

M.S. Ramaiah University of Applied Sciences

New BEL Road, MSR Nagar, Bangalore – 560054



**RAMAIAH
UNIVERSITY**
OF APPLIED SCIENCES

PO, PSO, PEO & CO

**Programme: B.Sc. (Hons) in Dialysis Therapy
Technology**

Programme Code: 402

**Programme Outcome (PO)
Programme Specific Outcome (PSO)
Program Educational Objectives (PEO)
Course Outcomes (CO)**

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Faculty of Life and Allied Health Sciences
M.S. Ramaiah University of Applied Sciences
Bangalore-560054

Registrar
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Faculty of Life and Allied Health Sciences (FLAHS)

Programme Name: B.Sc. (Hons) in Dialysis Therapy Technology

Programme Outcomes (POs)

At the completion of this program, the student should be able to:

- PO-1. **Clinical care:** Appraise on the evidence-based practice in dialysis therapy technology appropriate care regime
- PO-2. **Communication:** Discuss the diagnosis and justify the options with the patient, and negotiate appropriate treatment plans in a sensitive manner that is in the patient and society's best interests
- PO-3. **Membership of a multidisciplinary health team:** Discuss and communicate with and summarize relevant information to, other stakeholders including members of the healthcare team
- PO-4. **Ethics and accountability at all levels:** Describe and apply the basic concepts of clinical ethics to actual cases and situations
- PO-5. **Commitment to professional excellence:** Demonstrate respect for each patient's individual rights of autonomy, privacy, and confidentiality
- PO-6. **Leadership and mentorship:** Develop leadership in quality improvement and dialysis service delivery to enhance the wellbeing of the society and enriched healthcare experience
- PO-7. **Social accountability and responsibility:** Assess the patient care determinants at the local, regional and national level and build care modality as per the requirement
- PO-8. **Lifelong learning:** Evaluate the need and prioritize lifelong learning as an important outcome across the professional career

Programme Specific Outcomes

At the end of the B.Sc. (Hons) –Dialysis Therapy Technology programme the graduate will be able to:

- PSO-1. Apply knowledge and skills of renal replacement therapy to provide safe and effective care to the patients for achieving professional excellence.
- PSO-2. Adapt to technological advancement in instrumentation and diagnostics by upgrading to the latest practices in the field of dialysis therapy technology.
- PSO-3. Demonstrate the leadership qualities and strive for the betterment of organization, environment, and society
- PSO-4. Demonstrate an understanding of the importance of life-long learning through professional development, practical training, and specialized certifications

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Programme Education Objectives

- PEO-1. Provide students with a strong foundation in dialysis therapy technology, to enable them to devise and deliver effective solutions to the challenging problems
- PEO-2. Impart technical skills required to develop innovative solutions as per the industry and societal requirements in the field of dialysis therapy technology.
- PEO-3. Impart the required managerial and entrepreneurial skills to enable students to contribute to the patient care needs of the society.
- PEO-4. Instil human values, social, interpersonal and leadership skills required for professional success in evolving as global professionals.

Course Outcomes (COs)

Course Title & Code: General Anatomy (19AHG101A)

Upon completion of this course students will be able to:

- CO-1. Describe the structure and functional organization of a basic human cell and the normal anatomical positions and planes of the body
- CO-2. Explain the structure and functions of basic tissues
- CO-3. Explain the components of the organ systems and its basic functions
- CO-4. Identify the parts of a compound microscope and differentiate microscopy of basic tissues
- CO-5. Demonstrate the parts and position of bones in the human body and early development of fetus
- CO-6. Demonstrate the surface anatomy of structures and interpret data obtained from various imaging techniques.

Course Outcomes (COs)

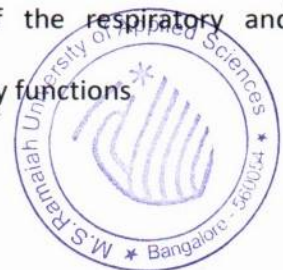
Course Title & Code: General Physiology (19AHG102A)

Upon completion of this course students will be able to:

- CO-1. Describe the functions of the organ systems in the body
- CO-2. Explain the mechanisms for the execution of these functions for homeostasis through the secretions of chemical and humoral factors
- CO-3. Explain the regulatory mechanisms in the control of blood pressure, urine formation maintenance of extracellular and intracellular volume
- CO-4. Perform to assess the normal values and parameters of the bodily function indicators such as blood indices, blood gases
- CO-5. Demonstrate the tests to assess the functional integrity of the respiratory and cardiovascular system
- CO-6. Correlate the disease condition with physiological aspects of bodily functions


