



GOA UNIVERSITY

**POSTGRADUATE STUDIES
&
RESEARCH PROGRAMMES**

**PROSPECTUS
2022-2023**

NUMBER OF SEATS AVAILABLE IN EACH PROGRAMME INCLUDING RESERVATIONS (ON CAMPUS)

S. No.	Programmes*	Total Seats available	SC	ST	OBC	DA	Other Indian Universities	Wards of Ex-Servicemen	General/ Unreserved Category	Economic Weaker Section (EWS)
Faculty of Languages and Literature										
a.	M.A. English	63	1	8	17	3	2	1	25	6
b.	M.A. French	19	1	2	5	1	2		6	2
c.	B.A. French	19	1	2	5	1	2		6	2
d.	M.A. Hindi	50	1	6	14	2	2	1	19	5
e.	M.A. Konkani	63	1	8	17	3	2	1	25	6
f.	M.A. Marathi	38	1	5	10	2	2	1	13	4
g.	M.A. Portuguese	19	1	2	5	1	2		6	2
h.	B.A. Portuguese	19	1	2	5	1	2		6	2
Faculty of Social Sciences										
a.	M.A. History	69	1	8	19	3	2	1	28	7
c.	M.A. Political Science	38	1	5	10	2	2		14	4
d.	M.A. Sociology	25	1	3	7	1	2		8	3
f.	B.L.I.Sc – Bachelor of Library and Information Science	31	1	4	8	1	2		12	3
g.	M.L.I.Sc – Master of Library and Information Science	25	1	3	7	1	2		8	3
Faculty of Life Sciences & Environment										
a.	M.Sc. Botany	38	1	5	10	2	2		14	4
c.	M.Sc. Marine Biotechnology	30	As per Central Govt. rule				JNU-NCCEB			
d.	M.Sc. Biotechnology	25	1	3	7	1	2		8	3
e.	M.Sc. Microbiology	25	1	3	7	1	2		8	3
f.	M.Sc. Zoology	38	1	5	10	2	2		14	4
g.	Post Graduate Diploma in Medical Laboratory Techniques (PGDMLT)	25	1	3	7	1	2		8	3
School of Physical & Applied Sciences										
a.	M.Sc. Electronics	19	1	2	5	1	2		6	2
b.	M.Sc. Mathematics	38	1	5	10	2	2		14	4
c.	M.Sc. Physics	50	1	6	14	2	2	1	19	5
School of Sanskrit, Philosophy & Indic Studies										
a.	M.A. Philosophy	19	1	2	5	1	2		6	2
Manohar Parrikar School of Law, Governance & Public Policy										
a.	M.A. Women's Studies	19	1	2	5	1	2		6	2
b.	Master of Social Work	19	1	2	5	1	2		6	2
School of International & Area Studies										
a.	M.A. International Studies	19	1	2	5	1	2		6	2
School of Chemical Sciences										
a.	M.Sc. Chemistry	100	2	12	27	4	2	1	42	10
b.	M.Sc. Biochemistry	25	1	3	7	1	2		8	3
Goa Business School										
a.	M.A. Economics	63	1	8	17	3	2	1	25	6
b.	M.Com	75	2	9	20	3	2	1	31	7
c.	M.B.A. (Financial Services)	75	2	9	20	3	2	1	31	7
d.	M.B.A.	75	2	9	20	3	2	1	31	7
e.	M.B.A. – Executive (S.F.)#	38	1	5	10	2	2		14	4
f.	Integrated M.B.A	38	1	5	10	2	2		14	4
g.	Master of Computer Applications	75	2	9	20	3	2	1	31	7
School of Earth, Ocean & Atmospheric Sciences										
a.	M.Sc. Applied Geology	31	1	4	8	1	2		12	3
b.	M.Sc. Marine Science	31	1	4	8	1	2		12	3
c.	M.Sc. Marine Microbiology	25	1	3	7	1	2		8	3
d.	M.Sc. Environmental Science / M.A. Environmental Science	31	1	4	8	1	2		12	3

*The University may decide to change the number of seats depending on demand and available infrastructure.

#Based on group discussion and/or interview. S.F.=Self Financed Programme



Goa University
P.O. Goa University, Taleigao Plateau, Goa 403 206
POST GRADUATE DIPLOMA PROGRAMME ON
MEDICAL LABORATORY TECHNIQUES

For the Academic Year 2019-2020

Implemented from: 2019-20

A brief description of the course:

Purpose : To give the youth broad exposure in the various medical laboratory techniques techniques.

Prerequisite : Science graduate with either Zoology, Microbiology, Biotechnology (6 units / or 3 units) with Chemistry as a subject up to SYBSc.

Duration: 2 Semesters with Theory and Practical courses (Total courses 8: 4 Theory and 4 Practical courses) followed by compulsory **one month Hands on Training in each of the laboratories** viz. Biochemistry, Blood Bank & Central Laboratory, Pathology and Microbiology in Goa Medical College /Govt. Hospital/ Institute identified in consultation with Chairman BOS.

Course fee: Course fee will be decided by the appropriate authority

Special feature: A collaborative teaching program between Departments of Biochemistry, Pathology, Microbiology of Goa Medical College and Zoology Department of Goa University.

