

Government of Karnataka NATIONAL EDUCATION POLICY-2020

CURRICULUM CONTENTS IN BIOTECHNOLOGY 2022-23

Undergraduate Course B.Sc.,
(Basic/Honors)

3rd and 4th Semester

Davangere University Shivagangothri Davangere-577007

ಅಧ್ಯಯನ ಮಂಡಳ ಜೈವಿಕ ತಂತ್ರಜ್ಞಾನ ಅಧ್ಯಯನ ವಿಭಾಗ ದ್ರಾವಣಗೆರೆ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ

July 27 Pate

Dr. Seema Jrais!

(Dr. B.T. Prabralcan). 24/8/22 DEAN

(Sandan Howain)

24/8/22

(Dr. Navya-A.M

Registrar
Davangere University
Shivagangotri, Davangere

PREAMBLE

The role of education is paramount in nation building. One of the major objectives of UGC is maintenance of standards of higher education. Over the past decades the higher education system of our country has undergone substantial structural and functional changes resulting in both quantitative and qualitative development of the beneficiaries. Such changes have gained momentum with the introduction of Choice Based Credit System (CBCS) which further expects Learning Outcome-Based curriculum to maximize the benefits of the newly designed curriculum. The Learning Outcome- Based Curriculum in Biotechnology will help the teachers of the discipline to visualize the curriculum more specifically in terms of the learning outcomes expected from the students at the end of the instructional process. The commission strives to promote the link of students with the society/industry such that majority of the students engage in socially productive activities during their period of study in the institutions and at least half of the graduate students will secure access to employment/self-employment or engage themselves in pursuit of higher education. The model curriculum envisages to cater to the developmental trends in higher education, incorporating multi-disciplinary skills, professional and soft skills such as teamwork, communication skills, leadership skills, time management skills and inculcate human values, professional ethics, and the spirit ofInnovation / entrepreneurship and critical thinking among students and promote avenues for display of these talents, linking general studies with professional courses. Besides imparting disciplinary knowledge to the learners, curriculum should aim to equip the students with competencies like problem solving, analytical reasoning and moral and ethical awareness. Introduction of internship and appropriate fieldwork/case studies are embedded in the curriculum for providing wider exposure to the students and enhancing their employability.

Learning outcomes specify what exactly the graduates are expected to know after completing a program of study. The expected learning outcomes are used as reference points to help formulate graduate attributes, qualification descriptors, program learning outcomes and course learning outcomes. Keeping the above objectives of higher education in mind the Learning Outcome-Based Curriculum Framework (LOCF) for the discipline of Biotechnologyhas been prepared and presented here.



Government of Karnataka

Model Curriculum

Program Name	B.Sc. Discipline	Total Credits for the Program	176
Core	Biotechnology	Starting year of implementation	2021-22

Program Outcomes: At the end of the program the student should be able to:

(Refer to literature on outcome-based education (OBE) for details on Program Outcomes)

- PO1. Understanding concepts of Biotechnology and demonstrate interdisciplinary skills acquired in cell biology, genetics, biochemistry, microbiology, and molecular biology
- PO2. Demonstrating the Laboratory skills in cell biology, basic and applied microbiology with an emphasis on technological aspects
- PO3. Competent to apply the knowledge and skills gained in the fields of Plant biotechnology, animal biotechnology and microbial technology in pharma, food, agriculture, beverages, herbal and nutraceutical industries.
- PO4. Critically analyse the environmental issues and apply the biotechnology knowledge gained for conserving the environment and resolving the problems.
- PO5. Demonstrate comprehensive innovations and skills in the fields of biomolecules, cell and organelles, molecular biology, bioprocess engineering and genetic engineering of plants, microbes, and animals with respect to applications for human welfare.
- PO6. Apply knowledge and skills of immunology, bioinformatics, computational modelling of proteins, drug design and simulations to test the models and aid in drug discovery.
- PO7. Critically analyse, interpret data, and apply tools of bioinformatics and multi omics in various sectors of biotechnology including health and Food.
- PO8. Demonstrate communication skills, scientific writing, data collection and interpretation abilities in all the fields of biotechnology.
- PO9. Learning and practicing professional skills in handling microbes, animals and plants and demonstrate the ability to identify ethical issues related to recombinant DNA technology, genetic engineering, animals handling, intellectual property rights, biosafety, and biohazards.
- PO10. Exploring the biotechnological practices and demonstrating innovative thinking in addressing the current day and future challenges with respect to food, health, and environment.
- PO11. Thorough knowledge and application of good laboratory and good manufacturing practices in biotech industries.
- PO12. Understanding and application of molecular biology techniques and principles in forensic and clinical biotechnology.
- PO13. Demonstrate entrepreneurship abilities, innovative thinking, planning, and setting up small-scale enterprises or CROs.

