



**RAMAIAH
UNIVERSITY**
OF APPLIED SCIENCES

**Programme Structure and Course Details
of
Bachelor (Hons) Dialysis Therapy
Technology
2024-2028**

Programme Code: 402

Head

Department of Allied Health Sciences
M S Ramaiah University of Applied Sciences
Bangalore 560054

**Faculty of Life and Allied Health Sciences
Department of Allied Health Sciences**

Dean - Academics
M S Ramaiah University of Applied Sciences
Bangalore - 560 054

University's Vision, Mission and Objectives

The M. S. Ramalah University of Applied Sciences (MSRUAS) will focus on student-centric professional education and motivates its staff and students to contribute significantly to the growth of technology, science, economy and society through their imaginative, creative and innovative pursuits. Hence, the University has articulated the following vision and objectives.

Vision

MSRUAS aspires to be the premier university of choice in Asia for student-centric professional education and services with a strong focus on applied research whilst maintaining the highest academic and ethical standards in a creative and innovative environment.

Mission

Our purpose is the creation and dissemination of knowledge. We are committed to creativity, innovation and excellence in our teaching and research. We value integrity, quality and teamwork in all our endeavors. We inspire critical thinking, personal development and a passion for lifelong learning. We serve the technical, scientific and economic needs of our society.

Objectives

1. To disseminate knowledge and skills through instructions, teaching, training, seminars, workshops and symposia in Engineering and Technology, Art and Design, Management and Commerce, Health and Allied Sciences, Physical and Life Sciences, Arts, Humanities and Social Sciences to equip students and scholars to meet the needs of industries, business and society
2. To generate knowledge through research in Engineering and Technology, Art and Design, Management and Commerce, Health and Allied Sciences, Physical and Life Sciences, Arts, Humanities and Social Sciences to meet the challenges that arise in industry, business and society
3. To promote health, human well-being and provide holistic healthcare
4. To provide technical and scientific solutions to real life problems posed by industry, business and society in Engineering and Technology, Art and Design, Management and Commerce, Health and Allied Sciences, Physical and Life Sciences, Arts, Humanities and Social Sciences
5. To instill the spirit of entrepreneurship in our youth to help create more career opportunities in the society by incubating and nurturing technology product ideas and supporting technology-backed business
6. To identify and nurture leadership skills in students and help in the development of our future leaders to enrich the society we live in
7. To develop partnership with universities, industries, businesses, research establishments, NGOs, international organizations, governmental organizations in India and abroad to enrich the experiences of faculties and students through research and developmental programmes

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Approved by the Academic Council at its 32th meeting held on 22nd June 2024

Programme Specifications: B.Sc. (Hons) –Dialysis Therapy Technology

Faculty	Faculty of Life and Allied Health Sciences (FLAHS)
Department	Allied Health Sciences
Programme Code	402
Programme Name	B.Sc. (Hons) –Dialysis Therapy Technology
Dean of the Faculty	Dr. Soma Chaki
Head of the Department	Dr. Tushar Shaw

1. **Title of the Award:** B.Sc. (Hons) –Dialysis Therapy Technology
2. **Mode of Study:** Full-Time
3. **Awarding Institution/Body:** M.S. Ramaiah University of Applied Sciences, Bangalore (India)
4. **Joint Award:** –
5. **Teaching Institution:** Faculty of Life and Allied Health Sciences
M.S. Ramaiah University of Applied Sciences, Bangalore (India)
6. **Date of Programme Specifications:** July 2024
7. **Date of Programme Approval by the Academic Council of MSRUA:** June 2024
8. **Next Review Date:** May 2028
9. **Programme Approving Regulatory Body and Date of Approval--**
10. **Programme Accrediting Body and Date of Accreditation--**
11. **Grade Awarded by the Accreditation Body--**
12. **Programme Accreditation Validity--**
13. **Programme Benchmark**
14. **Background and Details of the Programme**
 - 14.1 **Background and Need**

Advances in science and technology have made a paradigm shift in health care over the past decade resulting in a wider appreciation of the fact that health service delivery should go beyond just physicians and nurses and involve teamwork among clinicians and non-clinicians or allied health professionals. India is fast emerging into a global medical tourism hub with an international patient base growing in double digits every year. This rising trend has resulted in an increase in investment by health care providers installing best in class equipment, upgrading medical technology, and quality accreditation. In the current scenario physician's dependent on sophisticated machinery and technology to arrive at an appropriate diagnosis. Allied healthcare professionals (AHPs) who can handle these equipment's form an indispensable member of the team for successful management of patients

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Dialysis therapy technologists play a major role in patient care, patient education and patient compliance with the acquisition of necessary clinical skills and technical knowledge to perform dialysis successfully. With an increase in the incidence of diabetes-related to life style modifications, the patient population requiring dialysis has increased exponentially. Dialysis treatment has been viewed as a life-sustaining therapy that aims to extend survival and improve the quality of life.

To cater to this increased demand, dialysis centers have been established at various health care delivery levels. There is an acute shortage of well-trained competent dialysis therapy technologists who can maintain and operate the machines and educate the patients. While the damaged kidneys are under treatment or when a person is waiting for kidney transplantation. Dialysis is a lifesaving therapy it will replace the kidney function. Majority of these patients may not fully comprehend the medical information, and may not be able to communicate effectively with healthcare providers, understanding of the functioning of the body during health and disease is particularly important for kidney patients undergoing dialysis. These patients need to attend treatment sessions regularly and on time, follow dietary and fluid restrictions, and adhere to complex medication regimens, all of which requires appropriate communication and building of rapport with patients.

This innovative competency-based curriculum is adopted from the guidelines published by Ministry of Health and Family Welfare, allied health Section 2015- 2016. A competency-based program focuses on blend of skills and knowledge based on the needs of the community. The main competencies that have been identified as essential in an allied health care professional are clinical knowledge, patient care and communication approaches, which are then developed to teach relevant content across a range of courses and settings. The curriculum is outcome based and focuses on required theoretical concepts and practical skills in the domain. By undergoing this programme, students develop critical, analytical thinking and problem-solving abilities for a smooth transition from academic to real-life work environment. Students do one year internship in the hospitals for skill development to work in a team to enhance practical skills and problem-solving abilities. The students are required to submit a well written project report as partial fulfilment for the award of the degree, which will help develop skills of documenting scientific work. In addition, students are trained in communication skills and interdisciplinary topics to enhance their scope. The various new features such as foundation courses, early clinical exposure, bioengineering courses, major specialization, open electives and one year of internship make the students more versatile generating wide range of opportunities including registering for Masters in dialysis therapy technology.

Advanced teaching and learning resources, and experience of the faculty members with their strong connections with health care industry and research organizations makes this programme unique. For global mobility and acceptability of the graduates, the current curriculum structure is divided into smaller sections with focus on hours of studying that are converted into credit hours as per the international norms followed by various countries. Integrated structure of the curriculum. This competency based curriculum follows horizontal and vertical integration between disciplines; and bridges the gaps between both theory and practice, and between hospital-based practice and community practice.


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15. Programme Mission

The purpose of the programme is creation of knowledgeable human resources to work in government, semi-government, private and public sector owned hospitals and health care organizations and also to assume administrative positions. With further progression in education, graduates should be able to undertake teaching and research in colleges and universities as well as in scientific organizations.

16. Graduate Attributes

The courses have been designed with a focus on performance-based outcomes pertaining to Medical Radiology and Imaging Technology. The learning goals and objectives of the undergraduate education program is based on the performance expectations. They are articulated as learning goals (why we teach this) and learning objectives (what the students will learn). Using the framework, students will learn to integrate their knowledge, skills and abilities in a hands-on manner in a professional healthcare setting. The learning goals are divided into nine key areas,

1. Clinical care
2. Communication
3. Member of a multidisciplinary health care team
4. Ethics and accountability at all levels (clinical, professional, personal and social)
5. Commitment to professional excellence
6. Leadership and mentorship
7. Social accountability and responsibility
8. Scientific attitude
9. Lifelong learning

The aim of the curriculum is to produce Dialysis Technologists who are:

1. Technically and clinically competent
2. Aware of safety issues and the importance of patient care
3. Understand the theoretical basis for evidence-based practice
4. Effective members of the multidisciplinary team

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17. Programme Goal:

The programme acts as a specialized course and helps to develop critical, analytical and problem solving skills at first level. This foundation degree makes the graduates employable in health care organizations and also to assume administrative positions in various types of organizations. The students can progress to pursue a career in academics or health care industry or as a researcher.

18. Programme Outcomes (POs)

The courses have been designed with a focus on performance-based outcomes pertaining to specialty. The learning goals and objectives of the undergraduate education program is based on the performance expectations. They are articulated as learning goals (why we teach this) and learning objectives (what the students will learn). Using the framework, students will learn to integrate their knowledge, skills and abilities in a hands-on manner in a professional healthcare setting. These learning goals are divided into nine key areas, though the degree of required involvement may differ across various specialties:

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 patients' 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


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19. 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.

20. Programme Specific Outcomes (POs) for B.Sc. (Hons) –Dialysis Therapy Technology Program

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

21. Programme Structure:

B.Sc. (Hons) –Dialysis Therapy Technology Program

The following are the courses a student is required to successfully complete for the award of B.Sc. (Hons) –Dialysis Therapy Technology degree. The programme is delivered as per the time-table.


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SEMESTER-I

S. No.	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	AHD101A	General Anatomy	2	0	2	3	100
2	AHD102A	General Physiology	2	0	2	3	100
3	AHD103A	Health Care Delivery System	2	0	0	2	50
4	AHD104A	General Microbiology	2	0	2	3	100
5	AHD105A	Applied Physics	2	0	2	3	100
6	AHD106A	Basic Electrical and Electronics	2	0	2	3	100
7	AHN101A	Launguage-1	3	0	0	3	100
Total			15	0	10	20	650
Total number of contact hours per week				25 hours per week			

SEMESTER-II

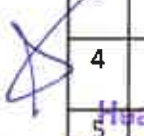
S. No.	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	AHD107A	General Biochemistry	2	0	0	2	50
2	AHD108A	General Pharmacology	2	0	0	2	50
3	AHD109A	Concepts of hospital Infection prevention	2	0	0	2	50
4	AHD110A	General Pathology	2	0	2	3	100
5	AHD111A	Environmental Science and Health	2	0	0	2	50
6	AHD112A	Early Clinical Education	0	0	24	12	100
Total			10	0	26	23	400
Total number of contact hours per week				36 hours per week			

SEMESTER-III

S. No.	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	DTC201A	Basic concepts in renal diseases	3	0	0	3	100
2	DTC202A	Applied Pharmacology related to dialysis	2	0	0	2	50
3	AHN202A	Language – 2(3)	3	0	0	3	100
4		Open Electives -1	2	0	0	2	50
7	DTC203A	Directed Clinical Education-1	0	0	26	13	100
Total			10	0	26	23	400
Total number of contact hours per week			36 hours per week				

SEMESTER-IV

S. N o.	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	DTC204A	Techniques in Haemodialysis-I(T+P)	2	0	2	3	100
3		Open Elective – 2	2	0	0	2	50
4	AHN203A	Constitution of India	2	0	0	2	50
5	AHN204A	Professional communication	1	0	2	2	50
8	DTC206A	Directed Clinical Education-2	0	0	24	12	100
Total			7	0	28	21	350
Total number of contact hours per week			35 hours per week				


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SEMESTER-V

S. No.	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	DTC301A	Techniques in Peritoneal Dialysis(T+P)	2	0	2	3	100
2		Techniques in haemodialysis-II (T+P)	2	0	2	3	100
3	DTC303A	Nutrition in Renal Disease	2	0	0	2	50
4	DTC304A	Directed Clinical Education-3	0	0	24	12	100
5	AHM305A	Project Management	2	0	2	2	50
Total			8	0	30	22	400
Total number of contact hours per week			38 hours per week				

SEMESTER-VI

S. No.	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	DTC305A	Extracorporeal Therapies other than Haemodialysis and Renal transplantation (T+P)	2	0	2	3	100
2	DTC302A	Clinical practice guidelines in dialysis	2	0	0	2	50
3	DTC307A	Directed Clinical Education-4	0	0	24	12	100
4	AHN308A	Research Methodology	0	0	2	3	50
5	AHN308A	Personality Development and Soft Skills	1	0	2	2	50
Total			5	0	30	22	350
Total number of contact hours per week			35 hours per week				

SEMESTER-VII

S. No.	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	DTP401A	Research project	0	0	20	10	100
2	DTI401A	Internship	0	0	20	10	100
Total			0	0	40	20	200

SEMESTER-VIII

S. No.	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	DTP402A	Research project	0	0	20	10	100
2	DTI402A	Internship	0	0	20	10	100
Total			0	0	40	20	200

Maximum Marks	2950 (650+400+400+350+400+350+200+200)
Total Credits	171 (20+23+23+21+22+22+20+20)

Note: The Vacations and other activities shall be as per the Time-Table for the corresponding batch.

