SHRI DAVARA UNIVERSITY

NAYA RAIPUR (C.G.)

PROGRAMME CURRICULUM

FOR

BECHELOR IN LIFE SCIENCES

(BIOTECHNOLOGY)

SEMESTER-IV

AS PER NEW EDUCATION POLICY-2020

AND

NATIONAL EDUCATION POLICT-2025

FOUR YEAR UNDERGRADUATE PROGRAMME2024-25

(EFFECTIVE FROM THE SESSION-2024-2025)

SEMESTER IV

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-04T	ORGANIC AND PHYSICAL CHEMISTRY - I	3	0	0	3	70	30	-	-	100
2.	BOSC-O4T	ANGIOSPERMS	3	0	0	3	70	30	-	-	100
3.	BTSC-04T	RECOMBINANT DNA TECHNOLOGY	3	0	0	3	70	30	-	-	100
DISCIPLINE GENERAL ELECTIVE COURSE (GE)/DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE)											
4.	SCGE-04	HISTORY OF INDIA FROM BEGINNING TO 2ND CENTURY BC	3	1	0	4	70	30	-	-	100
5.	BTSE-02T	BIOPROCESS ENGINEERING	3	0	0	3	70	30	-	-	100
ABILITY ENHANCEMENT COURSE (AEC)											
6.	AEC-04	COMMUNICATIVE ENGLISH AND SOFT SKILLS	2	0	0	2	35	15	-	-	50
SKILLS ENHANCEMENT COURSE (SEC)											
7.	SEC-04	EQUINE STUDIES & HORSEMANSHIP	1	1	0	2	35	15	-	-	50
PRACTICALS (LAB)											
8.	CHSC-04P	ORGANIC AND PHYSICAL CHEMISTRY – I LAB COURSE	0	0	2	1	-	-	35	15	50

9.	BOSC-O4P	ANGIOSPERMS LAB COURSE	0	0	2	1	-	-	35	15	50
10.	BTSC-04P	RECOMBINANT DNA TECHNOLOGY LAB COURSE	0	0	2	1	-	-	35	15	50
11.	BTSE-02P	BIOPROCESS ENGINEERING LAB COURSE	0	0	2	1	-	-	35	15	50
Total Contact hours Per Week:30		Total credit:				26	Total mark				650/700 (DSE)

FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

PART-A: Introduction			
Programme: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-IV**	**Session: 2024-2025**
Course Code	**CHSC-04T**		
Course Title	**ORGANIC AND PHYSICAL CHEMISTRY - I**		
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** ➢ **Master the synthesis, properties, and reactivity of various functional groups and apply this knowledge to understand their significance in organic chemistry.** ➢ **Employ the principles of chemical/Ionic equilibria, their influencing factors and applications.** ➢ **Interpret phase diagrams for one and two –component system, determine degrees of freedom and identify the triple point.** ➢ **Master the principles and applications of liquid – liquid mixtures using Raoult's law, Henry's and Nernst Distribution law.**		
Credit Value	**3 Credits**	**Credit =45 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	**A. Halides (5 hrs.)** **(i) Alkyl Halides:** Preparation: from alkenes and alcohols. Reactions: Nucleophilic substitution reactions of alkyl halides (alcohol, ester, nitrile &azonitrile formation, Williamson's ether synthesis), mechanism and stereochemistry of nucleophilic substitution reactions (SN1 and SN2), factors affecting SN1 and SN2 reactions. **(ii) Aryl Halides:** Chlorobenzene: Preparation by aromatic halogenation and Sandmeyer reaction. Aromatic nucleophilic substitution involving Benzyne Mechanism: KNH_2/NH_3 (or $NaNH_2/NH_3$). Reactivity and Relative strength of C-Halogen bond in alkyl and aryl/ Vinyl halides.	12

