

**YOGI VEMANA UNIVERSITY**

Vemanapuram, Kadapa – 516 005



Prof. P. Chandramati Shankar  
DEAN

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Mobile: +91-9703216196

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YVU/CDC/ B.Voc/ BOS /Chairman and Members

10<sup>th</sup> November 2020

To

The Chairman and Board Members,

**PROCEEDINGS OF THE VICE CHANCELLOR****(Present: Prof. M. Surya Kalavathi)**

Sub:- YVU -- CDC – Appoint of BOS Chairman and Members for B.Voc- Orders – Issued.

Ref: Vice- Chancellor orders dated 29-10-2020.

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**ORDER**

I am by direction of Hon'ble Vice- Chancellor appointing the following faculty/members from various departments of Yogi Vemana University and other institutions as Chairman and Members for Board of studies in Bachelor of Vocational degree course **Medical Lab Technology** for a period of two years from the date of the appointment.

S.No	Name	BOS Committee	College
1	Dr. P. Ramachandra Reddy ✓	Chairman	Department of Biochemistry
2	Dr. D. Vijaya Lakshmi	Member	Department of Micro Biology
3	Dr. S. P. Venkata Ramana ✓	Member	Department of Zoology
4	Dr. V. Ramakrishna ✓	Member	Department of Biotechnology & Bioinformatics
5	Dr. B. Spandana MD ✓	Member	Assistant Professor in Pathology RIMS, Kadapa
6	Dr. R. V. Jayanth Khasyp ✓	Member	Department of English
7	Mr. V. Jaya Swaroop ✓	Member	Yasoda Diagnostics Centre & Star Diagnostics Centre, Badvel

// BY ORDER//

*P. Chandramati*  
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College Development Council  
YOGI VEMANA UNIVERSITY  
KADAPA-516005

To

The Individuals concerned.

The Principals of concerned colleges of information and necessary action.

The Registrar, Yogi Vemana University, Kadapa

The Controller of Examinations for information.



# **Yogi Vemana University**

Vemanapuram, Kadapa District, A.P.

**Syllabus For**

**B. Voc. (Medical Lab Technology)**

**Under National Skill Qualification  
Framework (NSQF)**

**To be implemented from 2020-21**



**YOGI VEMANA UNIVERSITY::KADAPA**

**Faculty of Life Sciences**

**Under the CBCS scheme (ordinance 222)**

**Bachelor of Vocation Paramedical & Health Care (Medical Laboratory Technology)**

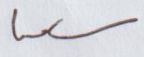
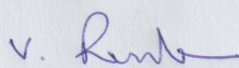
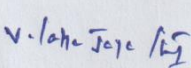
**B.Voc. Syllabus**

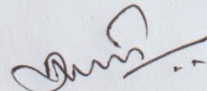
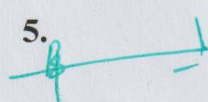
**Year I(Diploma)**

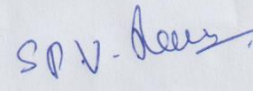
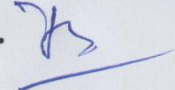
**Semester I**

Course Title	Unit	Title	Credits	Marks
Course I (General & Human Anatomy, Physiology-I)	I	Functional English	03	100
	II	Human Values and Professional Ethics		
	III	Basics of Human Anatomy-I		
	IV	Basics of Physiology –II		
Course II (Routine Laboratory Techniques-I)	I	Human Healthcare and Safety Regulations	03	100
	II	Introduction to Hematology and Routine Tests		
	III	Specimen Collection		
	IV	Laboratory Preparation in Hematology		
Course III (Bio molecules)	I	Structure, Functions and Classification of Carbohydrates	03	100
	II	Structure, Functions and Classification of Amino Acids and Proteins		
	III	Structure, Functions and Classification of Lipids		
	IV	Physical and Chemical Properties of Nucleic Acids		
Course IV (Microscopy and Cell Biology-I)	I	Microscopy	03	100
	II	Cell structure		
	III	Cell organelles		
	IV	Basics of cancer cell		
Course V (Fundamentals of Microbiology)	I	History and Scope of Microbiology	03	100
	II	Classification of Microorganisms		
	III	Morphology and Structure of Microorganisms		
	IV	Methods in Microbiology		
Course VI (Special Laboratory Techniques-I)	I	Elementary Knowledge of Chemistry-I	03	100
	II	Elementary Knowledge of Chemistry-II		
	III	Biochemical Test Profile-I		
	IV	Biochemical Test Profile-II		
Course VII		Practicals of Course I	02	100
Course VIII		Practicals of Course II	02	100
Course IX		Practicals of Course III	02	100
Course X		Practicals of Course IV	02	100
Course XI		Practicals of Course V	02	100
Course XII		Practicals of Course VI	02	100
Total Credits			30	

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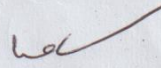
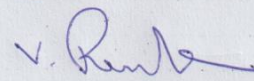
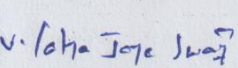


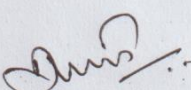
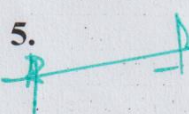
## Year 1 (Diploma)

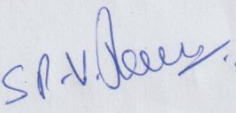
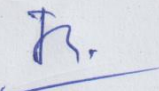
### Semester II