Open Elective Courses: A number of open elective courses from Faculty of Mathematical and Physical Sciences, Engineering Management and Commerce, Art and Design, Hospitality Management and Catering Technology, Pharmacy, Dental Sciences will be announced one semester prior to the scheduled semester.

The students can also register through online mode via digital platforms such as NPTEL, swayam, Coursera etc., as per the regulations.

22. Programme Delivery Structure

The programme is delivered on weekdays from Monday to Saturday as per the Time-Table.


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23. Teaching and Learning Methods

The course delivery comprises of combination of few or all of the following methods:

1. Face to face-lectures using audio-visuals
2. Workshops-group discussions, debates, presentations
3. Demonstrations
4. Guest lectures
5. Laboratory-work/Field work/Workshop
6. Hospital postings
7. Seminars
8. Group Exercises
9. Project Work

24. Learning methodologies

With a focus on self-directed learning, the curriculum will include a foundation course that focuses on communication, basic computer skills, professionalism, ethics and law. It also incorporates early clinical exposure and directed clinical education during specialty training. It is envisaged that the AHPs should have sufficient clinical exposure integrated with the learning of basic and laboratory sciences. There is an emphasis on the introduction of case scenarios for classroom discussion/case-based learning.

It is well documented in the literature that teaching and learning of clinical skills occur at the patient's bedside or other clinical areas supplemented by didactic teaching in classrooms and lecture theatres. Our institute has instituted clinical skill centers, laboratories and high-fidelity simulation laboratories to enhance the practice and training for allied and healthcare students and professionals. The skills training center overcomes the shortcoming of patients being used to learn and practice the necessary skills. The use of simulators addresses many issues such as lack of confidence and inadequate skills in handling the equipment. Practice on simulators and with corrective measures students can hone the skills and gain confidence to perform in real life situations.

Teaching and Learning Methods

- a. Team teaching/ Integrated teaching
- b. Face to Face lectures using audio-visuals.
- c. Seminars/journal clubs/e-lectures
- d. Case based discussions.
- e. Group discussions, debates, presentations
- f. Demonstrations on videos, computers, and models
- g. Hospital based learning.
- h. Laboratory work
- i. Dissertation/ Group project work
- j. School visits/Outreach center visits
- k. Interdepartmental meets
- l. Continuing medical education programs/symposiums/workshops state/national/international conferences and conventions

26. Assessment and Grading

26.1 Components of Grading

There shall be **two components** of grading in the assessment of each course:

Component 1, Continuous Evaluation (CE): This component involves multiple sub-components (SC1, SC2, etc.) of learning and experiential assessment. The assessment of the subcomponents of CE is conducted during the semester at regular intervals. This subcomponent represents the formative assessment of students' learning.

Component 2, Semester-end Examination (SEE): This component represents the summative assessment carried out in the form an examination conducted at the end of the semester.

Marks obtained CE and SEE components have 60:40 weightage (CE: 60% and SEE: 40%) in determining the final marks obtained by a student in a Course.

The complete details of Grading are given in the Academic Regulations.

26.2 Continuous Evaluation Policies

Continuous evaluation depends on the type of the course as discussed below:

26.2 Theory Courses

The following is the CE components:

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 25%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

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After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% in case of theory courses. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

26.2.1 Theory + Laboratory Courses

The following is the CE components:

CE (60% weightage)			SEE (40% weightage)	
SC1(Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory)30%	SEE(Lab) 10%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva-Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

27. Attendance

A minimum of 80 % attendance is compulsory to appear for semester end examinations.

28. Award of degree

As per the Academic Regulations for B.Sc. (Hons) DTT Programme

29. Student Support for Learning

Students are given the following support:

- 29.1 Reference Books in the Library
- 29.2 Pre-reads and handouts
- 29.3 Cases/ Case Study and Case lets
- 29.4 Magazines and Journals
- 29.5 Internet Facility
- 29.6 Computing Facility
- 29.7 Laboratory Facility
- 29.8 Workshop Facility
- 29.9 Staff Support
- 29.10 Lounges for Discussions
- 29.11 Any other support that enhances their learning

30. Quality Control Measures

The following are the Quality Control Measures:

1. Review of question papers and assignment at the Department Level
2. Student feedback
3. Opportunities for the students to see their assessed work.
4. Review by External Examiners and External Examiners Reports
5. Staff Student Consultative Committee Meetings
6. Student Exit Feedback
7. Subject Assessment Board
8. Programme Assessment Board

31. Curricular Map

Se m	Course Title	P O -1	P O -2	P O -3	P O -4	P O -5	P O -6	P O -7	P O -8	PS O -1	PS O -2	PS O -3	PS O -4
1	General Anatomy	3	1	2			1					3	3
1	General Physiology	2		1	1	1				2			
1	HCDS	1	1	1	2	1		2	1	2			1
1	General Microbiology	2	1	1	2	1				2			
1	Applied Physics			2		2			1	2			1
2	General Biochemistry	3	1	1		2				2			
2	General Pharmacology	3			2	2			1	3			1
2	General Pathology	2		1	1	2			1	2			1
2	Early Clinical Exposure	3	1					1	2	2	1		3

2	Concepts Of hospital infection prevention				3	3		3		3		1	
3	Basic concepts in renal disease	2		2		1		2	3	2	3	1	1
3	Applied Pharmacology related to dialysis	3	1	1		1				1			
3	Directed Clinical Education-1	3	2	2	1	2		2	1	2	3	1	1
4	Techniques in Hemodialysis	3	2	1		1		3	2	3	2	1	
4	Investigations in Renal Diseases	2			2	2		3	2	3			2
4	Directed Clinical Education-2	3	2	2	1	2		2	1	2	3	1	1
4	Open Electives - 2												
4	Constitution of India												
4	Professional communication												
5	Techniques in Peritoneal Dialysis(T+P)	3	2	1		1		2	2	3	2	1	
5	Techniques in Haemodialysis (T+P)	2	3	1		2		1	2	2		3	1
5	Nutrition in Renal Disease	2	2	3	1	2		3	2	2		2	2
5	Directed Clinical Education-3	3	2	2	1	2		2	1	2	3	1	1
5	Project Management	2	3	1		2	1	2		2	2	1	1
6	Extracorporeal Therapies other than Haemodialysis and Renal transplantation (T+P)	3	2	1		2	3	1		1	2	2	3
6	Clinical practice guidelines	2	2	3		2	2	3		3	2	1	

6	Directed Clinical Education-4	3	2	2	1	2		2	1	2	3	1	1
6	Research Methodology												
6	Personality Development and Soft Skills												
7	Research Project												
7	Internship												
8	Research Project												
8	Internship												

32. Co-curricular Activities

Students are encouraged to take part in co-curricular activities like seminars, conferences, symposia, paper writing, attending industry exhibitions, project competitions and related activities for enhancing their knowledge and networking.

33. Cultural and Literary Activities

Annual cultural festivals are held to showcase the creative talents in students. They are involved in planning and organizing the activities.

34. Sports and Athletics

Students are encouraged to take part in sports and athletic events regularly. Annual sports meet will be held to demonstrate sportsmanship and competitive spirit.

Head

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Programme Structure and Course Details of B.Sc. (Hons) –Dialysis Therapy Technology

(DTT 2024-2028)



**Dialysis Therapy Technology (DTT)
2024-2028**

SEMESTER 1



Head

Department of Allied Health Sciences
M S Ramaiah University of Applied Sciences
Bangalore 560054

Course Specifications: General Anatomy

Course Title	General Anatomy
Course Code	AHD101A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary:

The course aims to impart basic knowledge of general human anatomy which forms the basis for understanding other related subjects such as physiology, pathology and surgery. Emphasis will be placed on cell structure and functions. The various basic tissues of the body, their structure and functional co-relation will be taught. Formation of gametes and early development of the human fetus will be dealt with in short. Various organ systems, their components and basic functions will be covered under this course.

2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations


Head

Department of Allied Health Sciences

M.S. Ramaiah University of Applied Sciences

 Approved by the Academic Council at its 32th meeting held on 22nd June 2024

Dean - Academics

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

II. Teaching, Learning and Assessment

1. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Intended Learning Outcomes
1.	Describe the structure and functional organization of a basic human cell and
2.	the normal anatomical positions and planes of the body
3.	Explain the structure and functions of basic tissues
4.	Explain the components of the organ systems and its basic functions
5.	Identify the parts of a compound microscope and differentiate microscopy of basic tissues
6.	Demonstrate the parts and position of bones in the human body and early development of fetus

2. Course Contents:

Introduction

- Introduction to the human body as a whole
- Anatomical terms, planes and positions
- The cell: Structure, function and multiplication

Tissues

- Types, structure, characteristics, functions
- Simple and Compound Epithelium
- Connective tissue
- Cells, fibers and types
- Cartilage, Blood vessels, Muscle, Bone, Nervous tissue, Skin and Salivary Glands

Embryology

- Fertilization and General embryology

Osteology

- Axial skeleton (Skull: Cranium, air sinuses, Vertebral column: regions, movements and characteristics, Sternum, Ribs) Appendicular skeleton (Bones involving Shoulder girdle and Upper limb, Pelvic girdle and lower limb, healing of bones: cellular activity, Factors that delay healing, Diseases of bones and joints)
- Development of bone and stages of ossification

Organ systems

- Musculoskeletal system
- Digestive system
- Respiratory system

- Circulatory system
- Excretory system
- Nervous system
- Integumentary system
- Endocrine system
- Lymphoid system

Practical

- Histology of epithelium
- Histology of Connective tissue
- Histology of cartilage
- Histology of bone
- Histology of muscle
- Histology of nervous tissue
- Histology of blood vessels
- Histology of skin
- Histology of Salivary glands
- Demonstration of embryology models
- Demonstration of bones Surface anatomy of all organ system
- Interpretation of Radio images

3. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8			PSO -1	PSO -2	PSO -3	PSO -4
CO -1		1	2			1								
CO -2		1	2			1								
CO -3	3	1	2			1							3	3
CO -4		1	2			1								
CO -5			2			1								
CO -6	3	1	2			1							3	3

Approved by the Academic Council at its 32nd meeting held on 22nd June 2024


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

4. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		14
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory	15	
5. Hospital		
6. Model Studio		
Others		16
1. Case Study Presentation	05	
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	01	
Written Examination (Mid-Term tests and SEE)		10
Total Duration in Hours		55

5. Method of Assessment

The components and subcomponents of course assessment are presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well. The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

6. Achieving Course learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
15.	Leadership Skills	Group discussions

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

III. Course Resources

a. Essential Reading

- BD Chaurasia; 2015; Handbook of General Anatomy, 5th Edition; CBS Publishing.
- IB Singh; 2016; Textbook of Human Histology, 8th Edition; Jaypee Brothers Medical Publishers. IB Singh; 2017; Human Embryology, 11th Edition; Jaypee Brothers Medical Publishers.
- General Anatomy and Physiology – by Dr. Venkatesh
- Surface and Radiological Anatomy- with a Clinical Perspective- by Dr. Ashwini C A, 1st Edition,
- Jaypee Publishers, New Delhi

b. Recommended Reading

- Anne Waugh, Allison Grant; 2018; Ross & Wilson Anatomy and Physiology in Health and Illness, 13th edition; Elsevier Churchill Livingstone.
- Adam W.M. Mitchell, Richard Drake, A. Wayne Vogl; Gray's anatomy for Students; 3rd edition; Elsevier Churchill Livingstone.

c. Magazines and Journals

d. Websites

IV. Course Organization

Course Title		General Anatomy
Course Code		AHD101A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		June 2022
Next Course Specifications Review		June 2026

Course Specifications: General Physiology

Course Title	General Physiology
Course Code	AHD102A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

1. Course Summary

1. Aim and Summary

The course aims to impart basic knowledge and sufficient exposure to the physiological concepts and principles with emphasis on applied aspects of organ systems in the body, and to provide the foundations needed for further studies in pharmacology, pathology, pathophysiology and medicine.

