GOA UNIVERSITY

POSTGRADUATE STUDIES
&
RESEARCH PROGRAMMES

PROSPECTUS
2021-2022

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**
	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 s 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

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, pasteaur pipetts, 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 , Schaudinns Solution, K-dichromate – Orth's Solution, Regaud's Solution, Picric Acid, Bouins Solution; Hollande's Solution. Decalcifying fluids: Formic Acid – Gooding and Stewarts fluid, Nitric Acid – Aqueous nitric acid

2) Stains: Composition and technique, preparation and application of Iron Hematoxylins Weigert's iron hematoxylin, Heidenhains iron hematoxylin, Tungsten Hematoxylins, PTAH, Moybdenum Hematoxylin, Phophomdybdic acid hematoxylin

3) Connective tissue stains: History of connective tissue: composition; preparation & application of Masson trichrome, Von – Gieson, Reticulin stain Gomoris Silver methanamine. Elastic tissue stains:Verhoeffs method, Weigerts 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 Loprae, 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 microscpes (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. Decalification, 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 O02 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, artherosclerosis.

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 bilurubin.
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, pathologenecity, 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 (Rbies 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, Oppurtunistic 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, haemopoesis; 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. Heamorrhagic 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 neubaur 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: 2021-2022

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	SHIRODKAR BHUMIKA ROHIDAS	121708425711	bhumika.s2306@gmail.com	7040707884	30/11/2021
2	MASURKAR NEELAM NAMDEV	GU212242938	masurkarneelam6@gmail.com	9823975936	01/12/2021
3	NAIK SALINA ANIL	121708429061	salinanaik51@gmail.com	8432778615	01/12/2021
4	MORAJKAR PRIYANKA PANDURANG	121708423911	priyankamorajkar99@gmail.com	9075287798	01/12/2021
5	GADEKAR AISHWARYA SURESH	121708429061	gadekaraishwarya25@gmail.com	8080598257	01/12/2021
6	NAIK TANAVI KRISHNA	121708428501	tanvinaikborim@gmail.com	9545382076	01/12/2021
7	TAMBAK ANISA BANU	121708423021	anisatambak111@gmail.com	9665646775	01/12/2021
8	NAIK DIVYA SHRIKANT	121708428361	naikdiv1207@gmail.com	9373027254	01/12/2021
9	SATARKAR CHAITALI ANAND	121708428261	chaitalisatarkar13@gmail.com	9637652053	01/12/2021
10	NAYAKAR HANUMANT GOUDA S	121708427841	hanumantnayakar58855@gmail.com	9112325589	01/12/2021
11	FERNANDES AFINA	121708421741	afinafernandes17@gmail.com	8010306056	01/12/2021
12	SHIRODKAR SHRINGI SHRIRAM	121708426251	shirodkarshringi27@gmail.com	8767863834	01/12/2021
13	VAS ANGELA HENSTINA	121708427461	angelavas0021@gmail.com	8007527592	01/12/2021
14	SANIA LYNN PATIL	121708428101	saniaapatil@gmail.com	8208075028	01/12/2021
15	OMKAR NAIK	121708423061	onaik939@gmail.com	7038238733	01/12/2021
16	NAIK TRUPTI TULSHIDAS	121708424261	naiktrupti343@gmail.com	8605634414	01/12/2021
17	CHARI SHIVANI RATNAKAR	121708423651	shivanichari23@gmail.com	8390812804	01/12/2021
18	NAIK VIRAJ RAVINDRANATH	121708428581	naikviraj2021@gmail.com	9527404250	01/12/2021
19	NAIK TANVI NARAYAN	121708423901	tanvin840@gmail.com	8390512614	01/12/2021
20	GHADI NISHITA PURUSHOTTAM	121708423571	nishitaghadi23@gmail.com	9764733157	01/12/2021
21	ANDRADE FLYNNA ROSVILLA	121708428231	flynnaandrade21@gmail.com	9527112167	06/12/2021
22	SATARKAR DIKSHITA DURGADAS	GU212242951	dikshitasatarkar98@gmail.com	7822817552	13/12/2021
23	PALYEKAR RADHIKA YESHWANT	121708446101	radhikapalyekar797@gmail.com	7821056803	10/01/2022
24	GAWAS AMIT ASHOK	121708424951	gawasamit4141@gmail.com	8698741417	17/12/2021
25	MD ASHAR	121708427081	asharmohammedx@gmail.com	7319932937	07/12/2021

