

STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA

TEACHING AND EVALUATION SCHEME FOR 3rd Semester (Branch Name)(wef 2019-20)

Subject Number	Subject Code	Subject	Periods/week			Evaluation Scheme			
			L	T	P	Internal Assessment/ Sessional	End Sem Exams	Exams (Hours)	Total
Theory									
Th.1		BIOLOGY	4		-	20	80	3	100
Th.2		HOSPITAL & CLINICAL PHARMACY –I	4		-	20	80	3	100
Th.3		PATHOLOGY-I	4		-	20	80	3	100
Th.4		BIOMEDICAL INSTRUMENTATION	4			20	80	3	100
Th.5		Environmental studies	4			20	80	3	100
		<i>Total</i>	20			100	400	-	500
Practical									
Pr.1		BIOLOGY LAB	-	-	6	50	50		100
Pr.2		HOSPITAL & CLINICAL PHARMACY –I LAB	-	-	4	25	50		75
Pr.3		PATHOLOGY-I LAB	-	-	6	25	50		75
		Student Centered Activities(SCA)			3	-	-		-
		<i>Total</i>	-	-	19	100	150	-	250
		Grand Total	20	-	19	200	550	-	750

Abbreviations: L-Lecturer, T-Tutorial, P-Practical . Each class is of minimum 55 minutes duration

Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50% and in Aggregate is 40%

SCA shall comprise of Extension Lectures/ Personality Development/ Environmental issues /Quiz /Hobbies/ Field visits/ cultural activities/Library studies/Classes on MOOCs/SWAYAM etc. ,Seminar and SCA shall be conducted in a section.

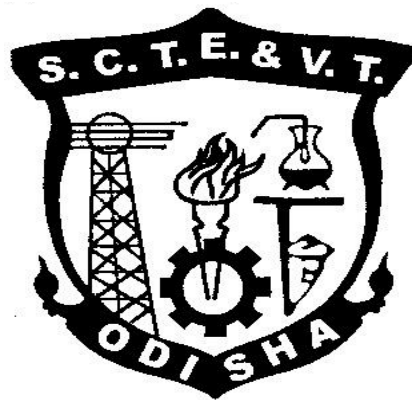
There shall be 1 Internal Assessment done for each of the Theory Subject. Sessional Marks shall be total of the performance of individual different jobs/ experiments in a subject throughout the semester

CURRICULLUM OF 3RD SEMESTER

For

DIPLOMA IN MEDICAL LAB TECHNOLOGY

(Effective FROM 2019-20 Sessions)



**STATE COUNCIL FOR TECHNICAL
EDUCATION & VOCATIONAL TRAINING,
ODISHA, BHUBANESWAR**

Th-1 BIOLOGY

Name of the Course: MLT			
Course code:		Semester	3 rd
Total Period:	60	Examination :	3 hrs
Theory periods:	4P / week	Internal Assessment:	20
Maximum marks:	100	End Semester Examination ::	80

A. RATIONALE:

The subject Biology is a compulsory paper for MLT. This subject includes Living world, Morphology of Flowering plants, Body fluids and circulation, Digestion and Absorption, Breathing and respiration, Excretory products and their elimination, Neural control and coordination, Chemical coordination and regulation, Human reproduction, Plants and mineral nutrition, Photosynthesis, Plant respiration, Plant growth and development, Cell and Tissues etc .

B. OBJECTIVE:

On completion of study of Biology, the students will be able to:

1. Have an enhanced knowledge and appreciation of the physiology of organisms;
2. Be able to develop cogent and critical arguments based on the course material;
3. Be able to perform, analyze and report on experiments and observations in physiology;
4. Be able to integrate related topics from separate parts of the course.

