SEMESTER 1

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNAJB





DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: B.Sc. (Hons) Biotechnology

NAME OF COURSE: Biochemistry (BHB1)

NAME OF FACULTY: Parneet Kaur

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Describe the chemistry of carbohydrates, lipids, proteins	Exams, Oral Exams, Quizzes, Home
	and amino acids.	Assignments
CO-2	Define the structure and function of nucleotides and	Exams, Oral Exams, Quizzes, Home
	nucleosides.	Assignments
CO-3	Explain the structure, function and the mechanism of	Exams, Oral Exams, Quizzes, Home
	action of enzymes.	Assignments.
CO-4	Enlist various classes of enymes.	Exams, Oral Exams, Quizzes, Home
		Assignments
CO-5	Express the concept of Metabolism	Exams, Oral Exams, Quizzes, Home
	✓ Y	Assignments
CO-6	Describe the catabolic and anabolic reactions related to	Exams, Oral Exams, Quizzes, Home
	carbohydrates and Lipids.	Assignments



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: **B.Sc. (Hons) Biotechnology**

NAME OF COURSE: Biochemistry Practicals pertaining to BHB101

NAME OF FACULTY: Parneet Kaur

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Analyze the activity of an Enzyme under optimum conditions.	Virtual lab
CO-2	Caliberate the effect of pH and Temperature on activity of salivary amylase enzyme.	Virtual lab
CO-3	Calculate the blood glucose by glucose oxidase method.	Vitual lab
CO-4	Analyze the quantitative estimation of proteins in unknown sample.	Virtual lab
CO-5	Identify the amino acids by paper chromatography.	Virtual lab
CO-6	Preparation of Buffers.	Virtual lab



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: **B.Sc. (Hons) Biotechnology**

NAME OF COURSE: **Biostatistics (BHB4)**

NAME OF FACULTY: Love Singla

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Apply basic statistical concepts commonly used in	Exams, Oral Exams, Quizzes, Home
	health and medical sciences	Assignments
CO-2	Use basic analytical techniques to generate results	Exams, Oral Exams, Quizzes, Home
		Assignments
CO-3	Interpret results of commonly used statistical analyses in	Exams, Oral Exams, Quizzes, Home
	written summaries	Assignments
CO-4	Demonstrate statistical reasoning skills correctly and	Exams, Oral Exams, Quizzes, Home
	contextually	Assignments
CO-5	Compute statistical problems using computer graphical	Exams, Oral Exams, Quizzes, Home
	means	Assignments, Virtual Labs
CO-6	Analyse data characteristics and form of distribution of	Exams, Oral Exams, Quizzes, Home
	data structure	Assignments



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: **B. Sc. (HONS) Biotechnology**

NAME OF COURSE: PRACTICALS PERTAINING TO (BHB4)

NAME OF FACULTY: Love Singla

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Practice question based on graphical representation	Group discussion, Class Assignment
CO-2	Enumerate the problems based on measures of central tendency & dispersion	Group discussion, Class Assignment
CO-3	Calculate the situations based on binomial distributions normal distributions	Group discussion, Class Assignment
CO-4	Solve problems based on t, f, z and Chi-square	Group discussion, Class Assignment
CO-5	Demonstrate poisson distributions with the help of examples	Group discussion, Class Assignment
CO-6	Calculate the problems based on measures of kurtosis.	Group discussion, Class Assignment



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc. Biotechnology Hons.

NAME OF COURSE: Cell Biology

NAME OF FACULTY: Mrs. Jaspreet Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Explain the structure and its function.	Exams, Class tests, class assignment, presentations and Seminars.
CO-2	Define cell membrane components.	Exams, Class tests, class assignment, Presentations and Seminars.
CO-3	Explain structure and function of cytoskeleton.	Exams, Class tests, class assignment, presentations and Seminars.
CO-4	Demonstrate the structure various organelles and their function.	Lab work, Computer simulations
CO-5	Describe extracellular matrix ,composition, receptor for	Viva, quiz, class assignments
	membrane their functions and expression	
CO-6	Analyze characteristics and molecular basis of cancer	Group discussions, class assignments



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B. Sc (Hons.)Biotechnology

NAME OF COURSE: Practical Pertaining to theory C2-BHB2

NAME OF FACULTY: Mrs. Jaspreet Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Analyse the effect of temperature and organic solvents on semipermeable membrane.	Lab work
CO-2	Demonstrate the structure of prokaryotic, eukaryotic cell and dialysis.	Lab work
CO-3	Operate microtomy to fix animal tissue by staining.	Lab work
CO-4	Evaluate cell division in onion root tip/insect gonads.	Lab work
CO-5	Prepare nuclear, mitochondrial slides.	Lab work
CO-6	Determine cell fractionation and enzyme activity in various	Lab work
	organelles.	



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE PROGRAM

: B.Sc (BT) 1st (1st SEM)

NAME OF THE COURSE

: (English Communication Skills I)

NAME OF FACULTY

: Lovepreet Singh (ASST. PROF.)

