

# **CURRICULUM FOR**

## **Diploma in Dialysis Technology**

(Applicable w.e.f. academic session 2017-18)

**COURSE NAME: DIPLOMA IN DIALYSIS TECHNOLOGY**

**DURATION OF COURSE: TWO YEARS**

**FULL-TIME/ PART – TIME: FULL-TIME**

**SRI GURU RAMDAS UNIVERSITY OF HEALTH  
SCIENCES, SRI AMRITSAR, PUNJAB**

## **1. DIPLOMA IN DIALYSIS TECHNOLOGY (DDT)**

A diploma level course in Dialysis Technique equips students with the skill set that is demanded of a Dialysis technician who can take up the responsibility in the domain with effective ease. This is a regular theory & practical oriented program. The mode of teaching will be in the form of regular classrooms, lectures / demonstrations supplemented by handouts, manuals, brochures, checklists, performance with supervised clinical practices.

## **2. Duration of Course**

The Diploma in Dialysis Technology Course is proposed to be a 2 years diploma course.

## **3. Eligibility Criteria for Admission**

The students shall be admitted as per the admission criteria and qualification prescribed in the Notification issued by the Board of Management of Sri Guru Ram Das University of Health Sciences from time to time.

## **4. Medium of Instructions**

The Medium of instruction during the course and for the university examination shall be in English.

## **5. Examination Scheme**

- 5.1 The examination for the first and second shall ordinarily be held twice year in the months of May/June and November/ December by the Institute as per University rules.
- 5.2 Annual Examination shall be held in May/June and supplementary within 6 months of annual examination.
- 5.3 The examination in theory/practical shall be held at the end of the 1<sup>st</sup> academic year (1<sup>st</sup> Year) and the end of 2<sup>nd</sup> academic year (2<sup>nd</sup> Year) with one internal and one external examiners.
- 5.4 Date of examination and appointment of examiner will be made by the Board of Management on recommendation of Faculty of Medical Sciences.
- 5.5 The examination for the first, second year of Diploma in Dialysis Technology Course would be held according to the prescribed syllabus.

## **6. Rules of Examination for Diploma in Dialysis Technology Course:**

- 6.1 The students shall submit his/her application for admission to the examination to Controller of Examinations SGRDUHS, Sri Amritsar through the Director Principal of the SGRDIMSAR, Sri Amritsar on the prescribed form with the required fee (the last date of which will be updated on university website after notification issued from Board of Management time to time).
- 6.2 The candidates will be given 25 marks for theory and 15 marks for practical as internal assessment in each subject on the basis of their performance during the year. That a candidate be eligible to appear in the examination provided he/she secured a minimum of 35% marks in internal assessment in theory and practical.
- 6.3 There will be fresh internal assessment and compulsory attendance for the students for the examination in which he/she has failed at the time of subsequent examination in that subject.
- 6.4 The students will not be allowed to appear in the examination unless he/she attends 75% of the total theory and practical in each subject separately.
- 6.5 Director Principal of the college is empowered to condone the shortage of attendance of lectures to the extent of 5% lectures delivered in each course of theory and practical.

- 6.6 A student will be deemed to have passed in the examination if he/she passes in each subject separately.
- 6.7 In case of students joining late owing to the late admission with the approval of the Vice-chancellor, their lecturers are to be counted from the date of joining. Deficiency in studies should be made up by attending special classes for them at the level of Head of the Department.

**7. First Year Diploma in Dialysis Technology Examination:**

The First Year Diploma in Dialysis Technology examination shall be in the following subjects and candidate shall be required to pass all the subjects:-

| Paper                     | Subject                                 | Theory |                     |       | Practical |                     |       | Grand Total |
|---------------------------|---|--------|---------------------|-------|-----------|---------------------|-------|-------------|
|                           |   | Marks  | Internal Assessment | Total | Marks     | Internal Assessment | Total |             |
| Paper-I                   | Human Anatomy, Physiology and Pathology | 75     | 25                  | 100   | 35        | 15                  | 50    | 150         |
| Paper-II                  | Basics of Hemodialysis                  | 75     | 25                  | 100   | 35        | 15                  | 50    | 150         |
| Paper-III                 | Basic Dialysis drug and Techniques      | 75     | 25                  | 100   | 35        | 15                  | 50    | 150         |
| <b>Supportive Subject</b> | Basics of Computer                      | ---    | ----                | ----  | ----      | ----                | ----  | ----        |

**Note.** The Examination in the subject of Basics of Computer will be conducted at college level and Grade will be sent to University for final inclusion in the result.