C: Topic wise distribution of periods:

S.L. No.	Topics	
1	Living world	2
2	Morphology of Flowering plants.	2
3	Body fluids and circulation	6
4	Digestion and Absorption	4
5	Breathing and respiration	4
6	Excretory products and their elimination	4
7	Neural control and coordination	8
8	Chemical coordination and regulation	5
9	Human reproduction	8
10	Plants and mineral nutrition	4
11	Photosynthesis	2
12	Plant respiration	2
13	Plant growth and development	2
14	Cell - The unit of life	3
15	Tissues	4
	Total	60

D: COURSE CONTENTS

1. Living world:

- 1.1 Definition and characters of living organisms
- 1.2 Diversity in the living world
- 1.3 Binomial nomenclature
- 1.4 Five kingdoms of life and basis of classification. Salient features of Monera, Protista, Fungi, Animalia and Plantae, Virus.

2. Morphology of Flowering plants

- 2.1 Morphology of different parts of flowering plants – Root, stem, inflorescence, flower, leaf, fruit, seed.
- 2.2 General Anatomy of Root, stem, leaf of monocotyledons & Dicotylidones.

3. Body fluids and circulation

- 3.1 Composition of blood, blood groups, coagulation of blood

- 3.2 Composition and functions of lymph
- 3.3 Human circulatory system
- 3.4 Structure of human heart and blood vessels
- 3.5 Cardiac cycle, cardiac output and ECG
- 3.6 Extra cellular fluid and intra cellular fluid.

4. Digestion and Absorption

- 4.1 Human alimentary canal and digestive glands
- 4.2 Role of digestive enzymes
- 4.3 Digestion, absorption and assimilation of digested food

5. Breathing and respiration

- 5.1 Human respiratory system
- 5.2 Mechanism of breathing and its regulation
- 5.3 Exchange of gases, transport of gases and regulation of respiration
- 5.4 Respiratory volumes

6. Excretory products and their elimination

- 6.1 Modes of excretion
- 6.2 Human excretory system- structure and function
- 6.3 Urine formation
- 6.4 Rennin angiotensin system

7. Neural control and coordination

- 7.1 Definition and classification of nervous system
- 7.2 Structure of a neuron
- 7.3 Generation and conduction of nerve impulse
- 7.4 Structure of brain and spinal cord
- 7.5 Functions of cerebrum, cerebellum, hypothalamus and medulla oblongata
- 7.6 Brief knowledge about Brain stain

8. Chemical coordination and regulation

- 8.1 Endocrine glands and their secretions
- 8.2 Functions of hormones secreted by endocrine glands

9. Human reproduction

- 9.1 Parts of female reproductive system
- 9.2 Parts of male reproductive system
- 9.3 Spermatogenesis and Oogenesis
- 9.4 Menstrual cycle
- 9.5 Fertilization and its process.

10. Plants and mineral nutrition:

- 10.1 Essential mineral, macro and micronutrients
- 10.2 Nitrogen metabolism, Nitrogen cycle, biological nitrogen fixation,

11. Photosynthesis

Autotrophic nutrition, photosynthesis, Photosynthetic pigments, Factors affecting photosynthesis.

12. **Plant respiration:** Respiration, glycolysis, fermentation (anaerobic).

13. Plant growth and development

Phases and rate of plant growth, Condition of growth, Introduction to plant growth Regulators and growth hormone.

14. Cell - The unit of life

Structure and functions of cell and cell organelles. Cell division

15. Tissues

Definition, types of tissues, location and functions.

Reference Books

- a. A Text book of Biology by B.V. Sreenivasa Naidu
- b.
- c. Botany for Degree students By A.C.Dutta.
- d. Outlines of Zoology by M. Ekambaranatha ayyer and T. N. Ananthakrishnan.
- e. A manual for pharmaceutical biology practical by S.B. Gokhale and C. K. Kokate

Syllabus to be covered up to I.A.