CO No.	Description of Course Outcomes	Method/s of Assessment
CO 1	Compare and contrast different genres of	MST, Class tests, Class Assignment.
	short stories.	
CO 2	Explain major themes of short stories that will	MST, Class Assignment, Class tests.
	make students capable to raise significant	
	question, to enhance their creative	
	expressions and reach well-reasoned	
	conclusion.	
CO 3	Designing letters for formal communication.	MST, Class assignments, Class tests,
CO 4	Apply the LSRW skills.	MST, PPTs.
CO 5	Practise English grammar to aware the	MST, Participation in class, Class
	students about the correct usage of it.	assignments, Class tests.
CO 6	Develop the fluency of language, and	MST, Participation in class, Class
	presentation skills.	assignments, Class tests.

SEMESTER-2

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNAJB



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: Bsc Biotechnology Hons. Ist sem

NAME OF COURSE: Plant anatomy and physiology

NAME OF FACULTY: Mrs. Jaspreet Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Demonstration of basic plant chemistry and physiology	Exams, Class tests, class assignment,.
CO-2	Explain photosynthesis, cellular respiration.	Exams, Class tests, class assignment, Seminars.
CO-3	Discuss plant water relationship, mechanism of stomatal opening and closing	Exams, Class tests, class assignment, presentations.
CO-4	Differentiate different phases of growth curve, growth hormones, concept of photoperiodisim, vernalisation.	Exams, Class tests, class assignment
CO-5	Describe micro and macro nutrient, mechanism of uptake	Viva, quiz, class assignments
СО-6	Illustrate histological organization of root and shoot	Group discussions, class assignments
		Exams, Class tests



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc (Hons.)Biotechnology

NAME OF COURSE: Practical Pertaining to theory C2-BHB7

NAME OF FACULTY: Mrs.Jaspreet Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Prepare stained mount of anatomy of monocot and dicot ,stem and leaf	Lab work
CO-2	Demonstation of opening and closing of stomata ,aerobic respiration.	Viva, quiz
CO-3	Practise separation of photosynthetic pigments by paper chromatography.	Lab work
CO-4	Analyse the preparation of root nodule from a leguminous plant	Lab work
CO-5	Experiment Guttation on leaf tips of grass and garden nasturtium.	Lab work
со-6 🔨	Perform plasmolysis of Tradescantia leaf.	Lab work



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE PROGRAM

: B.Sc(BT)Hons. Ist (2nd SEM)

NAME OF THE COURSE

: (English II)

NAME OF FACULTY

: Mandeep Kaur (ASST. PROF.)

СО	Description of Course Outcomes	Method/s of Assessment
No.		
CO 1	Develop critical and creative thinking	MST, Class tests, Class Assignment.
	skills by examine texts.	
CO 2	Develop the ability to respond to a variety	MST, Seminar, Class Assignment,
	of situation and contexts by shifting voice,	Class tests.
	tone, level formality, design, medium and	
	structure.	
CO 3	Demonstrate an appreciation of the	MST, Class assignments, class tests,
	literature through discussion and written	
	analysis.	
CO 4		MST, Seminar, GD, Role play
	Apply the LSRW skills.	examples.
CO 5	Practise English grammar to aware the	MST, Participation in class, Class
	students about the correct usage of it.	assignments, Class tests.
CO 6	Develop the fluency of language,	MST, Participation in class, Class
	presentation skills and creative writing.	assignments, Class tests.



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc (hons.) Biotechnology BHB9

NAME OF COURSE: Microbial physiology

NAME OF FACULTY: Parneet kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Classify diversity in microorganism based on their physical	Exams, Class tests, class assignment,
	and chemical requirements for growth	and Seminars.
CO-2	Demonstrate a cell function in the environment,	Exams, Class tests, class assignment,
	reproduction of microorganisms from simple substrates	Presentations and Seminars.
	available in the environment.	
CO-3	Define the interrelation of microbiology , biochemistry and	Exams, Class tests, class assignment,
	genetics in the context of a functioning bacterial cell.	presentations and Seminars.
CO-4	Discuss the Cell structure , growth factors, metabolism and	Exams, Class tests, class assignment,
	genetic composition of microorganisms.	group discussion.
CO-5	Describe chemolithotrophic metabolism.	Group discussions, class assignments
CO-6	Classify the diversity of Phototrophic bacteria and Explain	Group discussions, group assignments .
	the carbon dioxide fixation, calvin cycle and reductive TCA	
	cycle.	



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc (Hons.) Biotechnology

NAME OF COURSE: Practical Pertaining to theory BHB9

NAME OF FACULTY: Parneet Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Explain the growth curve of E.coli using turbidometric	Lab work
	method.	
CO-2	Illustrate the growth curve of <u>Aspergillus niger</u> by radial	Lab work
	growth measurements.	
CO-3	Identify the effect of pH on the growth of E.Coli.	Lab work
CO-4	Analyze the effect of temperature on growth of Aspergillus	Lab work
	niger by dry weight method.	
CO-5	Demonstrate the thermal death time and decimal reduction	Lab work
	time of E.coli.	
CO-6	Communicate Microbial Physiology related concepts and	Viva, quiz, class assignments
	experimental results through effective written and oral	
	communication.	



