

SARDAR PATEL UNIVERSITY

Rules and Regulations for

Post graduate Diploma in Dialysis Technology (PG-DIDT)

(w.e.f. JUNE-2011)

R. DIDT. 1:

Eligibility for the admission:

a) A Candidate for admission to the Post graduate Diploma in Dialysis Technology (PG-DIDT) must have passed the B Sc. Degree examination of the Sardar Patel University with Medical Technology (any speciality) / Microbiology/ Bio Chemistry/ Zoology / Botany/ Chemistry / Bio-Technology / Environment Science / Genetics / Bioinformatics as principal subject or B. Sc. (Home Science) (Vocational) or B. Sc (Industrial Microbiology) (Vocational) or B.Sc. (Nursing) / Bachelor of Physiotherapy (BPT) / Bachelor of Homeopathic Medicine and Surgery (BHMS) / Bachelor of Ayurvedic Medicine and Surgery (BAMS) examination of Sardar Patel University or an equivalent examination from any other recognized university.

b) A candidate who has passed an equivalent examining body and is seeking admission to the Institute recognised by this University shall not be admitted without producing an eligibility certificate from the Sardar Patel University

R. DIDT. 2:

Duration of the course:

The course of study for the Post graduate Diploma in Dialysis Technology (PG-DIDT) shall be a full time course and its duration shall be of one academic year.

R. DIDT. 3:

Medium of instruction:

The medium of instruction and examination shall be in English.

R. DIDT. 4:

Criteria for eligibility to appear in University examination

To become eligible to appear in the final examination conducted by Sardar Patel University -

a) a candidate has to keep two terms at the Institute recognised for teaching the course of studies in Post graduate Diploma in Dialysis Technology by the university.

b) a candidate has to keep the minimum attendance of 75% in Theory and Practicals separately.

c) a candidate has to obtain at least 30% marks in aggregate of all the papers/practical in the internal tests conducted by the Institute.

R. DIDT.5: The subjects for Post graduate Diploma in Dialysis Technology (PG-DIDT) and their total teaching hours during the course shall be as under:

Sr. No.	Subject	Course Code	Total Teaching hours
1	Anatomy and Physiology	PG-DIDT-101	90
2	Biochemistry and Pathology	PG-DIDT-102	90
3	Dialysis Technology I	PG-DIDT-103	90
4	Dialysis Technology II	PG-DIDT-104	90
5	Practicals and Oral	PG-DIDT-105 (P)	90
Total Teaching hours-Theory & Practicals			450
Clinical/Laboratory Posting			540
Total Teaching hours			990

R. DIDT. 6: Subjects-wise credits and Scheme of examination shall be as follows:

PG-DIDT
Subject-wise credits, Examination System and Marks distribution:
Theory and Practical

Course Code	Subject	Credit	Duration of Examination (hours)	Distribution of marks		Total
				University exam	Internal assessment	
PG-DIDT-101	Anatomy and Physiology	3	3 hours	80	20	100
PG-DIDT-102	Biochemistry and Pathology	3	3 hours	80	20	100
PG-DIDT-103	Dialysis Technology I	3	3 hours	80	20	100
PG-DIDT-104	Dialysis Technology II	3	3 hours	80	20	100
PG-DIDT-105 (P)	Practicals and Oral	3	1 day	160	40	200
	Total			480	120	600

R. DIDT. 7: Eligible candidate desirous for appearing in the University examination of any/all theory papers must forward his/her application in the prescribed form from the respective college to the University on or before the date prescribed for the purpose under the relevant ordinance.

R. DIDT.8: **Standard of passing:**
The standard of passing the Post graduate Diploma in Dialysis Technology degree examination will be as under:
(a) To pass the PG-DIDT examination, a candidate must obtain at least **45% marks** (aggregate of external and internal) in each subject and in practical separately.
(b) Award of class will be as per the other degree examinations of faculty of Medicine, Sardar Patel University.

R. DIDT. 9: The Post graduate Diploma in Dialysis Technology shall not be conferred upon a candidate unless he/she has passed in all the subjects of the theory examination and the practical in accordance with the provisions of relevant regulations.