GOA UNIVERSITY

030066 2018

Seat No. : PGZ-0721

P.R. No. : 201801542

This is to Certify that

Shri/Kum. : MASURKAR NEELAM NAMDEV

has passed POST GRADUATE DIPLOMA IN MEDICAL LABORATORY TECHNIQUES

examination held by GOA UNIVERSITY in the month of MARCH, 2023

and was placed in FIRST CLASS

Date of Declaration : 27/04/2023 Read by : Checked by : REGISTRAR

Medium of Instruction : English

GOA UNIVERSITY

030061 2018

Seat No. : PGZ-2221

P.R. No. : 201810701

This is to Certify that

Shri/Kum. : TAMBAK ANISA BANU

has passed POST GRADUATE DIPLOMA IN MEDICAL LABORATORY TECHNIQUES

examination held by GOA UNIVERSITY in the month of MARCH, 2023

and was placed in SECOND CLASS

Date of Declaration : 27/04/2023 Read by : Checked by : REGISTRAR

Medium of Instruction : English

Goa University
SBSB, M.Sc., Zoology
Inward No. 436
Date 20/12/22

GOA UNIVERSITY

POST GRADUATE DIPLOMA IN MEDICAL LABORATORY TECHNIQUES EXAMINATIONS HELD IN OCTOBER 2022 (SECOND TERM)