Assessment:

Weightage for assessments (in percentage)

Type of Course	Formative Assessment / IA	Summative Assessment
Theory	40	60
Practical	25	25
Projects	-	-
Experiential Learning (Internships etc.)	-	-

Contents of Courses for B.Sc. Biotechnology as Major Model II A

ter	Đ.	g Å	/Pr	33		Mai	'ks
Semester	Course	Course Category Theory/Pr actical Credits					I.A
	BTC: 103	DSC- 3	Theory	4	Biomolecules	60	40
3.	· ·		Practical	2	Biomolecules	25	25
		OE- 3	Theory 3 Nutrition and Health		60	40	
	BTC:104	DSC- 4	Theory	4	Molecular Biology	25	25
4.	D101107	D50- T	Practical	2	Molecular Biology	60	40
		OE- 4	Theory	3	Intellectual Property Rights	25	25

BSc Biotechnology (Basic/Hons.) Semester-3 Title of the course3:DSC1T, BTC103, Biomolecules

Program Name	BSc Biotechnology		Semester	Third Sem
Course Title	Biomolecules			
Course No.	BTC: 103 DSC -3T		No. of Theory Credits	4
Contact hours	56 hrs		Duration of ESA/Exam 2.30	
Formative Assessment Marks 40			Summative Assessment M	arks 60

Course	Pre-req	uisite	(s):
--------	---------	--------	------

Course Outcomes (COs): At the end of the course the student should be able to:

- 1. Acquire knowledge about types of biomolecules, structure, and their functions
- 2. Will be able to demonstrate the skills to perform bioanalytical techniques
- 3. Apply comprehensive innovations and skills of biomolecules to biotechnology field

Content of course: 3 DSC1T, BTC103, Biomolecules	Hrs
Unit-I	14

- a) Introduction Biomolecules, water, acid, base, PH, buffer
- b) Carbohydrates-sources, classification of carbohydrates. Structure, function and properties of carbohydrates. Monosaccharides Isomerism and ring structure, Sugar derivatives amino sugars.

Disaccharides - Sucrose and Fructose

Polysaccharides – Classification as homo and heteropolysaccharides, Homopolysaccharides - storage polysaccharides (starch and glycogen- structure, function properties), structural polysaccharides (cellulose and chitin-structure, properties), Heteropolysaccharides - glycoproteins and proteoglycans (Brief study).

Metabolism: Glycolysis and gluconeogenesis, Kreb's cycle, oxidative phosphorylation.

C) Amino Acids, Peptides and Proteins

Introduction, classification and structure of amino acids. Concept of - Zwitterion, isoelectric point, pK values. Essential and nonessential amino acids. Peptide bond and peptides-Vasopressin, Oxytocin, .Classification of proteins based on structure and function, Structural organization of proteins [primary, secondary (α, β) , tertiary and quaternary]. Fibrous and globular proteins, Denaturation and renaturation of proteins.

General aspects of amino acid metabolism: Transamination, deamination, decarboxylation and urea cycle.