The mechanisms of deranged function will be appreciated with an in-depth understanding of basic biophysical and physiological mechanisms. The purpose of developing these core competency criteria is to provide guidelines for the breadth and depth of knowledge in the physiological principles and concepts that are considered minimal and essential for further progress in understanding mechanisms of disease and body defenses.

2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per University regulations
Attendance requirement	As per University regulations

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

II. Teaching, Learning and Assessment

1. Course Outcomes (CO)

After undergoing this course students will be able to:

- CO1. Describe the functions of the organ systems in the body
- CO2. Explain the mechanisms for the execution of these functions for homeostasis through the secretions of chemical and humoral factors
- CO3. Explain the regulatory mechanisms in the control of blood pressure, urine formation maintenance of extracellular and intracellular volume
- CO4. Perform to assess the normal values and parameters of the bodily function indicators such as blood indices, blood gases
- CO5. Demonstrate the tests to assess the functional integrity of the respiratory and cardiovascular system
- CO6. Correlate the disease condition with physiological aspects of bodily functions



Head

Department of Allied Health Sciences
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Bangalore 560054

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

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III.

1. Course Contents:

Course Content
Blood Composition and function of blood, blood bank, blood transfusion, erythrocyte sedimentation rate (ESR) and packed cell volume, anemia, body fluids.
Cardiovascular System Heart and its muscles, cardiac output, heart sounds, blood pressure, hypertension, ECG.
Respiratory System Functions of respiratory system, physiological anatomy of respiratory system. Mechanism of normal and rigorous respiration. Intra pulmonary pleural pressure, surface tension, recoil tendency of the wall. Transportation of respiratory gases lung volumes and capacities, regulation of respiration.
Endocrine System Definition classification of endocrine glands & physiological, anatomy, hormones secreted, physiological function, and their hormones functions of endocrine glands regulation of secretion. Disorders - hypo and hyper secretion of hormone.
Digestive System Physiological anatomy of gastro intestinal tract, functions of digestive system, salivary gland's structure and functions, deglutition, stomach, gastric secretion, pancreas, functions of liver, gall bladder, intestine and lipids.
Nervous system Functions of nervous system, neuron structure, classification and properties. Neuroglia, nerve fiber, classification, conduction of impulses continuous and saltatory. Velocity of impulse. Synapse - Structure, types, properties. Receptors and synapses - Definition, classification, properties. Reflex action - Unconditioned properties of reflex action. Babinski's sign. Spinal cord nerve tracts. Ascending tracts, descending tracts - pyramidal tracts - extrapyramidal tracts. Functions of brain EEG. Cerebro spinal fluid (CSF): Formation, circulation, properties, composition and functions lumbar puncture. Autonomic nervous system: sympathetic and parasympathetic distribution and functions and comparison of functions
Excretory System Functions of kidneys structural and functional unit nephron, vasorecta, cortical and juxtamedullary nephrons: sites of reabsorption, substance reabsorbed, mechanisms of reabsorption glucose, urea, h + Cl amino acids etc. Tmg, tubular load, renal threshold % of reabsorption of different substances, selective secretion. Properties and composition of normal urine, urine output. Abnormal constituents in urine, mechanism of urine concentration. Counter - current mechanisms: micturition, innervation of bladder, cystometrogram. Diuretics: water, diuretics, osmotic diuretics, artificial kidney renal function tests - plasma clearance actions of Adh, aldosterone and Pth on kidneys. Renal function tests

Reproductive System

Function of reproductive system, puberty, male reproductive system. Functions of testes, spermatogenesis site, stages, factors influencing semen. Endocrine functions of testes. Androgens - testosterone structure and functions. Female reproductive system. Ovulation, menstrual cycle. Physiological changes during pregnancy, pregnancy test. Lactation: composition of milk factors controlling lactation.

Muscle Nerve Physiology

Classification of muscle, structure of skeletal muscle, sarcomere contractile proteins, neuromuscular junction. Transmission across, neuromuscular junction. Excitation contraction coupling. Mechanism of muscle contraction muscle tone, fatigue rigor mortis

LABORATORY:

1. White Blood Cell Count
2. Red Blood Cell Count
3. Blood Pressure Recording SL
4. Auscultation of Heart Sounds
5. Artificial Respiration SL
6. Pulmonary Function Test

2. Course Map (CO-PO-PSO Map)

Department of Allied Health Sciences
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	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	2			1					2			
CO-2	2								2			
CO-3	2				1				2			
CO-4	2		1		1				2			
CO-5	2								1			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

3. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		20
Demonstrations		2
2. Demonstration using Videos	2	
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		30
1. Course Laboratory	25	
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory	5	
5. Hospital		
6. Model Studio		
Others		8
1. Case Study Presentation	3	
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions	6	
5. Group Discussions	10	
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		10
Total Duration in Hours		70

Head
Department of Allied Health Sciences

4. Method of Assessment

Continuous Evaluation Policies: Continuous evaluation depends on the type of the course as discussed below:

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

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Dean - Academics
M.S. Ramaiah University of Applied Sciences
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In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

5. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion

5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
15.	Leadership Skills	Group discussions

V. Course Resources

a. Essential Reading

- Gerard J. Tortora, Bryan H. Derrickson (2013) Principles of Anatomy and Physiology 14th Edition. Wiley publications
- Sujit Kumar Chaudhuri (2011) Concise Medical New Central Book
- Chatterjee CC (2005) Human Physiology Volume 1 and 2 11th edition CBS publishers
- D. Venkatesh, H.H. Sudhakar (2015) Textbook of Medical Physiology. Lippincott Williams & Wilkins

b. Recommended Reading

- Guyton and Hall (2016) Textbook of Medical Physiology, 13edition Elsevier's publications
- Parveen Kumar and Michel Clark (2016) Kumar and Clark's Clinical Medicine Ninth edition
- Ganong's Review of Medical Physiology, 24th Edition (LANGE Basic Science) 24th Edition

c. Magazines and Journals

d. Websites

VI. Course Organization

Course name		General Physiology
Course code		AHD102A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

Course Specifications Approval		
Next Course Specifications Review		



Head

Department of Allied Health Sciences
 Jangraiah University of Applied Sciences
 Bangalore 560054

Course Specifications: Health Care Delivery Systems of India

Course Title	Health Care Delivery Systems of India
Course Code	AHD103A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The aim of the course is to introduce students to the Indian system of health care, health status of the population and initiatives taken at the national level towards improving health status of the population.

The students are oriented to importance of demography and vital statistics and concept of health and disease. The students are exposed to health care delivery systems such as- Siddha, Unani, Homeopathy, Ayurveda and Yoga and Naturopathy. Students are also introduced to concept of integrating health care system to achieve health, measures taken at National level for improving health status of population including National Health programmes..

2. Course Size and Credits:

Number of credits	02
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	0
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per academic regulation
Attendance requirement	As per academic regulation

Approved by the Academic Council at its 32nd meeting held on 22nd June 2024

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe the Health Care delivery system in India at primary, secondary and tertiary level and identify their role in the health care team
2.	Explain the AYUSH system of medicine
3.	Explain the National Health programs in terms of operation, achievements and constraints
4.	Explain the importance of Demography and Vital statistics in planning health policy
5.	Discuss role of epidemiology and epidemiological methods in health

4. Course Contents:

Introduction to healthcare delivery system

- Healthcare delivery system in India at primary, secondary and tertiary care Community participation in healthcare delivery system
- Health system in developed countries Private Sector National Health Mission; National Health Policy and issues in health care delivery system in India

National Health Programme

- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme

Introduction to AYUSH system of medicine

- Introduction to Ayurveda Yoga, naturopathy, unani, siddha and homeopathy Need for integration of various system of medicine

Health scenario of India- past, present and future

Demography & Vital Statistics

- Demography – its concept. Vital events of life & its impact on demography
- Significance and recording of vital statistics. Census & its impact on health policy

Epidemiology

- Principles of Epidemiology. Natural history of disease
- Methods of epidemiological studies Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8			PSO -1	PSO -2	PSO -3	PSO -4
CO-1		1		2	1		2				2			1
CO-2	1		1								2			
CO-3			1	2	1			1			2			
CO-4		1		1	1		2				2			
CO-5	1			1							2			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		25
Demonstrations		
3. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course		
Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	5	
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		05
Total Duration in Hours		35

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

7. Method of Assessment

Continuous Evaluation Policies: Continuous evaluation depends on the type of the course as discussed below:

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 25%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning method:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
15.	Leadership Skills	Group discussions


Head
Department of Allied Health Sciences
M.S. Ramaiah University of Applied Sciences
Bengaluru
Course Resources

9. Essential Reading

- Rothman (2012). Modern Epidemiology. Lippincott Williams and Wilkins Publishers
- Community Medicine with recent advances - AH Suryakantha - 4th Edition - Jaypee Publishers
- Review in Community Medicine - VVR SeshuBabu - 2nd Edition - Paras Medical Books
- Epidemiology for Undergraduates - Marina Rajan Joseph - Jaypee Publishers

10. Recommended Reading

- Park's Textbook of Preventive and Social Medicine - K. Park - 22nd Edition - Bhanot Publishers
- Oxford Textbook of Public Health - Roger Detels - 5th Edition - Oxford University Press
- National Health Programs of India - J Kishore - 12th Edition - Century Publications

11. Magazines and Journals

12. Websites

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

Course Organization

Course Title		Health Care Delivery Systems of India
Course Code		AHD103A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		


Head
Department of Allied Health Sciences
SRM Institute of Science and Technology
Bangalore 560054

Course Specifications: General Microbiology

Course Title	General Microbiology
Course Code	AHD104A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

This course introduces the principles of Microbiology with emphasis on applied aspects of Microbiology of infectious diseases particularly in the principles & practice of sterilization methods, collection and dispatch of specimens for routine microbiological investigations, interpretation of commonly done bacteriological and serological investigations, and control of hospital infections. This will help the students to maintain sterile working environment and appropriate sample collection.