Chapter: 1,2,3 and 4

Learning Resources:			
Sl.No	Title of the Book	Name of Authors	Name of Publisher
1.	Text book of Biology	S. B. Gokhale	Nirali Prakashan
2.	A Text book of Biology	Dr. Thulajappa and Dr. Seetaram.	Expert Educational Publishers
3.	A Text book of Biology	Naidu and Murthy	Birla

Th-2 HOSPITAL & CLINICAL PHARMACY –I

Name of the Course: MLT			
Course code:		Semester	3 rd
Total Period:	60	Examination :	3 hrs
Theory periods:	4P / week	Internal Assessment:	20
Maximum marks:	100	End Semester Examination ::	80

A. RATIONALE:

The subject HOSPITAL & CLINICAL PHARMACY –I is a compulsory paper for MLT. This subject includes Hospital, Hospital Pharmacy, Drug Distribution system in Hospitals, Introduction to Clinical pharmacy practice, Modern dispensing aspects, Common daily terminology used in the practice of Medicine, Disease, manifestation and patho-physiology.

B: OBJECTIVES:

The primary mission of hospital pharmacy is to manage the use of medications in hospitals and other medical centers. Goals include the selection, prescription, procurement, delivery, administration and review of medications to optimize patient outcomes.

C: Topic wise distribution of periods:

S.L. No.	Topics	Periods
1	Hospital	5
2	Hospital Pharmacy	10
3	Drug Distribution system in Hospitals	8
4	Introduction to Clinical pharmacy practice	5
5	Modern dispensing aspects	12
6	Common daily terminology used in the practice of Medicine.	5
7	Disease, manifestation and patho-physiology	15
	Total	60

Hospital Pharmacy:

1. Hospital-

Definition, Function, classifications based on various criteria, organization, Management and health delivery system in India.

2. Hospital Pharmacy:

Definition Functions and objectives of Hospital pharmaceutical services. Location, Layout, Flow chart of materials and men. Personnel and facilities requirements including equipments based on individual and basic needs. Requirements and abilities required for Hospital pharmacists.

3. Drug Distribution system in Hospitals.

Out-patient service, In-patient services- types of services detailed discussion of unit Dose system, Floor ward stock system, satellite pharmacy services, central sterile services, Bed side pharmacy.

4. Introduction to Clinical pharmacy practice-

Definition, scope.

5. Modern dispensing aspects-

Pharmacists and patient counseling and advice for the use of common drugs, medication history.

6. **Common daily terminology used in the practice of Medicine.**

7. **Disease, manifestation and patho-physiology-**

Salient symptoms to understand the disease like Tuberculosis, Hepatitis, Rheumatoid Arthritis, Cardio-vascular diseases, Epilepsy, Diabetes, Peptic Ulcer, Hypertension.

Syllabus to be covered up to I.A.

Chapter: 1,2,3 and 4

Learning Resources:			
Sl.No	Title of the Book	Name of Authors	Name of Publisher
1.	Hospital And Clinical Pharmacy	Mr. A. V. Yadav	Nirali Prakashan
2.	Hospital And Clinical Pharmacy	Dr. A. R. Paradkar	Nirali Prakashan
3.	Hospital And Clinical Pharmacy	D J Patil	Nirali Prakashan

Th-3 PATHOLOGY-I

Name of the Course: MLT			
Course code:		Semester	3 rd
Total Period:	60	Examination :	3 hrs
Theory periods:	4P / week	Internal Assessment:	20
Maximum marks:	100	End Semester Examination ::	80

A. RATIONALE:

The subject PATHOLOGY –I is a compulsory paper for MLT. This subject includes **Immuno Haematology & Blood Banking, Clinical Pathology And Haematology.**

B: OBJECTIVES:

The primary goal of the program is to educate residents to become knowledgeable anatomic and clinical pathologists who are self-motivated and competent to pursue either an academic or a private practice career in Pathology.

