Shiv Chhatrpati Shikshan Sanstha' s

Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)
Department of Biotechnology
Structured Work Plan for Teaching
Academic Year 2018-19 (Term-I)

Sr. No.	Class	Name of Ass. Prof.	Subject	Paper
1	B.Sc. I Year (Semester I)	Udaybhanu P. Sirdeshmukh	Biotechnology	Course Title: Basic bioscience Course Code: U-BBS-188 Course Title: Lab Course II Course Code: U-LAC-192

1. **Summary of Lesson Plan**

Class: B.Sc. BT. I year (First Semester) Name of Teacher: Udaybhanu P. Sirdeshmukh

Course Title: Basic bioscience Course Code: U-BBS-188

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	Basic Bioscience	**Unit I** Whittaker's five kingdom system of classification	19-20/06/2018	2	PPT presentation	2 assignments
		Classification of plants with a suitable example	21/06/2018	1	seminar	
		Classification of animals with a suitable example	22/06/2018	1	Video lectures	
		prokaryotic cell –bacteria	25/06/2018	1		
		eukaryotic cell-plant cell and animal cell	26/06/2018	1		
		a brief idea about Levels of organization in plants and animals	27-28/06/2018	2		
		Origin of life	02/07/2018	1		
		Unit II: Nutrition and				

		transport in flowering plant				
		Biophysical Process: Diffusion,	03/07/2018	1	PPT presentation	2 assignments
		Osmosis	04/07/2018	1	seminar	
		Facilitated Diffusion, Surface Tension	05/07/2018	1	Video lecture	
		Cohesion, Adhesion, Osmotic Pressure	09/07/2018	1		
		Plant nutrition				
		Photosynthesis-Definition and equation of photosynthesis, A brief idea about the intake of CO2and water by plant ,The trapping of light energy by chlorophyll	10-12/07/2018	3		
		the conversion of light energy into chemical energy,				
		the formation of carbohydrates, their subsequent storage, and release of oxygen	11-12/07/2018	2		
		Dependence of life on photosynthesis				
		Leaf structure-Morphological and anatomical organization of Monocotyledonous	16-17/07/2018	2		
		Morphological and anatomical organization of	18-19/07/2018	2		

		Dicotyledonous leaf.				
		Mineral nutrition-A brief idea about functions of minerals in plant metabolism	23/07/2018	1		
		Transport in flowering plants				
		Water and ion uptake-A brief idea about structure and function of root hairs in relation to their Surface area, and to water and ion uptake, water transport through xylem	24-25/07/2018	2		
		Transpiration –stomata structure and function	26/07/2018	1		
		Translocation of solute	30/07/2018	1		
		Osmotic Potential	31/07/2018	1		
		Photoperiodism, Vernalization	01/08/2018	1		
		Reproduction in Plant	02/08/2018	1		
		A Sexual reproduction in plant				
		Structure of Flower				
		Unit III:Life processes in animals-I				
		Animal Nutrition				
		Human alimentary canal-A brief idea about structure includes mouth, salivary glands, esophagus, Stomach, duodenum,	06-07/08/2018	2	PPT presentation	2 assignments

		pancreas, gall bladder, liver, ileum, colon, rectum and anus.				
		Function of alimentary canal-Mechanical and physical digestion, Chemical digestion, Absorption, assimilation and egestion of food	08/08/2018	1	seminar	
		Transport in humans				
		Circulatory system-structure and function of heart in terms of muscular contraction and the working Of valves	09-14/08/2018	3	Video lectures	
		the structure and function of arteries, veins and capillaries	15-21/08/2018	4		
		Components and functions of Blood-red blood cells, white blood cells, platelets and plasma.	22-27/08/2018	3		
		Unit IV: Life processes in animals-II				
		Respiration	28-29/08/2018	2		
		Aerobic respiration-Definition and a brief explanation with equation of aerobic respiration	30-03/08-09/2018	4	PPT presentation	2 assignments
		Anaerobic respiration-Definition and a brief	04-06/09/2018	03	seminar	