**Grading System**

|             |           |          |           |          |           |          |          |          |
|-------------|-----------|----------|-----------|----------|-----------|----------|----------|----------|
| Marks Range | 81 - 100  | 76 - 80  | 71 - 75   | 61 - 70  | 51 - 60   | 41 - 50  | 31 - 40  | 0 - 30   |
| Grade       | <b>A+</b> | <b>A</b> | <b>B+</b> | <b>B</b> | <b>C+</b> | <b>C</b> | <b>D</b> | <b>E</b> |

**8. Second Year Diploma in Dialysis Technology Examination:**

The First Year Diploma in Dialysis Technology Examination shall be open to a person who has previously passed the Second Year Diploma in Dialysis Technology Examination of this University.

| S. No.    | Subject                        | Theory |                     |       | Practical |                     |       | Grand Total |
|-----------|--------------------------------|--------|---------------------|-------|-----------|---------------------|-------|-------------|
|           |                                | Marks  | Internal Assessment | Total | Marks     | Internal Assessment | Total |             |
| Paper-I   | Modalities of Dialysis         | 75     | 25                  | 100   | 35        | 15                  | 50    | 150         |
| Paper-II  | Continuous Dialysis Management | 75     | 25                  | 100   | 35        | 15                  | 50    | 150         |
| Paper-III | Complications of Hemodialysis  | 75     | 25                  | 100   | 35        | 15                  | 50    | 150         |

## **9. Promotion and Number of Attempts allowed**

- 9.1 A candidate who fails in all the subjects in the First Year **Diploma in Dialysis Technology** examination shall not be promoted to Second Year class.
- 9.2 A Candidate who fails in one more or more subjects will be given four attempts including first attempt as a regular candidate, plus one mercy chance at the discretion of Vice- Chancellor, at six monthly intervals. However, he/she will have to clear all these attempts within 4 years of admission to the said course. at six monthly intervals to pass in those subjects. However, if he/she fails to pass in those subjects four extra attempts he/she will be required repeat the whole examination of 1<sup>st</sup> Year.
- 9.3 The candidate who will absent himself/herself from the examination will be deemed to have been failed in that subject.
- 9.4 A candidate who passes in at least one subject of University level First Year Diploma in Dialysis Technology examination will be permitted to attend classes of Second Year. However, the candidate will be required to pass in all subjects of 1<sup>st</sup> Year examination at least 6 months before the final examination of 2<sup>nd</sup> Year examination.
- 9.5 Candidate who passes in one or more subjects of Second Year Diploma in Dialysis Technology examination shall be exempted from appearing in these subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts including first attempt, as a regular candidate plus one mercy chance at the discretion of Vice- Chancellor, at six monthly intervals. However, he/she will have to clear all these attempts within 4 years of admission to the said course.

## **10. Appointments of Examiners:**

- 10.1 There shall be two examiners – One internal and one external.
- 10.2 Professor & head of the Department shall be Convener. The Examiner at least 3 years post PG teaching experience in that specification field will be appointed as Internal Examiner.
- 10.3 The external examiner shall be appointed from other Universities at least 3 years post PG teaching experience in that specification field.

## **11. Paper Setting and moderation of Question Papers**

The questions papers for 1<sup>st</sup> Year and 2<sup>nd</sup> Year will be set under the direction of Controller of Examinations.

Each Question Paper covering entire course consists of seven questions out of which six questions carry 10 Marks and one question carry 15 marks.