SARDAR PATEL UNIVERSITY

POST GRADUATE DIPLOMA IN DIALYSIS TECHNOLOGY (PG-DIDT)

CURRICULUM

PAPER I:

ANATOMY AND PHYSIOLOGY

COURSE CODE: PGDIDT: 101

ANATOMY

1. Urinary System:

Introduction to Urinary System

Kidney

Location

Size and shape

External structure

Hilum of the kidney

Internal Structure

Organs associated with kidney

Coverings of the kidney

Blood supply

Nerve supply

Nephron

Introduction

Size and shape

Structure

Types

Collecting duct

Ureter

Location

Size and shape

Structure

Blood supply

Nerve supply

Urinary Bladder

Location

Size and shape

Three layers of bladder wall

Structures

Relations of urinary bladder

Blood flow

Nerve supply

2. Arteries and Veins of the Limbs and the Neck

Radial Artery and Vein
Brachial Artery and Vein
Cephalic Vein
Basilic Vein
Ulnar Artery and Vein
Femoral Artery and Vein
Great Saphenous Vein
Intra Jugular Vein
Subclavian Vein

3. Peritoneum

Peritoneal Membrane
Perital peritoneum
Visceral peritoneum
Folds of peritoneum
Peritoneal cavity
Arterial supply
Venous drainage

Pores

Large pores
Small pores
Ultra pores

PHYSIOLOGY

1. Functions of Kidney

Role in Homeostasis
Excretion of waste products
Maintenance of water balance
Maintenance of electrolyte balance
Maintenance of acid base balance
Hemopoietic Functions
Endocrine Functions
Blood Pressure Regulation
Regulation of Blood Calcium level

2. Micturation

Process of filling
Sphincters
Micturition
Micturition reflux

PAPER II:

BIOCHEMISTRY AND PATHOLOGY

COURSE CODE: PGDIDT: 102

BIOCHEMISTRY

1. Proteins, Minerals, Vitamins

Proteins:

- Plasma proteins
- Albumin
- Globulin
- Immunoglobulins
- Fibrinogen
- Amino acids
- Functions of proteins
- Protein requirements
- Causes of protein deficiency

- Complications of protein deficiency
- Dietary sources of protein

Vitamins

- Water soluble and Fat soluble
- Recommended dietary allowances
- Deficiency diseases
- Upper intake level
- Overdose disease
- Dietary sources

Minerals (Dietary resource, requirement, uses and sources)

- Introduction
- Sodium
- Potassium
- Calcium
- Iron
- Magnesium
- Phosphate
- Iodine
- Copper
- Cobalt
- Chloride
- Fluoride

2. Nucleoproteins

- Hemoglobin

3. Nutrition

RDA for healthy individuals and for dialysis patients

RDA for health individuals

RDA for Hemodialysis patients

RDA for Peritoneal dialysis patients

PATHOLOGY

1. Acute Renal Failure

Definition

Causes

Prerenal

Renal

Post renal

Pathophysiology

Prevention

Risk factors

Treatment

Signs and symptoms

2. Chronic Renal failure

Definition

Causes

Pathophysiology

Prevention

Treatment and Management

3. Urinary tract infection

Causes

Prevention

Treatment

4. Diabetes

Types

Treatment

Complications

5. Hypertension

Types

Treatment

Complications

PAPER III:

DIALYSIS TECHNOLOGY - I

COURSE CODE: PGDIDT: 103

1. Types of Hemodialysis
 - Conventional Hemodialysis
 - Daily Hemodialysis
 - Nocturnal Hemodialysis
2. Principles of Hemodialysis
 - Ultrafiltration
 - Diffusion
 - Osmosis
 - Convection
3. Dialyser Membranes
 - High Flux and Low Flux
 - Membranes and their biocompatibility
4. Reprocessing of Dialysers
 - Rinse
 - Clean
 - Test
 - Disinfect
5. Chemicals used in dialysis unit
 - Chemicals used for Reprocessing
 - Formalin
 - Sodium Hypochloride
 - Hydrogen Peroxide
 - IV Fluids
 - Normal Saline
 - Half Normal Saline and Deci Normal Saline
 - Dextrose
 - Hemodialysis Concentrates
 - Acid Concentrate (Part A)
 - Bicarb Concentrate (Part B)
 - Acetate Concentrate
 - Machine Disinfectants
 - Puristerile
 - Citrosterile
 - Others
 - Sterillium
 - Betadine
6. CRRT (Continuous Renal Replacement Therapy) and special blood based therapies
 - CVVHD

CVVHF
CVVHDF
SCUF
IUF
SLED

7. Water Treatment
 - Steps in Water Treatment
 - Hemodialysis Water Quality
 - AAMI Standards
8. Vascular Access
 - Temporary access
 - Permanent access
9. Monitoring and Assessment of Hemodialysis
 - Pre, Post & Intra Dialytic patient assessment
 - Hemodialysis Machine monitoring
10. Lab data assessment
 - Normal Lab values
 - Lab values in renal failure