Unit -II a) Lipids	14
Classification and function of lipids, properties (saponification value, acid value, iodine number, rancidity), Hydrogenation of fats and oils Saturated and unsaturated fatty acids. General structure and biological functions of - phospholipids, sphingolipids, glycolipids, lipoproteins, prostaglandins, cholesterol, ergosterol. Metabolism: Beta oxidation of fatty acids. Brief account on cholesterol.	
b)Nucleic acids	
Structures of purines and pyrimidines, nucleosides, nucleotides in DNA Denovo and salvage pathway of purine and pyrimidine synthesis.	
c)Hormones	
Classification of hormones based on chemical nature and mechanism of action. Chemical structure and functions of the following hormones: Glucagon, Cortisone, Epinephrine, Testosterone and Estradiol.	
Unit -III -a) Vitamins	
Water and fat soluble vitamins, dietary source and biological role of vitamins Deficiency manifestation of vitamin A, B, C, D, E and K	
b) Enzymes	
Introduction, nomenclature and classification, enzyme kinetics-M.M.equation, L.B. plot, factors influencing enzyme activity, metalloenzymes, activation energy and transition state, enzyme activity, specific activity. Coenzymes and their functions (one reaction involving FMN, FAD, NAD). Enzyme inhibition- Irreversible and reversible (competitive, non-competitive and uncompetitive inhibitionwith an example each) Zymogens (trypsinogen, chymotrypsinogen and pepsinogen),	14
Isozymes (LDH, Creatine kinase, Alkaline phosphatase and their clinical significance).	, a minima
Unit -IV - Bioanalytical tools :	14
a) Chromatography :	1
Principle, procedure and applications of - paper chromatography, thin layer chromatography, adsorption chromatography, ion exchange chromatography,	
gel filtration chromatography, affinity chromatography, gas liquid chromatography and high performance liquid chromatography.	
b) Electrophoresis:	
Principle, procedure and applications of electrophoresis (paper electrophoresis, gel electrophoresis -PAGE, SDS- PAGE & agarose electrophoresis) and isoelectric focusing.	
c) Spectroscopy:	
Introduction, principle, procedure and applications UV-Vis spectrophotometry; mass spectroscopy-LC-MS, atomic absorption spectroscopy.	

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs) Acquire knowledge about types of biomolecules, structure, and their functions		Program Outcomes (POs)											
		2	3	4	5	6	7	8	9	10	11	12	13
					√							√	
Will be able to demonstrate the skills to perform bioanalytical techniques			*								✓	√	
Apply comprehensive innovations and skills of biomolecules to biotechnology field	V				√							✓	

Pedagogy: Lectures, Seminars, Industry Visits, Debates, Quiz and Assignments

Summative Assessment = 60 Marks	
Formative Assessment Occasion / type	Weightage in Marks
Attendance	10
Seminar	10
Debates and Quiz	10
Test	10
Total	60 marks + 40 marks = 100 marks

Course Title	Biomolecules		Practical Credits	2
Course No.	BTC:103	DSC-3P	Contact hours	
		Content		<u> </u>

- 1. Introduction to basic instruments (Principle, standard operating procedure) with demonstration. Micropipette, PH meter, colorimeter, UV-transilluminator, centrifuge, labeling reagent bottles, reading and precautions.
- 2. Definitions and calculations:Molarity, Molality, Normality, Mass percent % (w/w), Percent byvolume (% v/v), parts per million (ppm), parts per billion (ppb), Dilution of concentrated solutions. Standard solutions, stock solution, solution of acids.
- 3. Preparation of standard buffers by Hendersen-Hasselbach equation Acetate, phosphate, Tris and determination of pH of solution using pH meter.
- 4. Estimation of maltose by DNS method
- 5. Determination of α -amylase activity by DNS method
- 6. Estimation of proteins by Bradford method.
- 7. Estimation of amino acid by Ninhydrin method
- 8. Extraction of protein from soaked/sprouted green gram by salting out method
- 9. Separation of plant pigments by TLC/Paper chromatography
- 10. Separation of amino acids by circular paper chromatography
- 11. Native PAGE
- 12. Determination of iodine number of lipids

