Shiv Chhatrapati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)
Department of Biotechnology

Structured Work Plan for Teaching
Academic Year 2019-20 (Term-I)

1. Details of Classes to be taught

Sr. No.	Class	Name of Asst. Prof.	Subject	Paper
1	B.Sc. II	Dr. R. B. Ade	Biotechnology	**Course Title: Applied Microbiology** **Course Code : U-APM- 398** **Course Title: Lab Course IX** **Course code:U-LAC-402**
2	B.Sc. III			**Course Title: Animal Biotechnology** **Course Code: U—ANB-729** **Course Title: Lab Course XXV** **Course Code:U-LAC-633**

2. Summary of Lesson Plan

Name of Teacher: Dr. Ravikumar B Ade **Class: B.Sc. BT II Year. (III Semester)**

Course Title: Applied Microbiology

Sr. No.	Subject	Unit and Chapter to be covered	Date	No. of Lectures	Academic activities to be organized	No. of Test / Assignment with topic and date
1	Applied Microbiology	**Unit I:** **Soil Microbiology** Bio geo chemical cycles Carbon, Nitrogen cycles- Nitrification and denitrification Symbiotic and asymbiotic Nitrogen fixation Sulfur cycle, Winogradsky column phosphorus cycle oxidation / red unction reactions Water Microbiology- bacteriological examination and Enumeration Index organism- Control of microbiology, MPN, SPC, IMVIC etc. Air microbiology-Methods of enumeration and entrapment	15-6-19 to 27-06-19	02 03 02 02 02 01	Classroom Seminar Group Discussion	Examination will be conducted time to time
2		**Unit II:** **Introduction of food microbiology** Introduction of food Microbiology. Food Spoilage, Types of spoilage Microbiological examination of food. Food preservation-Methods of preservation. Single cell protein- Production and its significance. Advantage and disadvantages	28-07-19 To	03 02 02 01 01	Classroom Seminar Group Discussion	

			08- 08- 19			
3		**Unit III :** **Introduction to Medical microbiology.** Normal flora, Normal flora of various systems, Its advantages and contribution opportunistic flora Immune system, Infections, Mechanism of infections Various microbial infections and agents. Use of antimicrobial agents Chemotherapy- Chemotherapeutic agents, sulfa drugs and commencement of antibiotics Narrow spectrum and broad spectrum antibiotics, its mechanism of action Water born, food born and air born microorganism.	09- 08- 19 To 20- 09- 19	03 02 03 02	Classroom Seminar Group Discussion	

Practicals

Sr. No.	Name of Experiment	Date of Completion	No. of Practical's (Per Batches)
1.	Isolation of & Enumeration of microbes from soil	29/07/19	01
2.	Enumeration of microbes from air	5/8/19	01
3.	Microbial examination of water	12/8/19	01
4.	Isolation & Enumeration of Microbes from food sample	19/08/19	01
5	MPN test-determination of potability of water	26/08/19	01
6.	Isolation & identification of microbes by means of IMVIC test	02/09/19	01
7	Isolation of Rhizobium	8/09/19	01
8	Isolation of Azotobacter	14/09/19	01
9	Isolation of micro flora from human skin, tounge & throat.	20/09/19	01
10.	Visit to food & Diary Industries.	Nil	

Course teacher

Head

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Course title: Animal Biotechnology

Name of Teacher: Dr. R B Ade **Class : B.Sc. BT. III (V Semester)**

Sr. No.	Subject	Unit and Chapter to be covered	Date	No. of Lectures	Academic activities to be organized	No. of Test / Assignment with topic and date
1		**UNIT-I:** **Introduction to Animal tissue culture** Structure of animal cell, history of cell culture media and reagent, cell tissue and organs. Continuous cell line suspension culture, somatic cell cloning hybridization transformation and transfection of cell application of animal cell culture. *In vitro* testing of drugs, testing of toxicity of environmental pollution application of cell culture production of human and animal viral vaccines and pharmaceutical product and proteins.	15-06-19 To 27-06-19	01 03 01 01 01 01 01 01	Classroom Seminar Group Discussion	Unit test will be conducted time to time
2		**Unit-II** **Vaccines production and techniques** Introduction to the concept of vaccines, conventional methods of animal vaccines introductions, recombinant approaches to vaccine production, hybridoma technology,	28-07-19 To 12-08-19	01 03 03	Classroom Seminar Group Discussion	