PAPER IV:

DIALYSIS TECHNOLOGY - II

COURSE CODE: PGDIDT: 104

1. Nutrition management in dialysis patients
 - Malnutrition
 - Recommended daily allowance of nutrients for dialysis patients
 - Total parenteral Nutrition
 - Intradialytic parenteral nutrition
2. Anticoagulation in dialysis
 - Types of anticoagulation
 - Heparin in Detail
3. Infection control and universal precautions
 - Safety precautions
 - Infection control
 - Needle stick injury
 - Air borne diseases
 - Chemical exposure
4. Complications of Hemodialysis
 - Acute
 - Hypotension

- Muscle cramps
- Nausea and vomiting
- Head ache
- Chest pain
- Back pain
- Fever and chills
- Itching

Chronic

- Mineral bone disease
- Sleep disorders
- Left ventricular hypertrophy
- Infections
- Others

5. Indications and contraindications of dialysis therapy
6. Psychosocial aspects in dialysis, patient education
7. Body composition monitoring
 - Indications
 - Contraindications
 - Advantages
 - Procedure
 - Care of the machines
8. Drugs and dialysis
 - Erythropoietin
 - Vitamin Supplements
 - Vancomycin and other antibiotics
 - Dextrose Solution
 - Iron Sucrose
 - Colloids
 - Antihypertensive drugs
 - Emergency drugs
 - Nitroglycerides
 - Dopamine & Dobutamine
 - Epinephrine & Nor epinephrine
 - Others
9. Principles of Peritoneal dialysis
 - Osmosis
 - Diffusion
10. Types and complications of peritoneal dialysis
 - Selection of modality
 - Types of Peritoneal dialysis
 - Complication of PD
 - Non Infection complications
 - Infectious Complications

PRACTICALS

COURSE CODE: PGDIDT: 105 (P)

(A) Anatomy

1. Identification of different parts of the urinary system, kidney, nephrons, veins and arteries, Peritoneum
2. Urinary system
 - Kidneys
 - Ureter
 - Urinary bladder
 - Urethra
 - Renal Artery
 - Renal vein
 - Renal pelvis
3. Kidneys
 - Surface, Borders, Poles, Coverings and Hilum of the kidney
 - Cortex
 - Medulla
 - Renal pyramids
 - Major calyx
 - Minor calyx
 - Renal pelvis
 - Renal artery and vein
 - Capsule
 - Renal fascia
 - Renal fat
 - Ureter

(B) Dialysis technology

1. Patient assessment (Pre, Intra and post dialysis)
 - a. Weight
 - b. Edema
 - c. Vitals
 - Blood pressure
 - Pulse
 - Temperature
 - Respiration
 - d. Vascular access
 - Bruit and Thrill, Aneurysm, Pseudoaneurysm
2. Cannulation site selection and preparation
3. Cannulation of fistula
4. Predialysis patient and machine preparation
5. Dialyser reprocessing

6. Post dialysis machine preparation
7. Intra dialytic complication management
8. Medication administration
9. Heparin dosage selection
10. Machine trouble shooting

Suggested Reference Books:

Anatomy: Gray's Anatomy

Physiology: Text book of Physiology by Sembulingam

Biochemistry: Textbook of Biochemistry by Sathyanaraya

Pathology: Textbook of Pathology by Harsh Mohan

Dialysis: Handbook of Dialysis by Daugirdas,
Textbook of Dialysis therapy by Allen Nissensson

Examination Structure

- The external examination of four theory papers and one practical will be held at the end of the academic year.
- Candidates will be examined in four theory papers and two practical to make the total of 550 marks at the end of the year.
- This will include 400 marks of theory examination, 150 marks of practical.
- The ratio between internal and external assessment will be 20:80 respectively.
- For the purpose of internal assessment the Institute will conduct at least one test in the year.
- The distribution of marks will be as under (internal assessment)
 - Each internal theory exam will be of 100 marks
 - Each internal practical exam will be of 50 marks
 - That is $100+50=150$ marks in total.
- From these 100 and 50 marks 20% will be added in external theory and practical assessment respectively.
- Passing standard: 45%
- Award of rankings: According to university

		Theory Marks	Prac Marks
Anatomy and Physiology	Paper I	100	50
Biochemistry and Pathology	Paper II	100	
Dialysis Technology I	Paper III	100	50
Dialysis Technology II	Paper IV	100	50
	Total	400	200