Course Title	Unit	Title	Credits	Marks
Course I (General & Human Anatomy, Physiology-II)	I	Communication Skills	03	100
	II	Basics of Computer Skills		
	III	Basics of Human Anatomy-II		
	IV	Basics of Physiology -II		
Course II (Routine Laboratory Techniques-II)	I	Urine Examination	03	100
	II	Routine Hematological Tests		
	III	Stool Examination		
	IV	Sputum and Semen Examination		
Course III (Special Laboratory Techniques-II)	I	Basic Microbiology	03	100
	II	Staining Techniques		
	III	Introduction to Serology		
	IV	Serological Tests		
Course IV (Biology and Ecology of animals)	I	Introduction to Invertebrates	03	100
	II	Vertebrates		
	III	Ecosystem		
	IV	Animal interactions		
Course V (Enzymology and Bioenergetics)	I	Enzymes	03	100
	II	Enzyme Purification Techniques		
	III	Enzyme Kinetics		
	IV	Bioenergetics		
Course VI (Microbial Physiology Metabolism)	I	Microbial Nutrition	03	100
	II	Cultivation, Isolation and Preservation		
	III	Microbial Metabolism -I		
	IV	Microbial Metabolism -II		
Course VII		Practicals of Course I	02	100
Course VIII		Practicals of Course II	02	100
Course IX		Practicals of Course III	02	100
Course X		Practicals of Course IV	02	100
Course XI		Practicals of Course V	02	100
Course XII		Internship/On Job Training (for Two months after end of the semester)	02	100
Total Credits			30	

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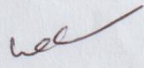
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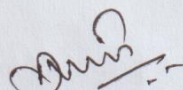


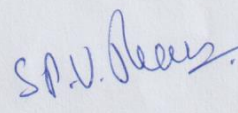
**YOGI VEMANA UNIVERSITY::KADAPA**  
**Faculty of Life Sciences**  
**Under the CBCS scheme (Ordinance 222)**  
**Bachelor of Vocation Paramedical & Health Care(Medical Lab Technology)**  
**B.Voc. Syllabus**  
**Semester I**  
**Part A: Skill Component**

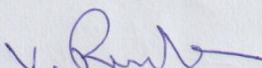
Course	Title	Credits	
	<b>General &amp; Human Anatomy, Physiology – I</b>		
	<b>Basic English</b>		
<b>Course I</b>	<b>Grammar</b>	03	
<b>Unit I</b>	Composition: Letter writing (formal and informal), Paragraph writing, Precise writing and essay writing. Conversational English: Role, play, dialogue writing, public speaking (oral skills).		
	<b>Human Values and Professional Ethics</b>		
<b>Unit II</b>	Importance of Human values: Happiness, competence, human aspiration, kindness, sense of sharing, respecting fellow men.		
	<b>Implications of Harmony on Professional Ethics</b>		
	Self discipline: personal integrity, professional dignity, honesty, work culture, institutional loyalty, team spirit, positive attitude. Importance of following rules – obedience.		
<b>Unit III</b>	<b>Basics of Human Anatomy – I</b>		
	Introduction to Anatomy: Body parts and areas terms of locations and positions, body cavities and their membranes, dorsal cavity, ventral cavity and planes and sections. Tissues types: Structure location and function of Epithelial tissue, Muscular tissue, Nervous tissue.		
	Musculoskeletal System: muscles and bones, Structure of bones, type of bones (Bones of cranium, face vertebral column, upper and lower limbs).		
	Circulatory System: Structure of heart, names and position of main blood vessels.		
	Lymphatic System: Lymph vessels, lymph nodes and lymphoid organs, their structure & functions.		
	Digestive System: Parts of gastrointestinal tract and associated glands(names)		
	Respiratory System: Parts of Respiratory System.(diagram, name, function)		

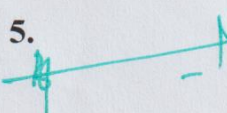
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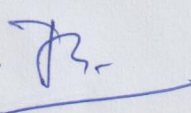
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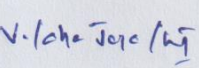
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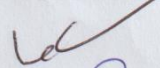
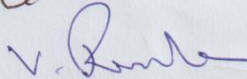
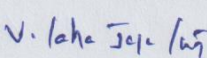
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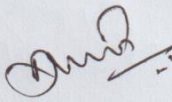

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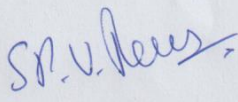
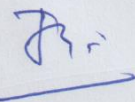


	Basics of Physiology-I		
Unit IV	Blood Composition, function, cellular components. Hemoglobin, anemia, blood groups, coagulation and body fluids. Cardiovascular System. Heart (Structure and functions), arteries, veins and capillaries. Circulation of blood, blood pressure. Function of heart and blood vessels. Control of heart rate, blood volume.(Diagram of heart and Functions in detail)		
	Respiratory system: Function of lungs (theory), pulmonary circulation, lung volume, gas transport between lung and tissue. Respiration disorders like anoxia, dyspnoea and obstructive airways.		
	Digestive Systems: Organs of GIT (structure and function, digestive secretions absorption and assimilation, gastrointestinal hormones, physiology of digestion. Structure and functions of liver, spleen, gallbladder and pancreas.		

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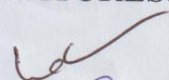
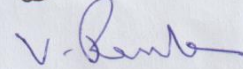
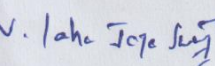
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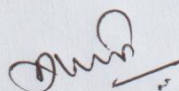

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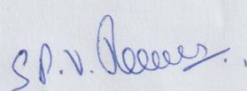
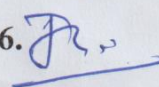