S.L. No.	Topics	Periods
1	IMMUNO HAEMATOLOGY & BLOOD BANKING	20
2	CLINICAL PATHOLOGY	10
3	HAEMATOLOGY	30
Total		60

IMMUNO HAEMATOLOGY & BLOOD BANKING

THEORY.

Introduction, Human blood group antigens, ABO blood group system and incompatibility, Rh blood group system and incompatibility , Technique of grouping and cross matching , Commb's test, Direct, Indirect , Blood Transfusion Procedure, Complication of blood transfusion, Blood Collection, Selection and Screening of donors., Collection of blood, Storage of blood, Cell separator and transfusion of various components of blood like Plasma and Platelet Separation , Organization, Operation and Administration of Blood Bank and anticoagulants.

CLINICAL PATHOLOGY :

Urine analysis, Physical, chemical, microscopic., Routine tests viz. Sugar, Albumin and Phosphates., Other tests viz. Bile salt, Bile pigment, Urobilin Ketone bodies, Chyle, Specific gravity, Total protein (Esbachs) etc., Faecal analysis for occult blood examination., Preparation of Seminal Fluid for analysis. , Preparation of aspiration fluids. , Ascitic fluid, Pleural fluid ,CSF , Others.

HAEMATOLOGY :

Introduction to haematology. , Collection of blood sample and anticoagulants., Red Cell Counts, Haemocytometer and procedure for R.B.C. Count., RBC diluting Fluid , Calculation , Write Cell Count, Procedure for W.B.C count , WBC diluting fluid , Calculation , Differential white cell count. , Morphology of write cell, Normal values, Romanosky Stains , Counting methods , Absolute Eosinophil Count Direct/Indirect smear examination., ESR, Westergren's, Wintrobe's, Factors affecting ESR, Importance and Limitation , Normal value and interpretation. , Packed Cell Volume (Haematocrit), Macro and Micro method ,Interpretation., Haemoglobin estimation , Colorimetric method ,Sahali's method, Cyanmethaemoglobin method. , Interpretation of result , Red Cell Indices, Calculation and importance of Reticulocyte count., Method- Interpretation ,Sickle Cell Preparation , Osmotic fragility test- Interpretation ,Estimation of G-6-PD, Principle of Electrophoresis. , Preparation of bone marrow aspiration and trephine biopsy.,Coagulation test: , Bleeding time , Whole blood coagulation time , Clot retraction test , Prothrombin time , Platelet count, Comments on peripheral smear., LE Cell Phenomenon.

Syllabus to be covered up to I.A.

Chapter: 1 and 2.

Learning Resources:			
Sl.No	Title of the Book	Name of Authors	Name of Publisher

1.	Robbins Basic Pathology	Vinay Kumar	Eslevier
2.	Rapid Review Pathology	Edward F. Goljan	Eslevier
3.	Concepts in Pathology	Devesh Mishra	R H D Publications

Th-4 BIOMEDICAL INSTRUMENTATION

Name of the Course: MLT			
Course code:		Semester	3 rd
Total Period:	60	Examination :	3 hrs
Theory periods:	4P / week	Internal Assessment:	20
Maximum marks:	100	End Semester Examination ::	80

A. RATIONALE:

The subject PATHOLOGY –I is a compulsory paper for MLT. This subject includes **Fundamental of Medical Instrumentation, Bioelectrical Potential and Electrodes, Bio-Transducer and Sensor.**

B: OBJECTIVES:

The main objective of this course is to introduce student to basic biomedical instrumentation . As a result student can understand, design and evaluate systems and devices that can measure, test and/or acquire biological information from the human body. ... 5 Measurement of blood flow and pressure.