2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	30
Number of semester weeks	16
Department responsible	Allied Health Sciences.
Course evaluation	Total Marks: 100
Pass requirement	As per the academic regulation
Attendance requirement	As per the academic regulation

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcomes
1.	Describe the morphology, physiology and characteristics of microorganisms
2.	Describe the principles and practice of sterilization and disinfection
3.	Discuss immunology, and immunity
4.	Demonstrate sterilization procedures and use of sterilization equipment
5.	Demonstrate Collection and transport of specimens to the laboratory

4. Course Contents:

Course Content

Introduction to Microbiology

History, introduction, scope, aims and objectives. Morphology and physiology of bacteria. Detail account of sterilization and disinfection. Brief account of culture media and culture techniques. Basic knowledge of selection, collection, transport, processing of clinical specimens and identification of bacteria and drug resistance in bacteria

Immunology

Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease Immunity. Structure and functions of Immune system. The Complement System. Antigen. immunoglobulin's - Antibodies - General structure and the role played in defense mechanism of the body. Immune response. Antigen - Antibody reactions - with reference to clinical utility. And hHypersensitivity reactions.

Systematic bacteriology

Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus, Meningococcus – brief account of each coccus– detailed account of mode of spread, laboratory diagnosis.

Mycobacteria - Tuberculosis and Leprosy.

Clostridium - Gas gangrene, food poisoning and tetanus.

Non-sporing Anaerobes - in brief about classification and morphology, in detail about Viruses:

HIV and Hepatitis- Pathogenesis, Lab Diagnosis and management

Laboratory:

Demonstration of sterilization equipment's: hot air oven, autoclave, bacterial filters.

Demonstration of commonly used culture media, nutrient broth, nutrient agar, blood agar, chocolate agar, MacConkey medium, L J media, Robertson cooked meat media. Anaerobic culture methods.

Antibiotic susceptibility test.

Demonstration of common serological tests: ELISA.

Demonstration of Grams staining.

Demonstration of Acid-fast staining.

Sample collection methods, storage and transport.

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	1								2			
CO-2	2		1		1				2			
CO-3	1		1						2			
CO-4	2				1				2			
CO-5	2	1		2					2			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		24
Demonstrations		
4. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory	16	
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		26
4. Clinical Laboratory	5	
5. Hospital	5	
6. Model Studio		
Others		
1. Case Study Presentation	2	2

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations	05	
Written Examination (Mid-Term tests and SEE)		8
Total Duration in Hours		60

7. Method of Assessment

Continuous Evaluation Policies: Continuous evaluation depends on the type of the course as discussed below:

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lecture
2.	Understanding	lecture
3.	Critical Skills	Assignments, case study discussion, small group discussion
4.	Analytical Skills	Assignments, case study discussion, small group discussion
5.	Problem Solving Skills	Assignments
6.	Practical Skills	-OSPE
7.	Group Work	Assignments
8.	Self-Learning	Assignment, OSPE
9.	Written Communication Skills	Assignment, Examination
10.	Verbal Communication Skills	Small group discussion
11.	Presentation Skills	Small group discussion
12.	Behavioral Skills	-
13.	Information Management	Assignment
14.	Personal Management	-
15.	Leadership Skills	-

Course Resources

9. Essential Reading

- Edmonstone. (2019). Systems Leadership in Health and Social Care. 1st Ed.
- Class notes
- Ananth Narayan, R. & Panicker, C.K.J., 2009. Textbook of Microbiology. 8th ed. Hyderabad: Universities Press (India) Pvt. Ltd.
- Evan Roitt et al, Immunology. 3rd ed. USA: McGraw Hill Companies Inc.

10. Recommended Reading

- Apurba S. Sastry & Sandhya Bhat K; Essentials of medical microbiology. Jaypee. The health Sciences Publisher

11. Magazines and Journals

12. Websites

Course Organization

Course Code		AHD104A
Course Title		General Microbiology
Course Leader/name		Dr. Tushar Shaw
Course Leader Contact Details	Phone	080 – 49065555
	E- mail	
Course Specifications Approval		June 2022
Next Course		June 2026

Course Specifications: Basic Electrical & Electronics

Course Title	Basic Electrical & Electronics
Course Code	AHD106A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

This course deals with basic principles and concepts of Elements of Electrical and Electronics as applied to biomedical instrumentation. Students are taught the fundamentals of circuit analysis, magnetic circuits, DC machines and transformers. In addition, principles of PN junction diode, Zener diode, semiconductor devices such as transistors, amplifiers and power supplies.

2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	45
Number of practical/tutorial hours	30
Number of semester weeks	16
Department responsible	Electrical and Electronic Engineering
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Head

Department of Allied Health Sciences
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Bangalore 560054

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcome
1.	State various laws of electric and magnetic circuits and explain their significance in biomedical instrumentation
2.	Explain DC machines, transformers and their applications
3.	Solve simple numerical problems on electric circuits and magnetic circuits,
4.	Explain working principles of PN junction diode, Zener diode, transistors and amplifier configurations

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- | | |
|----|---|
| 5. | Demonstrate electrical and electronic circuits for hardware modules using standard EDA tool |
|----|---|

4. Course Contents:

Course Content
DC and AC Fundamentals: Circuit elements, Voltage and Current Division, Ohm's Law and Kirchhoff's Laws, Sinusoidal voltage and currents, concept of cycle period, frequency, peak factor and form factor, phase difference, lagging, leading and in phase quantities. Study of AC circuits of pure R, L and C.
Magnetic Circuits: Magnetic effect of electrical current, Faraday's law of electromagnetic induction, statically and dynamically induced EMF's, self and mutual inductance, concepts of MMF, flux, flux density, reluctance, permeability and field strength, their units and relationship. Simple series and parallel magnetic circuits. Basic analogy between electric and magnetic circuits.
DC Machines and Transformers: Constructional details, working principle and methods of excitation of DC machine as a generator and a motor. Necessity of transformer, Constructional Details (core and shell types), Principle of operation, Ideal Transformer and Practical Transformer. Applications of DC machines and transformers in medical instrumentation.
Basic concepts in Electronics: Semiconductor: p-type, n-type; p-n junction diode, its characteristics, half wave, full wave and bridge type rectifiers, basic filter circuits, Zener diode characteristics, Zener diode as a voltage regulator.
Transistors: Transistor configurations: CB, CE and CC; Transistor parameters: alpha, beta and gamma, working of transistor as a switch, Amplifier, Characteristics of JFET,.
Amplifiers: Differential amplifiers and their transfer characteristics, IC Op-Amps, their ideal and practical characteristics, Op-Amp in different modes as inverting amplifier, non-inverting amplifier, summing amplifier, scale changer, differentiator and integrator. Lab course Design and simulate following circuits using standard EDA tool 1. Verification of Ohms Law.

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1			2		2			1	2			1
CO-2			2		1				2			
CO-3					2				2			
CO-4			2		1				1			
CO-5					1				1			
3: Very Strong Contribution, 2: Strong Contribution, 1:												

Moderate Contribution

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		15
Demonstrations		
5. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		15
1. Solving Numerical Problems	15	
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		25
1. Case Study Presentation	12	
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions	05	
5. Group Discussions	08	
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		05
Total Duration in Hours		60

Head

Department of Allied Health Sciences

M S Ramaiah University of Applied Sciences

Bangalore 560054

7. Method of Assessment

Continuous Evaluation Policies: Continuous evaluation depends on the type of the course as discussed below:

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

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In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Class room lectures, Assignments
2.	Understanding	Class room lectures, Assignments
3.	Critical Skills	Class room lectures, Assignments
4.	Analytical Skills	Class room lectures, Assignments
5.	Problem Solving Skills	Class room lectures, Assignments
6.	Practical Skills	
7.	Group Work	Assignment
8.	Self-Learning	Assignment

9.	Written Communication Skills	Assignment, Examination
10.	Verbal Communication Skills	
11.	Presentation Skills	
12.	Behavioral Skills	Course work
13.	Information Management	Assignment, Examination
14.	Personal Management	Course work
15.	Leadership Skills	

Course Resources

9. Essential Reading

- Class Notes
- Edward Hughes, (2002), Electrical and Electronics Technology, ELBS, 6th edition
- Millman and Halkias, (2001) Integrated Electronics, Tata McGraw-Hill Education

10. Recommended Reading

- F Mittle, V.N., (2007) Basic Electrical and Electronics Engineering, Tata McGraw Hill Edition, New Delhi, 1st edition
- Delton Horn T., (1993) Abraham Pallas, Basic Electricity and Electronics, Europe, McGraw-Hill Limited

11. Magazines and Journals

12. Websites

- Basic Electrical Technology (2013) <http://freevideolectures.com/Course/2335/Basic-Electrical-Technology/23>
- IITM Lectures (2013) <http://www.nptel.iitm.ac.in/courses/108105017/>

Course Organization

Course Code		AHD106A
Course Title		Basic Electrical and Electronics
Course Leader/s Name		As per Time - table
Course Leader Contact Details	Phone:	49065555
	E-mail:	< hod.ee.et@msruas.ac.in>
Course Specifications Approval Date		2019

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

Course Specifications: Applied Physics

Course Title	Applied Physics
Course Code	AHD105A
Department	Applied Physics
Faculty	Life and Applied Health Sciences

I. Course Summary

1. Aim and Summary

The aim of this course is to impart basic concepts of Physics and its application to solve medical problems.

The students are taught the basic topics in physics which include electromagnetic theory, electricity and magnetism, lasers and fiber optics. Interaction of radiation with matter will be discussed.

2. Course Size and Credits:

Number of credits	3
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	30
Number of semester weeks	16
Department responsible	Faculty of Mathematical & Physical
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Head

Department of Allied Health Sciences
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Bangalore 560054

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcome
1.	Explain the basic concepts in sound, electricity and magnetism, laser physics and electromagnetic radiation
2.	Describe concepts in optical fibers,
3.	Describe basic properties of fluids
4.	Conduct experiments as per the standard procedures and tabulate the measured Values

4. Course Contents:

Course Content
Basic Physics: Sound -The nature and propagation of sound wave (the characteristics of sound, wave theory), speed of sound in a material medium, intensity of sound, the decibel, Interference of sound waves, beats, diffraction, Doppler effect , Applications of Doppler effect
Optical fiber : Basic working principle of optical fibers : Types and structure of Optical fibers, modes of propagation, Refractive index profiles of step index and graded index fibers, Attenuation, Different types of loss mechanisms, Fiber optic application in medical field.
Electricity and Magnetism: A.C. and D.C. power supply with examples, single phase and poly phase power supply, switches, fuses, circuit breakers, earthing etc. main voltage drop: causes and remedy, cables; low tension, high tension. Magnets and magnetic field, force on an electric current in a magnetic field, force on electric charge moving in a magnetic field, Ampere's law, electromagnet and solenoids
Electromagnetic radiation: Electromagnetic radiation spectrum, common properties of electromagnetic radiation; relationship between energy, frequency, wavelength and velocity e.g. X-rays and gamma rays. Transmission through matter, law of exponential attenuation- practical aspects of radiation absorption and transmission through body tissues
Characteristics of laser light, Absorption, spontaneous emission and stimulated emission, Requisite conditions for production of a laser beam, Nd-YAG Laser, Semiconductor laser, Applications of laser to medical field
Fluid mechanics: Rate of flow —lines and tubes of flow—Streamline and turbulent flow— Bernoulli's theorem and its applications-Reynold's number- viscosity —Derivation of Poiseuille's equation —Experimental determination of viscosity of a liquid, Surface tension—capillary rise Diffusion—Fick's law—Graham's law for diffusion of gases, biomedical applications

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5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1			2		2			1	2			1
CO-2			2		1				2			
CO-3					2				2			
CO-4			2		1				1			
CO-5					1				1			
CO-6					2				2			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		25
Demonstrations		3
6. Demonstration using Videos	3	
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		18
1. Course Laboratory	18	
2. Computer Laboratory		
3. Engineering Workshop/Course		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		6
1. Case Study Presentation		
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	6	
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		08

Total Duration in Hours	60
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7. Method of Assessment

Continuous Evaluation Policies: Continuous evaluation depends on the type of the course as discussed below:

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva-

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Head
Department of Allied Health Sciences
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and CapabilitiesSkills	How imparted during the course
1.	Knowledge	Classroom lectures
2.	Understanding	Class room lectures,
3.	Critical Skills	Assignment
4.	Analytical Skills	Class room, assignment
5.	Problem Solving Skills	Class room, assignment
6.	Practical Skills	Class room, assignment
7.	Group Work	Classroom
8.	Self-Learning	Assignment
9.	Written Communication Skills	Assignment, examination
10.	Verbal Communication Skills	--
11.	Presentation Skills	--
12.	Behavioral Skills	Course work
13.	Information Management	Assignment, examination
14.	Personal Management	Assignment, examination
15.	Leadership Skills	--

Course Resources

9. Essential Reading

- Class notes
- David Halliday, Robert Resnick and Jearl Walker, (2013) Fundamentals of

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Physics,
New York, John Wiley & Sons.