	B. Alcohols & Phenols (7 hrs.) **(i) Alcohols** **(a)** Monohydric-nomenclature, methods of formation, Properties & chemical reactions distinction between primary, secondary & tertiary alcohols. **(b) Dihydric alcohols:** Nomenclature, methods of formation of ethylene glycol (from ethylene, epoxide, ethylene dibromide and ethylene diamine). Chemical reactions of vicinal glycols: with carbonyl compounds, dehydration, oxidative cleavage with Pb (OAc)4 and HIO4 and Pinacol-Pinacolone rearrangement (with mechanism). **(c) Trihydric alcohols:** Nomenclature and methods of formation (from Hydrolysis of fats and oils, propene and acrolein), chemical reactions of glycerol (with PCl5, HI, oxidation, and dehydration) and uses/applications. **(ii) Phenols** Nomenclature and methods of formation, physical properties, and acidic character. Resonance stabilization of phenoxide ion. Comparative acidic strength of alcohols and phenols. Electrophilic aromatic substitution, acetylation, and carboxylation. Mechanism of Fries rearrangement, Claisen rearrangement, and Reimer-Tiemann reaction.	
II	**Aldehydes/Ketones and acid/Its derivatives** **A. Aldehydes and Ketones (6hrs)** Nomenclature and structure of the carbonyl group, synthesis of aldehydes and ketones. Acidity of alpha hydrogens and formation of enolate, Concept of reactive methylene group, Keto-enol tautomerism in Acetoacetic ester. Oxidation of aldehydes by KMnO4, and Tollen's reagent, Reduction of aldehydes by $LiAlH_4$ and $NaBH_4$. Mechanism of nucleophilicadditons to carbonyl group with particular emphasis on aldol, Perkin, and Knoevenagel reactions. Wittig and Minnich reaction (without mechanism), Baeyer-Villager oxidation of Ketones (without mechanism), Cannizaro reaction (with mechanism), MPV, Clemmensen, and Wolf-Kushner reaction. **B. Acid & its derivatives (5 hrs)** **(i) Carboxylic Acids** Nomenclature, structure, physical properties, acidity of carboxylic acids, effect of substituent on acid strength, method of preparation and chemical reaction. Hell-Volhard-Zelinsky (HVZ) reaction, Reduction of carboxylic acids, Mechanism of Decarboxylation. Di carboxylic acids: - Methods of formation and chemical reactions, **(ii) Carboxylic Acid Derivatives** tructure, method of preparation & physical properties of acid chlorides, esters, amides (Urea) and acid anhydrides, Relative stability of acyl derivatives.	11

III	**Equilibrium** **A. Chemical equilibria (3hrs)** Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mas action, equilibrium constants and their quantitative dependence on temperature, pressure, and concentration, factors affecting equilibrium –Le Chatelier's principle. **B. Ionic Equilibria (5 hrs)** Ionization of acids and bases, Strong and weak electrolytes, degree of ionization ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect and solubility product with illustrative examples), Salt hydrolysis-calculation of hydrolysis constant and degree of hydrolysis for salt of strong acid and weak base, Buffer solutions –Introduction, Henderson-Hasselbalch equations for acidic and basic buffer. **C. Phase Equilibrium (3 hrs)** **(A)** Hibbs phase (no derivation), phase, component and degree of freedom, Application of phase rule to one component system (water system and Sulphur systems), Reduced phase rule. Application of phase rule to two component systems: Pb-Ag system. Congruent-Ferric chloride system.	11
IV	**Photochemistry and Liquid-liquid mixtures** **(A) Photochemistry (8hrs)** Interaction of radiation with matter, difference between thermal and photochemical reactions, Laws governing absorption of light, laws of photochemistry, Jablonski diagram depicting various process quantum yield, determination of quantum yield of reactions, reasons various processes, quantum yield. Some examples of photochemical reactions (e.g. Photochemical decomposition of Hydrogen iodide, Photosynthesis of HBr from H_2 and Br_2 and photosynthesis of HCl from H_2 and Cl_2). Photosensitization and Quenching, Photosensitized reactions. **(B) Liquid-Liquid mixtures (3 hrs)** Ideal liquid mixtures, Raoult's law of ideal solutions, Henry's law and its applications, Nernst distribution law, limitations, and applications (association and dissociation – No derivation.)	11
Keywords	***Halides (alkyl & aryl halides), Alcohols, Phenols, Aldehydes & Ketones, Carboxylic acids & their derivatives, Equilibrium (Chemical, Ioic, and Phase equilibria), Photochemistry, Liquid-Liquid mixtures***	
Signature of Convener & Members (CBoS)		

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

- Boyd, R. N. & Morrison , R. T. (1983), Organic Chemistry (uden title), Allyn and Bacon.
- Physical Chemistry.
- Atkins, P. W. De Paula, J.& Keeler, J. (2023), Atkins Physical Chemistry, Oxford University Press.
- MeQuarrie, D.A. & Simon, J. D. (2004), Molecular Thermodynamics Viva Books Pvt. Ltd: New Delhi.

Text Books Recommended-

- Bahl, A. (2010),Advanced Organic chemistry S.Chand publishing.
- Singh, J. &Yadav, L. D. S. (2016), Advanced Organic chemistry. PragatiPrakashan Meerut.
- Puri, L.B. Sharma, L. R. &Pathania, M. S. (2013), Principles of physical chemistry, Vishal Publishing. Co.
- Kapoor, K.L. (2019), A. Textbook of Physical Chemistry. Thermodynamics and Chemical Equilibrium (SI Units) – Vol. 2. 6th Edition.

