Programme: M. Sc. Zoology

SEMESTER I			
Core I	**Cell and Molecular Biology**		
Course Code: 21PZOC11	**Hrs/ Week : 6**	**Hrs/ Sem: 90**	**Credits: 4**

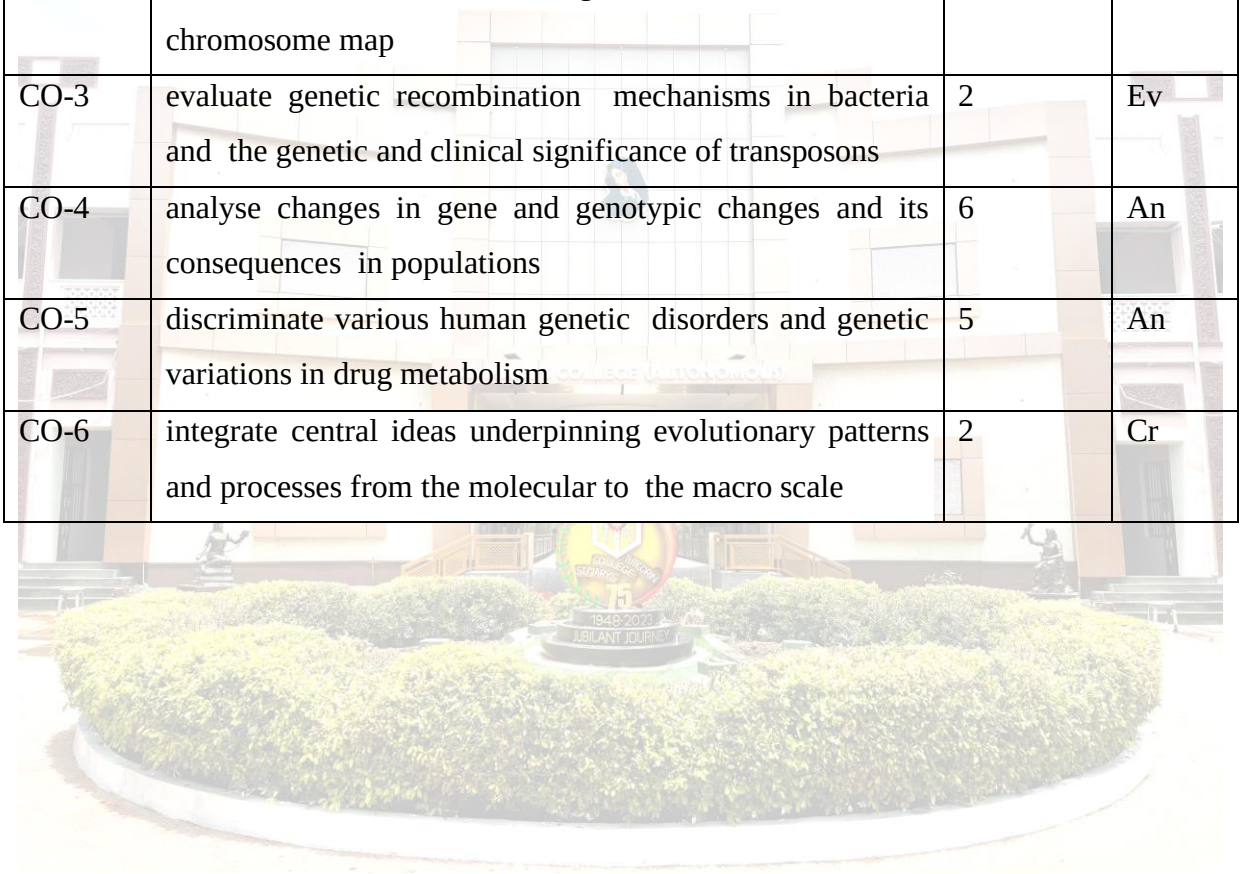
Course outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	describe the structure and function of biological membrane including the roles of gradients in energy transduction	1	Re
CO-2	illustrate the structural organization, control and regulation of gene at the transcriptional, post transcriptional level	2	Un
CO-3	outline the mechanisms of cell to cell signaling, including intercellular signaling and second messenger	5	An
CO-4	compare the structure and function of proteins, roles of amino acids in protein folding and protein-protein interactions	5	An
CO-5	examine cell cycle and its regulation, including mitosis and meiosis	4	An
CO-6	evaluate the characteristics, causes and role of genes in cancer	5	Ev