Practical assessment

	Assessment				
Formative ass	essment	Summative Asse	ssment		
Assessment Occasion / type	Weightage in Marks	Practical Exam	Marks	Total Marks	
Record	5	Major expt.	10		
Test	10	Minor expt.	06		
Attendance	5	Spotters	05	50	
Performance	5	viva-voce 04			
Total	25	25			

Re	ferences
1	An Introduction to Practical Biochemistry, 3rd Edition, (2001), David Plummer; Tata McGraw Hill Edu. Pvt. Ltd. New Delhi, India
2	Biochemical Methods,1st Edition, (1995), S.Sadashivam, A.Manickam; New Age International Publishers, India
3	Introductory Practical biochemistry, S. K. Sawhney&Randhir Singh (eds) Narosa Publishing. House, New Delhi, ISBN 81-7319-302-9
4	Experimental Biochemistry: A Student Companion, BeeduSasidharRao& Vijay Despande(ed).I.K International Pvt. LTD, NewDelhi. ISBN 81-88237-41-8
5	Standard Methods of Biochemical Analysis, S. K. Thimmaiah (ed), Kalyani Publishers, Ludhiana ISBN 81-7663-067

Course: 2 Open Elective Theory: OE3,BTC301,- Nutrition and Health

Program Name	BSc Biotechnology	7	Semester	Third Sem
Course Title	Nutrition and Hea	lth		
Course Code		OE-3	No. of Theory Credits	3
Contact hours	Lecture	42	Duration of ESA/Exam	2.30 Hours
Comact nours	Practical			
Formative Assessment Marks		40	Summative Assessment Ma	arks 60

Course Outcomes (COs): At the end of the course the student should be able to: 1. Study the concepts of food, nutrition, diet and health 2. To apply the best practices of food intake and dietary requirements 3. Acquire knowledgeabout various sources of nutrients and good cooking practices Content Hrs Unit—I - Introduction 14 Hrs Concepts of nutrition and health. Definition of Food, Diet and nutrition, Food groups. Food pyramids. Functions of food. Balanced diet. Meal planning. Eat right concept. Functional foods, Prebiotics, Probiotics, and antioxidants Unit—II - Nutrients Macro and Micronutrients - Sources, functions and deficiency. Carbohydrates, Proteins, Fats—Sources and calories. Minerals—Calcium, Iron, Iodine.

Sources and calories. Minerals –Calcium, Iron, Iodine.

Vitamins – Fat soluble vitamins –A, D, E & K. Water soluble vitamins – vitamin C Thiamine, Riboflavin, Niacin. Water–Functions and water balance. Fibre –Functions and sources. Recommended Dietary Allowance, Body Mass Index and Basal Metabolic Rate.

Unit -III — Nutrition and Health

Methods of cooking affecting nutritional value. Advantages and disadvantages. Boiling, steaming, pressure cooking. Oil/Fat — Shallow frying, deep frying. Baking. Nutrition through lifecycle. Nutritional requirement, dietaryguidelines: Adulthood, Pregnancy, Lactation, Infancy-Complementary feeding, Pre-school, Adolescence, geriatric. Nutrition related metabolic

Pedagogy: Lectures, Seminars, Industry Visits, Debates, Quiz and Assignments

disorders- diabetes and cardiovascular disease.