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: B. Sc. (HONS) Biotechnology

NAME OF COURSE: Genetics (BHB12)

NAME OF FACULTY: Love Singla

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Describe advanced techniques in genome analysis,	Exams, Oral Exams, Quizzes, Home
	molecular phylogenetics.	Assignments
CO-2	Analyse strategies of gene transfers, mutation, selection and	Exams, Oral Exams, Quizzes, Home
	migration, the chromosome structure, chromatin	Assignments, Class Assignments
	organization and variation.	
CO-3	Explore the applications of genetic engineering in plants and	Exams, Oral Exams, Quizzes, Home
	animals.	Assignments, Virtual Labs, Authentic
		Problem solving
CO-4	Develop the understanding for management of inherited	Exams, Oral Exams, Quizzes, Home
	human diseases, genome evolution, population variation	Assignments, Authentic Problem
	and speciation.	solving
CO-5	Insight into the applications of bioinformatics, statistical	Exams, Oral Exams, Quizzes, Home
	analysis in genetics.	Assignments,
CO-6	Comprehensive and detailed understanding of inbreeding	Exams, Oral Exams, Quizzes, Home
Y	and its effect on small/isolated population the principles of	Assignments, Virtual Labs, Authentic
	selection and breeding methods in plants and animals.	Problem solving



1

NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: B. Sc. (HONS) Biotechnology

NAME OF COURSE: PRACTICALS PERTAINING TO (BHB12)

NAME OF FACULTY: Love Singla

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Illustrate permanent and temporary mount of mitosis.	Group discussion, Virtual Classes,
		Class Assignment
CO-2	Explain permanent and temporary mount of meiosis.	Group discussion, Class
		Assignment, Virtual Classes
CO-3	Describe mendelian deviations in di-hybrid crosses	Group discussion, Class
		Assignment, Virtual Classes
CO-4	Demonstrate Barr Body.	Group discussion, Class
		Assignment, Virtual Classes
CO-5	Devise karyotyping with the help of photographs	Group discussion, Class
	$\sim \mathbf{Y}$	Assignment, Virtual Classes
CO-6	Distinguish Pedigree charts of some common characters	Group discussion, Class
	like blood group, color blindness.	Assignment, Virtual Classes



NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: BSc (Hons).Biotechnology

NAME OF COURSE: General Microbiology (BHB-13)

NAME OF FACULTY: Parminder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Identify the various classification of microorganism.	Exams, Class tests, presentations
		and Seminars.
CO-2	Define morphology & cell structure of major groups of	Exams, Class tests, class assignment,
	microorganisms.	Presentations and Seminars.
CO-3	List the various methods of cultivation and maintenance of	Exams, Class tests, class assignment,
	microorganisms.	presentations and Seminars.
CO-4	Draw & demonstrate growth curve, generation time,	Exams, Class tests, class assignment,
	synchronous batch & continuous culture.	presentations and Seminars.
CO-5	Determine the various methods based to control growth of	Viva, quiz, class assignments
	microorganisms And define water microbiology, Food	
	microbiology	
CO-6	Work collaboratively with members of a team in classroom and	Group discussions, Group projects
	laboratory activities.	and group assignments.





NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc (Hons.)Biotechnology

NAME OF COURSE: Practical Pertaining to theory -BHB13

NAME OF FACULTY: Parminder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Perform the experiments to isolation of bacteria.	Lab work
CO-2	Practice the different methods of staining.	Lab work
CO-3	Apply the various sterilization methods and prepare different types of media.	Lab work
CO-4	Estimate the amount of different bacterial cells.	Lab work
CO-5	Communicate microbiology related concepts and experimental results through effective written and oral communication.	Viva, quiz, class assignments
CO-6	Work collaboratively with members of a team in classroom and /or laboratory activities.	Group discussions, Group assignments.



NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc. Biotechnology (Hons.)

NAME OF COURSE: Spectroscopic Techniques (BHB 14)

NAME OF FACULTY: Parneet Kaur, Jaspreet Kaur, Parminder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Define absorption and emission spectroscopy, wave properties of light , quantum theory of light ,types of	Exams, Class tests, class assignment, group discussion.
	molecular motion .	
CO-2	Explain Rotational spectroscopy (rotational spectra, classical	Exams, Class tests.
	description of molecular rotation)	
CO-3	Describe centrifugal distortion, stark effect and rotational	Exams, Class tests.
	spectra of polyatomic molecules.	
CO-4	Enlist molecular vibration, harmonic oscillator, vibrational	Exams, Class tests.
	rules, principles of vibrational spectroscopy	
CO-5	Discuss isotopic effect, characteristics group vibrational	Exams, Class tests, discussion.
	energies, hydrogen bonds.	
CO-6	Discuss IR, Raman scattering, stokes & anti-stokes	Exams, Class tests, discussions.
	scattering, Raman spectra (rotational, vibrational Spectra,	
	diatomic, polyatomic molecules)	



NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc. Biotechnology (Hons.)

