THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY, HIGHER SPECIALITY COURSE (DM NEPHROLOGY)

SYLLABUS AND EXAMINATION PATTERN

I. AIMS AND OBJECTIVES

(i) The DM course in Nephrology at Tamil Nadu Dr.M.G.R. Medical University is designed to train the candidates with the objectives to impart a through knowledge in the subject as well as practical skills required to work as an independent consultant in the field of Nephrology and impart knowledge and skills to their students.

(ii) The Training is also intended to develop in them the art of effective communication and enthusiasm in updating information.

(iii) The training also imparts knowledge in research methodology and evokes interest in research.

II. TRAINING METHODS AND AREAS OF TRAINING

(i) The candidates will work in the department under the guidance of Assistant Professors, Associate Professors and Professors. They will be trained in the decision making process both in clinical and investigative aspects of nephrology. The candidates shall work taking up the responsibility of investigative and therapeutic management of patients under the guidance of senior teachers in nephrology.

(ii) The candidates will attend nephrology out patient department and Renal transplant OP. The candidates will write case sheets of the new patients and discuss the problems of old patients with Associate Professor and Professor of Nephrology.

(iii) (a) The candidates will be posted in the wards including transplant and dialysis departments for a stipulated period for which they are primarily responsible to take decisions in investigating and managing these patients, under the guidance of Assistant Professors, Associate Professors and Professors.

(b) During this tenure they will be trained to do Renal biopsy and its interpretation.

III. DIALYSIS

(a) HEMODIALYSIS

The candidates will be posted in Hemodialysis units in rotation where he or she will be trained in both technical and clinical aspects of Hemodialysis including double lumen venous catheterization, Dialyser reuse etc. They will also be trained in Continuous Renal Replacement Therapy (CRRT) – mode of dialytic therapy in critically ill patients.

The candidates will also be trained during this period in plasma pheresis and Hemoperfusion.

(b) PERITONEAL DIALYSIS

All candidates will be trained to perform acute intermittent Peritoneal Dialysis including its benefits and complications. Apart from that they will be trained in the management Continuous Ambulatory Peritoneal Dialysis (CAPD) patients.

IV. RENAL TRANSPLANTATION

The candidates will be trained in the workup of living kidney donors and recipients and prepare recipients for Renal Transplantation, manage them post operatively in the immediate and long term follow up.

They will also be trained in wait listing the appropriate Chronic Renal Failure (CRF) patients without living donors, preparing them for Renal Transplantation as and when the cadaver renal donor is available and managing them post operatively.

V. TEACHING PROGRAMME

The faculty members of department will be primarily responsible for teaching. In addition the following departments will be involved in the teaching Programme of DM Nephrology Post Graduates.

a. Urology
b. Internal Medicine
c. Radio Diagnosis
d. Pathology including Immuno Pathology
e. Micro-biology

The teaching schedule will be as follows, however the details may change time to time depending on the evolving circumstances.

S.NO.	TEACHING EXERCISE	FREQUENCY	DURATION
1.	Nephrology Grand Rounds	Once a week	3 Hours
2.	Clinical Bed side discussions	Once a week	2 Hours
3.	Seminars	Once in 2 weeks	2 Hours
4.	Journal Club	Once in 2 weeks	1 Hour
5.	Topic review	Once in 2 weeks	1 Hour
6.	Short Topic discussion	3 days per week	40 Minutes
7.	Renal Histo pathology discussion	Twice a week	1 Hour
8.	Nephrology - Internal Medicine case discussion	Once a week	1 Hour
9.	Nephrology case discussion	Once in 2 weeks	2 Hours
10.	Renal Radiology Rounds	Once a week	1 Hour
11.	Nephro Urology Clinic	Once in 2 weeks	1 Hour

The Teaching Programme will include:

1. Urology Lectures
2. Lectures in Statistics
3. Diet in Renal Disease

VI. DISSERTATION

1. The candidates will carry out one research project under the guidance of Professor. He or she will submit 6 copies of dissertation at the end of 2 ¾ years from the beginning of the course. The topic will be allotted in the first 3 months after joining the course. The work of dissertation will be supervised periodically by Professor and HOD. The submission of dissertation is a partial fulfillment for appearing in the final examination, but will not carry marks. However its approval is mandatory for passing the examination.

2. The Professor and Associate Professor should supervise to ensure that the candidate make atleast 2 presentations in the regional, national or International conferences during the period of Post Graduation.

VII. SYLLABUS

Separately furnished.

VIII. DURATION OF THE COURSE :– 3 YEARS:

Suggested period of postings:

1. Male Ward - 8 Months
2. Female Ward - 8 Months
3. Dialysis Unit - 7 Months
4. Transplantation - 7 Months

5. **Special Postings**

(a) Pediatric Nephrology Department	-	2 Months
(b) Radiology	-	15 days
(c) Rheumatology including Immunology	-	15 days
(d) Lab Services	-	1 Month
(e) Postings in Nephrology Department of other centers	-	2 months

Log book will be maintained by the candidates and will be submitted at time of clinical examination.

IX. INTERNAL ASSESSMENT:

This will be based on the daily interaction between the faculty members and post graduates.

X. EXAMINATION

Consists of theory, clinical and oral examination.

(a) THEORY:

(i) 4 papers

Paper I: Basic Sciences as applied to Nephrology
Paper II: Clinical Nephrology
Paper III: Dialysis and Transplantation
Paper IV: Recent Advances
Duration: 3 Hours

Marks for each paper: 100

(ii) Type of questions

1 Essay question for 20 marks

8 Short questions for 10 marks each

(Or)

10 Short questions for 10 marks each

Desirable - Minimum of 3 questions in short notes should be clinical problem solving.