Course Pre-requisite(s):

Summative Assessment = 60 Marks		
Formative Assessment Occasion / type	Weightage in Marks	
Attendance	10	
Seminar	10	
Debates and Quiz	10	
Test	10	
Total	60 marks + 40 marks = 100 marks	

1	Sri Lakshmi B, (2007), Dietetics. New Age International publishers. New Delhi						
2	Sri Lakshmi B, (2002), Nutrition Science. New Age International publishers. New Delhi						
3	Swaminathan M. (2002), Advanced text book on food and Nutrition. Volume I. Bappco						
4	Gopalan.C., RamaSastry B.V., and S.C.Balasubramanian (2009), Nutritive value of Indian Foods.NIN.ICMR.Hyderabad.						
5	Mudambi S R and Rajagopal M V, (2008), Fundamentals of Foods, Nutrition & diet therapy by New Age International Publishers, New Delhi						

14 Hrs

BSc Biotechnology (Basic/Hons.) Semester-3 Title of the course4:DSC1T, BTC104, Molecular Biology

Program Name	BSc Biotechnology		Semester	Fourth Sem	
Course Title	Molecular Biology			<u> </u>	
Course No.	BTC: 104	C: 104 DSC -4T No. of Theory Credits		4	
Contact hours	56 hrs		Duration of ESA/Exam	2.30 Hours	
Formative Assessment Marks 40			Summative Assessment M	arks 60	

Course Pre-requisite (s):

Course Outcomes (COs): At the end of the course the student should be able to:

- 1. Study the advancements in molecular biology with latest trends.
- 2. Will acquire the knowledge of structure, functional relationship of proteins and nucleic acids.
- 3. Aware about the basic cellular processes such as transcription, translation, DNA replication and repair mechanisms.

Content	Hrs
Unit-I - Molecular basis of life and Nucleic Acids	14 Hrs
An introduction to genome and its organization, 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. Unit -II - DNA Replication and Repair	14 Hrs
· •	74 1112
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, Recombination — Homologus and non homologus.	
Unit -III - Transcription and RNA processing	14 Hrs
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, RNA editing.	
Unit –IV - Regulation of gene expression and translation	14 Hrs
Gene regulation in prokaryotes- Operon concept, Lac, Trp operon. Genetic code and its characteristics, Wobble hypothesis Translation- in prokaryotes and eukaryotes- ribosome, enzymes and factors involved in translation. Mechanism of translation- activation of amino acid, aminoacyl tRNA synthesis, Mechanism- initiation, elongation and termination of polypeptide chain. Fidelity of translation, Inhibitors of translation. Protein folding and modifications, Post translational modifications of proteins.	

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)		Program Outcomes (POs)											
		2	3	4	5	6	7	8	9	10	11	12	13
Study the advancements in molecular biology with latest trends	√				1							1	
Will acquire the knowledge of structure, functional relationship of proteins and nucleic acids				and the second s	1	✓						✓	
Aware about the basic cellular processes such as transcription, translation, DNA replication and repair mechanisms	1				✓				~			✓	

Pedagogy: Lectures, Seminars, Industry Visits, Debates, Quiz and Assignments

Summative Assessment = 60 Marks		
Formative Assessment Occasion / type	Weightage in Marks	
Attendance	10	
Seminar	10	
Debates and Quiz	10	
Test	10	
Total	60 marks + 40 marks = 100 marks	

Course Title	Molecular Biology	····	Practical Credits	2
Course No.	BTC: 104	DSC-4P	Contact hours	
		Content		· · · · · · · · · · · · · · · · · · ·

- 1. Preparation of DNA model
- 2. Estimation of DNA by DPA method
- 3. Estimation of RNA by Orcinol method
- 4. Extraction and partial purification of protein from plant source by Ammonium sulphate precipitation.
- 5. Dialysis.
- 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
- 9. Study of Drosophila mutants.

Practical assessment

	Assessment				
Formative asso	essment	Summative Ass			
Assessment Occasion / type	Weightage in Marks	Practical Exam	Marks	Total Marks	
Record	5	Major expt.	10		
Test	10	Minor expt.	06		
Attendance	5	Spotters	05	50	
Performance	5	Viva-voce	04		
Total	25	25			