NAME OF COURSE: Practical Pertaining to theory BHB 14

NAME OF FACULTY: Parneet Kaur, Jaspreet Kaur, Parminder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Analyse purification of an enzyme from any natural	Lab work
	resources.	
CO-2	Explain the estimation of proteins by Lowry's method.	Lab work
CO-3	Estimate the proteins by Bradford method.	Lab work
CO-4	Perform assay for the purified enzymes.	Lab work
CO-5	Calculate the kinetics parameters.	Lab work
CO-6	Communicate Spectroscopic Techniques related concepts	Viva, quiz, class assignments
	and experimental results through effective written and oral	
	communication.	



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B. Sc (Hons.)Biotechnology Sem-III

NAME OF COURSE: Enzymology- BHB15

NAME OF FACULTY: Dr Parvinder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Describe structure, functions and the mechanisms of	Exams, Class tests, class
	action of enzymes.	assignment, presentations and
		Seminars.
CO-2	Analyze the kinetics of enzyme catalyzed reactions &	Exams, Class tests, class
	enzyme inhibitory and regulatory processes.	assignment,
		Presentations and Seminars.
CO-3	Identify and apply wide applications of soluble and	Exams, Class tests, class
	immobilized enzymes.	assignment, presentations and
		Seminars.
CO-4	Design, execute, record and analyze the results of	Lab work, Computer simulations
	enzymes related experiments using classical techniques,	
	modern instruments and computer softwares.	
CO-5	Communicate enzymology related concepts and	Viva, quiz, class assignments
	experimental results through effective written and oral	
	communication.	
CO-6	Work collaboratively with members of a team in	Group discussions, Group projects
	classroom and /or laboratory activities.	and group assignments.



4

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc (Hons.)Biotechnology Sem-III

NAME OF COURSE: Practical Pertaining to theory SECI-BHB15

NAME OF FACULTY: Dr Parvinder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Perform the experiments to purify enzymes from natural resources.	Lab work
CO-2	Estimate the quantity of proteins by Bradford/Lowry method.	Lab work
CO-3	Practise and perform assay for purified enzymes.	Lab work
CO-4	Calculate kinetic parameters such as Km, Vmax, Kcat	Lab work
CO-5	Communicate enzymology related concepts and experimental results through effective written and oral communication.	Viva, quiz, class assignments
CO-6	Work collaboratively with members of a team in classroom and /or laboratory activities.	Group discussions, Group projects and group assignments.



4

NAME OF THE DEAPRTMENT: Biotechnology and Food technology

NAME OF THE PROGRAMME: B.Sc. (HONS.) Biotechnology

NAME OF COURSE: Environmental Biotechnology (GE4-BHB16)

NAME OF FACULTY: A.P. Navjot Bharti

C.O.	Description of Course Outcome	Method/s of Assessment
NO. CO-1	Explain conventional and modern fuels and their environmental impact and the basic physiology of a microorganism and how their structure dictates their function in the environment.	Seminars, Presentation, class assignment, Exams
CO-2	Describe the principles of bioremediation, phytoremediation, bioleaching and waste water treatment.	MST, University exams, discussion, class test
CO-3	Apply various techniques to modify and augment microorganisms in the laboratory and environment.	Ppt., Assignment, presentation, Oral test
CO-4	Describe treatment of municipal waste and Industrial effluents, bio-fertilizers, Role of symbiotic and asymbiotic nitrogen fixing bacteria in the enrichment of soil. Algal and fungal bio-fertilizers (VAM)	Home assignment, presentation ,written test, MST, University exams
CO-5	Extend the bases for microbial metabolism of environmental contaminants	Discussion ,oral test
CO-6	Explain enrichment of ores by microorganisms (Gold, Copper and Uranium). Environmental significance of genetically modified microbes, plants and animals.	Oral presentation, home assignment,



NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: B. Sc. (HONS) Biotechnology

NAME OF COURSE: Molecular Biology (BHB17)

NAME OF FACULTY: Love Singla

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Demonstrate knowledge and understanding of the	Exams, Oral Exams, Quizzes, Home
	molecular machinery of living cells.	Assignments
CO-2	Analyze, interpret, and participate in reporting to their	Exams, Oral Exams, Quizzes, Home
	peers on the results of their laboratory experiments	Assignments, Class Assignments
CO-3	Devise to implement experimental protocols and adapt	Exams, Oral Exams, Quizzes, Home
	them to plan and carry out simple investigations.	Assignments, Virtual Labs, Authentic
		Problem solving
CO-4	Develop the understanding of the principles and basic	Exams, Oral Exams, Quizzes, Home
	mechanisms of metabolic control and molecular	Assignments, Authentic Problem
	signaling	solving
CO-5	Insight the participation in report orally on team work	Exams, Oral Exams, Quizzes, Home
	investigations of problem-based assignments	Assignments
CO-6	Comprehensive knowledge and understanding of the	Exams, Oral Exams, Quizzes, Home
	principles that govern the structures of macromolecules	Assignments, Virtual Labs, Authentic
	and their participation in molecular recognition.	Problem solving





NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: B. Sc. (HONS) Biotechnology

NAME OF COURSE: PRACTICALS PERTAINING TO (BHB17)