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

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	
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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

PART- A: Introduction			
Programme: Bachelor in Life Sciences **(Certificate/Diploma/Degree/Honors**		**Semester-IV**	**Session: 2024-2025**
Course Code	**CHSC-04P**		
Course Title	**Lab. Course -01 ORGANIC AND PHYSICAL CHEMISTRY - I**		
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 fundamentals of organic compounds analysis including preparation of sodium extract and detection of elements.** ➢ **Identify functional groups and prepare derivations.** ➢ **Determine the PH of various samples like water /acid/base/soil etc.** ➢ **Apply the concepts of phase equilibria to determine critical solution temperature and study concepts of Nernst distribution law and determine equilibrium constant of various reactions.**		
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	**Organic Analysis:** Systematic Identification of organic compounds: (a) Test for aliphatic and aromatic nature of substances. (b) Test for saturation and unsaturation. (c) Detection of elements (N, S and halogens) in organic compounds. (d) Identification of functional groups: (i) Carboxylic acids (ii) Phenols (iii) Aldehydes (iv) Ketones (v) Esters (vi) Carbohydrates (vii) Amines (viii) Amides (ix) **Halogen compounds.** (e) Determination of melting and boiling points. (f) Preparation of solid derivatives. PH Determination (1)Determination of PH of soil, water.		30

	(2) To measure the PH of various solution using PH indicators and PH meter. (3) To prepare and study the properties of buffer solutions. Phase Equilibrium: (1) To determine the critical solution temperature of two partially miscible liquids (phenol-water systems). (2) To study the effect of solute such as (i) sodium chloride (NaCl) , (ii) succinic acid (HOOC-CH2- CH2-COOH) on the critical solution temperature of two partially miscible liquids (e.g. phenol-water system). (3) To construct the phase diagram of two compounds (e.g. diphenylamine-benzophenone system) by cooling method. Nernst Distribution Law (1) To determine the partition coefficient of Iodine between water and carbon tetrachloride / Kerosene. (2) To determine the partition coefficient of benzoic water and benzene. (3) To determine the equilibrium constant of the reactions, KI+I2=KI3 by distribution method.	
Keywords	**Organic analysis, Aromatic/Aliphatic compounds, Saturated /Unsaturated compounds, Element detection, Functional groups, Derivatives for Functional groups, PH, Phase equilibria, Nernst Distribution Law.**	
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DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

- Boyd, R. N. & Morrison , R. T. (1983), Organic Chemistry (uden title), Allyn and Bacon.
- Physical Chemistry.
- Atkins, P. W. De Paula, J.& Keeler, J. (2023), Atkins Physical Chemistry, Oxford University Press.
- MeQuarrie, D.A. & Simon, J. D. (2004), Molecular Thermodynamics Viva Books Pvt. Ltd: New Delhi.

Text Books Recommended-

- Bahl, A. (2010),Advanced Organic chemistry S.Chand publishing.
- Singh, J. &Yadav, L. D. S. (2016), Advanced Organic chemistry. PragatiPrakashan Meerut.
- Puri, L.B. Sharma, L. R. &Pathania, M. S. (2013), Principles of physical chemistry, Vishal Publishing. Co.
- Kapoor, K.L. (2019), A. Textbook of Physical Chemistry. Thermodynamics and Chemical Equilibrium (SI Units) – Vol. 2. 6th Edition.

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

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 50 Marks
Continuous Internal Assessment (CIA): 30 Marks
End Semester Exam (ESE): 50 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):50	Two section A&B Section A :Q1 Short answer type-5*2=10 Section B : Descriptive answer type qts 1 out of 2frm each- 2*10=20 Marks	
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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF BOTANY

COURSE CURRICULUM

PART-A: Introduction			
Programme: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-IV**	**Session: 2024-2025**
Course Code	**BOSC-4T**		
Course Title	**Angiosperms**		
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 basics of plant identification,classification and nomenclature Understand the concept,diversity and evolution of Angiosperm plants.** ➢ **Become familiar with the intemal structure of plants and concept of plant tissues with its revolutionary concept** ➢ **Understand the reproductive system in flowering plants**		
Credit Value	**3 Credits**	**Credit =45 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	**Plant taxonomy**:Types of classification-artificial,natural and phylogenetic Bentham &Hooke (upto series),Engler &Prantl (upto series)and Hutchinson system of classification with its merit and demerits,Modern trends of taxonomy and Numerical taxonomy.Binomial nomenclatur system..Principles and rules (ICBN/ICN)Ranks and names,Typification,author citation,vali publication,principle of priority and its limitations;.Herbarium technique,important herbaria,d herbarium and Botanical gardens of India.	12
II	**Taxonomic Description:**Characteristics,systematics and economic importance of Dicotyledonous families- Brassicaceae,Malvaceae,Fabaceae(subfamily),Apiaceae,Rutaceae, Euphorbiaceae,Lamiaceae,Asteraceae.Monocotyledonous families - Orchidaceae,Liliaceae, Cyperaceae,Musaceae and Poaceae.(Floral features,Floral formulaand floral diagrami are essential.	11
III	**Anatomy**:Tissue system features,functions of different types of meristematic and permanent tissues.Internal Structure of dicot and monocot root stem and leaf.Root and shoot apex organizationStructure and function of cambium and secondary	11

	growth in root and stem.Wood (heartwood and sapwood,annual rings)Abnormal Secondary Growth(Dracaena Achyranthes, Nyctanthes,Boerhavia)	
IV	**Embryology:**Structure of anther and pollen.Structure and types of ovules,Embryo sacs-types, Pollination and Fertilization,Double fertilization,Endosperm types,structure and functions Development of embryo-Dicot and monocot embryo.Concept of Apomixes and Polyembryony Seed structure;appendages and dispersal mechanisms.	11
Keywords	**Taxonomy, Herbarium, Tissue, Fertilization**	
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DEPARTMENT OF BOTANY