S.L. No.	Topics	Periods
1	Fundamental of Medical Instrumentation	15
2	Bioelectrical Potential and Electrodes	20
3	Bio-Transducer	20
4	Sensor	5
Total		60

- 1. Fundamental of Medical Instrumentation:** Fundamental of Instrumentation, Different types of Medical Instrument, General diagram of biomedical instrumentation system. Measurand, Transducer/Sensor, Signal Conditioner, Display system, Alarm, data storage, data transmission, Performance requirements of Medical instrumentation system.
- 2. Bioelectrical Potential and Electrodes:** Biopotential-Resting membrane potential, Action potential, Sources of Bio-signals, Electrode-Function of Electrodes, Electrode metals, General classification of Electrodes, Surface electrode, Needle electrodes, Microelectrode and their uses, Electrode-Tissue interface, Metal-Electrolyte, Polarisation, Skin contact . impedance, Introduction to different Bio-signals.
- 3. Bio-Transducer:** Transducer-classification of Transducer, Bio- Transducer, Factors for Bio Transducer, Overview of Transducer characteristics: Static characteristics-
- Accuracy, Precision, Resolution, Sensitivity, Drift, Linearity, Threshold, Hysteresis, Span, Dynamic characteristics ,Zero order system, First order system, Displacement, Position and Motion Transducer: Working and uses of Potentiometric, Variable Capacitive, Variable Inductive Transducer, LVDT. Pressure Transducer: LVDT Pressure Transducer, Strain Gauge, Transducer for body temperature: Thermocouple, Electrical resistance Thermometer, Thermistors, P-N junction, Chemical thermometry: Photoelectric Transducer: Photovoltaic cell, Photoemissive cells, Piezoelectric transducer.
- 5. Sensor:** Optical fiber sensor: structure and working principle of optical fiber, Types of optical fiber sensors-Photometric sensor, Physical sensor, Chemical sensors: Biosensors: Introduction, Dissolved O₂ sensor and their application, Glucose sensor, pH sensor.

Syllabus to be covered up to I.A.

Chapter: 1 , 2 and 3.

Learning Resources:			
Sl.No	Title of the Book	Name of Authors	Name of Publisher
1.	Hand book of Biomedical Instrumentation	R.S.Khandpur	McGraw Hill Education
2.	Biomedical Instrumentation & measurement	Cromwell	Prentice Hall India Learning Private Limited

3.	Principle of Medical Electronic & Biomedical Insrtumentation	C.Raja Rao & S.K.Guha	Universities Press
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Th5. ENVIRONMENTAL STUDIES (Common to all Branches)

Name of the Course: Diploma in Electrical Engineering			
Course code:		Semester	3 rd
Total Period:	60	Examination :	3 hrs
Theory periods:	4P / week	Internal Assessment:	20
Maximum marks:	100	End Semester Examination ::	80

A. RATIONALE:

Due to various aspects of human developments including the demand of different kinds of technological innovations, most people have been forgetting that, the Environment in which they are living is to be maintained under various living standards for the preservation of better health. The degradation of environment due to industrial growth is very much alarming due to environmental pollution beyond permissible limits in respect of air, water industrial waste, noise etc. Therefore, the subject of Environmental Studies to be learnt by every student in order to take care of the environmental aspect in each and every activity in the best possible manner.

B. OBJECTIVE:

After completion of study of environmental studies, the student will be able to:

1. Gather adequate knowledge of different pollutants, their sources and shall be aware of solid waste management systems and hazardous waste and their effects.
2. Develop awareness towards preservation of environment.

C. Topic wise distribution of periods:

Sl. No.	Topics	Period
1	The Multidisciplinary nature of environmental studies	04
2	Natural Resources	10
3	Systems	08
4	Biodiversity and its Conservation	08
5	Environmental Pollution	12
6	Social issues and the Environment	10
7	Human population and the environment	08
	Total:	60

**D. C
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1. The Multidisciplinary nature of environmental studies:

- 1.1 Definition, scope and importance.
- 1.2 Need for public awareness.