		explanation with equation of anaerobic respiration				
		Differences between inspired and expired air	10-11/09/2018	02	Video lectures	
		Human gaseous exchange – the role of the exchange surface of the alveoli in gaseous exchange, exchange of gaseous by cell (limited up to uptake of oxygen and release of carbon dioxide)	12-13/09/2018	02		
		Excretion in animals				
		Definition of excretion. A brief idea about structure of kidney and nephron	17-18/09/2018	02		
		A brief explanation of the removal of carbon dioxide from the lungs, and of water and Urea through the kidneys	19-20/09/2018	02		
		Co-ordination and response	24-25/09/2018	02		
		Hormones-definition, endocrine gland source and function in human	26-01/09-10/2018	3		
		A Brief Idea about nervous system in human	02-03/10/2018	2		
		Sexual reproduction in humans-				
		the male reproductive system and give the	04-08/10/2018	2		

		functions of: testes, scrotum, sperm ducts, and Prostate glands, urethra and penis				
		the female reproductive system and give the functions of: ovaries, oviducts, uterus, cervix and Vagina	09-10/10/2018	2		
		the menstrual cycle with reference to the alternation of menstruation and ovulation,	11-17/10/2018	4		
		the effect of factors, such as diet and emotional state, which affect the menstrual cycle	18-22/10/2018	2		
		Methods of birth control: natural, chemical (spermicides), mechanical, hormonal and Surgical.	23-25/10/2018	03		

Lab course: II (Basic bioscience) **Course code: U-LAC-192**

Sr. No.	Practicals	Date	No. of Practicals
1	To study parts of a compound microscope	01/07/2018	2
2	To identify and study the morphology of representative types of bacteria, fungi and different animal and plant groups		2
3	Study of tissues and diversity in shapes and sizes of plant cells.	To	2
4	To study anatomy of stem and root of monocots and dicots		2
5	Preparation of herbarium sheets of flowering plants		2
6	To study the distribution of stomata on the upper and lower surfaces of leaves		2
7	To investigate and measure factors affecting rate of transpiration using a photometer.		2
8	To detect the presence of carbohydrates like glucose, sucrose and starch		2
9	To detect the presence of proteins		2
10	To detect the presence of fats (lipid) in different plants and animal materials		2
11	To detect the presence of urea in the given sample of urine		2
12	To test the presence of sugar in the given sample of urine.		2
13	To show that light is essential for photosynthesis.		2
14	To show that carbon dioxide is essential for photosynthesis.		2
15	To study the liberation of carbon dioxide gas during aerobic respiration.		2

16	To study the liberation of carbon dioxide gas during fermentation		2
17	To study the reproductive parts of commonly available flowers	30/09/2018	2
18	To understand diversity of living organisms through educational tour.		2

Date: 18/08/2018

Course Teacher

HoD

Head
Department of Biotechonlogy
Rajarshi Shahu Mahavidyalaya
(Autonomous) Latur-413 531

Principal

PRINCIPAL
Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)

Shiv Chhatrpati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur (Autonomous)

Department of Biotechnology

Structured Work Plan for Teaching
Academic Year 2018-19 (Term-I)

Sr. No.	Class	Name of Ass. Prof.	Subject	Paper
2	**B.Sc. III Year** (Semester V)	Udaybhanu P. Sirdeshmukh	Biotechnology	**Course Title: Developmental biology** **Course Code: U-DEB-630** **Course Title: Lab Course XXIV** **Course Code: P-LAC-634**

Class: B.Sc.BT. III (Fifth Semester) **Name of Teacher: Sirdeshmukh U.P.**

Course Title: Developmental biology **Course Code: U-DEB-630**

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
	Developmental biology	**UNIT I-How development works in Animals**				
		Developmental biology-Introduction	18/06/2018	1	PPT presentation	2 assignments
		Gametogenesis-Spermatogenesis and Oogenesis in animals	19-20/06/2018	2	seminar	
		Fertilization in animals	21-25/06/2018	2	Video Lectures	
		Embryonic Development in Animals				

		1.Drosophila melanogaster	26-02/06-07/2018	4		
		Blastulation, gastrulation, Germ layers, Neurulation				
		2.Xenopus laevis	03-09/07/2018	4		
		Blastulation, gastrulation, Germ layers, Neurulation				
		3.The Chick(Gallus gallus)	10-16/07/2018	4		
		Blastulation, gastrulation, Germ layers, Neurulation				
		UNIT II-				
		Cell division and Growth	17-18/07/2018	2	PPT presentations	2-assignments
		Cell lineage	19-23/07/2018	2	seminar	
		Apoptosis and Aging	24-26/07/2018	3	Video lectures	
		Abnormal development	30/07/2018	1		
		Teratogens and Teratogenesis	31/07/2018	1		
		Unit III				
		Morphogenesis	01/08/2018	1	PPT presentations	2-assignments
		Stem cell, Cell fate and potency	02/08/2018	1	seminar	