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

1.Simpson,M.G.(2006)Plant Systematics.Elsevier Academic Press,San Diego,CA,USA
2.Beck,C.B.(2010).An Introduction to Plant Structure and Development,II edition
3.Johri,B.M.(1984).Embryology of Angiosperms.Springer-Verlag,Berlin
4.Singh,G.(2012)Plant Systematics.Theory and Practice.Oxford &IBH Pvt.Ltd,New Delhi.
5.Bhojwani,SS.&Bhatnagar,SP(2011).Embryology of Angiosperms.Vikas Publication House Pvt.Lid.New Delhi 5 edition
6.Mauseth.1.1)(1988)Plant Anatomy.The Benjamin Cummings Publisher.USA
7.Pandey,B.P.(LatesEdt),Plant Anatomy

Text Books Recommended-

1.Simpson,M.G.(2006)Plant Systematics.Elsevier Academic Press,San Diego,CA,USA
2.Beck,C.B.(2010).An Introduction to Plant Structure and Development,II edition
3.Mauseth.1.1)(1988)Plant Anatomy.The Benjamin Cummings Publisher.USA
4.Jeffrey,C.(1982).An Introduction to Plant Taxonomy.Cambridge University Press,Cambridge
5.Judd,W.S.,Campbell,C.S.,Kellogg,E.A.,Stevens,P.F.(2002).Plant Systematics-A Phylogenetic Approach.Sinauer Associates Inc.,U.S.A.2 nd edition
6.Maheshwari,J.K.(1963).Flora of Delhi.CSIR,New Delhi
7.Radford,A.E.(1986).Fundamentals of Plant Systematics.Harper and Row,New York
8.Saxena N.B.and Saxena S.(2012).Plant Taxonomy Pragati Prakashan 9.Sharma 9.P.(2013).Plant Taxonomy.MC GRAW HILL INDIA.
10.Sharma,M.K.(2013)Plant Structures(An Introduction to Plant Anatomy).VayuEducation of India.
11.Chopra G.L.(2005)Angiosperm,Pradeep Publication,Jalandhar

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

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF BOTANY

COURSE CURRICULUM

PART- A: Introduction			
Programme: Bachelor in Life Sciences **(Certificate/Diploma/Degree/Honors**		**Semester-IV**	**Session: 2024-2025**
Course Code	**BOSC-04P**		
Course Title	**Lab.Course-02 (Angiosperms)**		
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 systematic status of flowering plants** ➢ **Learn collection of local flora ,identification and herbarium preparation** ➢ **Understand internal structure of different plant parts** ➢ **Understand the pollination and seed dispersal mechanism.** ➢ **Understand about reproduction system in flowering plants.**		
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	➢ Description of local plants of the syllabus in semitechnical language,floral formula and floral diagrams should be drawn ➢ Anatomy of primary and secondary growth in monocuts and dicots stem using hand sections or permanent slides. ➢ Anatomy of root,primary and secondary structure · Study of placentation. ➢ Study of types of ovule in permanent slide.	30

	➢ Isolation of globular,heart shape and torpedo embryo ➢ Study of pollination by insects ➢ Prepration of herbarium of local	
Keywords	**Herbarium, Monocot, Placentation, Pollination**	
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PART-C: Learning Resources

1.The Practical Fossil Finder (Practical Handbook)Hardcover-1 October 1991by Steve Parker(Author)Publishers Facts On File Inc

2.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).

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

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

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

6. Pandey,B.P.(2014).Modern Practical Botany Vol.II.S.Chand and Company Ltd.,NewDelhi.

7. .Bendre,A.M.and Kumar A.(2003).Manual of Practical Botany Vol.II.RastogiPublications,Meerut.

8..Santra S.C.and Chatterjee (2005).College Botany Practical Vol.III New Central Book Agency Pvt.Ltd

Text Books Recommended-

1. Principles of Paleontology Edition 3 Paperback-1 January 2006 by Arnold Miller,Michael Foote Publishers -W.H.Freeman &Co Lt

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	
Signature of Convener & Members (CBoS)		

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF BIOTECHNOLOGY

COURSE CURRICULUM

PART-A: Introduction			
Programme: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-IV**	**Session: 2024-2025**
Course Code	**BTSC-04T**		
Course Title	**Recombinant DNA technology**		
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 tools of genetic engineering.** ➢ **Develop competency in genetic exploitation for human welfare.** ➢ **Understand the practical application of recombinant DNA technology.** ➢ **Understand the use of information technology in the field of genome and proteome analysis.**		
Credit Value	**3 Credits**	**Credit =45 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	**Prerequisites of rDNA technology** 1.Recombinant DNA technology:General concept.Steps and application 2.Host controlled Restriction Modification System,Ligases and Polymerases, Klenow fragment,Taq,Pfu polymerase 3.Nuclease (Endo,Exo,and restriction endonuclease). 4.Modification Enzyme (Kinase, Phosphates and termina deoxynucleotidyltransferase),Reverse Transcriptase.	12
II	**Gene transfer** 1.Vectors:Based on Plasmid,Bacteriophages,Cosmid 2. High capacity vectors 3.The basic concept of Gene Transfer Methods:Microinjection, Electroporation,Lipofection,and Microprojectile. 4.Selection and Screening of Recombinants: Genetic and Hybridization methods.	11