		phage display technology for production of antibodies commercial scale production of diagnostic antigen and antisera Animal disease diagnostic kits.		01 04		
		Unit-III: **Introduction to Animal husbandry and new approaches** Structure of sperm and ovum, cryopreservation, artificial insemination, super ovulation , *in vitro* fertilization, culture of embryo, cryopreservation of embryo, embryo transfer, embryo splitting, embryo sexing, Application of transgenic technology, animal viral vectors, Animal cloning of embryonic and adult cell. conservation of animal species Social and moral issues *in situ* and *ex situ* preservation of germplasm ,in utero testing of fetus for genetic defects. Pregnancy diagnostic kits, antifertility animal vaccine knock out technology and animal model for human genetic disorder.	13-08-19 To 05-09-19	01 02 01 04 04 03 01	Classroom Seminar Group Discussion	
		Unit-IV:		01	Classroom Seminar	

		Methods and application of Biotechnology for animal conservation Transgenic animal production and application in expression of therapeutic proteins. Immunological and nucleic acid-based methods for identification of animal species, detection of meat adulteration using DNA based methods and detection food adulteration with animal protein. Identification of wild animal species using DNA based methods using different parts including bone, hairs, blood, skin and other parts by anti-poaching agencies.	06-09-19 To 13-10-19	01 01 02 02	Group Discussion	

Practicals:

Sr. No.	Subject	Practical's	Date	No. of Practical's
1	Animal Biotechnology	Laboratory organization and introduction to facility for ATC	30/07/19	04
2		Washing, sterilization of glass wares and equipment	6/08/19	04
3		Media preparation, slandered, reagent preparation concern with ATC	13/08/19	04
4		Media Sterilization methods	20/08/19	04
5		Media Sterility testing	20/08/19	04
6		Cell counting introduction- methods	27/08/19.	04
7		Differential cell counting and characterization	3/10/19	04
8		Total blood cell counting and characterization	9/10/19	04
9		Disaggregation of tissues, cells and their characterization with staining	15/10/19	04
10		Dissection of chick embryo and characterization techniques	21/10/19	04
		Disaggregation methods and study of tissues of chick embryo	21/10/19	04
11		Visit to Animal tissue culture facility	Nil	

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Department of Biotechnology

Structured Work Plan for Teaching
Academic Year 2019-20 (Term-II)

Details of Classes to be taught

Sr. No.	Class	Name of Asstt. Prof.	Subject	Paper
1	B.Sc. II	Dr. Ravindra Ade	Biotechnology	**Course Title: Plant Biotechnology** **Course Code : U-PLB-497** **Course Title: Lab Course XIII** **Course Code: U-LAC-501**
2	B.Sc. III			**Course Title: Biodiversity and Systematics** **Course Code: U-BIS-729** **Course Title: Lab Course XXV** **Course Code: U-LAC-735**

1. **Summary of Lesson Plan**

Name of Teacher: Dr. Ravindra Ade **Class : B.Sc. BT. II (IV Semester)**

Sr. No.	Subject	Unit and Chapter to be covered	Date	No. of Lectures	Academic activities to be organized	No. of Test / Assignment with topic and date
1	**Plant Biotechnology**	**Unit I:** **Traditional agriculture: Development of civilization.** **Breeding methods:** Advantages and disadvantages, **Introduction to plant Breeding:** Historical and traditional development for multiplication of agricultural produce. **Green revolution:** its implication and applications. Need of emergence of new	10-12-19 To 29-12-19	01 01 02 01 01 01	Classroom Group Discussion	Unit – I 27/12/19 Unit – II 15/01/20 Unit – III 27/02/20

		techniques. **New Breeding Technology** – Biotechnological Approaches		02 02 01 01 03		
		Unit II: **Introduction to Plant Tissue Culture:** Introductory History – Concepts of Cell theory & Cellular Totipotency **Milestones in plant tissue culture,** with respective scientist and their concepts **Infrastructure & Organization** of plant tissue culture: Design of laboratory – General & aseptic laboratory, different work areas, equipment & instruments required other	30-12-19 To 11-01-2020	02 02 03 01 02		
		Unit III: **Aseptic techniques** – Washing & preparation of glassware, packing. Sterilization: media sterilization, surface sterilization, aseptic work station, precautions to maintain aseptic conditions. **Nutritional requirements of the explants,** PGR's & their *in vitro* roles. Media preparation. Preparations of stock solutions and their sterilization **'Explants' for**	12-01-2020 To 23-02-2020	02 01 01 02 03 01		