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Course Outcomes (COs)

Course Title & Code: Health Care Delivery Systems of India (19AHG103A)

Upon completion of this course students will be able to:

- CO-1. Describe the Health Care delivery system in India at primary, secondary and tertiary level and identify their role in the health care team
- CO-2. Explain the AYUSH system of medicine
- CO-3. Explain the National Health programmes in terms of operation, achievements and constraints
- CO-4. Explain the importance of Demography and Vital statistics in planning health policy
- CO-5. Discuss role of epidemiology and epidemiological methods in health
- CO-6. Describe the Health Care delivery system in India at primary, secondary and tertiary level and identify their role in the health care team

Course Outcomes (COs)

Course Title & Code: General Microbiology (19AHG107A)

After undergoing this course students will be able to:

- CO-1. Describe the morphology, physiology and characteristics of microorganisms
- CO-2. Describe the principles and practice of sterilization and disinfection
- CO-3. Discuss immunology, and immunity
- CO-4. Demonstrate sterilization procedures and use of sterilization equipment
- CO-5. Demonstrate Collection and transport of specimens to the laboratory

Course Outcomes (COs)

Course Title & Code: Basic Electrical & Electronics (19AHG108A)

After undergoing this course students will be able to:

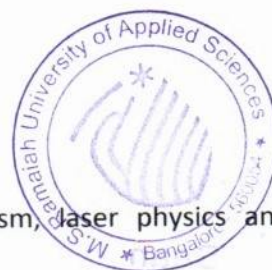
- CO-1. State various laws of electric and magnetic circuits and explain their significance in biomedical instrumentation
- CO-2. Explain DC machines, transformers and their applications
- CO-3. Solve simple numerical problems on electric circuits and magnetic circuits,
- CO-4. Explain working principles of PN junction diode, Zener diode, transistors and amplifier configurations
- CO-5. demonstrate electrical and electronic circuits for hardware modules using standard EDA tool

Course Outcomes (COs)

Course Title & Code: Applied Physics (19AHG116A)

After undergoing this course students will be able to:

- CO-1. Explain the basic concepts in sound, electricity and magnetism, laser physics and electromagnetic radiation



- CO-2. Describe concepts in optical fibers,
- CO-3. Describe basic properties of fluids
- CO-4. Conduct experiments as per the standard procedures and tabulate the measured values
- CO-5. Calculate the required parameters and plot the results
- CO-6. Interpret, compare with standard results and draw conclusions

Course Outcomes (COs)

Course Title & Code: General Biochemistry

Upon completion of this course students will be able to:

- CO-1. Describe the various laboratory apparatus used, the steps in specimen collection and safety measurements to be taken in biochemistry laboratory
- CO-2. Explain different models of atomic structure, acids, bases, buffers and disturbances in acid base balance
- CO-3. Explain quality control, precision, specificity, sensitivity when conducting special investigations
- CO-4. Demonstrate qualitative and quantitative estimations of various analyses (urine, blood)
- CO-5. Interpret the various biochemical parameters in health and disease

Course Outcomes (COs)

Course Title & Code: General Pharmacology (19AHG112A)

Upon completion of this course students will be able to:

- CO-1. Describe pharmacokinetic principles in relation to drug administration
- CO-2. Explain the concept of pharmacodynamics in relation to drug utilization in therapeutics
- CO-3. Explain the concept of chemotherapy in relation to infectious diseases
- CO-4. Explain the importance of adverse effects in therapeutics of various drug usage
- CO-5. Identify drugs dosage forms and posology in management of diseases and calculate doses in various age groups
- CO-6. Interpret the importance of drug combinations with reference to therapeutic index and drug utilization

Course Outcomes (COs)

Course Title & Code: Concepts of Infection Prevention (19AHG XXX)

After undergoing this course students will be able to:

- CO-1. Explain the steps involved in infection prevention and control
- CO-2. Understand the working and application of CSSD
- CO-3. Understand the working and application of CSSD
- CO-3. Explain the importance of antibiotic resistance in the patient care and ways to prevent it.
- CO-4. Apply the concepts of biomedical waste management to ensure clean and hazard free hospital


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Course Outcomes (COs)

Course Title & Code: General Pathology (19AHG114A)

Upon completion of this course students will be able to:

- CO-1. Describe basic facts and concepts of pathology
- CO-2. Explain fundamental aspects of hematology and blood banking
- CO-3. Explain the various clinical pathology tests
- CO-4. Perform laboratory tests related to hematology and clinical pathology
- CO-5. Interpret the results of laboratory tests
- CO-6. Apply concepts of general pathology to understand pathological basis of disease