2. Natural Resources:

Renewable and non renewable resources:

- 2.1 Natural resources and associated problems.
 - 2.1.1. Forest resources: Use and over-exploitation, deforestation, case studies, Timber extraction mining, dams and their effects on forests and tribal people.
 - 2.1.2. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.
 - 2.1.3. Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources.
 - 2.1.4. Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity, .
 - 2.1.5. Energy Resources: Growing energy need, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
 - 2.1.6. Land Resources: Land as a resource, land degradation, man

induces landslides, soil erosion, and desertification.

2.2 Role of individual in conservation of natural resources.

2.3 Equitable use of resources for sustainable life styles.

3. **Systems:**

3.1. Concept of an eco system.

3.2. Structure and function of an eco system.

3.3. Producers, consumers, decomposers.

3.4. Energy flow in the eco systems.

3.5. Ecological succession.

3.6. Food chains, food webs and ecological pyramids.

3.7. Introduction, types, characteristic features, structure and function of the following eco system:

3.8. Forest ecosystem:

3.9. Aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries).

4. **Biodiversity and it's Conservation:**

4.1. Introduction-Definition: genetics, species and ecosystem diversity.

4.2. Biogeographically classification of India.

4.3. Value of biodiversity: consumptive use, productive use, social ethical, aesthetic and optin values.

4.4. Biodiversity at global, national and local level.

4.5. Threats to biodiversity: Habitats loss, poaching of wild life, man wildlife conflicts.

5. **Environmental Pollution:**

5.1. Definition Causes, effects and control measures of:

5.1.1 Air pollution.

5.1.2 Water pollution.

5.1.3 Soil pollution

5.1.4 Marine pollution

5.1.5 Noise pollution.

5.1.6 Thermal pollution

5.1.7 Nuclear hazards.

5.2. Solid waste Management: Causes, effects and control measures of urban and industrial wastes.

5.3. Role of an individual in prevention of pollution.

5.4. Disaster management: Floods, earth quake, cyclone and landslides.

6. **Social issues and the Environment:**

6.1. Form unsustainable to sustainable development.

6.2. Urban problems related to energy.

6.3. Water conservation, rain water harvesting, water shed management.

6.4. Resettlement and rehabilitation of people; its problems and concern.

6.5. Environmental ethics: issue and possible solutions.

6.6. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies.

6.7. Air (prevention and control of pollution) Act.

6.8. Water (prevention and control of pollution) Act.

6.9. Public awareness.

7. **Human population and the environment:**

7.1. Population growth and variation among nations.

7.2. Population explosion- family welfare program.

7.3. Environment and human health.

7.4. Human rights.

7.5. Value education

7.6. Role of information technology in environment and human health.

Syllabus coverage up to Internal assessment

Chapters: 1, 2 and 3.

Learning Resources:			
Sl.No	Title of the Book	Name of Authors	Name of Publisher
1.	Textbook of Environmental studies	Erach Bharucha	#UGC
2.	Fundamental concepts in Environmental Studies	D.D. Mishra	S.Chand & Co-Ltd
3.	Text book of Environmental Studies	K.Raghavan Nambiar	SCITECH Publication Pvt. Ltd.
4.	Environmental Engineering	V.M.Domkundwar	Dhanpat Rai & Co

Pr-1 BIOLOGY LAB

Name of the Course: MLT			
Course code:		Semester	3 rd
Total Period:	90	Examination :	3 hrs
Lab. periods:	6 P / week	Sessional:	50
Maximum marks:	100	End Semester Examination ::	50

A. RATIONALE:

The response of **BIOLOGY** can be verified practically by applying different theorems and fundamental techniques. The students will become sure that the theoretical tricks which they have learned from books are true. The students will become competent in the field of Biological Studies.

B. OBJECTIVE:

Biology practical lessons are important in order to understand **biological** concepts. If science education **aims** to enhance the understanding of the natural world by students and how it functions, then the students have to experience and observe the relevant science phenomena.

C. Course content in terms of specific objectives:

1. Introduction to experiments in biology

- 1.1 Study of Microscope
- 1.2 Section cutting techniques
- 1.3 Mounting and staining
- 1.4 Permanent slide preparation.