		Organogenesis	06-07/08/2018	2	Video Lectures	
		Axes and symmetry determination	08/08/2018	1		
		Developmental commitment	09-14/08/2018	3		
		Fate Determinants, Inducers (induction), Competence	15-16/08/2018	2		
		Potency, Determination (commitment/specification),Differentiation				
		Control of gene expression	20-28/08/2018	6		
		Signaling systems -inducers, Signal (ligand) Binds receptor				
		Receptor is altered: modification/ second messengers/ cascade				
		And alters cell function via changing = metabolism, gene expression, shape Leading to change in fate				
		Drosophila melanogaster-Role of genes in Patterning during development	29-31/08/2018	3		
		Regeneration of missing parts in animals-Planarian regeneration, vertebrate limb Regeneration	03-04/09/2018	2		
		UNIT IV-.Plant Development			PPT presentations	2-assignments

		Plant Life Cycles	05/09/2018	1	seminars	
		Gamete Production in Angiosperms	06/09/2018	1	Video lectures	
		Pollination, Fertilization in plant	10-11/09/2018	2		
		Germination, Senescence	12/09/2018	1		
		Embryonic Development in plant				
		Embryonic Development in Monocotyledonous plant	13-17/09/2018	2		
		Arabidopsis thaliana (A dicotyledonous plant)-Role of genes in embryogenesis	18-19/09/2018	2		
		Role of genes in Organogenesis-Shoot patterning	20-24/09/2018	2		
		Root patterning	25-26-/09/2018	2		
		Leaf Patterning	27-02-/09-10/2018	3		
		Flower patterning	03-05/10/2018	3		

Lab course XX (Developmental biology) **course code: U-LAC-634**

Sr. No.	Practicals	Date	No. of Practicals
1	Introduction to developmental biology-embryo protocols, ethics, and model Systems.•General embryo protocols and ethic	01/07/2018	04
2	Study of frog development by using permanent mounted slides from zygote to Tadpole		04
3	Study of chick development by using permanent slides from 18 hours to 96 hours Of chick embryo.		04
4	A study types of egg by using chart, as well as real specimen eggs		04
5	A study of blastodisc of chick for their feature from hen egg.	TO	04
6	A study of chick development up to eight days through egg incubation, candling and Egg dissection technique.		04
7	A study of different types of sperms and its features by using chart		04
8	A study of pollen genesis by using T.S. of Anther preparation technique.		04
9	A study of T.S. of ovary for arrangement of ovules within ovary.		04
10	A study of Flower development from vegetative shoot of any suitable plant.		04
11	A study of morphological and anatomical changes in plants-(about tissue organization) during plant development from germinated seed, seedling and other stages of development.	30/09/2018	04

Date: 16/06/2018

Course Teacher **HoD** **Principal**

Head
Department of Biotechonlogy
Rajarshi Shahu Mahavidyalay
(Autonomous) Latur-413 512

PRINCIPAL
Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)

स्थापना - १९७०

Shiv Chhatrpati Shikshan Sanstha' s
Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)
Department of Biotechnology
Structured Work Plan for Teaching
Academic Year 2018-19 (Term-II)

Sr. No.	Class	Name of Ass. Prof.	Subject	Paper
1	**B.Sc. I Year** (Semester II)	**Udaybhanu P. Sirdeshmukh**	**Biotechnology**	**Course Title: Genetics** **Course Code: U-GEN-288** **Course Title: Lab Course VI** **Course Code: U-LAC-292**

1. Summary of Lesson Plan

Class: B.Sc.BT First year (Sem-II) **Name of Teacher: Mr.U.P.Sirdeshmukh**

Paper Title: **Genetics** **Paper code: U-GEN-288**

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	Biotechnology	**Unit I: Transmission /classical Genetics** -Introduction: Genetics and the organisms, Scope and significance of genetics, a brief idea from gene to phenotype, genetic symbols **-Transmission genetics** **Mendelism**: An overview Mendel's work Monohybrid cross, Dihybrid cross	29/11/2018 30/11/2018 04/12/2018 05/12/2018 06/12/2018	01 01 01 01 01	**-Power point presentation** **On each topic** **-Additional information videos** **presentation** **-D SP**	**Assignments** **Unit I** **26/12/2018**