SEMESTER I			
Core II	**Genetics and Evolution**		
Course Code: 21PZOC12	**Hrs/ Week: 6**	**Hrs/ Sem: 90**	**Credits: 4**

Course outcome

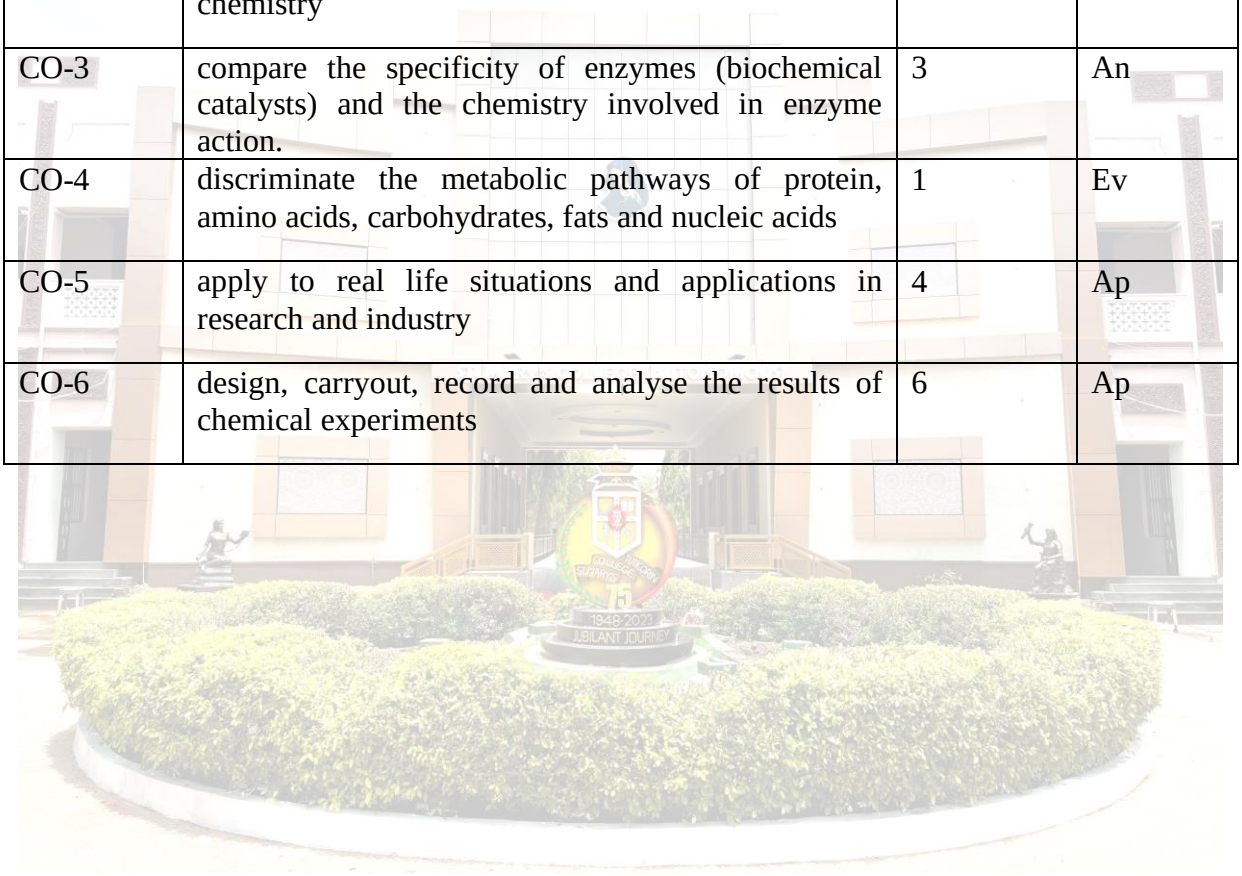
CO. No	Upon completion of this course, students will be able to	PSO addressed	CL
CO- 1	discuss the chromosomes, genetic recombination and linkage	1	Un
CO-2	examine the theories of crossing over and construction of chromosome map	1	An
CO-3	evaluate genetic recombination mechanisms in bacteria and the genetic and clinical significance of transposons	2	Ev
CO-4	analyse changes in gene and genotypic changes and its consequences in populations	6	An
CO-5	discriminate various human genetic disorders and genetic variations in drug metabolism	5	An
CO-6	integrate central ideas underpinning evolutionary patterns and processes from the molecular to the macro scale	2	Cr