The said programme is also offered by some Undergraduate colleges affiliated to Goa university

All the theory as well as practical, Core and Optional courses, will be evaluated by both internal and external examiners (double evaluation)

Course Structure

PAPER CODE	COURSE TITLE	CONTACT HOURS		MARKS		PAGE
		LECTURES	PRACTICALS	THEORY	PRACTICALS	

1ST SEMESTER

DLTC01	Laboratory Equipments and Instruments	36hrs	15 x 3 hrs	50	50	3
DLTC02	Clinical biochemistry – I	36 hrs	15 x 3 hrs	50	50	4
DLTC03	Clinical Microbiology (General and Systematic)	36 hrs	15 x 3 hrs	50	50	5
DLTC04	Clinical Pathology & Histology	36 hrs	15 x3 hrs	50	50	7

2nd SEMESTER

DLTO01	Applied Microbiology	36 hrs	15 x 3 hrs	50	50	9
DLT O02	Clinical Biochemistry II	36 hrs	15 x 3 hrs	50	50	10
DLTO03	Clinical Parasitology, Mycology & Virology	36 hrs	15 x 3 hrs	50	50	11
DLT O04	Hematology & Transfusion Medicine	36 hrs	15 x 3 hrs	50	50	13

List of text and Reference books:	14
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SEMESTER-I

POST GRADUATE DIPLOMA IN MEDICAL LABORATORY TECHNIQUES

PAPER DLTC 01: LABORATORY EQUIPMENTS AND INSTRUMENTS

Learning Objective: To provide students with theoretical and practical understanding of Laboratory equipment and techniques

Learning Outcome: The student should be able to understand structure and functions of laboratory equipments and instruments.

THEORY

Duration: 36 Hrs

Module 1: (Laboratory Equipments & Instruments)

1. Pipettes- Thoma pipettes (RBC, W.B.C.), Sahli's pipette, Westergren's pipette, pasteur pipettes, Graduated pipettes, Micropipettes etc.
2. Hemocytometer/Improved Neubauer Chamber Fuchs/Rosenthal Ruling etc.
3. Colorimeter/Spectrophotometer – Principle, parts, working
4. Hematology analyzer – 3 part/5 part differential counters (Cell Counter, Semi – automated/fully automated
5. Flow Cytometry and applications
6. Coagulometers
7. Hemoglobin Electrophoresis – Agar gel, C.A.M, HPLC, Capillary Electrophoresis method etc
8. Needles: Lumbar Puncture needle, Vim- Silverman needle, Bone- marrow aspiration biopsy needle, Trephine biopsy needle etc.
9. Urinometer, Esbach's Albuminometer, Automated Urine Analysers, Dipstick Reader etc.
10. Microscopes: Compound, Dark ground illumination, Phase contrast, Fluorescent Microscopy, Polarizing Microscope
11. Microtome: Base Sledge, Rocking type (Cambridge), Rotary microtome, Sliding microtome etc
12. Autotechnics on Automated tissue processor, principle, working; paraffin embedding bath etc.,
13. Refrigerated microtome, Freezing microtome, cryostat etc.
14. Automated Knife Sharpeners
15. Equipments for blood component separation in BB. Refrigerated centrifuge, Plasma expressers, Refrigerated water bath, Laminar Air flow bench, etc
16. Cytocentrifugation & applications
17. Quality Control in Pathology lab.

Module 2 (Chemicals, solutions, stains etc.,)

- 1) Preparation of Fixatives: Neutral Formalin, Buffered formalin, Mercuric – Zenker's Solution, Schaudinn's Solution, K-dichromate – Orth's Solution, Regaud's Solution, Picric Acid, Bouin's Solution; Hollande's Solution. Decalcifying fluids: Formic Acid – Gooding and Stewart's fluid, Nitric Acid – Aqueous nitric acid
- 2) Stains: Composition and technique, preparation and application of Iron Hematoxylin Weigert's iron hematoxylin, Heidenhain's iron hematoxylin, Tungsten Hematoxylin, PTAH, Molybdenum Hematoxylin, Phosphomolybdic acid hematoxylin
- 3) Connective tissue stains: History of connective tissue: composition; preparation & application of Masson trichrome, Von – Gieson, Reticulin stain Gomori's Silver methanamine. Elastic tissue stains: Verhoeff's method, Weigert's method
- 4) Carbohydrate Stains and Glycoconjugates, P.A.S technique, Alcian blue technique, combined Alcian blue–PAS, Mucicarmine, Colloidal iron, High iron diamine.
- 5) Lipid Stains: Oil Red O, Sudan Black B.
- 6) Pigments and Minerals: Perl's Prussian blue for ferric iron, Masson – Fontana method for melanin, Von – Kossa for Calcium
- 7) Micro-organisms: Gram's method & Modified methods, Ziehl – Neelsen ((ZN) stains for mycobacteria, Fluorescent method for mycobacterium, Modified Fite method for Mycobacteria Loeffler, Cresyl violet stain for Helicobacter sp., Grocott methanamine Silver for fungi, Mc Manus PAS method for glycogen a fungal wall
- 8) Amyloid – Congo – Red Technique
- 9). Enzyme Histochemistry and its diagnostic Applications
- 10). Immunohistochemical techniques
- 11). Tissue Microarray
- 12). Molecular Pathology Techniques: in Situ Hybridization / F.I.S.H

Module 3: Applied Pathology

1. Laboratory diagnosis of Anemias
2. Laboratory diagnosis & C.S.F picture in different types of Meningitis
3. Laboratory diagnosis of Hemorrhagic disorders
4. Laboratory diagnosis & L.F.T. findings in different types of jaundice.
5. Laboratory diagnosis/Urine/Blood findings in Kidney disorders.