III	**Genomic validation** 1.PCR:Types of PCR,Steps,Applications,Advantages and Limitations of PCR 2.Molecular Marker-RFLP,RAPD,and Microarray 3.Human Genome Project. 4.Gene Library: Genomic and cDNA library, Chromosome walking and jumping	11
IV	**Application of genetic technology** 1.Gene Therapy:In vivo and Ex vivo,germline and somatic gene therapy 2.Basic idea of stem cell technology:Types of stem cell cultures and their Significance 3.Introduction to Genomics,DNA sequencing methods-manual &automated Maxam &Gilbert and Sangers method 4.Introduction to protein structure, Chemical properties of proteins, physical interactions that determine the property of proteins, short-range interactions electrostatic forces, van der Waal interactions, hydrogen bonds, and Hydrophobic interactions.	11
Keywords	**Recombinant DNA, Vectors, PCR, cDNA library.**	
Signature of Convener & Members (CBoS)		

FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF BIOTECHNOLOGY

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended-

- **PS Verma and A KAgrawal**
- **An introduction to genetic engineering-S T Tischoll**

Reference Books Recommended-

- Molecular Biology;Watson
- Gene VIII;Benjamin Lewin
- The Cell,A molecular Approach;Geoffrey M.Cooper
- Molecular Biology of the Cell;Alberts
- Modern Biotechnology,2nd Edition,S.B.Primrose,Blackwell Publishing,1987
- Molecular Biotechnology:Principles and Applications of Recombinant DNA,4th Edition B.R.Glick,J.J.Pasternak and C.L.Patten,2010.
- Molecular Cloning:A Laboratory Manual (3rd Edition)Sambrook and Russell Vol.I to III,1989.
- Principles of Gene Manipulation 6th Edition,S.B.Primrose,R.M.Twyman and R.W.Old Blackwell Science,2001.

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
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 PROGRAMME (2024-28)

DEPARTMENT OF BITECHNOLOGY

COURSE CURRICULUM

PART- A: Introduction			
Programme: Bachelor in Life Sciences **(Certificate/Diploma/Degree/Honors**		**Semester-IV**	**Session: 2024-2025**
Course Code	**BTSC-04P**		
Course Title	**Lab. Course -03 Recombinant DNA technology**		
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 –** ➢ **Isolate nucleic acid from biological cells** ➢ **Estimate and manipulate nucleic acid.** ➢ **Amplify nucleic acid.** ➢ **Analyse nucleic acid on the basis of database.**		
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.Isolation of chromosomal DNA from plant cells 2.Isolation of chromosomal DNA from E.coli 3.Qualitative and quantitative analysis of DNA using spectrophotometer 4.Plasmid DNA isolation 5.Restriction digestion of DNA 6.Ligation of DNA. 7.Transformation of competent cells 8.Demonstration of PCR 9.Use of SNP databases at NCBI and other sites.	30

	10.Use of OMIM database 11.Detection of Open Reading Frames using ORF Finder	
Keywords	**Recombinant DNA, Vectors, PCR, cDNA library.**	
Signature of Convener & Members (CBoS)		

FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF BITECHNOLOGY

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended-

- PS Verma and A K Agrawal
- An introduction to genetic engineering-S T Tischoll

Reference Books Recommended-

- Molecular Biology;Watson
- Gene VIII;Benjamin Lewin.
- The Cell,A molecular Approach;Geoffrey M.Cooper.
- Molecular Biology of the Cell;Alberts
- Modern Biotechnology,2nd Edition,S.B.Primrose,Blackwell Publishing,1987.
- Molecular Biotechnology:Principles and Applications of Recombinant DNA,4th Edition, B.R.Glick,J.J.Pastemak and C.L.Patten,2010
- Molecular Cloning:A Laboratory Manual (3rd Edition)Sambrook and Russell Vol.I to III,1989.
- Principles of Gene Manipulation 6th Edition,S.B.Primrose,R.M.Twyman and R.W.Old Blackwell Science,2001.