Course	Title	Credits	
Course II	Routine Laboratory Techniques-I	03	
Unit I	<b>Human Healthcare and Safety Regulations</b>		
	Basic causes of accidents, laboratory accidents, First and aid.		
	Human health and Homeostasis, medical care in India and developing countries, Importance of Biomedical Waste disposal, NABL and SOP		
	<b>Organization of Laboratory</b>		
	Clinical Laboratories: Functional components, hygiene, safety of WRT patients, reports, analysis. Communication: Between physicians-patients and laboratory professionals. Basic needs of technicians and awareness of soft skills.		
	<b>Basic Laboratory Equipments</b>		
	Identification, maintenance and care of common laboratory glassware and equipments, handling and usage. Principle and maintenance of Centrifuge, Colorimeter, Hot air oven, Incubator, Microscope, Neubauer chamber, Autoclave etc.		
	<b>Buffers and Automation</b>		
	Water as a biological solvent. Dissociation of water. Buffer solution. Henderson Hasselbalch equation. Semi-auto analyzers		
Unit II	<b>Introduction to Hematology and Routine tests</b>		
	Components of blood and their functions, Hematopoietic systems of the body.		
	<b>Hematological Diseases</b>		
	Anemia: Types of anemia, Thalassemia, Polycythemia, Leukemia, Hemolytic disease of new born, multiple myelomas, parasitic infections of blood.		
Unit III	<b>Specimen Collection</b>		
	Specimen collection for hematological laboratory studies		
Unit IV	<b>Laboratory Preparation in Hematology</b>		
	Cleaning and maintenance of Laboratory and glassware		

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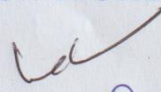
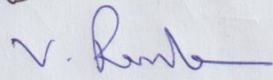
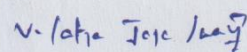
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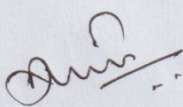

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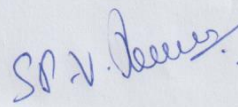



Course	Title	Credits	
Course III	Biomolecules	03	
Unit I	<b>Structure, Functions and Classification of Carbohydrates</b>		
	Carbohydrates: Definition, general feature, structure and classification. Derivatives of monosaccharides (glycosides, deoxysugars, amino sugars and other derivatives of biological importance); Oligosaccharides (maltose, lactose, sucrose, cellobiose, trehalose, raffinose). Sugars interaction with hydrazine, hydrogen cyanide, hydroxylamine; reduction and oxidation; periodic acid oxidation; action of alkali; acylation and methylation of sugars. Polysaccharides (amylase, amylopectin, starch, inulin, pectins, dextrins, glycogen, cellulose, chitin), GAGs in connective tissue and peptidoglycons in bacterial cell wall.		
Unit II	<b>Structure, Functions and Classification of Amino Acids and Proteins</b>		
	<b>Amino Acids:</b> Definition, general feature, structure and classification (s). Titration of amino acids. Peptide Bond: Definition, formation and peptide types. Chemical synthesis of polypeptides. Biologically active peptides. <b>Proteins:</b> Structure, general properties, classification and structural organization. Denaturation and renaturation, salting in and salting out. Forces stabilizing structure and shape of proteins. Diversity of proteins: fibrous proteins (keratins, collagen & elastin), globular proteins (hemoglobin, myoglobin) and conjugated proteins.		
Unit III	<b>Structure, Functions and classification of Lipids</b>		
	Fatty acids: Definition, general feature, structure and classification. Essential and non-essential fatty acids, Refractive index and their relation to molecular size, Properties of glycerol. Fats as source of energy and Waxes. Lipids: Definition, general feature, structure and classification. Tricylglycerols. Phospholipids: lecithins (Phosphatidylcholines), lysolecithins, cephalins (Phosphatidyl ethanolamines), Phosphatidylserines, phosphatidyl inositol, sphingomyelins, plasmalogens), cerebroside, gangliosides, sulfatides. Lipoproteins – Composition, classification and biological functions, Liposomes. Terpenes and Steroids –Biological significance of carotenes, phytol, Cholesterol and other animal sterols. Color reactions of sterols, Sterols of yeast and fungi (Mycosterols). Phytosterols, Steroidal hormones, Bile acids. Eicosanoids: Prostaglandins, Leukotrienes, Thromboxanes, Prostacyclins. Fat soluble vitamins.		

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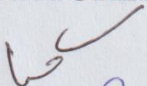
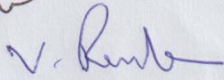
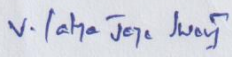
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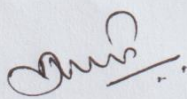
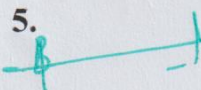
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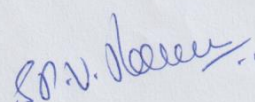
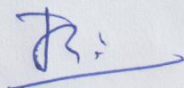


Unit IV	Physical and chemical properties of Nucleic Acids		
	<p>Nucleic Acids: Structure and properties of purines and pyrimidines, Nucleosides and nucleotides. Double helical structure of DNA and types of DNA. Denaturation of DNA. Types of RNA and its structure. Methods for isolation, purification and characterization of nucleic acids, Sequencing of polynucleotide's.</p> <p>Porphyrins: Ring and classification of porphyrins, Heme and other metalloporphyrins occurring in nature, Detection of Porphyrins spectrophotometrically and by fluorescence. Chemical nature and physiological significance of bile pigments.</p>		

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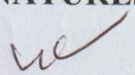
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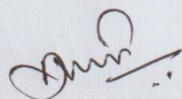
Course	Title	Credits	
Course IV	Microscopy and Cell Biology	03	
Unit I	Microscopy		
	Microscopy: Definition, principles, components, types and applications. Specimen preparation, staining and fixation.		
Unit II	Cell Structure		
	Structure and organization of Cell: Extra nuclear and nuclear. Types of cells (prokaryotic and eukaryotic); Plasma membrane: Structure, Osmosis, active and passive transport, endocytosis and exocytosis		
Unit III	Cell Organelles		
	Structure, types and functions of endoplasmic reticulum, mitochondria, Golgi Complex, Ribosomes, Lysosomes, Centrosomes. Nucleus: Structure and function of nuclear membrane, nucleolus and chromosomes. An elementary idea of cell transformation in Cancer. An elementary idea of cellular basis of immunity		
Unit IV	Basics of Cancer Cell		
	Cancer: Definition, Signs and Symptoms, causes, risk factors, types of cancers, carcinogens, metastasis, cell cycle and check points.		