(b) CLINICAL AND ORAL EXAM

There should not be more than 3 candidates per day.
There will be 2 external and 2 internal examiners.

(c) PATTERN OF EXAMINATION

(i) ***Clinical***

1 long case - 1 hour
2 Short Cases - 30 minutes each.
Ward Rounds (4 cases)

(ii) ***Oral Examination***

Viva
2 Histopathology slides
2 Radio imaging projections

(d) TOTAL MARKS

(i) ***Theory***

Paper I	-	100 Marks
Paper II	-	100 Marks
Paper III	-	100 Marks
Paper IV	-	100 Marks
Total	-	400 Marks

(separate minimum marks required to pass theory exam = 200 marks)

(ii) ***Clinical***

Long Case	-	100 x 1	=	100
Short Case	-	50 x 2	=	100
Ward Rounds	-	25 x 4	=	100
	Total		=	300

(separate minimum marks required to pass clinical exam = 150 marks)

(iii) Oral

Viva	-	50 Marks
2 Histopathology slides	–	25 Marks
2 Radio imaging projections	–	25 Marks
Total	-	100 Marks

(separate minimum marks is not necessary but will be added to the theory marks)

Hence Total marks are as follows:

Theory:	4 papers of 100 marks each	400
Orals:		100
	Total	500

Minimum Marks Required is 250 / 500

Clinical: Total 300

Minimum marks required is 150 / 300

SYLLABUS FOR D.M. NEPHROLOGY

I. ANATOMY

1. Gross Anatomy Embryology Histology including Electron Microscopy study of the Kidney.

II. PHYSIOLOGY

1. Renal circulation and Glomerular ultrafiltration.
2. Solute transport / Both Organic and inorganic.
3. Renal Acidification.
4. Urine Concentration & Dilution.
5. Role of Kidney in Blood pressure regulation.
6. Endocrine and Autocrine functions of the kidney.

III. INTEGRATED CONTROL OF BODY FLUID VOLUME AND COMPOSITION.

1. Vasoactive peptides / Arachidonic Acid Metabolites.
2. Sodium – Water Balance.
3. Potassium Balance
4. Acid Base Balance
5. Calcium and Phosphorus Metabolism.
6. Magnesium metabolism.

IV. APPROACH TO THE PATIENT WITH KIDNEY DISEASE:

1. Approach to the patient with Kidney Disease
2. Laboratory Assessment of Kidney Disease including Biopsy
3. Interpretation of Electrolyte and Acid – Base Parameters in Blood and Urine
4. Adaptation to Nephron Loss
5. Renal and Systemic Manifestations of Glomerular Disease
6. Diagnostic Kidney Imaging
7. Interventional Nephrology

V. EPIDEMIOLOGY OF KIDNEY DISEASE:

1. Epidemiology of Kidney Disease
2. Risk Factors and Kidney Disease
3. Nephron Endowment
4. Gender and Kidney Disease
5. Aging and Kidney Disease

VI. DISORDERS OF KIDNEY FUNCTION

1. AKI – Pathogenesis / Diagnosis / Therapy
2. Glomerular disease – Primary and Secondary
3. Micro and Macro Vascular Diseases of the kidney
4. Tubulo Interstitial Diseases
5. UTI / Pyelo Nephritis / Reflux Nephropathy
6. Urinary tract obstruction and Obstructive Nephropathy
7. Diabetic Nephropathy
8. Nephrolithiasis
9. Renal Neoplasia
10. Kidney disease in tropics
11. Pregnancy and Kidney diseases.

VII. INHERITED DISEASES OF THE KIDNEY:

1. Inherited Disorders of Podocyte Function
2. Inherited Disorders of the Renal Tubule
3. Cystic Diseases of the Kidney

VIII. PAEDIATRIC NEPHROLOGY

1. Developmental Nephrology
2. Congenital diseases of the kidneys, ureters, urinary bladder and urethra.
3. Glomerular and tubular diseases
4. Systemic diseases affecting the kidney
5. Acute and Chronic Kidney Failure
6. Dialysis and Transplantation with respect to Pediatric Nephrology.

IX. HYPERTENSION AND KIDNEY :

1. Primary and Secondary Hypertension
2. Renovascular Hypertension and Ischemic Nephropathy
3. Hypertension and Kidney Disease in Pregnancy
4. Antihypertensive Drugs
5. Diuretics

X. CHRONIC KIDNEY DISEASE:

1. **Path physiology of Uremia its Systemic manifestation**
   i. Pathophysiology of Uremia
   ii. Cardiovascular Aspects of Chronic Kidney Disease
   iii. Hematologic Aspects of Kidney Disease
   iv. Endocrine Aspects of Kidney Disease
   v. Neurologic Aspects of Kidney Disease
   vi. Mineral Bone Disorders in Chronic Kidney Disease

2. **Conservative and Pharmacological management:**
   i. Diet and Kidney Disease
   ii. Specific Pharmacologic Approaches to Clinical Renoprotection
   iii. Erythropoietin Therapy in Renal Disease and Renal Failure
   iv. Vitamin D, Calcimimetics, and Phosphate Binders
   v. Prescribing Drugs in Kidney Disease

3. **Invasive Management.**

   i. Hemodialysis
   ii. Peritoneal Dialysis
   iii. Intensive Care Nephrology
   iv. Plasmapheresis
   v. Extracorporeal Treatment of Poisoning

XI. RENAL TRANSPLANTATION

1. Transplantation Immunobiology
2. Donor and Recipient Issues
3. Clinical Management

XII. RECENT ADVANCES

i. Attaining Immunologic Tolerance
ii. Xenotransplantation
iii. Tissue Engineering and Regeneration
iv. Stem Cells in Renal Biology and Medicine