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

<table>
<tr><td colspan="3">Suggested Continuous Evaluation Methods:
Maximum Marks: 50 Marks
Continuous Internal Assessment (CIA): 15 Marks
End Semester Exam (ESE): 35 Marks</td></tr>
<tr><td colspan="2">Continuous Internal Assessment (CIA): 15
(By Course Teacher)</td><td>Internal Test/Quiz:10+10
Assignment/ Semenar-05
Total Marks-15</td><td>Better marks out of the two Tot Quiz + obtained marks in Assignment shall be considered against 15 Marks</td></tr>
<tr><td>End Semester Exam (ESE):35</td><td colspan="3">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</td></tr>
<tr><td colspan="4">Signature of Convener & Members (CBoS)</td></tr>
</table>

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF HISTORY

COURSE CURRICULUM

PART-A: Introduction			
Programme: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-IV**	**Session: 2024-2025**
Course Code	**SCGE-04**		
Course Title	**History of India from beginning to 2nd century BC**		
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.** ➢ **Understand about various sources of ancient Indian History.** ➢ **Understand various chrono logical Period of ancient Indian history.** ➢ **Become familiar with various aspects of political and cultural history of those periods.**		
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	**1.**Sources of ancient Indian history. 2.Literacy of sources brahman, Jain, Buddha and accounts of foreign Travelers 3.Archaeological sources: stone, tools, inscriptions, coins Architecture and sculptures	15
II	1.Vedic age 2.Mahajan padas 3.Flourishing of Magadh Empire	15
III	1.Achievements of Chandragupta Maurya and Ashoka and decline of Mauryan Empire 2.Indo Greeks 3.Sunga	15
IV	1.Satvahan 2.. Shaka Ksha trap and partiyon 3.kharvela	15
Keywords	**Source, Vaidik, Magadh, Shung, Karvelas**	
Signature of Convener & Members (CBoS)		

FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF HISTORY

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

1.उदयनारायण राय - गुप्त राजवंश तथा उसका इतिहास (नया संस्करण) 1988

2. श्री राम गोयल- भारत का राजनैतिक इतिहास भाग 2 एवं 3

3. श्री राम गोयल- गुप्त साम्राज्य का इतिहास

4. विशुद्धानंद पाठक- उत्तर भारत का राजनीतिक इतिहास

5 डी.सी. गांगुली - परमार राजवंश

. 6 .अवध बिहारी लाल अवस्थी- राजपूत राजवंश

7. भगवती प्रसाद पांथरी- गौखरी और पुष्यभूमि राजवंश

8. डॉ. बैजनाथ शर्मा- हर्षवर्धन

डॉ. के.ए. नीलकंठ शास्त्री- दक्षिण भारत का इतिहास

Text Books Recommended-

Reference Books Recommended-

1.Majumdar, Roy - An Advanced History of India Vol. I

2.. Ashvini Agrawal- Rise and Fall of the imperial Gupta

3. R.C. Majumdar & A.D. Pusalkar (Ed.) The Classicale Age "The age of Imperial

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

ART -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

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF BIOTECHNOLOGY

COURSE CURRICULUM

PART-A: Introduction			
Programme: Bachelor in Life Sciences (Certificate/Diploma/Degree Honors)		**Semester-IV**	**Session: 2024-2025**
Course Code	**BTSE-02T**		
Course Title	**BIOPROCESS ENGINEERING**		
Course Type	**DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE)**		
Pre-requisite (if any)	**As per program**		
Course Learning. Outcomes (CLO)	**After successfully completing this course, the students will be able to –** ➢ **Understand the prerequisite of bioprocess engineering Develop skills for the operation of bioreactors.** ➢ **Develop skills for industrial production.** ➢ **Understand the geological exploitation by the process of bioprocess engineering.**		
Credit Value	**3 Credits**	**Credit =45 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	**Concept of bioprocess engineering** 1.Introduction to bioprocess engineering. 2.Isolation, preservation, and maintenance of industrial microorganisms 3.Media for industrial fermentation. 4.Kinetics of microbial fermentation	12
II	**Bioreactors** 1.Types of fermentation processes 2.Operations of bioreactors. 3.Measurement and control of bioprocess parameters 4.Downstream processing	11
III	**Bioproducts** 1.Production of alcohol, acids and solvents 2.Production of antibiotics.	11

	3.Production of amino acids. 4.Whole cell immobilization for industrial application.	
IV	**Microbial role and regulation** 1.Application of microbes in mineral beneficiation 2.Application of microbes for oil recovery. 3.Quality control, quality assurance and standard operating procedures of fermenter. 4.Good manufacturing practices	11
Keywords	**Fermentation, bioreactors, fermentation-based production, mineral beneficiation**	
Signature of Convener & Members (CBoS)		

FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF BIOTECHNOLOGY

COURSE CURRICULUM

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:-

- Industrial Microbiology:Patel A.H.(1996).I edition,MacMillan India Limited publishing
- company Ltd New Delhi,India
- A Text Book of Microbiology:R.C.Dubey &D.K.Maheshwari
- Industrial Microbiology by Prescott &Dunns,AVI Publishing Company Inc
  Biotechnology;V.Kumaresan,Saras Publications

Reference Books Recommended-

- Wastewater Engineering-Treatment,Disposal &Reuse.Metall and Eddy,Inc.,Tata Mcgraw Hill,N.Delhi
  Microbiology-Pelczar&Pelczar
- Environmental Biotechnology,PrathamVashishith.Dominant Publishers And Distributors, N.Delhi.
- Principles of Fermentation Technology;Stanburry
  Industrial Microbiology;Casida.