## **12. Evaluation of Answer Books**

The answer books shall be got evaluated by putting fictitious roll numbers thereon or spot evaluation (Table marking) or any other method under the direction of the Controller of Examinations.

## **13. Minimum Pass Marks**

During all the three annual examinations in each subject paper the candidate shall have to obtain 50% in theory including internal assessment 50% practical including internal assessment.

13.1 The successful candidates shall be classified into divisions as under:-

- a) Those who obtain 60% or more marks First Division.

- b) Those who obtain 50% or more marks but below 60% marks Second Division.
- c) A candidate who will obtain 75% or more marks of the total marks in any subject shall be declared to have obtained distinction in that subject provided he/she passed in all the subjects of the courses in all the parts in the first attempt.

A candidate is eligible to appear in the examination provided he/she secures a minimum of 35% marks in internal assessment in theory and practical separately.

**14. Grace Marks**

There shall be no provision for grace marks.

**15. Declaration of Result**

The results will be tabulated and declared by the Controller of Examination's office.

**16. Award of Diploma**

On successfully passing the Second Year Diploma in Dialysis Technology examination the students shall be awarded the diploma of Diploma in Dialysis Technology.

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## Syllabus for First Year

### Paper-I: Human Anatomy, Physiology and Pathology

#### Anatomy

##### 1. Introduction:

- 1.1 Definition of anatomy and its divisions, Terms of location, positions and planes.
- 1.2 Cell and its organelles, Tissues & its classification, Glands.

##### 2. Musculoskeletal system:

- 2.1 Structure of Bone & its types.
- 2.2 Joints- Classification of joints with examples; details of synovial joint.
- 2.3 Bones & joints of upper limb, lower limb and their movements.
- 2.4 Axial skeleton & appendicular skeleton.
- 2.5 Skull, spine & its movements, intervertebral disc.
- 2.6 Muscles & its types.
- 2.7 Muscles of the upper limb, lower limb, trunk and neck.

##### 3. Cardiovascular System:

- 3.1 Arteries & veins, Capillaries & arterioles.
- 3.2 Heart- size, location, chambers, blood supply of heart, pericardium.
- 3.3 Systemic & pulmonary circulation.
- 3.4 Major blood vessels of Heart- Aorta, pulmonary artery, common carotid artery, subclavian artery, axillary artery, brachial artery, common iliac artery, femoral artery.
- 3.5 Inferior vena cava, portal circulation, great saphenous vein.

##### 4. Lymphatic System:

- 4.1 Lymph & Lymph vessels.
- 4.2 Structure of lymph node, names of regional lymphatics, axillary and inguinal lymph nodes.

##### 5. Gastro-intestinal System:

- 5.1 Parts of GIT, structure of tongue, pharynx, salivary glands.
- 5.2 Location & Gross structure of Oesophagus, stomach, intestine (small and large), liver, gall bladder, pancreas, spleen.

##### 6. Respiratory system:

- 6.1 Parts of Respiratory system; Structure of nose, nasal cavity, larynx, trachea, lungs, pleura, bronchopulmonary segments.

##### 7. Urinary System:

- 7.1 Parts of Urinary system, location and gross structure of kidney, ureter, urinary bladder, urethra.

##### 8. Reproductive system:

- 8.1 Parts of male reproductive system, gross structure of testis, vas deferens, epididymis, prostate.
- 8.2 Parts of female reproductive system, gross structure of uterus, ovary, fallopian tube, mammary gland.

##### 9. Endocrine glands:

9.1 Name of all endocrine glands, gross structure & functions of pituitary gland, adrenal gland, thyroid gland and parathyroid gland.

**10. Nervous system:**

10.1 Neuron, classification of NS.

10.2 Meninges, ventricles, CSF.

10.3 Gross features of cerebrum, midbrain, pons, medulla oblongata, cerebellum, name of basal nuclei.

10.4 Blood supply of brain, cranial nerves.

10.5 Spinal cord and spinal nerves.

10.6 Autonomic nervous system.

10.7 Visual & auditory pathways

**Practical Syllabus(20 Hours):**

1. **Demonstration** of all bones of the human body.