NAME OF FACULTY: Love Singla

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Illustrate the method of agarose gel electrophoresis of	Group discussion, Virtual Classes,
	plasmid DNA	Lab work, seminar
CO-2	Explain preparation of solutions for molecular biology	Group discussion, Virtual Classes,
	experiments.	Lab work, seminar
CO-3	Describe isolation of chromosomal DNA from bacterial	Group discussion, Virtual Classes,
	cells.	Lab work, seminar
CO-4	Demonstrate agarose gel electrophoresis of plasmid DNA	Group discussion, Virtual Classes,
		Lab work, seminar
CO-5	Devise method for isolation of Plasmid DNA by alkaline	Group discussion, Virtual Classes,
	lysis method	Lab work, seminar
CO-6	Distinguish various methods of DNA isolation from	Group discussion, Virtual Classes,
	different samples.	Lab work, seminar



1

NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: B.Sc. (HONS.) Biotechnology

NAME OF COURSE: Immunology (C9-BHB18)

NAME OF FACULTY: A.P. Navjot Bharti

C.O.	Description of Course Outcome	Method/s of Assessment
No.	(
CO-1	Explain the cellular and molecular basis of immune responsiveness.	University exam, Group discussion, Class test, Presentation
CO-2	Describe the roles of the immune system in both maintaining health and contributing to disease.	Class assignment, class test, ppt.
CO-3	Outline immunological response and how it is triggered and regulated.	Ppt., Assignment, Group discussion
CO-4	Define immunization and vaccines (active-passive) (traditional-modern vaccines), cytokines, MHC complex	Class test, MST, University exam
CO-5	Demonstrate a capacity for problem-solving about immune responsiveness.	Lab work, viva, assignment
CO-6	Transfer knowledge of immunology into clinical decision making through case studies presented in class	Presentation, Seminar, Discussion



1

NAME OF THE DEAPRTMENT: Biotechnology and Food technology

NAME OF THE PROGRAMME: B.Sc. (HONS.) Biotechnology

NAME OF COURSE: Practical Pertaining to theory C9- BHB18

NAME OF FACULTY: A.P. Navjot Bharti

C.O.	Description of Course Outcome	Method/s of Assessment
No.	(
CO-1	Differentiate leucocytes count	Lab work, viva
CO-2	Count total leucocytes and RBC	Lab work ,viva
CO-3	Demonstrate double immunodiffusion test using specific antibody and antigen.	Demonstration ,viva
CO-4	Describe Hemagglutination assay and Hemagglutination inhibition assay	Discussion, viva
CO-5	Separate serum from blood	Lab work ,viva
CO-6	Demonstrate ELISA.	Demonstration , viva



NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc (hons.) Biotechnology

NAME OF COURSE: Spectroscopic techniques BHB19

NAME OF FACULTY: Parneet kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Describe the concept of light interaction with matter and	Exams, Class tests, class assignment,
	analyze quantitative chemical sample by using this	and Seminars.
	technique.	
CO-2	Define the common tools used in spectroscopy.	Exams, Class tests, class assignment,
		Presentations and Seminars.
CO-3	Classify the different types of spectroscopy techniques .	Exams, Class tests, class assignment,
		presentations and Seminars.
CO-4	Demonstrate the basic concept of instrumentation, data	Exams, Class tests, class assignment,
	acquisition and data processing.	group discussion.
CO-5	Enlist the photoelectric effect and different types of	Group discussions, class assignments,
	spectroscopy related to this concept such as UPES, XPES and	Exams.
	ESCA.	
CO-6	Describe the magnetic field spectra (NMR)	Exams, group assignments .



NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc (Hons.) Biotechnology

NAME OF COURSE: Practical Pertaining to theory BHB19

NAME OF FACULTY: Parneet Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Analyze the chemical compounds by NMR spectroscopy.	Lab work
CO-2	Identify chemical compounds using emission spectroscopy	Lab work
CO-3	Classify 5 different chemical compounds by absorption spectroscopy.	Lab work
CO-4	Demonstrarte working principle of Electron spectroscopy	Viva, quiz, class assignments
CO-5	Enlist different tools required in photoelectron spectroscopy.	Viva, quiz.
CO-6	Communicate spectroscopy related concepts and experimental results through effective written and oral communication.	Viva, quiz, class assignments



NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc. Biotechnology (Hons.)

NAME OF COURSE: Industrial Fermentations (BHB 20)

NAME OF FACULTY: Parminder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Evaluate the production of industrial chemicals, biochemical & chemotherapeutic. Propionic acid, butyric acid, gluconic acids, itaconic acid ; Biofuels(Biogas, Ethanol, Butanol, Hydrogen, Biodiesel)	Exams, Class tests, class assignment, group discussion, Seminars.
CO-2	Define Microbial production pharmacological interest, steroids fermentations transformation, Secondary metabolism.	Exams, Class tests, class assignment, Presentations and Seminars.
CO-3	Explain Enzyme & Cell immobilization techniques in industrial processing, enzyme in organic synthesis, proteolytic enzymes, hydrolytic enzymes, glucose isomerises, enzyme in food.	Exams, Class tests, class assignment, presentations and Seminars.
CO-4	Demonstrate Purification & Characterization of proteins, upstream and downstream processing, solid and liquid handling.	Exams, Class tests, class assignment, group discussion.
CO-5	Discuss the distribution of microbial cells, centrifugation filtration of fermentation broth, ultra centrifugation, liquid extraction, ionic exchange recovery of biological products .Design model of fermentation system.	Exams, Class tests, class assignment, group discussion.
CO-6	Calculate Rate equation for enzyme kinetics, simple and complex reaction, Inhibition kinetics. Evaluate mathematical derivation of growth kinetics and metabolic engineering of antibiotic biosynthetic pathway.	Exams, Class tests, class assignment Group discussions, group assignments.



NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc. Biotechnology (Hons.)

NAME OF COURSE: Practical Pertaining to theory BHB 20

NAME OF FACULTY: Parminder Kaur

1		
C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Comparative analysis of design of a batch and continuous	Lab work
	batch fermenter.	
CO-2	Calculate of mathematical derivation of growth kinetics.	Lab work
CO-3	Demonstrate solvent extraction of metabolite from bacterial	Lab work
	culture.	
CO-4	Analysis of metabolite from bacterial culture.	Lab work
CO-5	Perform an enzyme assay and its hydrolytic activity	Lab work
CO-6	Communicate industrial fermentation related concepts and	Viva, quiz, class assignments
	experimental results through effective written and oral communication.	



NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc. Biotechnology (Hons.)

NAME OF COURSE: Environmental & Road Safety Awareness (BHB 22)

NAME OF FACULTY:

CO No.	Description of program outcomes	Methods of Assessment
CO 1	Apply systems concepts and methodologies to	Class tests, Assignment
	analyze and understand interactions between social	
	and environmental processes.	
CO 2	Master core concepts and methods from ecological	Group discussion, Brain storming sessions,
	and physical sciences and their application in	
	environmental problem solving.	
CO 3	Reflect critically about their roles and identities as	Group discussion, assignment
	citizens, consumers and environmental actors in a	
	complex, interconnected world.	
CO 4	Discuss the ethical, cross-cultural and historical	class tests, Assignment, Seminar
	context of environmental issues and the links	
	between human and natural systems.	
CO 5	Describe the fundamental theory of nature at small	Group discussion, assignment, Class tests
	scale & levels of storm & subatomic particles.	
CO 6	Describe safe ways to carry out leisure activities that	Seminar, Assignment, rapid fire questions
	take place on roadways.	



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT: Physical Sciences

NAME OF THE PROGRAMME: B.Sc.-III (N.M.) Sem -V

NAME OF COURSE: Inorganic Chemistry

NAME OF FACULTY: Dr.Satwant Kaur Shahi

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Discuss the concept of crystal field theory and crystal field splitting in tetrahedral and octahedral complexes. Illustrate the various factors affecting crystal field splitting.	Class test, quiz, Seminar
CO2	Gain the knowledge about the thermodynamic and kinetic stability of metal complexes and factors affecting the stability of complexes.	oral test, notes, Assignment
CO3	Elaborate the different substitution reactions of square planar complexes with examples.	PPT, Assignment
CO4	Discuss magnetic properties of different substances, methods of determining magnetic susceptibility and applications of magnetic moment data for 3d-metal complexes.	Assignment, seminar, Class test
CO5	Evaluate spin only magnetic moment for transition metal complexes.	Problem solving
CO6	Discuss types of electronic transitions, selection rules for d-d transitions and various applications of magnetic moment data for 3d-metal complexes.	Group discussion, viva, assignment



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT: Physical Sciences

NAME OF THE PROGRAMME: B.Sc.-III (N.M.) Sem-V

NAME OF COURS: Organic Chemistry

NAME OF FACULTY: A.P.Ramanjeet Kaur

	Description of Course Outcome	Mothod/s of Assassment
C.O. No.		Wethou's of Assessment
CO1	Knowledge about Nuclear magnetic resonance (NMR) spectroscopy.	Notes, Class test
CO 2	Understand the concept of Electromagnetic spectrum: Absorption Spectra	РРТ
CO 3	Learn about the Infrared (IR) absorption spectroscopy	Notes and black board test
CO4	Evaluate the problem related to NMR,UV, IR.	problem solving, Assignment-1, Viva
CO 5	Describe the nomenclature, preparation, physical and chemical properties of Organometallic Compounds.	Group discussion, class test
CO6	Explain the nomenclature, preparation, physical and chemical properties of Organosulphur Compounds.	Assignment-2, Viva



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT: Physical Sciences

NAME OF THE PROGRAMME: B.Sc.-III (N.M.) Sem-V

NAME OF COURSE: Physical Chemistry

NAME OF FACULTY: A.P.Himani Saini

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO1	Discuss the basic concepts of quantum mechanics (black	Assignment, quiz
	Law).	
CO 2	Derive Schrodinger wave equation for H atom and	Exam, oral test
	particle in 1 dimensional box. Also obtain expression for	
	various physical quantities.	
CO 3	Illustrate the importance of wave function and quantum	Class test, notes
	numbers. Explain the various characteristics of wave	
	function.	
CO4	Explain the rotational spectra of diatomic molecules and	Group discussion ,
	the effect of isotope on the rotational spectrum.	assignment
CO 5	Discuss infrared spectrum , energy levels of harmonic	seminar, class test
	oscillator and the concept of vibration frequencies of	
	different functional groups	
CO6	Describe the Rotational-Vibrational spectra of molecules	Viva, exam
	and the selection rules for the spectra.	