		plant tissue culture – histological and/or cellular characteristics Dedifferentiation and dedifferentiation, Organogenesis, Embryogenesis		01		
		Unit IV: **Callus culture technique** – Introduction, principle, **Suspension culture technique** – Introduction, principle, Growth & growth measurement, synchronization **Organ culture technique** – Introduction, principle, **Different routes of multiplication** in vitro – a) auxiliary bud proliferation, Micropropagationb) **somatic embryogenesis, Embryo rescue, anther and pollen culture, Protoplast isolation,** regeneration and fusion. **Plant secondary metabolites** and its applications. **Germplasm conservation** and cryopreservation. **Application of plant tissue culture** technology and their commercialization	24-02-2020 To 07-03-2020	03 02 03 04		

Practicals

Sr. No.	Subject	Practicals	Date	No. of Practical
1	Plant Biotechnology	General laboratory design for establishing plant tissue culture	15/12/2020 To 24/02/2020 Batch B,C,D	03
2		Collection of explants, washing of explants and sterilization of explants		03
3		Surface sterilization and aseptic manipulations		03
4		Media preparation, sterilization and subculture		03
5		Callus culture		03
6		Cell suspension culture		03
7		Anther and pollen culture		03
8		Embryo culture		03
9		Artificial seed production		03
10		Field visit-National research laboratories		03
11		Visit to commercial Plant tissue culture laboratory		03
12		Visit to Nursery		03
13		Visit to Forest department		03

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Name of Teacher: Dr. Ravindra Ade **Class : B.Sc. BT. III (VI Semester)**

Sr. No.	Subject	Unit and Chapter to be covered	Date	No. of Lectures	Academic activities to be organized	No. of Test / Assignment with topic and date
1	**Biodiversity and systematics**	**Unit-I:** **Biodiversity:** genetic diversity, molecular diversity and taxonomy DNA bar coding, population genetics Causes of biodiversity loss-Conservation of biodiversity Endangered species Overview of global biodiversity and extinction crisis	10-12-19 To 26-12-2019	02 02 02 01 01 01 02 02	Classroom Group Discussion	Unit – I 30/12/19 Unit – II 16/01/20120 Unit – III 26/02/20
		Unit-II: **Field studies:** Assessment of biodiversity of different ecosystem Sampling technique and quantitative methods for assessment.	27-12-19 To 15-01-2020	02 01 02 02 02		
		Unit-III : Plant Taxonomy Biosystematics and taxonomy Identification: Morphology of different plant group Study of characters Study of plant families Use of taxonomic literature and database Documentation and preservation Record and photography Illustration Species concept	16-01-2020 To 30-01-2020	02 02 02 02 02 02 02		

		Referencing and citation Preparation of keys computerized database generation.				
		Unit IV **Animal Taxonomy** Characters, procedure, Collections and Preservations. Curetting Process of identification Keys, types of keys merit and demerit Categories Evaluation of biodiversity indices Shannon wiener index Structural biochemical and molecular and numerical taxonomy Modern tools of taxonomy Application of molecular and computational tools for phylogeny.	31-01-2020 To 20-02-2020	01 02 03 02		

Practicals

Sr. No.	Subject	Practicals	Date	No. of Practicals
1	**Biodiversity and systematics**	Morphological studies of major groups A) Bryophytes B) Pteridophytes C) Gymnosperms D) Angiosperms	15/12/2019 to 24/03/2020 Batch A,B,C,D	04
2		Study of Leaf Morphology and Flower morphology		04
3		Study of fruits morphology		04
4		Surveys, collection and Herbarium preparation of different plant groups		04
5		Study of plant Identification using reference material		04
6		Visits to herbarium and culture collections centers		04
7		Photography and illustration in the field.		04
8		Documentation and dissemination of information.		04
9		Morphological studies of Insects		04
10		Morphological studies of Fishes. Visit to local market for identification.		04
11		Visit to Botanical, Zoological Gardens, Biosphere Reserves, Project Tiger and National sanctuaries		04

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