2. **Demonstration** of all organs of the human body.

3. **General Histology:**

Epithelium: Simple (squamous, cuboidal, columnar, ciliated), Stratified, Transitional.

Bone, muscles (skeletal, smooth, cardiac) • Cartilage (hyaline, elastic, fibro cartilage). Connective Tissue (loose and dense).

Arteries (large & medium sized), Veins.

**Books Recommended**

1. Ross and Wilson, Anatomy and Physiology, Churchill Livingstone.
2. Companion Pocketbook for quick review B.D. Chaurasia's Human Anatomy:  
-Vol. (1,2,3)
3. B.D. Chaurasia's Human Anatomy -Vol. (1,2,3)
4. B.D. Chaurasia's Handbook of General Anatomy
5. Textbook of Anatomy & Physiology for Nurses- Nachiket Shankar/ Mario Vaz
6. Anatomy for B.Sc. Nursing – Dr Renu Chauhan

**PHYSIOLOGY (50 hrs theory + 20 hrs practical)**

**THEORY**

**1) The Cell:**

1) Cell Structure and functions of the various organelles.

2) Endocytosis and exocytosis

3) Acid base balance and disturbances of acid base balances (Alkalosis, Acidosis)

**2) The Blood:**

1. Composition of Blood, functions of the blood and plasma proteins, classification and protein.

2. Pathological and Physiological variation of the RBC.

3. Function of Hemoglobin

4. Erythrocyte Sedimentation Rate.
  5. Detailed description about WBC-Total count (TC), Differential count (DC) and functions.
  6. Platelets – formation and normal level and functions
  7. Blood groups and Rh factor
- 3) Cardio-Vascular System:**
1. Physiology of the heart
  2. Heart sounds
  3. Cardiac cycle, Cardiac output.
  4. Auscultatory areas.
  5. Arterial pressures, blood pressure
  6. Hypertension
  7. Electro cardiogram (ECG)
- 4) Respiratory system:**
1. Respiratory movements.
  2. Definitions and Normal values of Lung volumes and Lung capacities.
- 5) Excretory system:**
1. Normal Urinary output
  2. Micturation
  3. Renal function tests, renal disorders.
- 6) Reproductive system:**
1. Formation of semen and spermatogenesis.
  2. Brief account of menstrual cycle.
- 7) Central Nervous system:**
1. Functions of CSF.
- 8) Endocrine system:**  
Functions of the pituitary, thyroid, parathyroid, adrenal and pancreatic Hormones.
- 9) Digestive system (for the students of Diploma in Scope Support Technology)**
1. Physiological Anatomy of the GIT.
  2. Food Digestion in the mouth, stomach, intestine
  3. Absorption of foods
  4. Role of bile in the digestion.

## **PRACTICAL**

1. The compound Microscope
2. Determination of ESR-By westergren's method
3. Determination of Blood Groups.
4. Measurement of human blood pressure.
5. Examination of Respiratory system to count respiratory rate and measure inspiration and respiration
6. Examination of pulse of the subject
7. Recording of BT,CT



## **Books Recommended**

1. Ross and Wilson, Anatomy and Physiology, Churchill Livingstone.
2. Basics of medical physiology- D Venkatesh, HH Sudhakar
3. Textbook of anatomy and physiology for nurses-Nachiket Shankar, Mario Vaz
4. Manual of practical physiology for BDS-DR. A.K.Jain

## **Pathology**

### **Theory Syllabus**

|  |            |
|--|------------|
| (Derangement of kidney functions)  | : 20 hours |
| Dialysis – the concept<br>(Brief history, definition, mechanism)   | : 4 hours  |
| Components of Dialysis<br>Access, blood flow, anticoagulant, dialysate)  | : 4 hours  |
| Hemodialysis – Basics<br>(Blood circuit: tubing, pump, dialyzer, flow rate, dialysate circuit, concentrates,<br>delivery systems, flow rate) | :12 hours  |
| Vascular access<br>(Temporary, Permanent)  | : 8 hours  |
| Dialysis water and water treatment   | : 4 hours  |
| Dialysis and Dialyzer<br>(including reuse)   | : 4 hours  |
| Hemodialysis machine   | : 4 hours  |