#### SIGNATURES:

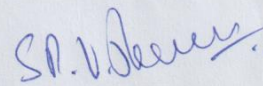
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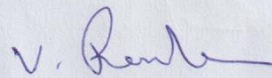
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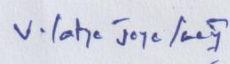
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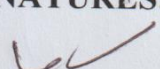
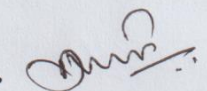
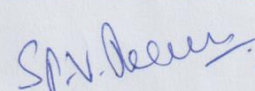
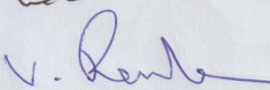

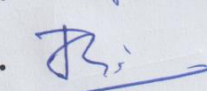
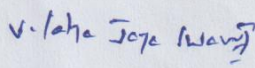
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Course	Title	Credits	
Course V	Fundamentals of Microbiology	03	
Unit I	History and Scope of Microbiology		
	History, scope and applications of Microbiology, Methods of Microbiology isolation of pure cultures, theory and practice of sterilization, Microscopic examination of micro-organism, Staining microbes (Simple, differential and selective staining). Nature of Microbial World: Prokaryotes and eukaryotes, growth pattern in microbes.		
Unit II	Classification of Microorganisms		
	Systemic position of Microorganisms: Taxonomy, nomenclature and classification (Five kingdom, Carl-Woes) taxonomic ranks, major characteristic features used for morphological, physiological, ecological, genetic and molecular basis for classification of bacteria, fungi and viruses		
Unit III	Morphology and structure of Microorganisms		
	Morphology & fine structure of bacteria, fungi, actinomycetes and algae; Organization of cell wall, cell membrane, flagella and capsules in bacteria. Formation of spores Animal Viruses: Morphology, cultivation and viral disease cycle. Bacteriophages: Morphology, multiplication, detection and enumeration.		
Unit IV	Methods in Microbiology		
	Physical (heat, radiation, pH, pressure, filters) and chemical (alcohol, acetone, acids, antibiotics, antiseptics, etc) approaches for sterilization and disinfection. Types of media: Natural and synthetic (Basal, complex, differential, selective and transport) Pure culture techniques: Enrichment, dilution plate, streak plate, spread plate, pour plate. Continuous and Batch cultures.		

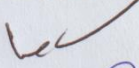
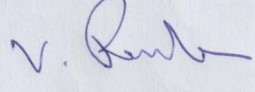
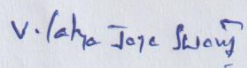
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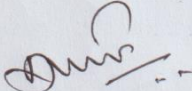

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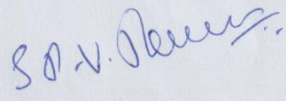
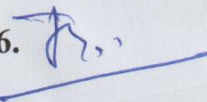


Course	Title	Credits	
Course VI	Special Laboratory Techniques –I	03	
Unit I	Elementary Knowledge of Chemistry – I		
	Inorganic Chemistry		
	Structure of atom, atomic weight, molecular and equivalent weight, Acids, bases and salts, pH indicators (pH meter, pH paper, universal indicator), Molar solutions, normal solutions, buffer solutions, percent solutions, saturated solutions, standard solutions.		
	Organic Chemistry		
	Organic compounds, aliphatic, aromatic, alcohol, ethers, phenols, acids etc		
Unit II	Elementary Knowledge of Chemistry-II		
	Physical Chemistry		
	Osmosis, osmotic pressure, diffusion, hypotonic, hypertonic and isotonic solutions.		
	Definition and classification of some colloids and crystalloids.		
	Analytical Chemistry		
Unit III	Principles, instrumentation, working, uses, care, maintenance of balances, monopan, twopan, toppan, centrifuges, pH meter, colorimeter, spectrophotometer, fluorimeter, flame photometer, ion selective electrodes, urinometer, chromatography instruments, electrophoresis units and densitometer.		
	Biochemical Test Profile-I		
	Quantities determination of blood, plasma and serum: Acid Phosphatase(ACP), Alkaline Phosphatase(ALP), Amino acids, Bilirubin, Cholesterol, Creatinine, Creatine phosphokinase(CPK), SGOT, SGPT, Uric Acid, Urea, TSH		
Unit IV	Quantitative determination of Urine: Amylase, Calcium, Chlorides, Creatinine, Sodium, Potassium, Glucose, Proteins, Urea nitrogen, uric acid		
	Biochemical Test Profile –II		
	Quantitative determination of CSF: Chlorides, Glucose, Proteins		
	Sterilization Techniques: Definition & Methods, principles, bacteriological filtration, irradiation, tyndalization		

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# YOGI VEMANA UNIVERSITY::KADAPA

Faculty of Life Sciences

Under the CBCS scheme (Ordinance 222)

Bachelor of Vocation Paramedical & Health Care (Medical Lab Technology)

B.Voc. Syllabus

Year I (Dipoloma)

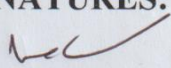
Practicals for Semester I

Part A: Skill Component

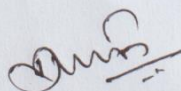
Sr. No	Experiment	Credits	
Course VII	(General & Human Anatomy, Physiology -1)	02	
1	Course of Epithelial, Muscle, Nerve and mammalian blood cells through permanent or temporary cells		
2	Study of the skeletal system of human beings		
3	To study human respiratory system		
4	To study human circulatory system		
5	To study human digestive system		
6	To study the compound microscope and parts		
7	To separate the plasma and serum from given blood sample		
8	<p>To visit the following places, meet people visiting/living/working in that environment, understand their life style, understand value of human life in each environment and share with them the aspects of their joys and sorrows</p> <ol style="list-style-type: none"><li>1. Charitable and Government Hospitals</li><li>2. Orphanages</li><li>3. Old age homes</li><li>4. Training institution for handicapped</li><li>5. Drug De-Addiction centers</li><li>6. Schools in rural areas</li><li>7. Industries</li><li>8. Slums</li><li>9. Jails</li></ol> <p>(The students shall prepare their project note books during each visit mentioning their experience about life of the people to whom they visited)</p>		