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: BSc Biotechnology

NAME OF COURSE: Environment Technology Sem-5th

NAME OF FACULTY: Manpreet Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Describe different types of pollutions such as water,air,	Exams, Class tests, class
	soil and their effects on environment	assignment, presentations
CO-2	Comprehend the waste water treatment both aerobically	Exams, Class tests, class
	and an aerobically	assignment,
		Presentations and Seminars.
CO-3	Description of vermicomposting method and	Class tests, Class assignment,
	bioremediation role in environment pollution	presentations and Seminars.
CO-4	Explanation of different monitoring method for	Exams, Class tests, class
	pollution checking.	assignment,
		Presentations and Seminars.
CO-5	Communicate environmental concepts and experimental	Viva, quiz, class assignments
	results of various techniques through effective written	
	and oral communication	
CO-6	Work collaboratively with members of a team in	Group discussions, Group projects
	classroom and /or laboratory activities.	and group assignments.



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc Biotechnology 3rd year

NAME OF COURSE: Immunology

NAME OF FACULTY: Mrs.Jaspreet Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Enumerate basic concepts and history of immunology	Exams, Class tests, class assignment,
		presentations and Seminars.
CO-2	Describe about various cells and organs involved in immune	Exams, Class tests, class assignment,
	response and various techniques to evaluate humoral	Presentations and Seminars.
	immunity and cell mediated immune response.	
CO-3	Justify structure and function of antibody molecule and	Exams, Class tests, class assignment,
	their analysis methods such as precipitation and	presentations and Seminars.
	agglutination.	
CO-4	Discuss the mechanism of hypersensitivity reaction and the	Exams, Class tests, class assignment
	role of MHC molecule in immune system.	
CO-5	Illustrate about cancer ,AIDS and autoimmune diseases.	Viva, quiz, class assignments
CO-6	Demonstrate about vaccine ,types of vaccines ,their	Group discussions, Exams, Class tests.
	importance and production of Monoclonal antibody.	



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: B.Sc. Biotechnology

NAME OF COURSE: Biochemical engineering(paper iv)

NAME OF FACULTY: Parneet Kaur

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Explain Biochemical Engineering	Exams, Oral Exams, Quizzes, Home Assignments
CO-2	Define Medium sterilization.	Exams, Oral Exams, Quizzes, Home Assignments
CO-3	Demonstrate different types of Bioreactor as well as Explain scale-up and Kinetics.	Exams, Oral Exams, Quizzes, Home Assignments
CO-4	Identify different control and monitoring instruments in bioprocess and Calculate the mass transfer coefficient (KLa) in different phases during Bioprocess.	Exams, Oral Exams, Quizzes, Home

		Assignments
CO-5	Classify different processes used in Downstream processing.	Exams, Oral Exams, Quizzes, Home Assignments
CO-6	Define different chromatographic techniques used in purification of bioproducts.	Exams, Oral Exams, Quizzes, Home Assignments

Still.



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT: Physical Sciences

NAME OF THE PROGRAMME: B.Sc.-III (N.M.) Sem -VI

NAME OF COURSE: Inorganic Chemistry

NAME OF FACULTY: Dr.Satwant Kaur Shahi

C.O. No.	Description of Course Outcome	Method/s of Assessment
		-
CO1	Understand concept of hard and soft acids- bases, the relation of hardness and softness with electronegativity.	Class test, quiz
CO2	Illustrate the importance of elements and metal ions in biological system, structure and functions of haemoglobin and myoglobin.	oral test, Seminar
CO3	Elaborate the biological role of alkali and alkaline earth metal ions with special reference to Ca ⁺² .	Assignment ,notes,PPT
CO4	Describe Silicones and Phosphazenes as examples of inorganic polymers and also discuss bonding in triphosphazenes.	Assignment, seminar, Discussion
CO5	Discuss nomenclature, classification, Preparation method, properties, bonding and applications of organometallic compounds.	Group discussion, class test
CO6	Understand the compounds of metal carbonyls, metal-ethylene complexes with suitable examples and the nature of bonding in metal carbonyls.	Viva, PPT



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT: Physical Sciences

NAME OF THE PROGRAMME: B.Sc. -III (N.M.) Sem-VI

NAME OF COURS: Organic Chemistry

NAME OF FACULTY: A.P.Ramanjeet Kaur

C O No	Description of Course Outcome	Mothod/s of Assossment
C.O. No.	Description of Course Outcome	Wethou's of Assessment
CO1	Learn the key features of heterocyclic compounds, its molecular orbital structure, methods of synthesis and chemical reaction with mechanism of electrophilic substitution and special reactions	Notes, Test, PPT
CO 2	Discuss the synthesis of polymers, its properties and uses.	Assignment-1, Viva
CO 3	Appraise the organic synthesis via enolates.	Demonstrate by experiment, Notes
CO4	Describe the classification, nomenclature, preparation, physical and chemical properties of Carbohydrates.	Assignment-2, Discussion, Viva
CO 5	Formulate the structure of ribose and deoxyribose.	PPT, Test
CO6	Explain the classification, structure and stereochemistry of amino acids, proteins, peptides and nucleic acids.	Seminar by Students, Test