2. Study of cell and its inclusion.

- 3) Study of Stem, Root, Leaf, seed, fruit, flower and their modifications
- 4) Detailed study of frog by using computer models
- 5) Microscopic study and identification of tissues pertinent to Stem, Root, Leaf, seed, fruit and flower.
- 6) Identification of bones
- 7) Determination of blood group.
- 8) Determination of blood pressure.
- 9) Determination of tidal volume

Pr-2 HOSPITAL & CLINICAL PHARMACY –I LAB

Name of the Course: MLT			
Course code:		Semester	3 rd
Total Period:	60	Examination :	3 hrs
Lab. periods:	4 P / week	Sessional:	25
Maximum marks:	75	End Semester Examination ::	50

A. RATIONALE:

The response of **HOSPITAL & CLINICAL PHARMACY** can be verified practically by applying different theorems and fundamental techniques. The students will become sure that the theoretical tricks which they have learned from books are true. The students will become competent in the field of **CLINICAL PREPARATION**.

B. OBJECTIVE:

Clinical pharmacy is one of the services provided by pharmacists in an attempt to promote rational drug therapy that is safe, appropriate, and cost-effective.

C. Course content in terms of specific objectives:

1. Pharmaceutical care/definition and applications.
2. Patient care process: assessment, care plan, evaluation.
3. Patient interviewing skills.
4. Drug Therapy Problems (DTP).
5. Workshop on Drug Therapy Problems.
6. Data collection from medical files.
7. Manual and SOAP format completing.
8. Oral discussion and comprehensive analysis of case.

Pr-3 PATHOLOGY-I LAB

Name of the Course: MLT			
Course code:		Semester	3 rd
Total Period:	90	Examination :	3 hrs
Lab. periods:	6 P / week	Sessional:	25
Maximum marks:	75	End Semester Examination ::	50

1. RATIONALE:

The response of **PATHOLOGY** can be verified practically by applying different theorems and fundamental techniques. The students will become sure that the theoretical tricks which they have learned from books are true. The students will become competent in the field of **PATHOLOGY**.

2. OBJECTIVE:

The primary goal of the program is to educate residents to become knowledgeable anatomic and clinical pathologists who are self-motivated and competent to pursue either an academic or a private practice career in Pathology.

3. Course content in terms of specific objectives:

1. Analysis of Urine for routine and others tests.
2. Urine microscopic examination.
3. Faeces occult blood test.
4. Seminal fluid analysis.
5. Analysis of aspiration fluids.
6. Staining and examination of different smears.
7. Use of Microscope, care and Maintenance.
8. Haemoglobin estimation –Sahali's.
9. Demonstration of colorimetric Hb estimation.
10. Total RBC Count.
11. Total Leucocyte Count.
12. Differential count of Leucocyte.
13. Reticulocyte.
14. Total platelet count, Direct, Indirect.
15. Absolute Eosnophil count, Direct , Indirect.

List of Equipments for a batch size thirty

Sl. No.	Equipment	Quantity
1	Test tube	
2	Folin-Wu tube	
3	Glass slide mycoleand cover slips	
4	Petri dish	
5	Glass beaker	
6	Glass flask	
7	Pasteur pipette	
8	Graduated pipettes	
9	Syringes	
10	Disposable gloves	
11	Tourniquet	
12	Microscope	
13	Bunsen burner or spirit lamps or candles	
14	Centrifuge Machine	
15	Electrophoresis apparatus	
16	Chromatography:	
17	Autoclave	
18	Hematology analyzer	
19	Hot Air Oven	
20	Setup for radioimmunoassay or RIA	

21	Setup for enzyme linked immunosorbant assay (ELISA)	
22	Colorimeter	
23	Burette	
24	General laboratory stands, racks, filter paper, reagents, etc.	