- Murugesan, R., (2008) Electricity and Magnetism, 7th Edition, S. Chand and Company
- Arora, C. L., (2007) B.Sc. Practical Physics, S. Chand and Company Ltd.
- William E. J McKinney Radiographic latent image processing –American Society for Nondestructive Testing (1982)
- W. J. Meredith & J.B. Massey. Fundamental Physics of Radiology 1992(Varghese Publishing House).
- Robin J. Wilks, Principles of Radiological Physics, 2nd Revised edition (Oct. 1 1987)Churchill Livingstone;
- George A. Hay , Donald J. Hughes First-year Physics for Radiographers 3rd Revised edition (1997) BailliereTindall;

10. Recommended Reading

- Geoffery Rose (2008). Rose's strategy of preventive medicine. OUP Oxford Publishers
- Basic Medical Radiation physics – by L Stanton Stanton 1963 (Butterworth)
- Thomas S. Curry III James E. Dowdey, Robert E. Murry Jr. Christensen's Physics of Diagnostic Radiology Fourth EditionLWW (August 1, 1990)
- Thayalan, K., (2003) Basic Radiological Physics,New Delhi, Jayapee Brothers Medical Publishing Pvt. Ltd.
- Bushberg, Seibert, Leidholdt and Boone, (2002) The essential physics of Medical Imaging,North America, Lippincot Williams and Wilkins.

11. Magazines and Journals

12. Websites

- www.ocw.mit.edu/courses/physics
- <http://nptel.ac.in/>

Course Organization

Course		Applied Physics
Course		AHD105A
Course Leader/s Name		As per time table
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	hod.pl.mp@msruas.ac.in
Course Specifications Approval		May 2019
Next Course Specifications Review		May 2023

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

Programme Structure and Course Details of B.Sc.(Hons)–Dialysis Therapy Technology

(DTT2024-2028)



**RAMAIAH
UNIVERSITY
OF APPLIED SCIENCES**

**Dialysis Therapy Technology (DTT)
2024-2028**

SEMESTER 2

A handwritten signature in blue ink, appearing to be 'K' or 'Kishore'.

Head

Department of Allied Health Sciences
Ramaiah University of Applied Sciences
Bangalore 560054

Course Specifications: General Biochemistry

Course Title	General Biochemistry
Course Code	AHD107A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The course aims to impart basic knowledge on biochemistry and its role in health and diseases, emphasizing on the diagnostic aspect of the subject. The course is designed to provide an understanding of the basic process of life in molecular terms. The students are oriented to chemistry of carbohydrates, proteins, lipids, and various metabolic pathways to understand and utilize different biomolecules, nutrition, and nutritional support with special emphasis on parental nutrition. Students learn about specimen collection, and different laboratory apparatus used and preparation of solutions. They are exposed to the concept of quality control. They will perform routine urine and blood investigations and interpret and diagnose abnormalities.

2. Course Size and Credits:

Number of credits	02
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per academic regulations
Attendance requirement	As per academic regulations

Head

Department of Allied Health Sciences
M.S. Ramaiah University of Applied Sciences

Approved by the Academic Council at its 32nd meeting held on 22nd June 2024

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 Bangalore - 560 054

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe the various laboratory apparatus used, the steps in specimen collection and safety measurements to be taken in biochemistry laboratory
2.	Explain different models of atomic structure, acids, bases, buffers and disturbances in acid base balance
3.	Explain quality control, precision, specificity, sensitivity when conducting special investigations
4.	Demonstrate qualitative and quantitative estimations of various analyses (Urine, blood)
5.	Interpret the various biochemical parameters in health and disease

4. Course Contents:

Specimen collection

Pre-analytical variables. Collection of blood. Collection of CSF & other fluids. Urine collection. Use of preservatives. Anticoagulants.

Introduction to laboratory apparatus

Pipettes: different types (graduated, volumetric, Pasteur, automatic etc.). Calibration of glass pipettes. Burettes, beakers, petri dishes, depression plates. Flasks: different types (volumetric, round bottomed, Erlenmeyer conical etc.). Funnels: different types (conical, Buchner etc.). Bottles: reagent bottles – graduated and common, wash bottles different type specimen bottles

Instruments

Use, care and maintenance of: water bath, oven & incubators, water distillation plant, water deionizers, refrigerators, cold box, deep freezers, reflux condenser, centrifuge, balances, colorimeter, spectrophotometer, pH meter and electrodes.

Centrifuges: definition, principles, Svedberg unit, centrifugal force, centrifugal field, RPM, conversion of G to RPM and vice versa, different types of centrifuges.

Manual balances: single pan, double pan, triple balance, direct read out electrical balances.

Safety of measurements & Conventional and SI units

Dilutions

Acids & Bases

Acid- base indicator Theory

Quality control

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)											Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8				PS O -1	PS O -2	PS O -3	PS O -4
CO-1		1	1		2							2			
CO-2					2							2			
CO-3	1				2							2			
CO-4	2				2							3			
CO-5	2				2							2			
CO-6	3				2							2			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution															

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		14
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation	15	
2. Guest Lecture		
3. Industry/Field Visit	09	
4. Brain Storming Sessions	05	
5. Group Discussions	11	
6. Discussing Possible Innovations	01	
Written Examination (Mid-Term tests and SEE)		05

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Total Duration in Hours	60
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7. Method of Assessment

Continuous Evaluation Policies: Continuous evaluation depends on the type of the course as discussed below:

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 25%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

Head

Department of Allied Health Sciences
M S Ramaiah University of Applied Sciences
Bangalore 560054
Course Resources

9. Essential Reading

- Vasudevan, D.M., Sreekumari, S., Vaidyanathan, K. Textbook of Biochemistry for Medical Students, Jaypee Brothers Medical Publishers, New Delhi, 8th Ed, 2016
- Satyanarayana U, Chakrapani U. Biochemistry. Books & Allied (P) Ltd, Kolkata 4th Ed, 2013

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

10. Recommended Reading

- Murray Rk, Granner Dk, Rohrer W. Harper's Illustrated Biochemistry, Lange McGraw Hill, New York, 30th Ed, 2015
- Champe P, Harvey R, Ferrier Dr. Lippincott's Illustrated Reviews Biochemistry, Wolters Kluwer Health, Lippincott Williams & Wilkins, New Delhi, 6th Ed, 2013
- Das Debjyoti, Fundamentals of Biochemistry books & allied, Kolkata 14th Ed, 2012
- Varley, Clinical chemistry 4th edition
- Teitz, Fundamentals of clinical chemistry 6th edition

11. Magazines and Journals

- Public Health Nutrition
- Journal of clinical chemistry and laboratory medicine
- Indian journal of medical biochemistry

12. Websites

Course Organization

Course Title		General Biochemistry
Course Code		AHD107A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		June 2022
Next Course Specifications Review		June 2026

Course Specifications: General Pharmacology

Course Title	General Pharmacology
Course Code	AHD108A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The aim of the course is to introduce students of allied health sciences to the Pharmacological basis of therapeutics. This should help them to understand therapeutics in management of various diseases.

Pharmacology, the science of drugs, has special reference to the students of allied health sciences. Practice of various technologies involves use of pharmacological agents both for diagnosis and treatment. The students are oriented to importance of pharmacological basis of therapeutic intervention. Broad understanding of pharmacology with emphasis on how human body handles a drug is imperative to these students.

2. Course Size and Credits:

Number of credits	02
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per academic regulations

Approved by the Academic Council at its 32th meeting held on 22nd June 2024


 Date: 63/1/195
 M.S. Ramaiah University of Applied Sciences
 Bangalore - 560 054

Head
 Department of Allied Health Sciences
 M.S. Ramaiah University of Applied Sciences
 Bangalore - 560 054

Attendance requirement	As per academic regulations
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Head

Department of Allied Health Sciences
 A E Ramoah University of Applied Sciences
 Bangalore 560054

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcome
1	Describe pharmacokinetic principles in relation to drug administration
2	Explain the concept of pharmacodynamics in relation to drug utilization in therapeutics
3	Explain the concept of chemotherapy in relation to infectious diseases
4	Explain the importance of adverse effects in therapeutics of various drug usage
5	Identify drugs dosage forms and posology in management of diseases and calculate doses in various age groups
6	Interpret the importance of drug combinations with reference to therapeutic index and drug utilization

4. Course Contents

General Pharmacology

Introduction to pharmacology-various terminologies-sources & routes of drug administration – Absorption & Factors modifying drug absorption – Distribution of drugs – Metabolism: Phase II, - Excretion: routes, modes & kinetics of elimination – Excretion – Mechanism of drug action in brief, synergism & antagonism and Factors modifying drug action – Adverse drug reactions – ADR reporting & monitoring – Drug interactions

Pharmacokinetics

Pharmacokinetics and dynamics of drugs acting on Central Nervous System & Respiratory System Introduction to CNS and Neurotransmitters, drugs used in insomnia, Sedatives and hypnotics

Safety and efficacy of drugs acting on Cardio vascular system & blood. Drugs used in ischemic heart disease-nitrates-Calcium channel, immunomodulators, hormones

Drug use in children and geriatric population with reference to antimicrobials.

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5. Course Map (CO-PO-PSO Map) RM

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8					PSO-1	PSO-2	PSO-3	PSO-4
CO-1	2			2	2								2			
CO-2	2			1	2								2			
CO-3	2				2								2			
CO-4	3				2			1					3			1
CO-5	2				2			1					2			1
	2			1	1								2			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution																

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		25
Demonstrations		5
1. Demonstration using Videos	5	
2. Demonstration using Physical		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course		
Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Term tests and SEE)		05

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Total Duration in Hours

35

7. Method of Assessment

Continuous Evaluation Policies: Continuous evaluation depends on the type of the course as discussed below:

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 25%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

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After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

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8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods

S.No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

Course Resources

2. Essential Reading

- Essentials of Medical Pharmacology: K.D. Tripathi, 6th edition, Jaypee Publishers
- Medical Pharmacology. S K Shrivastava. Avichal publishing NewDelhi
- Manual of Practical Pharmacology. Avichal Publications.

3. Recommended Reading

- Lippincott's Illustrated Reviews: Pharmacology, 5th edition, by Richard A. Harvey and Pamela C. Champe, Lippincott Williams & Wilkins Publisher
- Katzung's Basic and Clinical Pharmacology 13th edition. Lange Publication.