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT: Physical Sciences

NAME OF THE PROGRAMME: B.Sc.-III (N.M.) Sem-VI

NAME OF COURSE: Physical Chemistry

NAME OF FACULTY: A.P.Himani Saini

C.O. No.	Description of Course Outcome	Method/s of Assessment
	\sim	
CO1	Understand the concept of polarizability, pure rotational	Assignment, quiz
	and pure vibrational Raman spectra of diatomic molecules, selections rules	
CO 2	Discuss the concept of potential energy curves,	oral test, Seminar
	qualitative description of selection rules and Franck-	
	Condon principle.	
CO 3	Explain space lattice and unit cell. Laws of	Class test, notes, PPT
	crystallography-(i) Law of constancy of interfacial angles.	
	(ii) Law of rationality of indices (iii) Law of symmetry	
	elements in crystals.	
CO4	Know about the space lattice and unit cell, X ray	Group discussion,
	diffraction of various crystals, Derivation of Bragg's	assignment
	equation.Explain the band structure of solids and	
	determine the electrical properties.	
CO 5	Discuss the interaction of radiations with matter, various	seminar, class test
	Laws of photochemistry: Grothus- Drapper law, Stark-	
	Einstein law, photosensitized reactions and energy	
C06	Describe Jeblonski diagram (radiative and non radiative	Test ppt
000	processes) the basic concept of Laser and Maser	Test, ppt
	Photochemistry of vision and colour	



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: B.Sc Biotechnology Sem-VI

NAME OF COURSE: Microbial Technology

NAME OF FACULTY: Dr Parvinder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Describe how microorganisms can be utilized to	Exams, Class tests, class
	generate new products or degrade waste.	assignment, presentations and
		Seminars.
CO-2	Explain the basic concepts of microbial gene and	Exams, Class tests, class
	genome structure and function, and processes involved	assignment,
	in transformation of microorganisms genome.	Lab work
CO-3	Describe the basic concepts of biopesticides and	Exams, Class tests, class
	bioremediation	assignment, dry lab experiments
	\sim	on computer
CO-4	Demonstrate legal and ethical issues related to	Exams, Presentations.
	microbial technology through getting insight into IPR	
CO-5	Communicate microbial technology related concepts	Viva, quiz, class assignments
	and experimental results through effective written and	
	oral communication.	
CO-6	Work collaboratively with members of a team in	Group discussions, Group projects
	classroom and /or laboratory activities.	and group assignments.
		·



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: Biotechnology and Food Processing

NAME OF THE PROGRAMME: B. Sc. Biotechnology

NAME OF COURSE: Tissue Culture Technology (Paper VII)

NAME OF FACULTY: Love Singla

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Outline the knowledge and understanding regarding	Exams, Oral Exams, Quizzes, Home
	basics of animal and plant cell culture, their historical	Assignments
	developments and major contribution.	
CO-2	Analyze, interpret different methods of cellular	Exams, Oral Exams, Quizzes, Home
	totipotency, protoplast isolation and culture	Assignments, Class Assignments
CO-3	Devise to implement industrial experimental and	Exams, Oral Exams, Quizzes, Home
	applications of plant and animal tissue culture.	Assignments, Virtual Labs, Authentic
		Problem solving
CO-4	Illustrate the establishment of plant tissue culture and to	Exams, Oral Exams, Quizzes, Home
	set up a primary culture after mechanical	Assignments, Authentic Problem
	disruption/enzymatic disruption of cells.	solving
CO-5	Determine the viability and cell count by	Exams, Oral Exams, Quizzes, Home
	haemocytometer.	Assignments
CO-6	Calculate the cell number by crystal violet staining.	Exams, Oral Exams, Quizzes, Home
		Assignments, Virtual Labs, Authentic
		Problem solving



DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEAPRTMENT: BIOTECHNOLOGY & FOOD PROCESSING

NAME OF THE PROGRAMME: BSc Biotechnology

NAME OF COURSE: Fermentation Technology Sem-6th

NAME OF FACULTY: Manpreet Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Description of raw material and culture used in	Exams, Class tests, class
	fermentation technology	assignment, presentations
CO-2	Explain different types of fermentation process along	Exams, Class tests, class
	with its applications	assignment,
		Presentations and Seminars.
CO-3	Describe fermentative production of various products	Class tests, Class assignment,
	such as alcohol beverages, biofuels and vinegars	presentations and Seminars.
CO-4	Description and production of microbial	Exams, Class tests, class
	polysaccharides, flavours and additives	assignment,
		Presentations and Seminars.
CO-5	Identify food concepts and various food production	Viva, quiz, class assignments
	methods	
CO-6	Work collaboratively with members of a team in	Group discussions, Group projects
	classroom and /or laboratory activities.	and group assignments.