BAGALKOT UNIVERSITY

Mudhol Road, Jamkhandi – 587301 Dist: Bagalkote

PROGRAM /COURSE STRUCTURE AND SYLLABUS
Of
BIOTECHNOLOGY

IV SEMESTER

BACHELOR OF SCIENCE
(CHEMISTRY)

As Per NEP – 2020 and Adapted from RCU Belagavi Applicable from the Academic Year 2024-25

SEMESTER-IV											
Category	**Course code**	**Title of the Paper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration of exams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
L7		Kannada Functional Kannada	40	60	100	4	-	-	3	2
L8		English	40	60	100	4	-	-	3	2
		Hindi								
		Sanskrit								
		Telugu								
		Urdu								
DSC4	126BSC04BIODSC07T	Molecular Biology	40	60	100	4	-	-	4	2
	126BSC04BIODSC08L	Molecular Biology	25	25	50	-	-	4	2	4
DSC4	Another Department Code	Another Department Course Title	40	60	100	4	-	-	4	3
			25	25	50	-	-	4	2	3
SEC	126COM03XXXSEC03T	Artificial Intelligence	20	30	50	1	-	2	2	2
VBC7	1126COM04XXXVBC08B	Yoga/ Sports	25	-	25	-	-	2	1	-
VBC8	126COM04XXXVBC09B	H&W, /NCC/NSS/R&R/CA	25	-	25	-	-	2	1	-
			Total Marks		**600**	**Semester Credits**			**22**	

BSc Biotechnology
Semester-IV
Title of the Course: DSC-4
Subject code: 126BSC04BIODSC07T
Paper: Molecular Biology

Number of Theory Credits	Number of lecture hrs./semester	Number of practical Credits	Number of practical hrs./ Sem
4	56	**2**	**56**

Unit No.	Course Content	Hours
Unit I	**Molecular basis of life and Nucleic Acids** An introduction RNA and experimental proof of DNA as genetic material and types of DNA.Structure and functions of DNA and RNA, Watson and Crick model of DNA and other forms of DNA (A and Z) functions of DNA and RNA including ribozymes.	14
Unit II	**DNA Replication and Repair** Replication of DNA in prokaryotes and eukaryote– Enzymes and proteins involved in replication, Theta model, linear and rolling circle model. Polymerases and all enzyme components. The replication complex: Pre-primming proteins, primosome, replisome, unique aspects of eukaryotic chromosome replication, Fidelity of replication DNA damage and Repair mechanism: photo reactivation, excision repair, mismatch repair and SOS repair.	14
Unit III	**Transcription and RNA processing** Central dogma, RNA structure and types of RNA, Transcription in prokaryotes RNA polymerase, role of sigma factor, promoter, Initiation, elongation and termination of RNA chains. Transcription in eukaryotes: Eukaryotic RNA polymerases, transcription factors, promoters, enhancers, mechanism of transcription initiation, promoter clearance and elongation RNA splicing and processing: processing of pre-mRNA: 5‟ cap formation, polyadenylation, splicing, rRNA and tRNA splicing.	14

Unit IV	**Regulation of gene expression and translation** Genetic code and its characteristics, Wobble hypothesisTranslation- in prokaryotes and eukaryotes- ribosome, enzymes and factors involved in translation. Mechanism of translation- activation of amino acid, aminoacyltRNA synthesis, Mechanism- initiation, elongation and termination of polypeptide chain. Fidelity of translation, Inhibitors of translation. Protein folding and modifications, Post translational modifications of proteins.	14

Course: Practical

Semester-4

Paper: Molecular Biology;

Paper Code: 126BSC04BIODSC08L

1. Preparation of DNA model
2. Estimation of DNA by DPA method
3. Estimation of RNA by Orcinol method
4. Column chromatography – gel filtration (Demo)
5. Extraction and partial purification of protein from plant source by Ammoniumsulphate precipitation.
6. Extraction and partial purification of protein from animal source by organic solvents.
7. Protein separation by SDS-Polyacrylamide Gel Electrophoresis (PAGE)
8. Charts on- Conjugation, Transformation and Transduction, DNA replication, Types of RNA .