6. Automation in Laboratory
7. Administration and medico-legal aspects; Accreditation of Laboratory

PRACTICALS

15 x 3Hrs

1. Demonstration and use of pipettes
2. Demonstration of needles & procedures
3. Demonstration of working of Rotary Microtome; Section cutting.
4. Demonstration of working of Automated cell counters (3 part and 5 part)
differential counts
5. Demonstration of Blood component separation in Blood Bank.
6. Demonstration of Lab workup of Hemorrhagic disorders
7. Laboratory diagnosis of Anemias – Charts
8. Laboratory diagnosis of Meningitis – Charts
9. Laboratory diagnosis of Jaundice – Charts
10. Laboratory diagnosis of Renal diseases – Charts

Text –Book Reference Books

1. John D. Bancroft, Marilyn Gamble, Churchill, Livingstone: Theory and Practice of Histological techniques, Elsevier Publication
2. C. F. A. Culling : Handbook of Histopathological technique (including Museum technique) Butterworth & CO (Publishers) Ltd. London
3. Sood Ramnik: Medical Laboratory Technology, Jaypee Brothers, Medical Publishers (P) Ltd. Delhi
4. John Bernard Henry (Ed): Clinical diagnosis and management by laboratory methods.
5. Praful Godkar: Textbook of Medical laboratory Technology
6. R. N. Makroo: Compendium of Transfusion Medicine

Paper DLTC 02: Clinical Biochemistry I

THEORY

Module 1:

- The scope of biochemistry:
- Chemical organization of the cell.
- Organic and inorganic components of the cell.
- Marker enzymes of the cell.
- Hydrogen ion concentration and buffers: pH
- Blood buffers, regulation of blood pH.
- Acid base metabolism.

Module 2:

- Carbohydrate chemistry.
- Protein chemistry.
- Lipid chemistry.

Module 3:

- Enzymes:- Definition, classification, factors affecting enzyme action.
- Enzyme inhibition,
- Isoenzymes,
- Regulation of enzyme activity.
- Vitamins.
- Minerals.

PRACTICALS:

1. Estimation of pH. Use of pH meter.
2. Qualitative and quantitative Carbohydrate chemistry.
3. Qualitative and quantitative Protein chemistry.
4. Qualitative and quantitative Lipid chemistry.
5. Estimation of haemoglobin by cyanmeth haemoglobin
6. Estimation of chloride in serum
7. Estimation of serum calcium
8. Estimation of serum inorganic phosphorus.

9. Separation of amino acid and its identification by paper chromatography-
Demonstration
10. Separation of serum protein by electrophoresis- Demonstration
11. Separation of lipid by Thin layer chromatography - Demonstration
12. Estimation of serum Na^+ / K^+ ions by Flame photometer- Demonstration.

Paper DLTC 03: Clinical Microbiology (General and Systematic)

THEORY

Module 1:

- Introduction to microbiology- historical prospective, principle of microbiology, microscopes (types and uses)
- Bacteria: Classification, anatomy, reproduction , growth and nutrition.
- Sterilization:- methods employed, both physical and chemical.
- Media used in Microbiology:- Classification, types, constituents, methods of preparation, adjustment of pH, sterilization.

Module 2:

- Serology:- Antigen, antibody, antigen-antibody reaction.
- Newer methods of diagnosis: PCR, Bactec, Flow cytometry.

Module 3:

- Systemic (Individual Bacteria): Diagnosis features (morphology, cultured characters, biochemical reaction,, antigenic characters, pathogenicity and laboratory diagnosis) of *Staphylococcus*, *Streptococcus*, *Pneumococcus*, *Neisseria*, *Corynebacteria*, *Clostridia*, *Escherichia coli*, *Klebsiella species*, *Salmonella*, *Shigella*, *Proteus*, *Pseudomonas*, *Mycobacterium tuberculosis*, *Treponema pallidum*.

PRACTICALS

1. Preparation of smears for staining and fixation from samples and culture media (both liquid and solid media).
2. Care and use of microscopes (including Fluorescent microscope).
3. Staining techniques: (Gram staining, zeihl nelson, Fluorescent method): preparation of satins, procedure, reporting of smears, principle involved.
4. Equipments used in sterilization: Description (structure), working principle involved, articles sterilized, advantages and disadvantages.
5. Culture media: types, constituents of each media, method of preparation, adjustment of pH, sterilization, uses.
6. Culture techniques: different methods of inoculation from clinical samples and bacterial

growth from media.

7. Preparation of wet mount and motility of organisms.
8. Sputum examination: Physical examination, wet preparation, smear examination, concentration techniques for mycobacteria.
9. Serology: Widal, VDRL, RPR, ELISA, PCR, Flow cytometry.
10. Systemic bacteriology: Practical demonstration of diagnostic features of
 - Gram positive organisms.
 - Gram negative organisms.
 - Anaerobes, spirochetes.
 - Mycobacteria.