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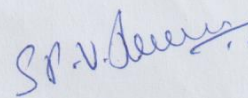
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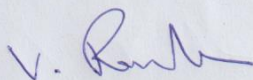
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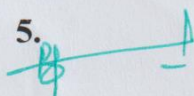
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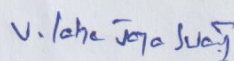
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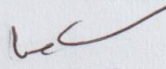
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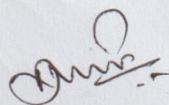


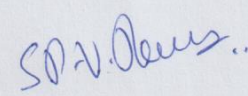


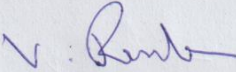
Course VIII	Routine Laboratory Technology-I	02	
1	To identify and to study applications of the different laboratory instruments a. Hot air oven b. Centrifuge c. Autoclave d. Burettes & Pipettes e. Colorimeter f. Neubauer's Chamber ,		
2	Determination of hemoglobin concentration by Sahil's method		
3	Determination of hemoglobin concentration by Cyanmeth method		
4	Determination of total erythrocyte (RBC) count		
5	Determination of leukocyte (WBC) count		
6	Determination of packed cell volume (PCV)		
7	Determination of erythrocyte sedimentation rate (ESR)		
8	Determination and calculation of red blood indices MCH, MCH, MCHC		
9	Study of differential leukocyte count by Leishman stain		
10	Determination of absolute Eosinophil count		
11	Determination of platelet count		
Course IX	Biomolecules	02	
1.	Qualitative tests for: (a) Carbohydrates (b) Amino acids and proteins, (c) Cholesterol and lipids.		
2.	Determination of saponification value of fats.		
3.	Determination of Iodine number of fats.		
4.	Estimation of ascorbic acids by Dichlorophenol Indophenol method.		
5.	Titration curve for amino acids and determination of pKA value.		
6	Verification of Beer-Lambert law for nitrophenol or cobalt chloride.		
7.	Estimation of amino acids by ninhydrin method.		
8.	Estimation of Protein by Biuret method.		
9.	Estimation of Carbohydrate by Anthrone method.		

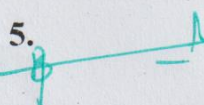
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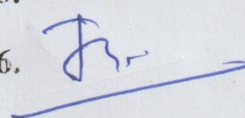
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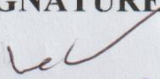
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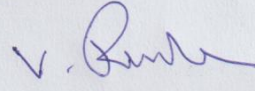
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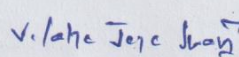


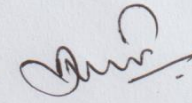
Course X	Microscopy and Cell Biology	02	
1	<p>Classification up to orders, ecological notes and economic importance, some of the following:</p> <p>Protozoa:</p> <ol style="list-style-type: none"> <li>Examination of cultures of Euglena and Paramecium.</li> <li>Slides: Amoeba, Trypanosoma, Monocystis,</li> <li>Porifera: Sycon, Grantia, Euplectella, Hyalonema, Spongilla, Euspongia</li> <li>Cnidaria (Coelenterata): Porpita, Velella, Physalia, Aurelia, Rhizostoma, Metridium, Millipora, Alcyonium, Hydra (W.M) Hydra with buds. Obelia (Colony and medusa), Sertularia, Plumularia.</li> <li>Platyhelminthes: Dugesia, Fasciola, Taenia, Miracidium, sporocyst, Redia, Cercaria of Fasciola, Scolelex, Nottia, Taenia</li> <li>Nematelminthes: Ascaris. Wuchereria</li> <li>Annelida: Earth Worm, Leech</li> <li>Arthropoda: Peripatus, Prawn, Lobster, Cancer (Crab), Sacculina, Eupagurus (Hermit Crab), Lepas, Balanus, Apis, Lepisma (Silver Fish), Schistocerca (Locust), Poecilotheria, (A.K Grasshopper, Gryllus (cricket), mantis (Praying mantis), scarabaeus (Dung beetle), Aeschna (Dragon fly) Odontaspis</li> <li>Mollusca: Anodonta, Mytilus, Ostrea, Cardium, Pecten, Solen. (Razorfish) Pecten, Haliotis, Patella, Aplysia, Dori,</li> <li>Echinodermata: Scaphinotus, Ophiura, Anemonia, Echinodermata, Alanossus</li> </ol>		
2	<p>CELL BIOLOGY</p> <p>Paper chromatography</p> <p>Gel electrophoresis through photographs or through research laboratories</p> <p>Familiarity with TEM &amp; SEM.</p> <p>Study of different ultra structures of cell organelle through photographs.</p>		