DEPARTMENT OF ZOOLOGY

Sr. No	Seat No	Registration No	Gender	Name of the Candidate	DLTO 01 Applied Microbiology							DLTO 02 Clinical Biochemistry - II							DLTO 03 Clinical Parasitology, Mycology and Virology							DLTO 04 Hematology and Transfusion Medicine							Total of Second Term	Grace of Second Term	Total of First Term	Grace of First Term	Grand Total	Grace Total	Percentage	Class
					Theory	Grace	Practical	Grace	Paper Total	Grace Total	Pass/Fail	Theory	Grace	Practical	Grace	Paper Total	Grace Total	Pass/Fail	Theory	Grace	Practical	Grace	Paper Total	Grace Total	Pass/Fail	Theory	Grace	Practical	Grace	Paper Total	Grace Total	Pass/Fail								
				Maximum Marks	50		50		100			50		50		100			50		50		100			50		50		100			400		400		800			
				Minimum Marks	20		20		40			20		20		40			20		20		40			20		20		40			160		160		320			
1	PGZ-0121	201710930	F	CHARI SHIVANI RATNAKAR	27		35		62		P	10		13		23		F	21		29		50		P	21		36		57		P	192		209	$01	401	$01	–	FAILS
2	PGZ-0221	201811822	F	FERNANDES AFINA	26		36		62		P	17	$03	30		47	$03	P	29		35		64		P	26		44		70		P	243	$03	214	$05	457	$08	58.13	SECOND CLASS
3	PGZ-0321	201804823	F	FLYNNA ROSVILLA ANDRADE	32		38		70		P	23		26		49		P	22		35		57		P	23		40		63		P	239		237	$02	476	$02	59.75	SECOND CLASS
4	PGZ-0421	201801633	F	GADEKAR AISHWARYA SURESH	36		40		76		P	20		17	$03	37	$03	P	28		38		66		P	24		44		68		P	247	$03	254	$01	501	$04	63.13	FIRST CLASS
5	PGZ-0721	201801542	F	MASURKAR NEELAM NAMDEV	34		35		69		P	14		32		46		F	27		36		63		P	20		41		61		P	239		270		509		–	FAILS
6	PGZ-0921	201711418	F	MORAJKAR PRIYANKA PANDURANG	27		35		62		P	18	$02	33		51	$02	P	33		32		65		P	32		40		72		P	250	$02	269		519	$02	65.13	FIRST CLASS
7	PGZ-1021	201801701	F	NAIK DIVYA SHRIKANT	33		35		66		P	19	$01	15		34	$01	F	25		33		58		P	21		37		58		P	218	$01	219	$02	437	$03	–	FAILS
8	PGZ-1121	201803443	M	NAIK OMKAR	33		39		72		P	26		28		54		P	27		32		59		P	25		39		64		P	249		244		493		61.63	FIRST CLASS
9	PGZ-1221	201801760	F	NAIK SALINA ANIL	34		43		77		P	14		25		39		F	25		36		61		P	25		43		68		P	245		274		519		–	FAILS
10	PGZ-1321	201810893	F	NAIK TANVI KRISHNA	29		36		65		P	26		20		46		P	32		38		70		P	21		41		62		P	243		235		478	$02*	60.00	FIRST CLASS
11	PGZ-1421	201810798	F	NAIK TANVI NARAYAN	27		36		63		P	19	$01	20		39	$01	P	33		35		68		P	18	$02	37		55	$02	P	225	$03	234		459	$03	57.75	SECOND CLASS
12	PGZ-1521	201710581	F	NAIK TRUPTI TULSHIDAS	30		35		65		P	13		22		35		F	24		32		56		P	23		36		59		P	215		216		431		–	FAILS
13	PGZ-1621	201811848	M	NAIK VIRAJ RAVINDRANATH	37		40		77		P	25		27		52		P	32		34		66		P	28		38		66		P	261		279		540		67.50	FIRST CLASS
14	PGZ-1721	201808074	M	NAYAKAR HANUMANT GOUDA S.	32		38		70		P	17	$03	31		48	$03	P	27		38		65		P	24		42		66		P	249	$03	231	$02	480	$05	60.63	FIRST CLASS
15	PGZ-1821	201808064	F	PATIL SANIA LYNN	27		33		60		P	6		18	$02	24	$02	F	22		28		50		P	13		36		49		F	183	$02	184	$02	367	$04	–	FAILS
16	PGZ-1921	201808046	F	SATARKAR CHAITALI ANAND	25		35		60		P	13		17	$03	30	$03	F	25		31		56		P	19	$01	40		59	$01	P	205	$04	197	$07	402	$11	–	FAILS
17	PGZ-2021	201701795	F	SHIRODKAR BHUMIKA ROHIDAS	29		40		69		P	25		31		56		P	29		40		69		P	23		38		61		P	255		207	$03	462	$03	58.13	SECOND CLASS
18	PGZ-2121	201808054	F	SHIRODKAR SHRINGI SHRIRAM	29		38		67		P	18	$02	20		38	$02	P	30		33		63		P	23		44		67		P	235	$02	228	$01	463	$03	58.25	SECOND CLASS
19	PGZ-2221	201810701	F	TAMBAK ANISA BANU	27		40		67		P	12		16		28		F	23		32		55		P	18	$02	42		60	$02	P	210	$02	235	$02	445	$04	–	FAILS
20	PGZ-2321	201808087	F	VAS ANGELA HENSTINA	32		36		68		P	16		18	$02	34	$02	F	28		33		61		P	21		40		61		P	224	$02	240		464	$02	–	FAILS
21	PGZ-2521	201807990	M	GAWAS AMIT ASHOK	32		36		68		P	15		20		35		F	23		33		56		P	20		38		58		P	217		204	$06	421	$06	–	FAILS
22	PGZ-2621	201801735	F	PALYEKAR RADHIKA YESHWANT	23		36		59		P	8		17	$03	25	$03	F	23		28		51		P	13		34		47		F	182	$03	210	$06	392	$09	–	FAILS
23	PGZ-2721	201800251	F	SATARKAR DIKSHITA DURGADAS	25		33		58		P	17	$03	29		46	$03	P	25		29		54		P	23		37		60		P	218	$03	226		444	$03	55.88	SECOND CLASS

$ Grace Marks / $* Grace Marks to Secure a Class — [shaded box] Fail

Note : Any discrepancy in the result should be communicated to the Examination Section by the H.O.D within a weeks time from the declaration of the result.