Paper DLTC 04: Clinical pathology and histopathology

THEORY

Module 1:

- Histo-pathological techniques: Fixatives and fixation; Grossing, dehydration, clearing, impregnation and embedding; Microtome knives and types of microtomes, section cutting, errors in cutting, mounting media, decalcification, automation in tissue processing; Frozen section.
- Staining: Theory of staining, dyes and stains; Mordants, differentiation; Haematoxylin and Eosin staining- principles and procedures;
- Special stains-- P.A.S., Verhoeff's, Massons trichrome, Von Giesson, Fat stains and other stains.

Module 2:

- Examination of urine: Sample collection; Physical examination and Chemical tests-- principles and methods; Reagent strip method
- Microscopic examination- crystals, casts, sediments,
- Stool examination, Pregnancy tests, Semen analysis, Sputum examination.

Module 3:

- Cytological techniques: Exfoliative cytology- fixation, pap staining. Cytological processing of fluids. Fine needle aspiration cytology (FNAC) -- procedure, staining of slides, H & E staining and MGG staining. Automation in cytology.
- Examination of CSF and other body fluids-- pleural, peritoneal, synovial fluid.

PRACTICALS:

1. Grossing and museum techniques.
2. Microtomes knives and their sharpening, section cutting, errors in section cutting and mounting.
3. Decalcification, automation in tissue processing.

4. Routine staining techniques-hematoxylin and eosin (H &E) staining.
5. Special staining demonstration- P.A.S., Verhoeff's, Massons trichrome, Von Giesson, fat stains.
6. Examination of urine- Physical and chemical examination, use of Reagent strips.
7. Examination of urine - microscopic
8. Exfoliative cytology-Fixation, Pap staining procedure.
9. Fine needle aspiration cytology (F.N.A.C)- procedure, stains
10. Examination of body fluids- pleural, peritoneal and synovial.
11. C.S.F. examination.
12. Stool examination
13. Sputum examination
14. Pregnancy tests.
15. Semen analysis.

SEMESTER-II

POST GRADUATE DIPLOMA IN MEDICAL LABORATORY TECHNIQUES

PAPER DLTO 01: APPLIED MICROBIOLOGY

Learning Objective: To provide students with theoretical and practical understanding of Applied microbiology

Learning Outcome: The student should be able to understand theory and practical aspects of Applied Microbiology

THEORY

Duration: 36 Hrs

MODULE 1:

1. Microscopes – detailed account of structure, working principle, applications
2. Collection, handling and transport of samples
3. Culture methods
4. Methods for laboratory identification of bacteria
5. Maintenance of stock cultures
6. Common therapeutic agents
7. Antimicrobial susceptibility testing

MODULE 2:

1. Infection – sources, modes of transmission of infection, types of infectious diseases
2. Immunity – Innate, Acquired, Active, Passive
3. Vaccines – storage, transport, Immunization schedule
4. Hospital Acquired Infections
5. Biomedical Waste Management
6. Standard Precautions
7. Needle stick injury – Prevention and Management

MODULE 3:

1. Laboratory diagnosis of UTI
2. Laboratory diagnosis Diarrheal diseases
3. Laboratory diagnosis of Cholera
4. Laboratory diagnosis of Meningitis
5. Laboratory diagnosis of PUO
6. Laboratory diagnosis Respiratory infections
7. Laboratory diagnosis of Pyogenic infections – Superficial and Deep
8. Laboratory diagnosis of Anaerobic infections (Spore bearing and Non spore bearing bacteria)
9. Laboratory diagnosis of STIs
10. Programmatic management of Tuberculosis
11. Quality Control in Microbiology
12. Inventory / Stock Management

PRACTICALS

15 x 3 hrs

1. Procedures for collection of samples – blood, urine, stool, swab, transport media use
2. Identification of bacteria – colony morphology, biochemical tests
3. Antimicrobial susceptibility testing
4. Demonstration of vaccines
5. Biomedical Waste Management
6. Standard Precautions
7. Laboratory diagnosis of UTI – Practical aspects
8. Laboratory diagnosis Diarrheal diseases – Practical aspects
9. Laboratory diagnosis of Meningitis – Practical aspects
10. Laboratory diagnosis of PUO – Practical aspects
11. Anaerobic culture methods
12. Laboratory diagnosis of STIs – Practical aspects
13. Practical aspects of Management of Tuberculosis

Reference Books:

1. Kanungo (2017) Ananthanarayan and Paniker's. textbook of Microbiology, Universities Press
2. Baveja, C. P. and V.Baveja. (2015) Textbook of Microbiology for Medical Laboratory Technicians, Arya Publications
3. Baveja C.P. (2018) Textbook of Microbiology, Arya Publications
4. Apurba Sankar Sastry and Sandhya Bhat K.(2018) Essentials of Medical Microbiology, Jaypee Publications

Paper DLT 002 Clinical Biochemistry II

THEORY

Module 1

- Carbohydrate metabolism: Clinical aspects of Regulation of Blood sugar and Diabetes
- Protein metabolism: starvation, and protein energy malnutrition
- Lipid metabolism Clinical aspects of lipid profile, atherosclerosis.