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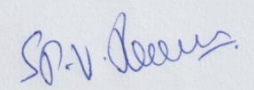
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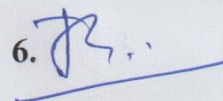
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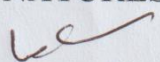
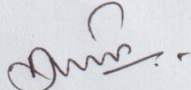
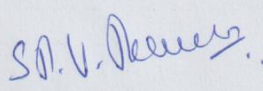
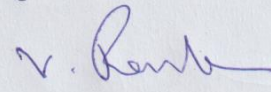
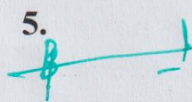
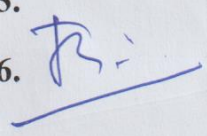
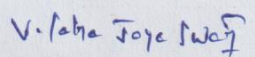
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Course XI	Fundamentals of Microbiology	02	
1.	Use of microscope in examination of unstained bacteria, fungi, algae, parasites and stained cell preparations including simple staining, Gram's staining, acid fast staining, capsule staining using prokaryotic and eukaryotic cells, hanging drop preparation.		
2.	Preparations of culture media, spread plates, pour plates, selective media, and differential media.		
3.	Separation of pure cultures and study the effect of selective nutrients on prokaryotes.		
4.	Isolation of Soil Bacteria, Soil Fungi, Soil Actinomycetes.		
5	Sterilization methods: a. Autoclave b. Hot air oven c. Filtration d. Radiation e. Fumigation f. Laminar air flow g. Antibiotic sensitivity test h. Phenol coefficient test		
Course XII	Special Laboratory Techniques-I	02	
1	Working Principles of laboratory instruments		
2	Importance and methods of cleaning of glass apparatus		
3	Calibration of apparatus		
4	Preparation and standardization of volumetric solutions		
5	Basic titration such as acid vs alkali, silver nitrate vs sodium chloride		
6	Preparation of buffer solution and measurement of their pH		
7	Verification of Beer Lambert's Law		
8	Determination of blood sugar level of plasma (or serum) a. Orthotoluidine method, b. Glucose oxidase method		
9	Determination of the serum urea nitrogen a. Diacetyl monoxime method		
10	Determination of serum creatinine: Alkaline picrate method		
11	Determination of serum total cholesterol		
12	Determination of serum bilirubin a. Malloy and Evelyn b. DMSO method		
13	Determination of serum glutamate pyruvate transaminase (SGPT) and serum glutamate Oxaloacetate transaminase (SGOT) End point reaction		
14	Sterilization Techniques		

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# YOGI VEMANA UNIVERSITY::KADAPA

Faculty of Life Sciences

Under the CBCS scheme (Ordinance 222)

Bachelor of Vocation Paramedical & Health Care (Medical Lab Technology)

B.Voc. Syllabus

Year I (Dipoloma)

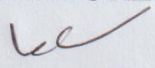
Semester II

Part A: Skill Component

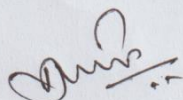
Course code	Title	Credits	
Course I	General & Human Anatomy, Physiology -II	03	
Unit - I	<b>Communication skills</b>		
	Essentials of written communication		
	a. CV/resume preparation		
	b. E-mail writing		
	c. Report writing		
	d. Agenda and minutes preparation		
	e. Preparing notices/circular (General)		
Unit - II	<b>Basics of Computer Skills</b>		
	Introduction to computer: Introduction, Internal and external input/output devices. Concepts of hardware and software. Concepts of operating systems. Data, information properties, Types information computing flies, internet, server.		
	<b>MS WORD, EXCEL, POWER POINT:</b> Usage and applications		
Unit - III	<b>Basics of Human Anatomy-II</b>		
	Endocrine System: Various endocrine glands, Thyroid parathyroid, Adrenal glands, pituitary and pancreas. Thymus and sex glands (Function & clinical significance)		
	Reproductive System: Structure and function male and female systems.		
	Nervous System: Parts of brain, spinal card, peripheral nervous system (function)		
Unit - IV	<b>Basics of Human Physiology-II</b>		
	Excretory System: Parts of Urinary system, Structure & function of kidney and urinary bladder. Mechanism of urine formation, Disorders of kidney.		
	Menstrual cycle, oogenesis, and spermatogenesis		
	Nervous System: Neurons & its functions.		

**SIGNATURES:**

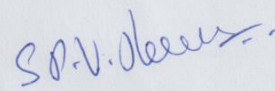
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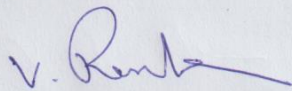
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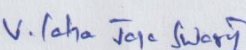
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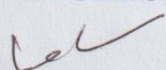
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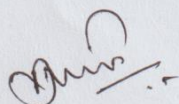


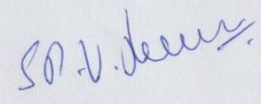


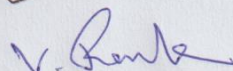
Course code	Title	Credits	
Course II	Routine laboratory technology-II	03	
UNIT - I	<b>Urine Examination</b> Urine analysis, routine examination of urine, rapid chemical tests of urine. Clinical significance, specimen collection, laboratory investigations.		
UNIT - II	<b>Routine Hematological Tests</b> Determination of hemoglobin concentration, determination of hematocrit, enumeration of formed elements, calculations of red blood cell indices - MCV, MCH and MCHC, Automated systems in hematology, study of blood smear, reticulocyte count, erythrocyte sedimentation rate (ESR), eosinophil count, and platelet count.		
UNIT - III	<b>Stool Examination</b> Gross examination, physical examination of stool, determination of pH, chemical examination of feces, microscopic examination of stool specimen. Clinical significance, specimen collection, laboratory investigations.		
UNIT - IV	<b>Semen Examination</b> Semen analysis: Routine examination of semen, quantitative determination of semen fructose, interpretation of results, Sperm count, motility, viability, HOS test. <b>Sputum Examination:</b> Indication, collection, transport, preservation for different types of sputum analysis. Physical, chemical and microscopic examination of sputum and its significance.		