LENC - Lower Exam Not Cleared

Read by: [signature]

Checked by: [signature]

Declared on: 16 DEC 2022

Assistant Registrar (Exam-PG) — Assistant Registrar (Exam) — Controller of Examinations

Goa University
SBSB, M.Sc., Zoology
Inward No. 710
Date 27/4/23

GOA UNIVERSITY

POST GRADUATE DIPLOMA IN MEDICAL LABORATORY TECHNIQUES EXAMINATIONS HELD IN MARCH, 2023 (SECOND TERM) (REPEATERS)

SCHOOL OF BIOLOGICAL SCIENCES AND BIOTECHNOLOGY (ZOOLOGY)

Sr. No.	Seat No.	Registration No.	Gender	Name of the Candidate	DLTO 01 APPLIED MICROBIOLOGY							DLTO 02 CLINICAL BIOCHEMISTRY - II							DLTO 03 CLINICALPARASITOLOG, MYCOLOGY & VIROLOGY							DLTO 04 HEMATOLOGY & TRNSFUSION MEDICINE							Total of Second Term	Grace of Second Term	Total of First Term	Grace of First Term	Grand Total	Grace Total	Percentage	Class
					Theory	Grace	Practical	Grace	Paper Total	Grace Total	Pass/Fail	Theory	Grace	Practical	Grace	Paper Total	Grace Total	Pass/Fail	Theory	Grace	Practical	Grace	Paper Total	Grace Total	Pass/Fail	Theory	Grace	Practical	Grace	Paper Total	Grace Total	Pass/Fail								
				Maximum Marks	50		50		100			50		50		100			50		50		100			50		50		100			400		400		800			
				Minimum Marks	20		20		40			20		20		40			20		20		40			20		20		40			160		160		320			
1	PGZ-0121	201710930	F	CHARI SHIVANI RATNAKAR	27		35		62		P	19	$01	26		45	$01	P	21		29		50		P	21		36		57		P	214	$01	225	$01	439	$02	55.13	SECOND CLASS
2	PGZ-0721	201801542	F	MASURKAR NEELAM NAMDEV	34		35		69		P	23		32		55		P	27		36		63		P	20		41		61		P	248		270		518		64.75	FIRST CLASS
3	PGZ-1021	201801701	F	NAIK DIVYA SHRIKANT	33		35		68		P	19	$01	28		47	$01	P	25		33		58		P	21		37		58		P	231	$01	219		450	$01	56.38	SECOND CLASS
4	PGZ-1221	201801760	F	NAIK SALINA ANIL	34		43		77		P	21		25		46		P	25		36		61		P	25		43		68		P	252		274		526		65.75	FIRST CLASS
5	PGZ-1521	201710581	F	NAIK TRUPTI TULSHIDAS	30		35		65		P	28		22		50		P	24		32		56		P	23		36		59		P	230		216		446		55.75	SECOND CLASS
6	PGZ-1821	201808064	F	PATIL SANIA LYNN	27		33		60		P	AB		18	$02	18	$02	F	22		28		50		P	13		36		49		F	177	$02	182	$02	359	$04	–	FAILS
7	PGZ-1921	201808046	F	SATARKAR CHAITALI ANAND	25		35		60		P	20		17	$03	37	$03	P	25		31		56		P	19	$01	40		59	$01	P	212	$04	209	$04	421	$08	53.63	SECOND CLASS
8	PGZ-2221	201810701	F	TAMBAK ANISA BANU	27		40		67		P	18	$02	26		44	$02	P	23		32		55		P	18	$02	42		60	$02	P	226	$04	235	$02	461	$06	58.38	SECOND CLASS
9	PGZ-2321	201808087	F	VAS ANGELA HENSTINA	32		36		68		P	27		18	$02	45	$02	P	28		33		61		P	21		40		61		P	235	$02	240		475	$02	59.63	SECOND CLASS
10	PGZ-2521	201807990	M	GAWAS AMIT ASHOK	32		36		68		P	13		20		33		F	23		33		56		P	20		38		58		P	215		204		419		–	FAILS
11	PGZ-2621	201801735	F	PALYEKAR RADHIKA YESHWANT	23		36		59		P	13		17	$03	30	$03	F	23		28		51		P	19	$01	34		53	$01	P	193	$04	210		403	$04	–	FAILS

$ Grace Marks — [shaded box] Appeared For Paper

Note : Any discrepancy in the result should be communicated to the Examination Section by the Dean / PD within a weeks time from the declaration of the result.

LENC - Lower Exam Not Cleared

Read by: [signature]

Checked by: [signature]

Declared on: 27 APR 2023

Assistant Registrar (Exam-PG) — Assistant Registrar (Exam) — Controller of Examinations