SEMESTER I			
Core III	**Biochemistry**		
Course Code: 21PZOC13	**Hrs/Week: 5**	**Hrs/ Sem: 75**	**Credits: 4**

Course Outcome:

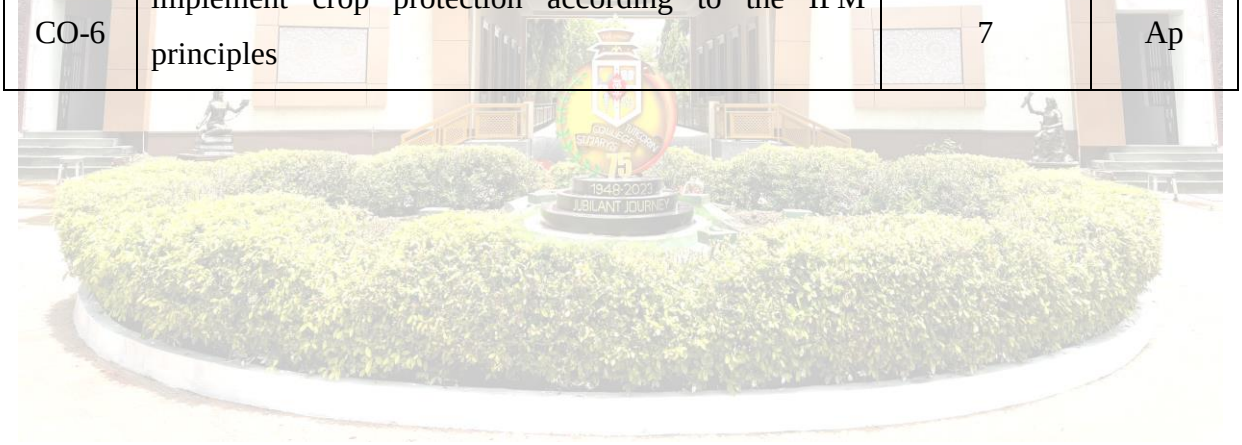
CO. No	Upon completion of this course, students will be able to	PSO addressed	CL
CO- 1	explain structure and functions of biomolecules	1	Un
CO-2	able to examine the relation between biology and chemistry	2, 4	An
CO-3	compare the specificity of enzymes (biochemical catalysts) and the chemistry involved in enzyme action.	3	An
CO-4	discriminate the metabolic pathways of protein, amino acids, carbohydrates, fats and nucleic acids	1	Ev
CO-5	apply to real life situations and applications in research and industry	4	Ap
CO-6	design, carryout, record and analyse the results of chemical experiments	6	Ap



SEMESTER I			
Core IV	**Applied Entomology**		
Course Code: 21PZOC14	**Hrs/ Week : 5**	**Hrs/ Sem: 75**	**Credits: 4**

Course outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	classify the various orders of insects	2	Ap
CO-2	understand the importance of beneficial insects and methods to collect, mount and preserve them	6	Un
CO-3	analyze the main pest species of crops based on the symptoms of the attack and morphological traits	2	An
CO-4	explain the life cycle of main pest species on crops and insect vectors	1,2	Un
CO-5	apply appropriate indirect and direct measures to prevent or reduce pest attack	7	Ap
CO-6	implement crop protection according to the IPM principles	7	Ap



SEMESTER II			
Core V	**Animal Physiology**		
Course Code: 21PZOC21	**Hrs/ Week: 5**	**Hrs/Sem: 75**	**Credits: 4**

Course outcomes

CO. No	Upon completion of this course, students will be able to	PSOs addressed	CL
CO- 1	compare digestive and circulatory system and regulation of blood pressure and heart beat	1	Un
CO-2	understanding mechanisms of respiration and point out physiological adaptations to special conditions	2	Un
CO-3	investigate the relationship between different environments and excretory organs and osmo ionic regulation	5	An
CO-4	appraise neuromuscular mechanisms and relate the physical and chemical phenomena	2	An
CO-5	defend the endocrine glands and associated physiological actions	5	Ev
CO-6	apply the physiological principles to promote healthy lifestyle	5	Ap

SEMESTER II			
Core VI	**Immunology**		
Course Code: 21PZOC22	**Hrs / Week : 5**	**Hrs / Sem: 75**	**Credits : 4**

Course Outcome:

CO. No	Upon completion of this course, students will be able to	PSO addressed	C L
CO-1	explain the genetic basis of antibody diversity, organization and arrangement of immunoglobulin genes	1	Un
CO-2	discuss the structure and function of MHC molecules and the immunologic responses involved in preventing and combating infections	1,2	Un
CO-3	demonstrate the principle of the routine serologic procedures performed in the clinical laboratory.	2	Ap
CO-4	outline the basic mechanisms, distinctions and functional interplay of innate and adaptive immunity	1, 2	An
CO- 5	examine immunological response and how it is triggered and regulated	1,2	An
CO-6	analyse the role and advances being made in transplantation with artificial organs and the aberrations of the immune system such as infections and autoimmunity	4	An

SEMESTER II			
Core VII	**Applied Biotechnology**		
Course Code : 21PZOC23	**Hrs / Week : 5**	**Hrs / Sem : 75**	**Credits : 4**

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	apply biotechnological manipulation of microbes for production of industrially important products	1,4,5	Ap
CO-2	examine the application of biotechnology in treatment of diseases and production of pharmaceutical products	4,5	An
CO-3	apply biotechnology to monitor environmental pollution and apply their knowledge to alleviate the effects of various environmental pollutants using biotechnology.	3,5	Ap
CO-4	create transgenic animals	5,6,8	Cr
CO-5	evaluate the ethical issues related with genetically modified organism	5,7,8	Ev
CO-6	apply the practical and theoretical knowledge of naomaterials acquired for pursuing their research in nanosciences	3,6,7	Ap

SEMESTER II			
Core VIII	**Microbiology**		
Course Code: 21PZOC24	**Hrs/ Week : 4**	**Hrs / Sem : 60**	**Credits : 4**

Course Outcome :

CO. NO	Upon completion of this course, the students will be able to	PSO addressed	CL
CO-1	identify the microorganisms using biochemical testing and staining technique	1,2	Re
CO-2	explain the structural organization and life cycle of microorganisms	2	Un
CO-3	classify microorganisms based on the modern trends of Taxonomy	2	Ap
CO-4	analyze the role of microorganisms in fermentation, medicine and the production of microbial products	4	An
CO-5	apply scientific methods in the design and execution of experiments	6	Ap
CO-6	develop practical skills in microbial techniques	6	Cr

SEMESTER III			
Core IX	**Computational Biology**		
Course Code: 21PZOC31	**Hrs/ Week: 6**	**Hrs/ Sem: 90**	**Credits: 4**