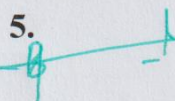
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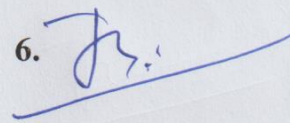
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7. V. Laha Jyoti Saha



Course Code	Title	Credits	
Course III	Special laboratory technology-II	03	
Unit-I	Basic Microbiology		
	Morphology, physiology and classification of bacteria, anatomy of bacterial cell, and growth requirement of bacteria, growth curve. Gram positive & Gram negative Bacteria. Virus (definition, properties & examples) Normal flora of human body.		
UNIT-II	Staining Techniques		
	Simple, Gram's staining, Capsular staining, flagella staining, spores staining and lactophenol cotton blue staining. Sputum test for AFB		
UNIT-III	Introduction of serology		
	Antigens, antibodies, structure and classes of antibodies, monoclonal antibodies and its uses. Collection and preparation of serum.		
UNIT-IV	Serological tests		
	Serological test for syphilis (STS), agglutination, c-reactive protein test (CRP), Rheumatoid arthritis test (RA), Serodiagnosis of streptococcal infection (ASO Test), HBsAg, HIV-I (rapid triDot test), Widal test, tuberculin test.		

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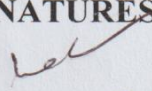
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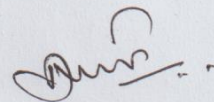
Course code	Title	Credits	
Course - IV	<b>BIOLOGY AND ECOLOGY OF ANIMALS</b>	<b>03</b>	
<b>UNIT-I</b>	<b>Introduction to invertebrates</b>		
	Systematic study of Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematihelminthes, Annelida, Arthropoda, Molusca, and Echinodemata with special reference to pathogens.		
<b>UNIT -II</b>	<b>Vertebrates</b>		
	Introduction and systematic study of the Pieces, Amphibians, Reptiles, Aves and Mammals with special reference to infectious diseases.		
<b>UNIT-III</b>	<b>Ecosystem</b>		
	Ecology: Scope and subdivisions of ecology. Ecosystem: Components, ecological energy, food web. Ecological factors -Temperature, light and soil Biogeochemical cycles & concepts of limiting factors. Ecological adaptations of animals in different habitats. Population : Characteristics and regulation of population		
<b>UNIT-IV</b>	<b>Animal interactions</b>		
	Animal interactions: Types, inter-specific competition, herbivory, carnivory, symbiosis. Community Ecology: Nature of communities. Inter and intra Competition, antagonism, predatism, parasitism, commensalism, mutualism and specific relationships.		

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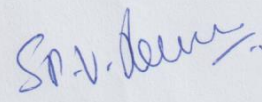
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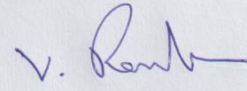
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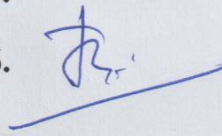
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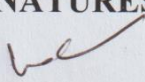
V. Lakshmi Sree Swamy



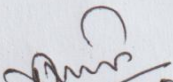
Course code	Title	credits	
Course –V	ENZYMOLGY AND BIOENERGETICS	03	
UNIT-I	<b>Enzymes</b>		
	Introduction to enzymes. General characteristics of enzymes. Prosthetic group. Holoenzymes, apoenzyme and cofactors, Coenzymes and their biochemical functions, assay of enzyme activity, units of enzyme activity. Active site of enzymes. IUB system of nomenclature and classification. Theories of enzyme catalysis: Proximity and orientation effects, acid base catalysis, covalent catalysis. Role of metals in enzyme catalysis.		
UNIT-II	<b>Enzyme Purification techniques</b>		
	Enzyme Purification: isolation and purification, Preliminary fractionation, precipitation techniques. Chromatography methods: Gel filtration adsorption, ion exchange and affinity chromatography Types of support materials. Selection of appropriate conditions and elution procedures. Criteria of enzyme purity.		
UNIT-III	<b>Enzyme Kinetics</b>		
	Enzyme Kinetics: Factors affecting enzymatic reactions, substrate concentration, pH and temperature. Michaelis-Menten equation. Determination of Km value and its significance. Enzyme inhibition: Types of inhibition, Allosteric enzymes and enzyme regulation. Isoenzymes and their clinical significance.		
UNIT-IV	<b>Bioenergetics</b>		
	Concept of free energy, Endothermic and exothermic reactions, role of ATP & other high energy compounds. Biological oxidations. Enzymology of oxido-reduction reactions, Electron transport chain and oxidative phosphorylation.		

#### SIGNATURES:

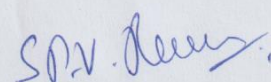
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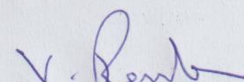
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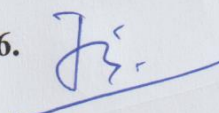
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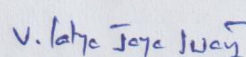
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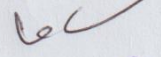
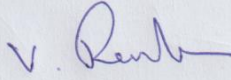
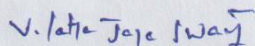
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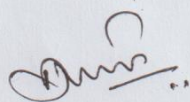



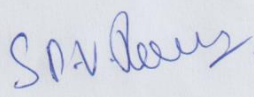
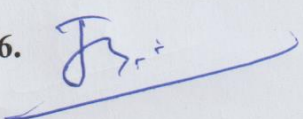


Course code	Title	credits	
Course VI	<b>MICROBIAL PHYSIOLOGY AND METABOLISM</b>	03	
<b>UNIT - I</b>	<b>Microbial Nutrition</b>		
	Classification of microorganisms based on carbon, energy and electron sources. Major and minor nutritional elements and other growth factors. Chemotrophs: Acetogens, methanogens. Phototrophs: Bacterial photosynthetic pigments systems Modes of CO <sub>2</sub> fixation. Hallobacterial photosynthesis and anaplerotic reactions.		
<b>UNIT - II</b>	<b>Cultivation, Isolation and Preservation</b>		
	Microbial growth: growth in population, growth curve, mathematical expression growth, measurement of growth. Factors effecting bacterial growth, continuous culture and synchronous culture		
<b>UNIT -III</b>	<b>Microbial Metabolism -I</b>		
	Microbial Metabolism: Respiration and fermentation, glycolysis, Pentose Phosphate pathway, The Enter Doudoroff pathway. Tricarboxylic acid Cycle, Glyoxylate cycle. Catabolism of lipid and Proteins. Beta oxidation. Uncouplers and inhibitors		
<b>UNIT -IV</b>	<b>Microbial Metabolism-II</b>		
	Energy & Biosynthesis: Transport of nutrient by bacteria. Biochemical Mechanisms of ATP synthesis. Biosynthesis of Amino Acids, Carbohydrates and nucleotides		