Course Outcomes (COs)

Course Title & Code: Directed clinical education – I

Upon completion of this course students will be able to:

- CO-1. Describe the movement of patient from the point of entry into the hospital till treatment
- CO-2. Describe the role of nursing in patient care
- CO-3. Explain the importance of inter professional team approach to patient care
- CO-4. Demonstrate bed making, lifting and transport of patients
- CO-5. Assist in bed side management of patient in the wards OT and Out patient
- CO-6. Assist in changing surgical dressings and collection of samples for Lab Tests

Course Outcomes (COs)

Course Title & Code: Basic concepts in renal diseases (19DTT205A)

Upon completion of this course students will be able to:

- CO-1. Describe the basic concepts of renal diseases in adults and children, congenital and inherited diseases
- CO-2. Describe the basic concepts in pregnancy-associated renal diseases and tumors
- CO-3. Explain the different types of renal diseases in acute and chronic kidney diseases
- CO-4. Explain the urinary tract infection how it will affect to the kidney
- CO-5. Explain the normal and diseased renal changes
- CO-6. Describe the conservative care in AKI and CKD

Course Outcomes (COs)

Course Title & Code: Applied Pharmacology Related to Dialysis (19DTT202A)

Upon completion of this course students will be able to:

- CO-1. Describe Concepts of the interactions of chemical agents with living tissues, effect of drugs on the body, drugs and alteration of disease processes, toxicity effects.
- CO-2. Explain Drug use in renal disease, drugs in special populations pharmacokinetics, drug interactions,
- CO-3. Explain pharmacology of drugs affecting blood and blood coagulation
- CO-4. Discuss the importance of plasma expanders in the management of renal diseases.
- CO-5. Discuss role of diuretics in management of renal illness.
- CO-6. Apply the pharmacological concepts to prepare dialysis fluids and their complications.



Course Outcomes (COs)

Course Title & Code: Studentship [Directed clinical education] – II (19DTT210A)

Upon completion of this course students will be able to:

- CO-1. Identify the presence of the kidney diseases
- CO-2. Assist in planning an appropriate diet according to the renal disease
- CO-3. Assist in planning an appropriate diet according to the renal disease
- CO-4. Assist in Initiating therapy in each of the conditions on time
- CO-5. Assist in packing and sterilization of dialysis trays
- CO-6. Perform basic life support

Course Outcomes (COs)

Course Title & Code: Techniques in Hemodialysis

Upon completion of this course students will be able to:

- CO-1. Classify the various types and techniques of anticoagulation in hemodialysis
- CO-2. Discuss hemodialysis prescription and hemodialysis adequacy
- CO-3. Explain the types of vascular access, their advantages, disadvantages, complications, and their management and pre and post-vascular access creation assessment and monitoring
- CO-4. Describe the dialysis water treatment plant components, their functions, and monitoring of water treatment plant
- CO-5. Explain the steps of dialyzer reprocessing and complications related to dialyzer reprocessing
- CO-6. Explain the hemodialysis patient-related and machine-related complications and their management

Course Outcomes (COs)

Course Title & Code: Investigations in Renal Diseases

Upon completion of this course students will be able to:

- CO-1. Explain the hematological, biochemical and microbiological tests used in renal failure patients
- CO-2. Explain the basic principles of blood crossmatching and immunologic test related to renal disease
- CO-3. Explain renal biopsy
- CO-4. Explain the basics radiological investigations related to dialysis technology
- CO-5. Explain the importance of nuclear medicine and radiological interpretations s KUB X-ray, MRI, USG, Renal Doppler for assessing renal functions and vascula for dialysis

Course Outcomes (COs)

Course Title & Code: Directed clinical education – III (19DTT220A)

Upon completion of this course students will be able to:

- CO-1. Demonstrate the competencies acquired for patient preparation, equipment handing and Dialysis operation



- CO-2. Demonstrate the ability to start hemodialysis, peritoneal dialysis in different patient population including pediatric population
- CO-3. Demonstrate A-V cannulation
- CO-4. Operate hemodialysis machines, CAPD cycler machines independently
- CO-5. Start and close hemodialysis sessions independently
- CO-6. Train patients to independently perform peritoneal dialysis

Course Outcomes (COs)

Course Title & Code: Techniques in Peritoneal Dialysis

Upon completion of this course students will be able to:

- CO-1. Explain the principles and apparatus used in peritoneal dialysis
- CO-2. Describe the CAPD and APD procedure
- CO-3. Explain the adequacy and prescription for peritoneal dialysis
- CO-4. Describe the infectious and non-infectious complications in peritoneal dialysis
- CO-5. Demonstrate the use, care and maintenance of various instruments used in peritoneal dialysis
- CO-6. Interpret the peritoneal equilibrium test in APD and CAPD