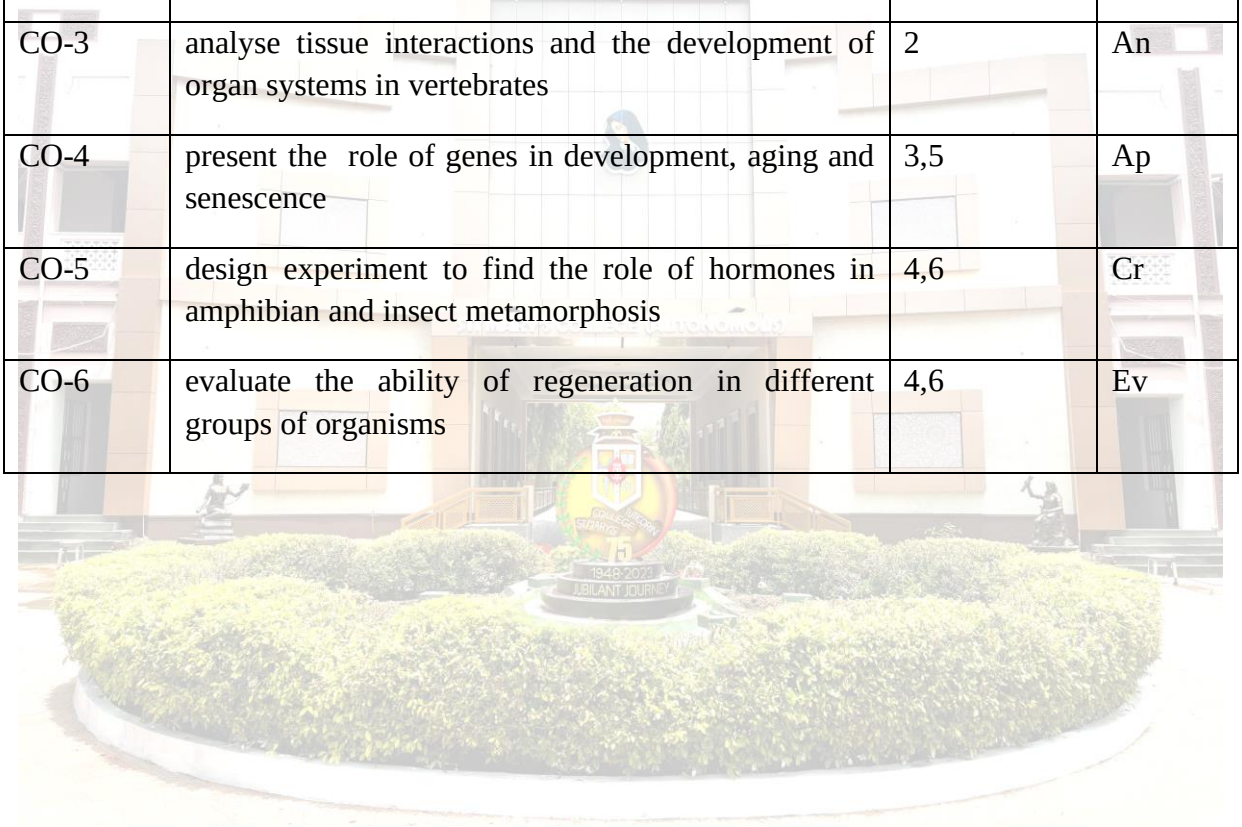
Course Outcome

CO. No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand descriptive and inferential statistical methods effectively and apply to design experiments	4	Un
CO-2	analyse and differentiate the biological data in a statistical perspective correctly and contextually and apply it for deriving research conclusions	7	An
CO-3	carryout correlation and regression analysis and recognize theoretical distributions	6	Ap
CO-4	convert biological data into computational problem and execute quantitative analysis	4	Ap
CO-5	demonstrate the mastery of concepts of skills for biological data management, analysis and graphical presentation	7	Ev
CO-6	formulate and test using appropriate statistical tools and softwares	4,6	Cr

SEMESTER III			
Core XI	**Developmental Zoology**		
Course Code: 21PZOC33	**Hrs/ Week: 5**	**Hrs/ Sem: 75**	**Credits: 4**

Course Outcomes

CO. No	upon completion of this course, students will be able to	PSO addressed	CL
CO-1	define the process of gametogenesis and fertilization	1	Re
CO-2	discuss the patterns of cleavage, morphogenetic movements and gastrulation in different animals	2	Un
CO-3	analyse tissue interactions and the development of organ systems in vertebrates	2	An
CO-4	present the role of genes in development, aging and senescence	3,5	Ap
CO-5	design experiment to find the role of hormones in amphibian and insect metamorphosis	4,6	Cr
CO-6	evaluate the ability of regeneration in different groups of organisms	4,6	Ev



SEMESTER III			
Core XII	**Research Methodology and Biotechniques**		
Course Code : 21PZOC34	**Hrs / Week : 5**	**Hrs / Sem : 75**	**Credits : 4**