Re	ferences
1	Glick, B.R and Pasternak J.J (1998) Molecular biotechnology, Principles and application of recombinant DNA, Washington D.C. ASM press
2	Howe. C. (1995) Gene cloning and manipulation, Cambridge University Press, USA
3	Lewin, B., Gene VI New York, Oxford University Press
4	Rigby, P.W.J. (1987) Genetic Engineering Academic Press Inc. Florida, USA
5	Sambrook et al (2000) Molecular cloning Volumes I, II & III, Cold spring Harbor Laboratory Press New York, USA
6	Walker J. M. and Ging old, E.B. (1983) Molecular Biology & Biotechnology (Indian Edition) Royal Society of Chemistry U.K
7	Karp. G (2002) Cell & Molecular Biology, 3rdEdition, John Wiley & Sons; I

Course: 2 Open Elective Theory: OE4,BTC302,- Intellectual Property Rights

Program Name	BSc Biotechno	ology	Semester	Fourth Sem
Course Title	Intellectual Pr	operty Rights		
Course Code		OE-4	No. of Theory Credits	3
Contact hours	Lecture	42 Hrs	Duration of ESA/Exam	2.30 Hours
Contact nours	Practical	-		
Formative Asses	ssment Marks 6	0	Summative Assessment N	Marks 40

Course Pre-requisite(s): Semester I and II of composite Home Science.	
Course Outcomes (COs): At the end of the course the student should be able to:	
1. Knowledge about need and scope of Intellectual property rights	
2. Acquire knowledge about filing patents, process, and infringement	
3. Knowledge about trademarks, industrial designs, and copyright	
Content	Hrs
Unit-I - Introduction to Intellectual property rights (IPR):	14 Hrs
Genesis and scope. Types of Intellectual property rights - Patent, Trademarks, Copyright, Design, Trade secret, Geographical indicators, Plant variety protection. National and International agencies - WIPO, World Trade Organization (WTO), Trade-Related Aspects of Intellectual Property Rights (TRIPS), General Agreement on Tariffs and Trade (GATT).	
Unit -II - Patenting, process, and infringement	14 Hrs
Basics of patents - Types of patents; Patentable and Non-Patentable inventions, Process and	
Product patent. Indian Patent Act 1970; Recent amendments; Patent Cooperation Treaty (PCT)	
and implications. Process of patenting. Types of patent applications: Provisional and complete	
specifications; Concept of "prior art", patent databases (USPTO, EPO, India). Financial	
assistance, schemes, and grants for patenting. Patent infringement- Case studies on patents	
(Basmati rice, Turmeric, Neem)	
Unit -III - Trademarks, Copy right, industrial Designs	14 Hrs
Trademarks- types, Purpose and function of trademarks, trademark registration, Protection of trademark. Copy right- Fundamentals of copyright law, Originality of material, rights of reproduction, industrial Designs: Protection, Kind of protection provided by industrial design.	

Pedagogy

Summative assessment = 60 marks theory paper,				
Formative Assessment Occasion / type		Weightage in Marks		
Assignment		10		
Seminar		10		
Case studies		10		
Test		10		
Total		60 Mraks + 40 marks = 100 Marks		
Re	eferences			
1	Manish Arora. 2007. Universal's Guide to Patents Law (English) 4th Edition) -Publisher: Universal Law Publishing House			
2	Kalyan C. Kankanala. 2012. Fundamentals of Intellectual Property. Asia Law House			
3	Ganguli, P. 2001. Intellectual Property Rights: Unleashing the knowledge economy. New Delhi: Tata McGraw-Hill Pub			
4	World trade organization - http://www.wto.org			
5	World Intellectual Property organization — www.wipo.int Office of the controller general of Patents, Design & Trademarks - www.ipindia.nic.in			

Department of Studies in Biotechnology Shivagangothri, Davangere-577 007.

Prof. Gopinath S. M. Chairman -BoS

Mob: 8660793877

No: DU: BT: 2022-23

Date: 24-08-2022

<u>Proceedings of Board of Studies (BoS) meeting of U.G. Biotechnology Board</u> <u>Davangere University (2021-22)</u>

Board of Studies (BoS) meeting of U.G. Biotechnology board of Davangere University was held in the Department of Studies in Biotechnology, Davangere University, Shivagangothri, on 24-08-2022 (Wednesday) at 11.30 AM.