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
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)		

FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF BIOTECHNOLOGY

COURSE CURRICULUM

PART- A: Introduction			
Programme: Bachelor in Life Sciences **(Certificate/Diploma/Degree/Honors**		**Semester-IV**	**Session: 2024-2025**
Course Code	**BTSE-02P**		
Course Title	**LAB COURSE, BIOPROCESS ENGINEERING**		
Course Type	**LABORATARY COURSE, DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE)**		
Pre-requisite (if any)	**As per program**		
Course Learning. Outcomes (CLO)	**After successfully completing this course, the students will be able to –** ➢ **Isolate and maintain industrially significant microbes.** ➢ **Develop skills for alcoholic production.** ➢ **Develop skills for acid production.** ➢ **Develop skills for antibiotic and enzyme production.**		
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	❖ Isolation of industrially important microorganisms for microbial process ❖ Determination of thermal death point (TDP)and thermal death time (TDT) of microorganisms. ❖ Comparative studies of ethanol production using different substrates Microbial production of citric acid using Aspergillus Niger. ❖ Microbial production of antibiotics (Penicillin) ❖ Production and estimation of alkaline protease.		30
Keywords	**Fermentation,bioreactors,fermentation-based production,mineral beneficiation**		
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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)

DEPARTMENT OF BIOTECHNOLOGY

COURSE CURRICULUM

PART-C: Learning Resources		
Text Books, Reference Books and Others		
Text Books Recommended- 1.Practical Microbiology:Dubey,R.C.and Maheshwari.D.K.2012.,S.Chand &Company,Pvt.Ltd 2.Experiments in Microbiology,Pathology and Tissue Culture:Aneja,K.R.1993.,Vishwa Prakashan		
Reference Books Recommended- ❖ Wastewater Engineering-Treatment,Disposal &Reuse.Metall and Eddy,Inc.,Tata Mcgraw Hill,N.Delhi ❖ Microbiology-Pelczar&Pelczar ❖ Environmental Biotechnology,PrathamVashishith.Dominant Publishers And Distributors, N.Delhi. ❖ Principles of Fermentation Technology;Stanburry. ❖ Industrial Microbiology;Casida.		
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		
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 PROGRAMME (2024-28)

DEPARTMENT OF ENGLISH

COURSE CURRICULUM

PART-A:Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)		**Semester-IV**	**Session: 2024-2028**
Course Code	**AEC- 04**		
Course Title	**Communicative English and Soft Skills**		
Course Type	**Ability Enhancement Course (AEC)**		
Prerequisite	**As per PROGRAMME**		
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Learn deviant use of English both in written and spoken forms. • Understand the importance of communication n English. • Apply the ability to improve competence in using English language. • Analyze the importance of reading skills, • Develop language for speaking with confidence		
Credit Value	**2 Credits**	**1 Credit-15 Hours - Learning & Observation**	
Total Marks	**Max. Marks: 50**	**Min marks -20**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (45 min. per period)-30 Periods

Unit	Topics(Course Content)	No. of Period
I	**What is communication?** • Purpose of Communication. • Types of Communication (Verbal and Non- Verbal), • The motivating factors (lntrinsic and Extrinsic) • Barriers of Communication (Internal and External).	**07**
II	**Building Vocabulary** i. Use of Dictionary, ii. Building vocabulary through synonyms and antonyms, iii. Use of Phrasal Verbs, Idioms and Phrases iv. Unseen passage	**07**
III	**Conversation in English** (Performance Based) **A) Reading:** Very short stories (Gif of Magi, Cinderella, The Selfish Giant, Stories from Panchatantra), Newspaper reports / Fact-based articles, Diction and tone,	**08**

	Identifying topic sentences, Reading aloud: Reading an article/report. **B) Spoken English for the Real world and Situational Dialogues (any four)** • Call Center: Talking to service Providers, Professional Enquiries, Talking with peers/ seniors. • Bank: for opening an account (seeking information on loans/FDs/other schemes. • Office: (seeking information regarding job vacancy) • Market (asking for price of an object, discount etc), • Restaurant: (asking for the special dish, offerings in the menu and ordering for food) • At the Railway Station / Bus Station enquiry: (Arrival and departure of buses/ trains) • Hotel: Booking a room, asking tariff rate • Travel agency:-(Asking to book tickets fares, finding vacancies in hotels) C) **Greetings and Common Etiquettes:** Introducing oneself Invitation; Making Requests; Expressing Gratitude; Complimenting and Congratulating; Expressing Sympathy; Apologizing; Complaining and Expressing Regret	
IV	**Applied Riding Practice and Ethics** i. Introduction to trail riding or arena riding ii. Group riding etiquette and communication iii. Intro to jumping and dressage (optional for advanced learners) iv. Ethical treatment and welfare of horses v. Assessment through practical demonstrations and logbook maintenance **Presentation skills** (Performance Based): Effective oral presentation, Characteristics of good oral presentation. Use of quotations and anecdotes. Ways of Oral Presentation (Seminar, Viva -voce, Interview, Power Point etc.) Gestures/ Mannerism during oral presentation. Media methods used for effective oral presentation, Body Language, Attire.	**08**
Keywords	Communication, Vocabulary, Conversation, Reading, Presentation.	