	ology	-Test cross, reciprocal cross	08/12/2018	01	**presentation**	**26/12/2018**
		-principles of Mendel		02	**On each topic**	
		- application of Mendelian principles in the study of human traits	11 to 13/12/2018	01	**-Additional information videos presentation -D SP**	
		Extensions and modifications of basic principles		02		
		-Lethal alleles, Multiple alleles	15 to 18/12/2018	01		
		-Gene interactions - complementary gene interaction		02		
		- epistasis, duplicate gene interaction	19/12/2018	01		
		Interaction between sex and heredity	20 to 22/12/2018	01		
		-sex- influenced and sex-limited characteristics		02		
		-Cytoplasmic inheritance.		02	**Open Book test**	
		Unit II	25/12/2018			
		-Linkage			**Quiz competition**	**Unit II**
		-recombination and eukaryotic gene mapping	26/12/2018	01		**16/01/2019**
		-crossing over- mechanism of crossing over		01		
		-Sex determination in animals	27/12/2018	03		
		-chromosomal theory of sex determination				
		-genic balance theory	29/12/2018 To 03/01/2019			
		-Sex determination in plants				
		-Sex linkage, Pedigree analysis				
			05/01/2019			
			08/01/2019			
			09 to 12/01/2019			

1	Biotechnology	- Prokaryotic gene mapping by using conjugation - transformation and transduction techniques **Unit III: Gene mutation and chromosomal mutations** -Concept of Mutation, Mutagens -spontaneous and induced mutation -complementation test, -Benzer's experiment about rII locus inT_4 bacteriophage - point mutation **Cytogenetics:** -chromosome structure, number and size - Karyotyping of chromosomes - structural chromosomal mutations -numerical Chromosomal mutations **Chromosomal aberrations:** -syndromes-Down syndrome, kleneifelter syndrome - Turner syndrome, Cri-du-chat syndrome -Application of mutation in improvement of plants and microbes for human welfare	15 to 16/01/2019 17 to 22/01/2019 23/01/2019 To 29/01/2019 30-02/02/2019 05 to 09/02/2019 12/02/2019 To 14/02/2019 16/02/2019	02 02 02 01 02 02 01 02 02 02 01 01	**Power point presentation On each topic -Additional information videos presentation -D SP**	**Unit II 16/01/2019** **Unit III 16/02/2019**
1	Biotechnology	**Unit IV:Recent trends in genetics** A brief idea about 1. Quantitative genetics 2. Population genetics: Gene and genotypic frequencies, Hardy –Weinberg equilibrium	20/02/2019 To 28/02/2019	02 02	**Power point presentation On each topic -Additional information videos presentation -D SP -Quiz Competition -Open Book Test**	**Unit IV 28/02/2019**

Lab course: VI (Genetics) **Course code: U-LAC-292**

Sr. No.	Practicals	Date	No. of Practicals
1	Problems based on monohybrid and dihybrid cross.	10/12/2018	2
2	Problems based on interaction of genes		2
3	Problems based on pedigree analysis.	To	2
4	Problems based on Hardy-Weinberg equilibrium.		2
5	To study the human blood group by using given blood sample.		2
6	Study of Human traits, Animal traits and plant traits for its diversity in phenotype.		2
7	Study of karyotype.	30/03/2019	2

Date: 28/11/2018

Course Teacher **HoD** **Principal**

Head
Department of Biotechonlogy
Rajarshi Shahu Mahavidyalay
(Autonomous) Latur-413 53

PRINCIPAL
Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)

स्थापना - १९७०

Shiv Chhatrpati Shikshan Sanstha' s

Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)
Department of Biotechnology
Structured Work Plan for Teaching
Academic Year 2018-19 (Term-II)

Sr. No.	Class	Name of Ass. Prof.	Subject	Paper
2	**B.Sc. III Year** (Semester VI)	Udaybhanu P. Sirdeshmukh	Biotechnology	**Course Title: Agriculture biotechnology** **Course Code: U-AGB-730** **Course Title: Lab Course XXIV** **Course Code: P-LAC-736**