MEMBERS PRESENT:

1. Prof. Gopinath S M

Professor,

Department of Studies in Biotechnology,

Davangere University,

Davangere

2. Dr. Seema J Patel

Associate Professor.

Department of Studies in Biotechnology,

Davangere University,

Davangere

3. Dr. Navya H M

Assistant Professor.

Department of Studies in Biotechnology,

Davangere University,

Davangere

4. Dr. B T Prabakar.

Assistant Professor

Department of Biotechnology

Sahyadri Science College

Shimoga

5. Mr. Sardar Hussain

Department of Biotechnology

Govt Science College

Chitradurga

Prof. Gopinath S.M. Chairman, BoS welcomed the board members to the meeting. The chairman of the board briefed the agenda to the members and invited for discussion. The board has thoroughly discussed about each Topics in the curriculum. Proceedings have been recorded and provided hereunder.

• U.G. Biotechnology syllabus preparation (NEP) 2022-23. 3rd & 4th Semester.

Few changes were made from that of the model curriculum prepared by the subject wise expert committee.

- Contents of course (Page No. 4) Number of credits for DSC3, DSC4 changed to 4
- DSC 3T Biomolecules unit I Addition a) Introduction to Biomolecules; water, acids, bases, pH, buffer
 - b) Oligosaccharides changed to disaccharides. Polysaccharides "reaction" changed to function
 - c) Amino acids and proteins "Peptides- Vasopressin, oxytocin"

Unit II - a) Lipids - "Biosynthesis" is changed to brief account of cholesterol

- b) Nucleic acids (shifted from III unit)
- c) Hormones (shifted from III unit)

Unit III - a) Enzymes (shifted from II unit), enzyme kinetics - added MM equation, LB plots Unit IV - c) Spectroscopy - Introduction and LC MS added

- Page No. 7 Practical exam scheme included
- Page No. 8 Lecture hrs, exam duration, Formative and summative assessment marks added.
- DSC 4T Unit I Genome and its organization added

Unit II - Recombination - homologous, non homologous added

Unit III - RNA editing added

Unit IV- Gene regulation in Prokaryotes – Operon concept, Lac operon, Trp operon added

- DSC 4P Experiment No. 4 replaced with Dialysis. Study of Drosophila mutants experiment added as experiment No.9
- Page No.10 Practical exam scheme included
- Page No. 12 Contact hrs, Formative and summative assessment marks added

The Chairman thanked all the members for their active participation and kind cooperation.

Chairman and members in the board of Studies		Signature
Prof. Gopinath S M	Chairman	Juning
Dr. Seema J Patel	Internal Member	Coro
Dr. Navya H M	Internal Member	24/8/22
Dr. B T Prabhakar	External Member	S 24/8/2
Mr. Sardar Hussain	External Member	Derving ,

13/10/22

Registrar
Davangere University
Shivagangotri, Davangere

(Prof. Constituti S M) ಅಧ್ಯಯನೆ ಮಂಡಳ ಜೈವಿಕ ತಂತ್ರಜ್ಞಾನ ಅಧ್ಯಯನ ವಿಭಾಗ ದಾವಣಗೆರೆ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ ಶಿವಗಂಗೋತ್ರಿ, ದಾವಣಗೆರೆ-577007

QUESTION PAPER PATTERN Semester B.Sc. Degree Examination,

(CBCS Scheme-NEP Syllabus)

BIOTECHNOLOGY

Paper	
Paper Code	
Time: 2 Hours	Max. Marks; 60
Note: All parts are compulsory	
SECTION-A	
1. Answer any Five of the following	(2x5=10)
a) b) c) d) e)	
f)	
g) h)	
SECTION-B	
Write short notes on any Five of the following	(4x5=20)
 2. 3. 4. 5. 6. 7. 8. 	
9 PART-C	
Answer any Three of the following 10. 11. 12. 13.	(10x3=30)