### **Subsidiary subjects:**

1. Basics of computer : 20 hours

## **BASICS OF COMPUTER**

**Theory : 30 hours**

**Practical's : 30 hours**

### **THEORY**

Introduction to computer – I/O devices – memories – RAM and ROM – Different kinds of ROM – kilobytes, MB, GB their conversions – large computer – Medium, Micro, Mini computers - Different operating system – Networking – LAN, WAN, MAN (only basic ideas)

Typing text in MS word – Manipulating text – Formatting the text – using different font sizes, bold, italics – Bullets and numbering – Pictures, file insertion – Aligning the text and justify – choosing paper size – adjusting margins – Header and footer, inserting page No's in a document – Printing a file with options – Using spell check and grammar – Find and replace – Mail merge – inserting tables in a document.

Creating table in MS-Excel – Cell editing – Using formulas and functions – Manipulating data with excel – Using sort function to sort numbers and alphabets – Drawing graphs and charts using data in excel – Auto formatting – Inserting data from other worksheets.

Preparing new slides using MS-POWERPOINT – Inserting slides – slide transition and animation – Using templates – Different text and font sizes – slides with sounds – Inserting clip arts, pictures, tables and graphs – Presentation using wizards.

Introduction to Internet – Using search engine – Google search – Exploring the next using Internet Explorer and Navigator – Uploading and Download of files and images – E- mail ID creation – Sending messages – Attaching files in E- mail.

Role of Computers in the Health care: - HIS, Medical Equipment, Pharmacy in inventory management, Patient record maintenance.

### **PRACTICAL**

- Typing a text and aligning the text with different formats using MS-Word
- Inserting a table with proper alignment and using MS-Word - Create mail merge document using MS-word to prepare greetings for 10 friends
- Preparing a slide show with transition, animation and sound effect using MSPowerpoint
- Customizing the slide show and inserting pictures and tables in the slides using MSpowerpoint
- Creating a worksheet using MS-Excel with data and sue of functions Using MSEXcel prepare a worksheet with text, date time and data Preparing a chart and pie diagrams using MS-Excel
- Using Internet for searching, uploading files, downloading files creating e-mail ID

### **Second Year**

- A. Complications of Hemodialysis : 12 Hours
- Access related complication
  - Dialyzer related complication
  - Dialysate related complication
  - Anticoagulant related complication
  - Machine/Blood Pump associated complication
  - Metabolic complications
  - Management of complications
  - Maintenance of hygiene in Dialysis unit
  - Access – core
  - Anticoagulation
- B. Doses of Hemodialysis : 8 hours
- Duration, index, clearance
  - Middle molecules, Urea reduction ration
  - Urea kinetic modeling, Dialysis adequacy
- C. Continuous Dialysis : 10 hours
- Continuous arteiovenous hemofiltration
  - Continuous venovenous hemofiltration
  - Continuous hemodiafiltration
  - Continuous slow hemodialysis
  - Component, access, tubing, filter, replacement, fluid, Antigoagulation, flow rate.
- D. Peritoneal Dialysis : 30 hours
- History, Perotioneal physiology, kinetics technique, catheter, dialysate fuuid, insertion procedure,

drainage, complication. Continuous peritoneal dialysis procedure, dose.

**Practical :160 Teaching Hours:**

- Actual conduction of Hemodialysis :  
140 hours
- Actual conduction of Peritoneal Dialysis :  
20 hours
- Clinical assessment of patients

**Practical :**

A. Demonstration : (60 Teaching Hours) Demonstration of -

- A Hemodialysis unit
- Demineralisation plant
- Machine
- Initiation of Dialysis
- Conduction of Dialysis
- Dialysis – closure
- Washing, cleaning, reuse
- Maintenance of hygiene in Dialysis unit
- Access – core
- Anticoagulation

B. Actual participation in Dialysis Procedure : 120 Teaching Hours including clinical evaluation of patient