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**YOGI VEMANA UNIVERSITY::KADAPA**

**Faculty of Life Science**

**Under the CBCS scheme(Ordinance 222)**

**Bachelor of Vocation Paramedical & Health Care (Medical Laboratory Technology)**

**B.Voc Syllabus**

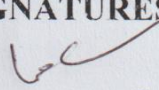
**Practical's for Semester II**

**Part A: Skill Component**

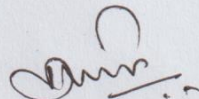
Sr.no	Experiment	Credits	
<b>Course VII</b>	<b>GENERAL AND HUMAN ANATOMY AND PHYSIOLOGY-II</b>	<b>02</b>	
1	To study human urinary system.		
2	To study human reproductive system.		
3	To study human nervous system.		
4	To measure the blood pressure of human being.		
5	To measure the body weight and height and calculate BMI of a human (body mass index).		
6	Introduction to the MS-word.		
7	Introduction to the MS-excel and Power Point		
8	Introduction to the internet.		
<b>Course VIII</b>	<b>ROUTINE LABORATORY TECHNOLOGY-II</b>	<b>02</b>	
1	To prepare of the 0.1N HCl.		
2	To prepare the different concentration of solutions.		
3	To prepare different bulbs required in the laboratory.		
4	To determine the nature of the given solution.		
5	To find out the normality of given solution.		
6	Routine examination of urine physical examination of urine.		
7	Determination of specific gravity of urine by urinometer and refracto meter.		
8	Chemical examination of urine.		
9	Microscopic examination of urine.		
10	Physical and chemical examination of semen.		
11	Microscopic examination of semen.		
12	HOS test for sperm coiling		
13	Physical examination of stool.		
14	Chemical examination of stool.		
15	Microscopic examination of stool.		
16	Determination of reducing substances in stool.		
17	Routine examination of sputum.		

**SIGNATURES:**

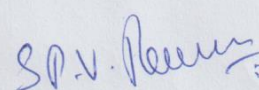
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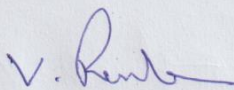
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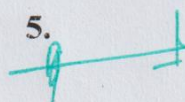
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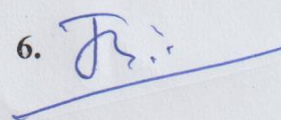
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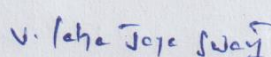
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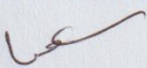
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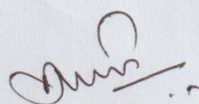


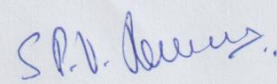


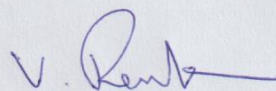
<b>Course IX</b>	<b>SPECIAL LABORATORY TECHNOLOGY-II</b>	<b>02</b>	
<b>1</b>	Preparation of smear		
<b>2</b>	Monochrome staining (simple staining)		
<b>3</b>	Gram's staining		
<b>4</b>	Study of motility of bacteria by hanging drop method		
<b>5</b>	Study of capsular staining		
<b>6</b>	Study of acid fast bacilli staining		
<b>7</b>	Study of material parasite		
<b>8</b>	Isolation of bacteria by streak plate techniques		
<b>9</b>	To perform qualitative Widal test		
	<b>(On Job Training)</b>		

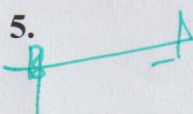
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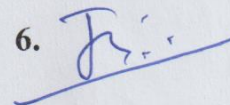
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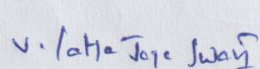
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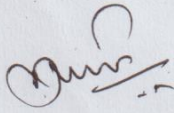

Course code	Title	Credits	
<b>Course X</b>	<b>ENYMOLOGY AND BIOENERGETICS</b>	<b>02</b>	
1.	Assay of serum alkaline phosphatase activity.		
2.	Effect of pH on enzyme activity.		
3.	Effect of temperature on enzyme activity.		
4.	Effect of substrate concentration on enzyme activity.		
5.	Inhibition of alkaline phosphatase by EDTA.		

Course code	Title	Credits	
<b>Course XI</b>	<b>MICROBIAL PHYSIOLOGY AND METABOLISM</b>	<b>02</b>	
1.	Measurement of Soil Enzymes		
2.	Sterilization of germs by UV light.		
3.	The replica plating technique.		
4.	Presumptive, confirmed and completed tests for safety of water supplies.		
5.	Relation of free oxygen to microbial growth, monitoring of dissolved oxygen in various effluents.		
6.	Determination of COD in Industrial effluents.		
7.			
8.	Effects of anti-metals on microbial culture (Inhibition by Sulfanilamide)		
9.	Determination of water activity of various substrates and assay of surface active agents.		
10.	Turbidmetric / spectrophotometric monitoring of growth using liquid cultures. Efficiency of photosynthesis in photoautotroph's.		

Course code	Title	Credits	
<b>Course XII</b>	<b>INTERUNSHIP/ONJOB TRAINING</b>	<b>02</b>	
	Two months training at the end of the semester		

#### SIGNATURES:

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4. V. Renu  
7. V. Lakshmi Jeyaraj

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3. S.V. Renu  
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