learn the preparation, bonding, and reactions of C-C σ- & π-bonded compounds.** ➢ **To understand the concept and chemistry of aromatic compounds and their reactions.** ➢ **To learn the basic concepts of various states of matter & understand the basic concepts of surface chemistry and chemical kinetics.**		
Credit Value	**1 Credits**	**Credit =30 Periods -learning & Observation**	
Total Marks	**Max. Marks:=50**	**Min Passing Marks: 20**	

PART -B: Content of the Course		
Total No. of Teaching-learning Periods (45 Min. per period) -15 Periods		
Unit	Topics (Course contents)	
I	**Introduction of Chemistry Laboratory** General introduction of the chemistry laboratory, common instructions for safe working in chemical laboratories, Good Laboratory Practices (GLP), Good Manufacturing Practices (GMP).Laboratory design, Storage, ventilation, lighting, fume, cupboard, arrangement of the store, Safety provisions, Organization of practical work, Maintenance of laboratory, equipment Cleaning of laboratories and glasswares / plasticwares and preparation room. Classification of apparatus in store and laboratory.	08
II	**Introduction of Chemistry Apparatus** Glass apparatus - Beaker, test tube, boiling tube, funnel, separating funnel, filtration flask, round bottom flask, flat bottom flask, condenser Liebig flask, watglass etc. measuring conical or condenser, Petridis, desiccators. Volumetric Apparatus – Measuring cylinder, burette, pipette, volumetric flask, analytical balance, single-pan electronic balance/ electrical analytical balance, Micropipette, Three way Pipette Bulb etc.	07
III	**Introduction of Chemistry Equipments** Clevenger apparatus, Buchner funnel, Soxhlet extractor, wire gauze, cork borers, filter pumps, crucible, mohr clip, pipe clay triangle, pestle and mortar, sprit lamp,spatulas, thermometer, pH meter	08

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IV	**Introduction of Chemistry Equipments**- laboratory centrifuge. Apparatus for heating and reaction: Magnetic Stirrer, Bunsen burner, water bath, oil bath hot plate, sand ,bath, hot air oven, heating mantle etc.	07
Keywords	*Introduction of Chemistry Laboratory.* Introduction of Chemistry Apparatus. Introduction of Chemistry Equipments.	
Signature of Convener & Members (CBoS)		

SHRI DAVARA UNIVERSITY NAYA RAIPUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

PART-C: Learning Resources

- Text Books, Reference Books and Others Paula, B. Y. (2014). Organic Chemistry (7th Ed.). Pearson Education, Inc. (Singapore).
- Solomons, T. W. G. (2017). Organic Chemistry (Global Ed.). John Wiley & Sons.
- Morrison, R. T., & Boyd, R. N. (2010). Organic Chemistry (7th Ed.). Prentice-Hall Of India Limited.
- Laidler, K. J., & Meiser, J. H. (2006). Physical Chemistry (2nd Indian Ed.). CBS Publishers.
- . Atkins, P. W., & De Paula, J. (2006). Physical Chemistry (8th Ed.). Oxford University Press.
- . Dogra, S., & Dogra, S. (2006). Physical Chemistry through Problems (2nd Ed.). New Age International.
- Sangaranarayanan, M. V., & Mahadevan, V. (2011). Textbook of Physical Chemistry. University Press.

Text Books Recommended-

Text Books Recommended-

- Bahl, A., & Bahl, B. S. (2014). Organic Chemistry (22nd Ed.). S. Chand & Sons.
- Ahhuwalia, V. K., & Goyal, M. (2001). A Textbook of Organic Chemistry. Narosa Publishing House.
- . Jain, M. K., & Sharma, S. C. (2017). Modern Organic Chemistry. Vishal Publishing Company. Puri, B. R., Sharma, L. R., & Pathania, M. S. (2013). Principles of Physical Chemistry (46th Ed.)..
- Shoban Lal Nagin Chand And Co. 5. Bahl, B. S. A., & Tuli, G. D. (2009). Essentials of Physical Chemistry (Multicolour Ed.). S. Chand & Company Pvt Ltd. 6. Puri, B. R., Sharma, L. R., & Kalia, K. C. (2018). Principles of Inorganic Chemistry. Nagin Chand and Co., New Delhi,

Reference Books Recommended-

- Atkins, P. W., & De Paula, J. (2006). Physical Chemistry (8th Ed.). Oxford University Press.
- . Dogra, S., & Dogra, S. (2006). Physical Chemistry through Problems (2nd Ed.). New Age International.

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Online Resources-

- Introduction to Computer Fundamental from W3school: https://www.w3schools.blog/computer-fundamentals-tutorial
- Introduction to MS-Word from W3school: https://www.w3schools.blog/ms-word-tutorial
- Introduction to MS-Excel from W3school:https://www.w3schools.com/excel/excel_introduction.php
- ntroduction to MS-PowerPoint from W3school:https://www.w3schools.blog/powerpoint-tutorial Introduction to MS-Access from W3school:
- https://www.youtube.com/watch?v=WxMSckEcio4http://www.internshala.com

Online Resources-
e-sources/e-books and e-learning portals

- https://www.rgycsm.org/uploads/books/MICROSOFT-OFFICE-BOOK.pdf
- https://www.youtube.com/watch?v=SH40YV5AJ6A
- https://www.youtube.com/watch?v=SH40YV5AJ6A
- https://hte.rajasthan.gov.in/dept/dte/board

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 50 Marks
Continuous Internal Assessment (CIA): 15 Marks
End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): 15 (By Course Teacher)	Internal Test/Quiz:10+10 Assignment/ Semenar-10 Total Marks-15	Better marks out of the two Tot Quiz + obtained marks in Assignment shall be considered against 15 Marks

End Semester Exam (ESE):50	Two section A&B Section A :Q1 Objective 5*1=5 Marks Q2 Short answer type-5*4=20 Section B : Descriptive answer type qts 1 out of 2frm each- 10*1=10 Marks

Signature of Convener & Members (CBoS)