Module 2 & 3

- Gastric function tests.
- Pancreatic function tests.
- Liver function tests.
- Thyroid function tests.
- Cardiac function test
- Kidney function test

PRACTICALS

1. Chemistry of saliva.
2. Chemistry of gastric juices
3. Estimation of bilirubin.
4. Estimation of glucose in blood. GTT and its interpretation.
5. Estimation of serum proteins.
6. Estimation of blood urea.
7. Estimation of creatinine in blood.
8. Estimation of uric acid in blood.
9. Normal urine.
10. Full urine report.
11. Clearance tests - Demonstration
12. Demonstration of liver function/ cardiac function / kidney function tests.
13. Serum lipid profile
14. C.S.F. examination.

Paper DLTO 03: Clinical parasitology, mycology and virology

THEORY

Module 1: Parasitology:

- Introduction to parasitology terminologies, definitions, relationships.
- Protozoa: geographic distribution, habitat, morphology, life cycle, pathogenecity, laboratory diagnosis of the following parasites:
 1. *Entamoeba histolytica*
 2. *Giardia lamblia*
 3. *Trichomonas vaginalis*
 4. *Leishmania donovani*
 5. *Plasmodium*
 6. *Cocoidian* parasites causing diarrhea
- Cestodes: On the same line as protozoan parasites for the following:
 1. *Taenia sagenata*
 2. *Taenia solium*
 3. *Echinococcus granulosus*
- Helminths: On the same line as protozoan parasites for the following:
 1. *Trichuris trichiura*
 2. *Ankylostoma duodenale*
 3. *Ascaris lumbricularis*
 4. *Enterobius vermicularis*

Module 2: Mycology :

- Introduction to mycology including classification
- *Candida albicans* and other candida species
- Dermatophytes
- *Cryptococcus*
- Oppotunistic fungi (*Aspergillus*, *Pencillium*, *Mucor*)

NB: Serial no: ii-v will be on the basis of morphology, cultural characters, biochemical (if any), antigens, pathogenecity and laboratory diagnosis.

Module 3: Virology:

- General virology: Definations, classification, properties of viruses, viral replication, cultivation, laboratory diagnosis.
- Systemic virology: On the basis of structure, cultivation, pathogenicity, Laboratory diagnosis of the following viruses:
 - i) Bacteriophage
 - ii) Picomaviruses (Polio viruses)

- iii) Rhabdoviruses (Rabies virus)
- iv) Arboviruses (Dengue, Chikungunya, JE)
- v) Influenza virus
- vi) Hepatitis virus
- vii) HIV
- viii) Herpes virus

PRACTICALS

A) Parasitology

- 1) Stool examination: gross, microscopic, for adult parasite, segment of Taenia, ova, cysts, and larvae of parasite, etc.
- 2) Gross and microscopic features (whenever applicable) of intestinal/ vaginal protozoa.
- 3) Laboratory diagnosis of malaria: demonstration of whole parasite, parasite antigen, enzymes, serology, etc.
- 4) Gross and microscopic features of cestodes: to include adult worms, segment, larvae, eggs.
- 5) Gross and microscopic features of Helminthes: to include adult worms, eggs, larvae.

B) Mycology

- 6) Diagnostic features- practical demonstration of gross and microscopic features (wet mount, slide culture) and other tests whenever applicable for following: Candida, Cryptococcus, Dermatophyte, Opportunistic fungi.

C) Virology :

- 7) General virology: types of symmetry, morphology of virus models, cultivation in embryonated egg
- 8) Laboratory diagnosis of the following viruses: Poliovirus, Rhabdovirus, HIV, Hepatitis.
- 9) Bacteriophage—structure using a model.

Paper DLTO 04: Hematology and Transfusion medicine

THEORY:

A) Hematology:

- Blood--- composition and function, haemopoiesis; RBC'S- structure, function and synthesis; Hemoglobin- structure, function, abnormal haemoglobins; Reticulocytes; Study of peripheral blood smear, parasites in blood.
- Hemolytic disorders—classification, general evidence of hemolytic nature of anaemia (screening tests). Hemolytic workup -- Sickling, Osmotic Fragility tests, Heinz bodies, G-6-P-D screening, Hb electrophoresis, Hb-F estimation.
- White blood corpuscles-- Description, morphology, leucopoiesis, Total WBC count and corrected Total WBC count, leucopenia, leucocytosis. Absolute counts— absolute eosinophil count. Differential WBC count. Leukemia, Leukemoid reaction, special stains for leukemias—PAS, Sudan Black, Myeloperoxidase. Bone marrow examination and iron staining of marrow.
- Platelet structure and function--- The normal hemostatic mechanism. Hemorrhagic disorder due to vascular (capillary) defect and platelet abnormalities. Theory of blood coagulation. Coagulation abnormalities— pathogenesis and classification. Laboratory tests and investigations of Bleeding disorders ie. Vascular disorders, platelet disorders, coagulation

B) Transfusion medicine:

- Blood groups- Introduction, ABO and sub groups, basic genetics, antigen and antibodies. ABO grouping techniques, problems in ABO grouping. , Rh blood group—basic genetics, antigen and antibodies, RH grouping techniques, problem in RH grouping. Other blood group systems and their significance.
- Blood banking--- Selection of a blood donor, blood collection. Complications of blood transfusion. Investigations of a mismatched blood transfusion.
- Blood component separation and therapy, Compatibility testing, Antihuman globulin test.
- Organization and administration of a blood bank, FDA rules, blood safety.