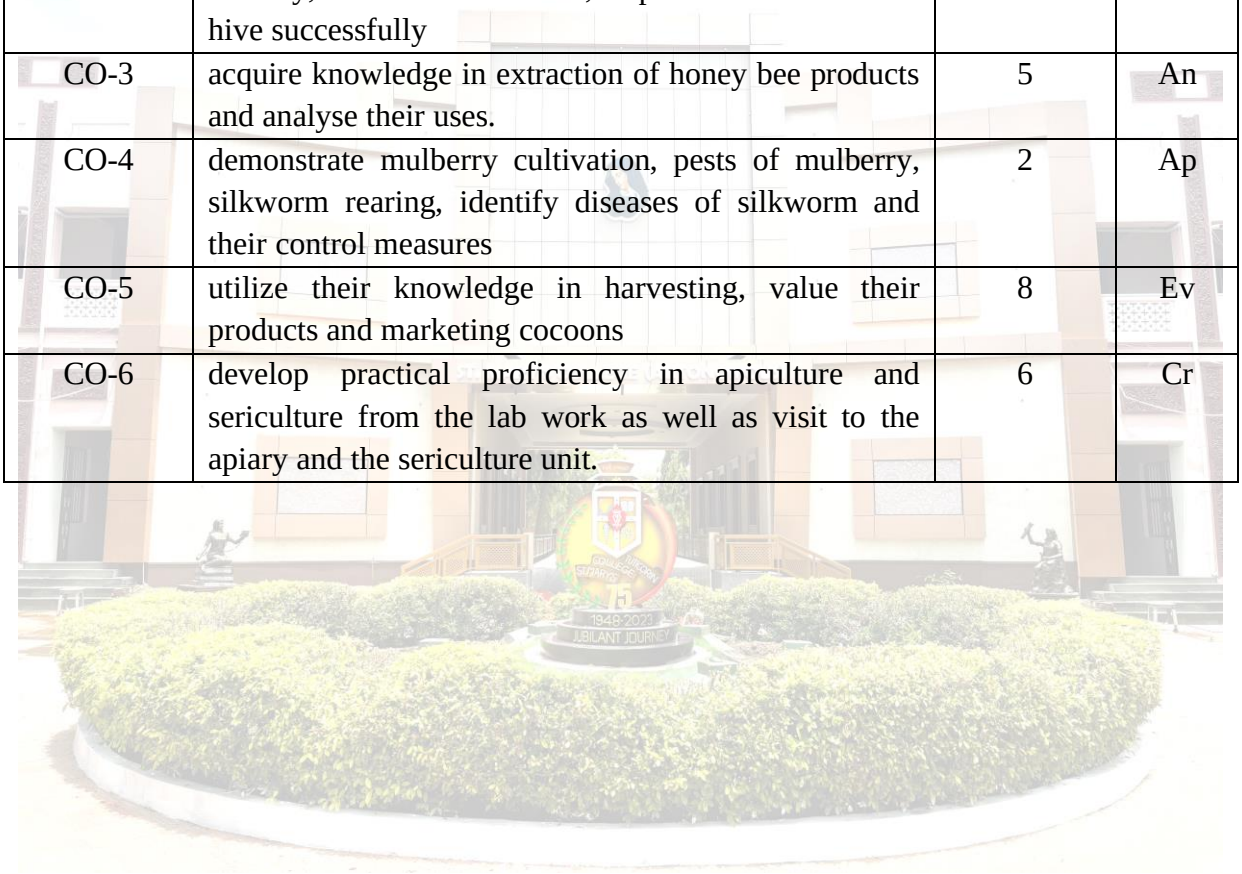
Course Outcomes

CO.No.	Upon completion of this course,students will be able to	PSO addressed	CL
CO-1	explain different methodologies to be adopted for conducting research in more appropriate manner.	1	Un
CO-2	construct scientific knowledge in the design and implementation of an experiment.	2	Ap
CO-3	analyze a range of qualitative and quantitative research techniques to the scientific issues.	4	An
CO-4	select new scientific tools, concepts and theories to solve scientific problems.	6	Ev
CO-5	develop skills to communicate scientific ideas in both written and oral formats	7	Cr
CO-6	make a broad range of laboratory skills to perform experiments for employment prospects.	8	Cr

SEMESTER IV			
Core XV	**Commercial Zoology**		
Course Code: 21PZOC43	**Hrs/ Week: 5**	**Hrs/ Sem: 75**	**Credits: 4**

Course Outcome

CO. No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand the behaviour of bees, prevent swarming and manage bee colonies	3	Un
CO-2	identify, choose suitable bees, inspect and maintain bee hive successfully	2	Re
CO-3	acquire knowledge in extraction of honey bee products and analyse their uses.	5	An
CO-4	demonstrate mulberry cultivation, pests of mulberry, silkworm rearing, identify diseases of silkworm and their control measures	2	Ap
CO-5	utilize their knowledge in harvesting, value their products and marketing cocoons	8	Ev
CO-6	develop practical proficiency in apiculture and sericulture from the lab work as well as visit to the apiary and the sericulture unit.	6	Cr



SEMESTER IV			
Core Elective	**B. Vermitechnology**		
Course Code : 21PZOE42	**Hrs / Week : 4**	**Hrs / Sem : 60**	**Credits : 4**

Course Outcome

CO. No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO- 1	discuss basic techniques of vermiculture and different species of earthworms suitable for culture	1	Un
CO – 2	analyse the mechanisms of vermicomposting technology	6	An
CO – 3	perform recycling of wastes generated from various sources in an eco-friendly manner	5	Ap
CO – 4	explore new techniques and deepen their mastery in organic solid waste management	2	Cr
CO – 5	execute practical technology and entrepreneurship skills	8	Ap
CO – 6	evaluate problems, constraints and opportunities for self-employment.	3	Ev

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