4. Magazines and Journals

5. Websites:

Course Organization

Course		General Pharmacology
Course		AHD108A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		



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Department of Allied Health Sciences
M.S. Ramaiah University of Applied Sciences

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Course Specifications: Concepts of Hospital infection prevention

Course Title	Concepts of Infection Prevention
Course Code	AHD109A
Department	Allied Health Sciences
Faculty	Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The aim of the course is to help students understand the basic concepts of quality in health Care and develop skills to implement prevention of infection spreading in the health system.

The students will be introduced to aspects such as Bio medical waste management and environment safety, Infection prevention and control, Antibiotic Resistance and Disaster preparedness and management.

2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcomes
1.	Explain the steps involved in infection prevention and control
2.	Understand the working and application of CSSD
3.	Explain the importance of antibiotic resistance in the patient care and ways to prevent it.
4.	Apply the concepts of biomedical waste management to ensure clean and hazard free hospital environment

4. Course Contents:

Bio medical waste management and environment safety

Definition of Biomedical Waste. Waste minimization. BMW – Segregation, collection, transportation, treatment and disposal (including color coding). Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste. BMW Management & methods of disinfection. Modern technology for handling BMW. Use of personal protective equipment (PPE). Monitoring & controlling of cross infection (Protective devices)

Infection prevention and control

Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment (PPE)]. Prevention & control of common healthcare associated infections. Components of an effective infection control program and Guidelines (NABH and JCI) for Hospital Infection Control. Spill management

Antibiotic Resistance

History of antibiotics. How resistance happens and spreads. Types of resistance- Intrinsic, acquired, passive. Trends in drug resistance. Actions to fight resistance. Bacterial persistence. Antibiotic sensitivity. Consequences of antibiotic resistance. Antimicrobial stewardship- Barriers and opportunities. Tools and models in hospitals.

Working of CSSD:

Understand the concepts of sterilization, disinfection in CSSD, Structure and working of CSSD

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5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
CO-1				3			3				3		1	
CO-2				1	3		1				3			
CO-3				1	3		1				3			
CO-4					3		1				3			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration In Hours
Face to Face Lectures		20
Demonstrations		2
7. Demonstration using Videos	2	
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		8
Practical Work		
1. Course Laboratory	15	
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory	5	
5. Hospital	5	
6. Model Studio		
Others		
1. Case Study Presentation	2	
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions	3	
5. Group Discussions	10	
6. Discussing Possible Innovations		

7. Journal club	
Written Examination (Mid-Term tests and SEE)	8
Total Duration in Hours	38

7. Method of Assessment

Continuous Evaluation Policies: Continuous evaluation depends on the type of the course as discussed below:

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 25%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

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[Signature]

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8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

Course Resources

9. Essential Reading

- Class notes
- Essentials of Hospital Infection Control by Apurba Shastry

10. Recommended Reading

11. Magazines and Journals

12. Websites

Course Organization

Course Code		AHD109A
Course Title		Concepts of Infection Prevention
Course Leader/Name		As per time table
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval Date		10/5/2019
Next Course Specifications Review Date:		10/5/2023



Head

Department of Allied Health Sciences
M S Ramaiah University of Applied Sciences
Bangalore 560054

Approved by the Academic Council at its 32th meeting held on 22nd June 2024



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Course Specifications: General Pathology

Course Title	General Pathology
Course Code	AHD110A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The aim of the course is to introduce students of allied health sciences to concepts of general Pathology. This should help them to build a foundation for understanding pathological basis of various diseases with special reference to radiation technology and dialysis technology. The course would help integrate knowledge of basic concepts of pathology and clinical medicine into allied sciences. At the end of the course, the student will learn fundamental aspects of cellular injury, inflammation, tissue repair, immunology, neoplasia, histopathology, hematology and blood banking

2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcome
1.	Describe basic facts and concepts of pathology
2.	Explain fundamental aspects of hematology and blood banking
3.	Explain the various clinical pathology tests
4.	Perform laboratory tests related to hematology and clinical pathology
5.	Interpret the results of laboratory tests
6.	Apply concepts of general pathology to understand pathological basis of

4. Course Contents:

General Pathology

General Pathology Adaptations, Cell Injury and Repair: Hyperplasia, atrophy, metaplasia, necrosis and apoptosis - Differences between apoptosis and necrosis.

Acute and Chronic inflammation: Five cardinal signs of inflammation- Outcomes of acute inflammation- Chronic inflammation-Granulomatous inflammation-Acute phase proteins.

Tissue repair, regeneration and hemodynamic disorders: Cutaneous wound healing- Pathologic aspects of repair-Hyperaemia and congestion-Thrombosis and Virchow triad-Embolism-Infarction Shock; Bronchial asthma, COPD.

Diseases of immune system: Hypersensitivity reaction-Type I, II, III, and IV hypersensitivity reactions.

Neoplasia: Definition of neoplasia. Differences between benign and malignant tumors ;

Metastasis ; Carcinogenesis – Causes ; Carcinoma of oral cavity – Causes; Etiology of

Carcinoma cervix – type of virus implicated, high risk sero-types, Screening investigations;

Breast carcinoma – Risk factors

Histopathology

Introduction to histopathology. Receiving of specimen in the laboratory. Grossing techniques.

Mounting techniques: various mountants. Maintenance of records and filing of the slides.

Use & care of microscope. Various fixatives, mode of action, preparation and indication.

Section cutting. Tissue processing for routine paraffin sections. Decalcification of tissues.

Staining of tissues: H & E Staining. Bio- medical waste management. Frozen section cutting and staining.

Blood Bank

Introduction. Blood grouping and Rh types. Cross matching

Laboratory

Examination: physical, chemical, microscopic.

Blood grouping Rh typing. Cross matching (Observation), how to send samples for cross matching, PT, APTT and Hb, packed cell volume (PCV), erythrocyte sedimentation rate (ESR), bleeding time, clotting time

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8			PS O -1	PSO -2	PS O -3	PSO -4
CO-1	1				1						2			
CO-2	1		1	1							2			
CO-3	2				2						2			
CO-4	2		1		2						2			
CO-5	2			1							2			
CO-6	2		1		2			1			2		1	
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		25
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical	05	
3. Demonstration on a Computer		
Practical Work		
Conducting demo interviews and focus	15	
Computer lab (software demonstration)		
Demonstrating analysis using a case study		
Others		
1. Case Study Presentation		
2. Brain Storming Sessions		
3. Group Discussions		
4. Discussing Possible Innovations		
Written Examination		10
Total Duration in Hours		55

7. Method of Assessment

Continuous Evaluation Policies: Continuous evaluation depends on the type of the course as discussed below:

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

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S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

Course Resources

9. Essential Reading

- Sood R, (1996), Laboratory Technology- Methods and interpretation, 4th Ed. J.P. Bros, New Delhi.
- Nayak R, (2017), Textbook of Pathology for Allied Health sciences, Jaypee brothers Medical Publishers, New Delhi.
- MdTahmiunur Rahman Sajal et al, (2013), A Short Textbook of Pathology, 2nd Ed, Jaypee, New Delhi

Course Organization

Course		General Pathology
Course		AHD110A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		

Course Specifications: Early Clinical Exposure

Course Title	Early Clinical Exposure
Course Code	AHD112A
Department	Allied Health Sciences
Faculty	Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The aim is to expose the students in a social or clinical context that enhances learning of health, illness or disease, and the role of the allied health professional.

The students are taken to the hospital "wards/clinics" and made to understand the protocols and patterns to enhance their skills and understand diseases and ailments.

2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	
Number of practical/tutorial hours	300
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Intended Learning Outcomes
1.	Describe the movement of patient from the point of entry into the hospital till treatment

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2.	Describe the role of nursing in patient care
3.	Explain the importance of inter professional team approach to patient care
4.	Demonstrate bed making, lifting and transport of patients
5.	Assist in bed side management of patient in the wards OT and Out patient
6.	Assist in changing surgical dressings and collection of samples for Lab Tests

4. Course Contents:

Course Content
1. Introduction to Hospital- Registration record keeping OPD Laboratories and Wards
2. Introduction to Nursing- Nursing principles, Nursing care, Bed Making, lifting of and transport of patients from bed to wheel chair and from bed to stretcher
3. Bed side management Giving and taking Bed Pan, urinal, sputum tray . Observation of stool urine and sputum. Observe the use and care of catheters and enema procedure
4. Method of giving nourishment. Feeding, Tube feeding, drips transfusion
5. Surgical dressing. Simple aseptic precautions, dressing procedures.
6. Introduction to operation theater outlay. Preoperative, intraoperative and post-operative areas
7. Introduction to dialysis unit including patient care and equipment.
8. Introduction to department of radio diagnosis and various sub units such as X ray Doppler Ultra sonography CT MRI

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3							2					2			3
CO-2	3							2					2			3
CO-3	3							2					2			3
CO-4	3							2					2	1		3
CO-5	3							2					2			3
CO-6	3	1					1	2					2			3

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face-to-Face Lectures		
Demonstrations		
4. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems	10	10
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		270
4. Clinical Laboratory	100	
5. Hospital	170	
6. Model Studio		
Others		
1. Case Study Presentation	5	
2. Guest Lecture		
3. Industry/Field Visit		10
4. Brain Storming Sessions	5	
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		10
Total Duration in Hours		300

7. Method of Assessment

There are two components for assessment in this Course

Component- 1: 60% weight

Group activity/Case study

Component- 2: 40% weight

Evaluation/MCQs/Report

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The assessment questions are set to test the learning outcomes. In each component, certain learning outcomes are assessed. The following table illustrates the focus of learning outcome in each component assessed:

No.	Intended Learning Outcome	Mode of Assessment	
		Component 1 (CE)	Component 2 (SEE)
1	Understand the basics of qualitative research	X	X
2	Explain different methods of qualitative research including overview of phenomenology and ethnography approaches	X	X
3	Apply techniques of data analysis and interpretation using QDA miner lite -2	X	X
4	Develop skills to write a report based on the qualitative data analysis	X	X

The Course Leader assigned to the course, in consultation with the Head of the Department, shall provide the focus of COs in each component of assessment in the above template at the beginning of the semester.

Course reassessment policies are presented in the Academic Regulations document.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Case study and group discussions
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	Case study and group discussions
8.	Self-Learning	Assignments/Reports
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions

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11.	Presentation Skills	Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

Course Resources

9. Essential Reading

10. Recommended Reading

11. Magazines and Journals

Course Organization

Course		AHD112A
Course		Directed Clinical Education I
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		

Head

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(DTT 2024-2028)



DIALYSIS THERAPY TECHNOLOGY (DTT) 2024-2028

SEMESTER 3


Head
Department of Allied Health Sciences
M S Ramaiah University of Applied Sciences
Bangalore 560054

Course Specifications: BASIC CONCEPTS IN RENAL DISEASES

Course Title	Basic concepts in renal diseases
Course Code	DTC201A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

II. Course Summary

1. Aim and Summary

The course aims to provide information about the basic concepts of renal diseases in adults and children, including the pregnancy associated renal diseases. Course gives an overview of the different types of renal diseases that emphasis on the caustic, risk factors and the manifestations acute and chronic renal diseases in both adults and children

2. Course Size and Credits:

Number of credits	3
Total hours of class room interaction during the semester	45
Number of practical/tutorial hours	
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations



Head

Department of Allied Health Sciences
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Bangalore

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Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcomes
1.	Describe the basic concepts of renal diseases in adults and children, congenital and inherited diseases
2.	Describe the basic concepts in pregnancy-associated renal diseases and tumors
3.	Explain the different types of renal diseases in acute and chronic kidney diseases
4.	Explain the urinary tract infection how it will affect to the kidney
5.	Explain the normal and diseased renal changes
6.	Describe the conservative care in AKI and CKD

4. Course Contents:

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	2												2			
CO-2	2												2			
CO-3	2				1		2						2	2		1
CO-4	2							2					2	2		
CO-5	2		2		1		1	3					2	3	1	1
CO-6	2		1		1			1					2	3	1	

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

6. Course Teaching and Learning Methods

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

Basic Concepts of Renal Diseases

- Acute renal failure.
- Nephrotic syndrome – primary & secondary.
- Nephritic syndrome.
- UTI (urinary tract infections.)
- Asymptomatic urinary abnormalities.
- Chronic renal failure.
- Disorders of body fluids
- Renal stone diseases.
- Obstructive uropathies
- Congenital & inherited renal diseases.
- Tumors of kidney.
- Pregnancy associated renal diseases.
- Hematologic aspects of kidney diseases
- Pathophysiology of uremia
- Renal vascular disorders & hypertension associated renal diseases.
- Conservative management of kidney disease

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		40
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course		
Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		

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3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		05
Total Duration in Hours		45

7. Method of Assessment

The following is the CE components:

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 25%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations

Creative Submissionaa) Virtual Labs

bb) Viva / Oral Exam cc) Lab Manual Reportdd) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage.

The Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% in case of theory courses. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
15.	Leadership Skills	Group discussions

Head

Department of Allied Health Sciences

M.S. Ramaiah University of Applied Sciences

Course Resources

9. Essential Reading

- Concepts of renal diseases and its management- Dr.Renuka
- BRENNER & Rector's THE KIDNEY

10. Recommended Reading

- Mitchell. Introduction to Health Care. 4th Ed. Cengage Publications
- Concepts of renal diseases and its management- Dr.Renuka
- BRENNER & Rector's THE KIDNEY
- Chronic Kidney Disease, Dialysis, and Transplantation Companion to Brenner & Rector's The Kidney-Third Edition

11. Magazines and Journals

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

- Journal of Renal disorders and management
- <https://www.ajkd.org/>

12. Websites

- https://www.niddk.nih.gov/-/media/Files/Health-Information/Communication-Programs/NKDEP/Renal_Fall10_Advances_508.pdf?la=en
- <https://emedicine.medscape.com/article/238798-overview>
- Access Medicine e-Books www.accessmedicine.com
- Annual Reviews Biomedical Science Collection
- <http://www.annualreviews.org/>
- Nature Online <http://www.nature.com/nature/index.html>
- Emerald www.emeraldinsight.com

Course Organization

Course		DTC201A
Course		Basic concepts in renal diseases
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		



Head

Department of Allied Health Sciences
M S Ramaiah University of Applied Sciences
Bangalore 560054

Course Specifications: Applied pharmacology related to dialysis

Course Title	Applied Pharmacology Related to Dialysis
Course Code	DTC202A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The aim of the course is to introduce students of dialysis technology the role of Pharmacological agents in the outcome of renal therapeutics. Renal diseases can come in the way of management of various diseases by pharmacological interventions, this need to be understood by these students.


The students are oriented to importance of pharmacological principles of drug therapy. The students are exposed to drugs acting on various systems in the body. They will know the importance of care to be taken during drug interventions in renal diseases. Drugs which themselves can lead to renal diseases will be discussed in this course. Drugs which need therapeutic monitoring in renal patients are discussed.

2. Course Size and Credits:

Number of credits	02
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	
Number of semester weeks	
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

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

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcomes
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.
2.	Explain Drug use in renal disease, drugs in special populations pharmacokinetics, drug interactions,
3.	Explain pharmacology of drugs affecting blood and blood coagulation
4.	Discuss the importance of plasma expanders in the management of renal diseases.
5.	Discuss role of diuretics in management of renal illness.
6.	Apply the pharmacological concepts to prepare dialysis fluids and their complications.

4. Course Contents:

Course Content
<ol style="list-style-type: none">1. Introduction to drug therapy.<ol style="list-style-type: none">a. IV fluid therapy with special emphasis in renal diseases.b. Anti-hypertensives: classification, actions, dosage, side effects & contraindications, special reference during dialysis, vasopressors, drugs used in hypotension.c. Drugs & dialysis: dose & duration of administration of drugsd. Dialyzable drugs: phenobarbitone, lithium, methanol etc.e. Antibioticsf. Immunosuppressant's2. Vitamin D & its analogues, phosphate binders, iron, folic acid & other vitamins of therapeutic value.3. Erythropoietin in detail. Heparin, low molecular weight heparin and heparin-induced thrombocytopenia. Importance of pharmacodynamics in therapeutics.4. Heparin . Protamine sulphate as antidote and indication. Alternative anticoagulants. Formalin, citrate, sodium hypochlorite, hydrogen peroxide: role as disinfectants & adverse effects of residual particles applicable to formalin. Roll of plasma expanders and importance of drug interactions.

5. Role of Diuretics: classification, actions, dosage, side effects & contraindications. Potassium exchange resins with special emphasis on mode of administration.

6. Hemodialysis concentrates: composition & dilution (acetate & bicarbonates). Peritoneal dialysis fluid in particular hypertonic solutions: composition.
7. Vaccination in CKD

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3		1										1			
CO-2		1	1										1			
CO-3	1		1		1								1			
CO-4			1										1			
CO-5	1		1										1			
CO-6	3		1										1			

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		25
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshon/Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		

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Others		
1. Case Study Presentation		
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		05
Total Duration in Hours		30

7. Method of Assessment

The following is the CE components:

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% in case of theory courses. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative

(Semester End Examination-SEE) should be 60:40.

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Head

Department of Allied Health Sciences

1 S Ramalah University of Applied Sciences

Dangliang 62004

The Course Leader assigned to the course, in consultation with the Head of the Department, shall provide the focus of COs in each component of assessment in the above template at the beginning of the semester.

Course reassessment policies are presented in the Academic Regulations document.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
15.	Leadership Skills	Group discussions

Head

Department of Allied Health Sciences

M.S. Ramaiah University of Applied Sciences

Bangalore 560 054

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M.S. Ramaiah University of Applied Sciences

Bangalore - 560 054

Course Resources

9. Essential Reading

- Class notes
- Lippincott's Illustrated Reviews: Pharmacology, 5th edition, by Richard A. Harvey and Pamela Champe, Lippincott Williams & Wilkins Publisher

10. Recommended Reading

- Essentials of Medical Pharmacology: K.D. Tripathi, 6th edition, Jaypee Publishers

11. Magazines and Journals

- Indian Journal of Pharmacology. Published by Indian Pharmacological Society. (ISSN 0253-7613).

Course Organization

Course Code		DTC202A
Course Title		Applied Pharmacology related to dialysis
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		


Head

Department of Allied Health Sciences

M. G. Rangaiah College of Applied Sciences
Bangalore 560054

Course Specifications: Directed clinical education – I

Course Title	Directed clinical education] – I
Course Code	DTC203A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The course aims to impart basic knowledge and additional skills in clinical procedures, and interaction with patients and professional personnel. Students apply knowledge from previous clinical learning experiences under the supervision of a nephrologist or senior Dialysis Technologist. Students are tested on intermediate clinical dialysis technology skills. At the end of this course, the student will be able to apply the knowledge acquired on renal diseases. They will be assisting with basic dialysis therapy techniques.

2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	0
Number of practical/tutorial hours	300
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Teaching, Learning and Assessment

3. Course Outcomes (CO)

No.	Intended Learning Outcomes
1.	Identify and evaluate the presence of the kidney diseases

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2.	Assist in planning appropriate vitals monitoring and taking history
3.	Perform to do the patient assessment pre & post-dialysis
4.	Assist in Initiating therapy in each of the conditions on time
5.	Assist in packing and sterilization of dialysis trays
6.	Perform waste management and documentation

4. Course Contents:

Course Content
<ol style="list-style-type: none"> 1. Introduction to dialysis unit 2. Vitals monitoring 3. Biomedical waste management 4. Infection protocols 5. Identifying the diseases with patients' history 6. Learn how to diagnose and evaluate patients with various disease conditions 7. Practice to do the patient assessment pre & post-dialysis in the pre-setup and dialysis record documentation 8. Learn to order appropriate test towards confirmation of diagnosis 9. Documentation 10. Check list maintenance 11. Hemodialysis machine cleaning



Head

Department of Allied Health Sciences

MS Ramalah University of Applied Sciences

Bangalore 560054

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3							2					1			2
CO-2	3							2					1			2
CO-3	3							2					1			2
CO-4	3							2					1			2
CO-5	3							2					1			2
CO-6	3							2					1			2

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration In Hours
Face to Face Lectures		0
Demonstrations		
10. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		100
1. Course Laboratory	20	
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	80	
6. Model Studio		
Others		20
1. Case Study Presentation		
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		
Total Duration in Hours		120

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7. Method of Assessment

The following is the CE components:

Theory Component CE	Laboratory Component
SC1 (Logbook)	SC2 (VivaVoce)
50Marks	50Marks

In CE there shall be two subcomponents of CE (SC1, SC2,), namely log book and viva-voce assessment. Each subcomponent is evaluated individually accounting to 100% Weightage as indicated in Course Specifications.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
15.	Leadership Skills	Group discussions

Course Resources

9. Essential Reading

- Class notes

10. Recommended Reading

- Essentials of Medical Pharmacology: K.D. Tripathi, 6th edition, Jaypee Publishers

11. Magazines and Journals

- Journal of Renal disorders and management

12. Websites

Course Organization

Course Code		DTC203A
Course		Directed Clinical Education- I
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		


Head

Department of Allied Health Sciences
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

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

Programme Structure and Course Details of B.Sc. (Hons) –Dialysis Therapy Technology

(DTT 2024-2028)



**Dialysis Therapy Technology (DTT)
2024-2028**

SEMESTER 4


Head
Department of Allied Health Sciences
M S Ramaiah University of Applied Sciences
Bangalore 560054

Course Specifications: Techniques in Hemodialysis-I

Course Title	Techniques in Hemodialysis-I
Course Code	DTC204A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

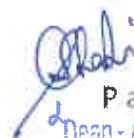
1. Aim and Summary

The course aims to impart knowledge on hemodialysis and its role in health and diseases, the course is designed to provide an understanding of hemodialysis in chronic kidney disease. The students are oriented to hemodialysis apparatus physiological differences. Students learn about the hemodialysis machines, and different HD apparatus used and they will perform routine HD procedures and blood investigations and interpret and diagnose abnormalities

2. Course Size and Credits:

Number of credits	4
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	40/20
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

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Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Intended Learning Outcomes
1.	Explain about the history types and treatment options for CKD patients
2.	Describe about the basic dialysis principles of hemodialysis
3.	Explain about dialysate compositions and access for hemodialysis
4.	Classify the various types and techniques of anticoagulation in hemodialysis
5.	Demonstrate the Dialysate solutions preparation for hemodialysis dialysate
6.	Demonstrate the hemodialysis machines and managing the safety alarms

4. Course Contents:

Course content

Theory

1. Treatment options of RRT
2. Introduction to dialysis
3. Indications of hemodialysis
4. History of hemodialysis
5. Principles of hemodialysis
6. HD Apparatus