PRACTICALS

- 1) Use and care of microscopes; blood collection.
- 2) Anticoagulants and study of improved Neubauer chamber, erythrocyte count.
- 3) Haemoglobinometry: Sahli's method
- 4) Peripheral Blood smear preparations and staining; differential WBC count
- 5) Peripheral blood smear examination and morphological abnormalities
- 6) Total WBC count
- 7) Reticulocyte count
- 8) Demonstration of Hemolytic workup -- Osmotic fragility test, Heinz bodies, Sickling, G-6-P-D estimation, Hb-electrophoresis, Hb-F estimation.
- 9) Bone marrow examination- staining of smear, iron staining of marrow, Special stains- PAS, Sudan black, Myeloperoxidase
- 10) Platelet count
- 11) BT, CT, CRT
- 12) Demonstration of Prothrombin time, A.P.P.T and FDP estimation
- 13) E.S.R, P.C.V, Blood indices
- 14) ABO grouping and Rh typing
- 15) Demonstration of Coomb's test, Compatibility testing.

TEXT / REFERENCE BOOKS:

1. Textbook of Medical Laboratory Technology: Ramnik Sood.
2. Textbook of Medical Laboratory Technology: Praful Godkar
3. Theory and Practice of Histological Techniques : J D Bancroft and M Gamble
4. Clinical Diagnosis and Management by Laboratory Methods : J Bernard Henry
5. Textbook of Medical Biochemistry : M N Chatterjee & Rana Shinde
6. Essentials of Biochemistry : Pankaja Naik
7. Text Book of Biochemistry : Vasudevan and Shree Kumari
8. Text Book of Biochemistry : A Lehninger
9. Text Book of Biochemistry : Deb
10. Text Book of Harper's Illustrated Biochemistry : Murray, Granner and Rodwell.
11. Hematology of Medical Technologies: Seiverd

12. Practical Haematology : John Dacie and S M Lewis
13. Compendium of Transfusion Medicine : R N Makroo
14. Essentials Of Human Genetics : S.M Bhatnagar, ML Kothari , L A Mehta
15. Screening And Diagnosis Of Fetal Malformation- A Practical Guide: A K Debdas
16. Human Genetics: A.Gardner and T. Davies
17. A Textbook Of Human Genetics : Amita Sarkar
18. Medical Genetics At A Glance : Dorian .J. Pritchard & Bruce R. Korf
19. Human Genetics Concepts & Application : Ricki Lewis
20. Text Book of Microbiology (8th ed.) : Ananthanarayan and Panikers
21. Concise Microbiology (1st ed.) : C P Baveja and V Baveja



Goa University
Taleigao Plateau, Sub Post Goa University, Goa 403206 India.
REPORT OF THE STUDENT REGISTRATION

Admission Session: 2022-2023

College/Department : School of Biological Sciences & Biotechnology					
Programme Name : Post Graduate Diploma in Medical Laboratory Techniques					
Registration Category : Goa University With P.R. Number					
Student Status : P.R Number Generated					
Sr.No	Student Name as per HSSC	Application No	Email Id	Mobile No	Registration Date
1	DIVYANKA DATTAPRASAD SATARKAR	GU222350143	DIVYANKASATARKAR@GMAIL.COM	9168436792	15/09/2022
2	DABOLKER PRATIKSHA PRASHANT	GU222355863	pratikshadabholkar36@gmail.com	8308847829	15/09/2022
3	PRITI MOHANDAS KURTIKAR	GU222355864	kurtikarpriti90@gmail.com	7820928856	15/09/2022
4	SUDHADEVI YALLAPPA BYALAL	GU222355895	sudhabyalal7722@gmail.com	9309479076	15/09/2022
5	AMONKAR ANJALI VASUDEV	GU222355921	anjaliamonkar1523@gmail.com	7588262340	15/09/2022
6	KANDOLKAR SAISHA DEVANAND	GU222355926	saisha.kandolkar@gmail.com	9404912733	15/09/2022
7	VALANTINA ABIXA FERNANDES	GU222355929	valantinafernandes241@gmail.com	9049562824	15/09/2022
8	TRUSHA GOKULDAS KERKAR	GU222355991	Manshakerkar@gmail.com	9588685441	15/09/2022
9	SALIMA SAMIR NADAF	GU222356030	sanadanadaf062001@gmail.com	9284454065	15/09/2022
10	HAMISHA JITENDRA PARAMPAIKAR	GU222356075	parampaikarhamisha1510@gmail.com	9420236884	15/09/2022
11	VAISHNAVI VISHWANATH NAIK	GU222356103	vaishnavi.naik2505@gmail.com	7378760221	15/09/2022
12	ANKITA KESHAV SATARKAR	GU222356182	ankitasatarkar273@gmail.com	9637446615	15/09/2022
13	SHRADDHA SURYAKANT SALGAOKAR	GU222356206	shraddhasalgaokar@gmail.com	7507346295	15/09/2022
14	DIKSHA ROHIDAS BONDBAGKAR	GU222356225	bondbagkardiksha@gmail.com	9067280443	15/09/2022
15	VAISHNAVI KRISHNAKANT GOVEKAR	GU222356242	vinayakpednekar844@gmail.com	8766088779	15/09/2022
16	KIRTI PRABHAKAR GAONKAR	GU222356252	sadashivsawal@yahoo.in	9527897626	15/09/2022
17	NIDHI DINESH NAIK	GU222356260	nidhinaik8090@gmail.com	8806792317	15/09/2022
18	MARIANNE FATIMA ARAUJO	GU222356277	venesadidas@gmail.com	9822161611	15/09/2022
19	ARLEKAR SAMIKSHA CHANDRAKANT	GU222356279	arlekarsamiksha@gmail.com	7038185297	15/09/2022
20	TEJESH ARJUN GAONKAR	GU222356284	gaonkartejas670@gmail.com	8830262163	15/09/2022
21	GAUDE TEJAS TIPU	GU222358211	deepborker04@gmail.com	7888257217	15/09/2022
22	DIXITA DEEPAK REDKAR	GU222358269	dixitareddkar@gmail.com	9356487649	15/09/2022
23	CHAVAN RASIKA RAJAN	St. Xavier's College, Mapusa	rasikaa1604@gmail.com	9604350286	22/09/2022
24	RANE BHAVYA ABASAHEB	Ganpat Parsekar College of Education	bhavyarane0607@gmail.com	7798637801	22/09/2022
25	SAMIKSHA SAKHARAM SHETGAONKAR	St. Xavier's College, Mapusa	samikshashetgaonkar403512@gmail.com	8999536306	04/11/2022