Name of Teacher: Sirdeshmukh U.P. **Class: B.Sc.BT. III (Sixth Semester)**

Course Title: Agriculture Biotechnology **Course Code: U-AGB-730**

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
	Agriculture Biotechnology	UNIT- I: Agriculture and its recent trends				
		Basics of agriculture, Methods of agriculture	4/12/2018	1	PPT presentation	1 assignments 01/01/2019
		Agricultural crops Need of agricultural management	05-07/12/2018	2	seminar	
		Plant pathology/diseases, Plant - pathogen interaction	10-11/12/2018	2	Video Lectures	
		Plant breeding – Concept and types	12-18/12/2018	4		
		Agricultural nanotechnology	19-25/12/2018	4		

		UNIT-II:				
		Biomass: Composition, Types, Biomass as a energy Source, Biomass conversion and Utilization.	26/12/2018 to 01/01/2019	4		
		Bioethanol production	02/01/2019	1		
		Mushroom cultivation	04-09/01/2019	4		
		-Biofertilizers: Concept and Types of Biofertilizer	11-14/01/2019	02		
		Microbial Inoculum - Rhizobium Inoculant, Azotobacter, and Phosphate Solubilizing Biofertilier	15-16/01/2019	02		
		Bio-pesticides- Definition and Types (Microbial and Botanical)	18-21/01/2019	02	PPT presentations	
		Advantages of Biopesticides over chemical pesticides.	22/01/2019	1	seminar	
		Single Cell Protein and its Nutritive Value eg. Spirulina	23/01/2019	1	Video lectures	
		Secondary metabolites and its applications	25-28/01/2019	2		1 assignments 25/01/2019
		UNIT- III:				
		Molecular markers - hybridization and PCR based markers	29-30/01/2019	2		
		RFLP, RAPD	01-05/02/2019	03	PPT presentations	1 assignments 8/02/2019

		STS, SSR	06-08/02/2019	02	seminar	
		AFLP, SNP markers	11-12/02/2019	02	Video Lectures	
		Development of population, RILs, BCILs, NIL, ILs	13-15/02/2019	02		
		DNA fingerprinting-principles and applications	18/02/2019	01		
		introduction to mapping of genes/QTLs	19-20/02/2019	2		
		Marker assisted selection (MAS)-strategies for Introducing genes of biotic and abiotic stress resistance in plants	22-25/02/2019	2		
		molecular diagnostics of pathogens in plants . -A Case study	26-27/02/2019	2		
		UNIT- IV: Plant Genetic engineering				
		Agrobacterium-plant interaction; virulence; Ti and Ri plasmids; opines and their significance; T-DNA transfer; disarmed Ti plasmid	01-05/03/2019	3		
		Genetic transformation - Agrobacterium-mediated gene delivery; co integrate and binary vectors and their utility	06-08/03/2019	2		
		direct gene transfer - PEG-mediated, electroporation, particle bombardment and	11-12/03/2019	2		

		alternative methods				
		screen able and selectable markers	13/03/2019	1		
		characterization of transgenics; chloroplast transformation	15-18/03/2019	2	PPT presentations	1-assignments 20/03/2019
		marker-free methodologies	19/03/2019	1	seminars	
		advanced methodologies - cisgenesis, intragenesis and genome editing	20/03/2019	1	Video lectures	
		molecular pharming - concept of plants as biofactories,	22-25/03/2019	2		
		production of industrial enzymes and pharmaceutically important compounds	26/03/2019	1		

Lab course XXIV (Agriculture biotechnology)
Course code: U-LAC-736

Sr. No.	Subject	Practicals	Date	No. of Practicals
	Agriculture biotechnology	1. Isolation of Rhizobium sp.from root nodule and application of rhizobium bio fertilizer for Leguminous crops.	20/12/2019	01
		2. Isolation of phosphate solubilizing bacteria from given soil sample and its application in the Field.		01
		3. Determination of Total Phosphorus, sulphur and nitrogen of soil.		01
		4. Study of stress response in plant		01
		5. Extraction and identification of plant secondary metabolites.	TO	01
		6. Preparation of bio extract for the detection of antimicrobial / anti pathogenic activity.		01
		7. Production of pearl oyster mushroom from agricultural residues.		01
		8 A study of percentage seed germination.		01
		9. Visit to Cell Culture Facilities /Production /Biofertilizer Industry.	30/03/2019	01

Date: 28/11/2018

Course Teacher **HoD** **Principal**

Head
Department of Biotechonlogy
Rajarshi Shahu Mahavidyalaya
(Autonomous) Latur-413 531

PRINCIPAL
Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)