Course Outcomes (COs)

Course Title & Code: Clinical Practice Guidelines in Dialysis

Upon completion of this course students will be able to:

- CO-1. Explain the KDOQI and KDIGO guidelines
- CO-2. Describe the guidelines for adequacy in both HD and PD
- CO-3. Explain the guidelines for CKD evaluation
- CO-4. What guidelines should or should not be: implications for guideline production
- CO-5. Endorsement of the KDIGO guidelines on kidney transplantation

Course Outcomes (COs)

Course Title & Code: Nutrition in Renal Disease (19AHG109A)

Upon completion of this course students will be able to:

- CO-1. Define the concepts of balanced diet and its importance
- CO-2. Discuss the functions of food and diet based disorders
- CO-3. Brief about RDA and its role in diet planning
- CO-4. Explain the functions of carbohydrates, proteins and lipids
- CO-5. Elaborate on the importance of assessing nutritional status
- CO-6. Describe the role of nutrition in CKD patients


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Course Outcomes (COs)

Course Title & Code: Directed clinical education – IV (19DTT310A)

Upon completion of this course students will be able to:

- CO-1. Demonstrate the competencies acquired for patient preparation, equipment handling and operation under supervision
- CO-2. Assist in starting hemodialysis, and peritoneal dialysis in different patient population including pediatric population
- CO-3. Demonstrate the reprocessing procedure
- CO-4. Operate hemodialysis machines, CAPD cyclers reuse machines under supervision
- CO-5. Able to do management of technical and non-technical complications during hemodialysis and peritoneal dialysis

Course Outcomes (COs)

Course Title & Code: Extracorporeal therapies other than hemodialysis

Upon completion of this course students will be able to:

- CO-1. Explain the principals involved in Continuous renal replacement therapy, Hemoperfusion, Plasmapheresis and Liver dialysis
- CO-2. Explain the anticoagulation protocol for Continuous renal replacement therapy, Hemoperfusion, Plasmapheresis and Liver dialysis
- CO-3. Explain the patient-related and machine-related complications during Continuous renal replacement therapy, Hemoperfusion, Plasmapheresis and Liver dialysis with its management
- CO-4. Demonstrate the Continuous renal replacement therapy, Hemoperfusion
- CO-5. Demonstrate the Plasmapheresis and Liver dialysis procedure.

Course Outcomes (COs)

Course Title & Code: Pediatric Dialysis and Transplantation

Upon completion of this course students will be able to:

- CO-1. Explain the hematological, biochemical and microbiological tests used in renal failure patients
- CO-2. Explain the basic principles of blood cross matching and immunologic test related to renal disease
- CO-3. Explain maintenance hemodialysis for pediatric patients
- CO-4. Explain the basics radiological investigations related to pediatric patients
- CO-5. Explain the importance technical aspects and major complication in dialysis


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Course Outcomes (COs)

Course Title & Code: Directed clinical education – V (19DTT320A)

Upon completion of this course students will be able to:

- CO-1. Demonstrate the competencies acquired for patient preparation, equipment handling and operation
- CO-2. Perform the ability to start hemodialysis, peritoneal dialysis in different patient population including pediatric population
- CO-3. Demonstrate A-V cannulation
- CO-4. Operate hemodialysis machines, CAPD cyclers reuse machines independently
- CO-5. Start and terminate hemodialysis sessions independently
- CO-6. Perform the preparation for CRRT, hemoperfusion and plasmapheresis

Course Outcomes (COs)

Course Title & Code: Internship

Upon completion of this course students will be able to:

- CO-1. Initiate, monitor and close of hemodialysis procedure independently.
- CO-2. Identify and manage complications during hemodialysis and peritoneal dialysis
- CO-3. Able to do plasmapheresis
- CO-4. Starting termination of the hemodialysis procedure in various types of dialysis machines
- CO-5. Fistula and graft cannulation independently

Course Outcomes (COs)

Course Title & Code: Internship

Upon completion of this course students will be able to:

- CO-1. Perform special hemodialysis techniques like SLED, CRRT, perform CAPD exchange and train the patient / relative for CAPD exchange procedure
- CO-2. Perform dialysis machine maintenance, sterilization procedure of dialysis unit
- CO-3. Prepare dialyzer reuse technique, maintain RO plant
- CO-4. Counsel dialysis patients regarding transplantation and able to monitoring transplant patient in immediate post-transplant period
- CO-5. Identify and manage complications during hemodialysis and peritoneal dialysis


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