Department of Biochemistry
 Paper: Biochemistry
 (No.) (Title)
 PGDMLT PRACTICALS
GOA UNIVERSITY
ATTENDANCE SHEET
 Class: MA / MCOM / MCA / MMS / MSC / Part II
 Academic Year: 2022-23
 Term: I / II Months
 1st term
 Total number of lectures delivered by the teacher during the term: 18 Months
 MLT54
 Total number of lectures delivered by the teacher during the term: 18 Months
 01/12/22 02/12/22 03/12/22 04/12/22 05/12/22 06/12/22 07/12/22 08/12/22 09/12/22 10/12/22 11/12/22 12/12/22 13/12/22 14/12/22 15/12/22 16/12/22 17/12/22 18/12/22
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
 Teacher's Name:
 Date of Lectures:
 Time of Lectures:
 No. of lectures delivered:
 Sr. No. Name of the Students
 1. Anantkar Anjali Vasudev
 2. Aranya Monaganu Kalimankar
 3. Anikar Sanuksha C
 4. Bandlagkar Diksha Rohidas
 5. Bhalal Sudhadani Yallappa
 6. Chavan Rozika Rajan
 7. Fernandes Valantina Abiza
 8. Gaonkar Kirti Prabhakar
 9. Gaonkar preeti Pradab
 10. Gaonkar Tejash Arjun
 11. Gaudle Tejash Tipu
 12. Govekar Vaishnavi K.
 13. Kandalakar Susha Renuka
 14. Kerkar Prisha Gokuldar
 15. Kulkarni Priti Mohandas
 16. Madan Salima Samir
 17. Naik Nishi Dinesh
 18. Naik Vaishnavi V. V.
 19. Parampalkar Hanisha Jyoti
 20. Rane Bhavya Abasab
 21. Redkar Rishika Deepak
 22. Salgaonkar Shradha S.
 23. Salunkar Anika Keshav
 24. Salunkar Divyanka D.
 25. Samiksha Shergaonkar
 Signature of the Teacher
 Signature of the Head of Dept.

MLT-524 HEMATOLOGY & BLOOD TRANSFUSION MEDICINE
 PRACTICALS
GOA UNIVERSITY
ATTENDANCE SHEET
 Class: MA / MCOM / MCA / MMS / MSC / Part II
 Academic Year: SEMESTER - I
 Term: I / II Months
 Total number of lectures delivered by the teacher during the term: 18 Months
 01/12/22 02/12/22 03/12/22 04/12/22 05/12/22 06/12/22 07/12/22 08/12/22 09/12/22 10/12/22 11/12/22 12/12/22 13/12/22 14/12/22 15/12/22 16/12/22 17/12/22 18/12/22
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
 Teacher's Name:
 Date of Lectures:
 Time of Lectures:
 No. of lectures delivered:
 Sr. No. Name of the Students
 1. Anjali V. Anantkar
 2. Monaganu F. Aranya
 3. Sanuksha C. Anikar
 4. Diksha R. Bandlagkar
 5. Sudhadani Y. Bhalal
 6. Rozika R. Chavan
 7. Valantina Abiza Fernandes
 8. Kirti P. Gaonkar
 9. Tejash A. Gaonkar
 10. Tejash A. Gaonkar
 11. Gaonkar Tejash Arjun
 12. Gaonkar Tejash Arjun
 13. Gaonkar Tejash Arjun
 14. Gaonkar Tejash Arjun
 15. Gaonkar Tejash Arjun
 16. Gaonkar Tejash Arjun
 17. Gaonkar Tejash Arjun
 18. Gaonkar Tejash Arjun
 Signature of the Teacher
 Signature of the Head of Dept.