Name and Signature of Convener & Members of CBS

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Fluency in English - Part II, Oxford University Press, 2006.
- Enrich Your English, OUP, SR Inthira and V. Saraswathi, CIEFL,1997
- Oxford A-Z of English Usage, ed. Jeremy Butterfield, OUP, 2007.
- Longman Dictionary of Common Errors, N.D. Turton and J.B. Heaton, Longman, 1998
- Contemporary Communicative English, S Chand
- Malhotra Prerna, Deb Dulal Halder,(2019) Communication Skills: Theory and Practice, Eighth Edition,
- BookAge Publications, New Delhi.

Online Resources:

- Applying Communication Theory for Professional Life: A Practical Introduction. Dainton andZelley, http://tsime.uz.ac.zw/claroline/backends/download.php/url-L0ludHJvX3RvX2NvbWl1bmliYXRpb2Sf
- https://web.sol.du.ac.in/my_modules/type/cbcs-4l=2ldata/root/B.Com/Semester%20ABILITY-ENHANCEMENT 20COMPU_ SORY%20COURSE-AECC/English%20Communication%20A-B-C/Unit%201-5.pdf
- https:/larchive.ore/details/personality-development-book/mode/1up
- https://www.coursera.org/articles/presentation-skills
- https://eniaminball.com/blogleood-body-lanzuage-best-visual-aid-falks/
- https://www.cbs.de/en/blog/15-effective-presentation-tips-to-improve-presentation-skills/
- https://blow.moderngeoy.com/importance-of-body-language-in-presentations-good-bad-examples

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): (By Course Teacher)	**Internal test/Quiz-:10 & 10 Assignment /seminar-05 Total marks:-15**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 15 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-05 marks: Q2. Short answer type-5x2=10 marks ction B: Descriptive answer type question, 1 out of 2 from each unit-4x5=20 marks otal = 35 marks**	

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-2028)

EQUINE STUDIES & HORSEMANSHIP

COURSE CURRICULUM

PART-A: Introduction			
Programme: Common to All the UGs		**Semester-IV**	**Session: 2024-2025**
Course Code	**DUSECHS-T&P**		
Course Title	**Equine Studies & Horsemanship**		
Course Type	**Skill Enhancement Course (SEC)**		
Pre-requisite (if any)	**As per Programme**		
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able:** **i. to develop riding proficiency and demonstrate basic riding skills and control at various gaits.** **ii. to understand equine behavior and care by gaining knowledge of horse behavior and basic care practices.** **iii. to enhance physical fitness and coordination by improving fitness, balance, and coordination through riding practice.** **iv. to learn riding techniques and styles by exploring different riding techniques and disciplines for specialization.** **v. to promote safety and risk management by applying safety protocols and risk management strategies in equestrian activities.**		
Credit Value	**02 Credits**	**1 Credit =15 Hours-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	**Introduction to Horse-Riding and Equine Basics** ➢ History and evolution of horse-riding in sport and culture ➢ Introduction to equine anatomy and physiology ➢ Types of horse breeds and their characteristics ➢ Equipment and tack: saddle, bridle, stirrups, reins, riding attire ➢ Basic grooming and horse care	**07**
II	**Groundwork and Safety Protocols** Approaching, haltering, and leading a horse Stable management and horse behaviour basics Feeding, hydration, and routine checks Safety guidelines for riders and handlers Risk management and emergency procedures	**07**
III	**Basic Riding Techniques** Mounting and dismounting techniques Correct rider posture and balance Use of reins, legs, and seat for communication Walking, halting, and changing directions Basic trot and control exercises	**08**
IV	**Applied Riding Practice and Ethics** Introduction to trail riding or arena riding Group riding etiquette and communication Intro to jumping and dressage (optional for advanced learners) Ethical treatment and welfare of horses Assessment through practical demonstrations and logbook maintenance	**08**

PART-C: Learning Resources

i. https://www.coursera.org/learn/equine

ii. https://www.coursera.org/learn/equine-welfare

iii. https://www.edx.org/learn/animal-behavior

iv. https://www.youtube.com/user/EquestrianCoach

v. https://www.riding-instructor.com/

vi. https://horseandrider.com/

vii. https://equestrian.ca/

viii. https://www.bhs.org.uk/

ix. https://www.udemy.com/courses/search/?q=horse%20riding

x. https://equineinstitute.org/

PAPART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

- **Practical (riding techniques, horse care demonstration, logbook):15 marks**
- **End Sem. Exam. (Theory): 35**

Signature of Convener & Members (CBoS)