DEPARTMENT OF BIOCHEMISTRY

Percentage Attendance during Training / Internship of PGDMLT Students conducted by the school of Biological Sciences and Biotechnology-Zoology, Goa University (2022-2023 batch & 2020-2021 batch, repeater) in the Department of Biochemistry (Clinical Lab) for Six months (16/11/ 2023 to 15/05/2024)

Sr. No.	Name	Percentage
1	Amonkar Anjali Vasudev	98%
2	Arlekar Samiksha Chandrakant	100%
3	Sudhadevi Yallappa Byalal	100%
4	Chavan Rasika Rajan	100%
5	Govekar Vaishnavi Krishnakant	96%
6	Kandolkar Saisha Devanand	96%
7	Naik Vaishnavi Vishwanath	93%
8	Parampaikar Hamisha Jitendra	100%
9	Satarkar Ankita Keshav	93%
10	Satarkar Divyanka Dattaparasad	96%
11	Samiksha Sakharam Shetgaonkar	96%
12	Mathondkar Pankaj Vijay	Not attended duty in the Department of Biochemistry
13	Gawas Amit Ashok	98%
14	Palyekar Radhika	98%

Noel Menezes 11/06/24
Dr. Carlos Noel Menezes
Associate Professor & Ag. Head

Dr. Carlos Noel Menezes
MD
Associate Professor
Department of Biochemistry
Goa Medical College
Reg. No: 2142

Copy received
from Pathology Dept.

Pathology

No. GMC/Path/2024/
Department of Pathology
Goa Medical College,
Bambolim - Goa.

Dated:- 23/05/2024

To,
The Dean,
Academic Section,
Goa Medical College,
Bambolim - Goa.

Sub: Attendance and date of completion of internship of PGDMLT Students
of batch during the period from 2022-2023.

Ref. No.: GU/SBSB-ZOO/PGDCG & MLT/2024/ dated 16/05/2024

Sir,

With regard to the subject referred to above vide letter under reference,
enclosed please find the required information of the students listed below during the
period of their posting in the Department of Pathology for Internship training:

Sr. No.	Name of Students	Period of posting in Pathology Department	No. of Days attended	Percentage of attendance
1	Amonkar Anjali Vasdev	01/04/2024 to 15/05/2024	43/45	95.55%
2	Arlekar Samiksha Chandrakant	01/04/2024 to 15/05/2024	38/45	84.44%
3	Sudhadevi Yallappa Byalal	01/04/2024 to 15/05/2024	42/45	93.33%
4	Chavan Rasika Rajan	01/04/2024 to 15/05/2024	42/45	93.33%
5	Govekar Vaishnavi Krishnakant	16/11/2023 to 31/12/2023	42/45	93.33%
6	Kandoikar Saisha Devanand	16/11/2023 to 31/12/2023	45/45	100%
7	Naik Vaishnavi Vishwanath	16/11/2023 to 31/12/2023	42/45	93.33%
8	Parampaikar Hamisha Jitendra	16/11/2023 to 31/12/2023	43/45	95.55%
9	Satarkar Ankita Keshav	01/01/2024 to 15/02/2024	38/45	84.44%
10	Satarkar Divyanka Dattaprasad	01/01/2024 to 15/02/2024	43/45	95.55%
11	Samiksha S. Shetagaonkar	01/01/2024 to 15/02/2024	43/45	95.55%
12	Mathondkar Pankaj Vijay	Absent		
13	Gawas Amit Ashok	16/02/2024 to 31/03/2024	42/45	93.33%
14	Palyekar Radhika	16/02/2024 to 31/03/2024	42/45	93.33%

Kindly do the needful.

Thanking you,

Yours faithfully,



(For) (Dr. R.G.W. Pinto)
Professor. & Head
Department of Pathology

GOA UNIVERSITY

20 21 010666

Seat No. : PGZ-0122

P.R. No. : 201800273



CERTIFICATE

This is to certify that Miss. AMONKAR ANJALI VASUDEV after having passed the Post Graduate Diploma in Medical Laboratory Techniques Examination held in August 2023 has satisfactorily completed the Compulsory Internship Training for a period of six months from 15th November 2023 to 15th May 2024 at the Biochemistry, Blood bank, OPD-13 Central Lab, Pathology and Microbiology Departments in Goa Medical College, as per the ordinance of the University. The above candidate is eligible for the award of the Post Graduate Diploma in Medical Laboratory Techniques at the ensuing Convocation of this University.

Date of Declaration : 29/09/2023

Read by :

Checked by :

REGISTRAR

Medium of Instruction : English

Issued on 12/08/2024

GOA UNIVERSITY

20 21 010665

Seat No. : PGZ-0322

P.R. No. : 201404545



CERTIFICATE

This is to certify that Miss. ARLEKAR SAMIKSHA CHANDRAKANT after having passed the Post Graduate Diploma in Medical Laboratory Techniques Examination held in August 2023 has satisfactorily completed the Compulsory Internship Training for a period of six months from 15th November 2023 to 15th May 2024 at the Biochemistry, Blood bank, OPD-13 Central Lab, Pathology and Microbiology Departments in Goa Medical College, as per the ordinance of the University. The above candidate is eligible for the award of the Post Graduate Diploma in Medical Laboratory Techniques at the ensuing Convocation of this University.

Date of Declaration : 29/09/2023

Read by :

Checked by :

REGISTRAR

Medium of Instruction : English

Issued on 12/08/2024