Dialyzer -types /structure/membrane/clearance/ high flux & low flux

Blood tubing, transducer protector

Hemodialysis machines

7. Dialysate Compositions and delivery system
8. Anticoagulation in hemodialysis
9. Vascular access

- Temporary access and permcath
- Permanent access
- Cannulation techniques

Practical

1. Setting up dialysis machine for dialysis
2. Dialyzer membranes – types, surface area and biocompatibility
3. Types of dialyzers and handling the equipment's in hemodialysis unit
4. Preparation of concentrates (Bicarbonate and acid concentration) and monitoring
5. Pre-dialysis patients monitoring
6. Pre-dialysis patient education
7. Priming of extracorporeal circuit
8. Handling the temporary catheters and permcath for hemodialysis

9. Cannulation techniques for AVF
10. Anticoagulation preparation uses in different situation and management of complications
11. Record maintenance

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3		1					1	2	2		1	3		1	
CO-2	2							1	2	1		1	2			
CO-3	3	2			1			1	3	2		1	3	2		
CO-4	3	2	1		1			1	3	2		1	3	2	1	
CO-5	3	2	1					1	2	1		1	3	2	1	
CO-6	2	2	1					1	2	1		1	2	2	1	

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		30
Demonstrations		
8. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory	20	
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory	20	40

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5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		10
Total Duration in Hours		90

7. Method of Assessment

The following is the CE components:

Theory Component CE			Laboratory Component CE	
			SEE	
SC1 (Term tests) 30%	SC2 (Innovative + Lab Assignment) 10%	SC3 (Written + Lab assignments) 20%	SEE (Theory) 30%	SEE (Lab) 10%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment;

Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually

accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents

can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
15.	Leadership Skills	Group discussions

Course Resources

9. Essential Reading

Approved by the Academic Council at its 32th meeting held on 22nd June 2024

- Class notes
- John T. Daugirdas, Peter G. Blake, Todd S. Ing. Handbook of Dialysis, 5th edition (2014), Lippincott Williams and Wilkins.
- Allen R. Nissenson, Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley & Belfus
- R. Gokal, Ramesh Khanna, Raymond T. Krediet, K.D. Nolph. Textbook of Peritoneal –Dialysis 2nd ed. edition (2000) Springer.
- Text book of Nephrology –Oxford and Brenner Rector (Reference only)

10. Recommended Reading

- R. Gokal, Ramesh Khanna, Raymond T. Krediet, K.D. Nolph. Textbook of Peritoneal –Dialysis 2nd ed. edition (2000) Springer.
- Text book of Nephrology –Oxford and Brenner Rector (Reference only)

11. Magazines and Journals

- Journal of Renal disorders and management
- Hemodialysis techniques

12. Websites

Course Organization

Course Code		DTC204A
Course Title		Techniques in Hemodialysis-I
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		

Course Specifications: Directed clinical education – II

Course Title	Directed clinical education – II
Course Code	DTC206A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary


1. Aim and Summary

The course aims to impart basic knowledge and additional skills in clinical procedures, instead reaction with patients and professional personnel. Students apply knowledge from previous clinical learning experiences under the supervision of a nephrologist or senior Dialysis Therapy Technologist. Students are tested on intermediate clinical dialysis therapy technology skills including hemodialysis and peritoneal dialysis Therapy

2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	
Number of practical/tutorial hours	300
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Approved by the Academic Council at its 32th meeting held on 22nd June 2024


d
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Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcomes
1.	Demonstrate the competencies acquired for patient preparation, equipment handling and operation
2.	Demonstrate the ability to start hemodialysis in different patient population including pediatric population
3.	Demonstrate A-V cannulation and dressing, removal of catheters
4.	Operate hemodialysis machines independently
5.	Start and termination of hemodialysis sessions independently
6.	Train patients for AVF care and nutritional management

4. Course Contents:

To achieve final competency substantial time will be spent:

Setting up multi field techniques under supervision.

Participating in the quality control procedures in the department in accordance with the protocols.

Simulating and localizing a target volume.

Discussing the role of local rules and outline those in place in the different departments

Pre –Dialysis and post Dialysis assessments

- Dialysis machine connection and disconnection
- Monitoring during Dialysis
- Priming of the extracorporeal circuit
- Assemble and demonstrate extracorporeal blood circuit
- Assisting in hemodialysis procedures
- Preparation of dialysis solutions-Bicarbonate and acid concentration
- dialysis fluid composition and steps of preparation
- Prepare dialysis fluid according to the protocol and documentation
- Identify and solve the minor technical problems occurring due to improper dialysis fluid preparation, handling and usage
- Starting hemodialysis with Temporary catheters
- Handling the hemodialysis machine as per the protocols
- Managing the alarms
- Prepare and deliver the anticoagulation
- Demonstrate Hand wash techniques
- Wearing personal protective equipment

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- Dialysis catheter dressing and removal
- Disinfection
- Types of disinfectants used in the HD unit
- Disinfectants used in other areas of the dialysis unit
- Handling of Hemodialysis machine alarms
- Assist to do the cannulation procedure and Decannulation procedure
- Manage anticoagulation on patients during dialysis

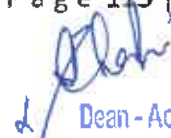


Head

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Bangalore - 560054

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5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3				1								1		1	
CO-2	3		2				2							1		
CO-3	3							1					1			
CO-4	3	2			2									3		
CO-5	3			1			1									1
CO-6	3	1		1			1						2	1		

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		
Demonstrations		
10. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory	40	
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	180	
6. Model Studio		
Others		
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry/Field Visit		

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4. Brain Storming Sessions		10
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		10
Total Duration in Hours		240



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7. Method of Assessment

The following is the CE components:

Theory ComponentCE	Laboratory Component CE
SC1 (Logbook)	SC2 (VivaVoce)
50Marks	50Marks

In CE there shall be two subcomponents of CE (SC1, SC2,,) namely log book and viva-voce assessment. Eachsubcomponent is evaluated individually accounting to 100% Weightage as indicated in Course Specifications

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

Course Resources

a. Essential Reading

- Class notes
- Clinical Manual
- John T. Daugirdas, Peter G. Blake, Todd S. Ing. Handbook of Dialysis, 5th edition (2014), Lippincott Williams and Wilkins.
- Allen R. Nissenson ,Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley & Belfus
- R. Gokal, Ramesh Khanna, Raymond T. Krediet , K.D. Nolph. Textbook of Peritoneal –Dialysis 2nd ed. edition (2000) Springer.
- Text book of Nephrology –Oxford and Brenner Rector (Reference only)

b. Recommended Reading

- R. Gokal, Ramesh Khanna, Raymond T. Krediet , K.D. Nolph. Textbook of Peritoneal –Dialysis 2nd ed. edition (2000) Springer.
- Text book of Nephrology –Oxford and Brenner Rector (Reference only)

c. Magazines and Journals

- Journal of Renal disorders and management
- Hemodialysis techniques

d. Websites

Course Organization

Head

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Bangalore 560054

Course Code		DTC206A
Course Title		Directed Clinical Education III
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		

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Programme Structure and Course Details of B.Sc. (Hons) –Dialysis Therapy Technology

(DTT2024-2028)



**DIALYSIS THERAPY TECHNOLOGY (DTT)
2024-2028**

SEMESTER 5

Department of Health Sciences
Ramaiah University of Applied Sciences
Bangalore 560064

Course Specifications: Techniques in Peritoneal Dialysis

Course Title	Techniques in Peritoneal Dialysis
Course Code	DTC301A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The course aims to impart knowledge on peritoneal dialysis and its role in health and diseases, the course is designed to provide an understanding of peritoneal dialysis in chronic kidney disease. The students are oriented to peritoneal apparatus physiological difference and nutritional support with special emphasis on parental nutrition. Students learn about sample collection, and the different PD apparatus used. They will perform routine PD exchange procedures and blood investigations and interpret and diagnose abnormalities

2. Course Size and Credits:

Number of credits	4
Total hours of classroom interaction during the semester	30
Number of practical/tutorial hours	60/20
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

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Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcomes
1.	Explain the principles and apparatus used in peritoneal dialysis
2.	Describe the CAPD and APD procedure
3.	Explain the adequacy and prescription for peritoneal dialysis
4.	Describe the infectious and non-infectious complications in peritoneal dialysis
5.	Demonstrate the use, care and maintenance of various instruments used in peritoneal dialysis
6.	Interpret the peritoneal equilibrium test in APD and CAPD

4. Course Contents:

Course Content	
1.	Anatomy & Physiology of Peritoneal Dialysis
2.	Principles of Peritoneal dialysis
3.	Modes of peritoneal dialysis
4.	Apparatus for Peritoneal Dialysis
5.	Peritoneal Dialysis Catheters, Placement, and Care
6.	Insertion of peritoneal dialysis catheters
7.	Peritoneal Dialysis for the Treatment of Acute Kidney Injury
8.	Peritoneal Dialysis Techniques <ul style="list-style-type: none"> • Continuous Ambulatory Peritoneal Dialysis (CAPD) • Automated Peritoneal Dialysis (APD)
9.	Peritoneal dialysate: standard fluid composition
10.	Adequacy of Peritoneal Dialysis and Chronic Peritoneal Dialysis Prescription
11.	Peritoneal equilibration test and modelling
12.	Complications of Peritoneal Dialysis
13.	Volume Status and Fluid Overload in Peritoneal Dialysis
14.	Peritonitis and Exit-Site Infection
15.	Hernias, Leaks, and Encapsulating Peritoneal Sclerosis
16.	Metabolic, Acid-Base, and Electrolyte Aspects of Peritoneal Dialysis
17.	Causes, Diagnosis, and Treatment of Peritoneal Membrane Failure
18.	Nutritional Issues
Practical	

1. The performing procedure of peritoneal dialysis
2. Insertion of peritoneal dialysis catheters
3. Pre-operative preparation for peritoneal catheter insertion
4. Peritoneal dialysis catheter insertion technique
5. Malfunctioning catheters
6. Investigation and management of malfunctioning catheters
7. Repositioning peritoneal dialysis catheters
8. Technique for performing the peritoneal equilibration test
9. Performing an exit site dressing
10. Pre-operative assessment for peritoneal dialysis patients
11. Post-operative management for peritoneal dialysis patients
12. Performing exchange procedure using non-dextrose dialysate
13. Operating APD machines

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3			2					1			1	3			2
CO-2		2								3				2		
CO-3		3			3				2		2		2	3		
CO-4	3		3						3				3		3	
CO-5			2							2					2	
CO-6		2							1					2		

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

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6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		26
Demonstrations		
11. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems	04	
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory	08	

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2. Computer Laboratory		42
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	30	
6. Model Studio		
Others		12
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	02	
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		10
Total Duration in Hours		90

7. Method of Assessment

The following is the CE components:

SEE (40% weightage)CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE (Theory) 30%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour theory paper of 50 marks

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with a weightage of 40% in case of theory courses. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40. Achieving learning outcomes

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Case study and group discussions
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	Case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Case discussions ,Seminars
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

Course Resources

9. Essential Reading

- Class notes
- Clinical Manual
- John T. Daugirdas, Peter G. Blake, Todd S. Ing . Handbook of Dialysis, 5th edition (2014), Lippincott Williams and Wilkins.
- Allen R. Nissenson ,Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley & Belfus
- R. Gokal, Ramesh Khanna, Raymond T. Krediet , K.D. Nolph. Textbook of Peritoneal –Dialysis 2nd ed. edition (2000) Springer.
- Text book of Nephrology –Oxford and Brenner Rector (Reference only)

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10. Recommended Reading

- R. Gokal, Ramesh Khanna, Raymond T. Krediet, K.D. Nolph. Textbook of Peritoneal –Dialysis 2nd ed. edition (2000) Springer.
- Text book of Nephrology –Oxford and Brenner Rector (Reference only)

11. Magazines and Journals

- Websites Journal of Renal disorders and management
- Peritoneal techniques

12. Websites

Course Organization

Course Code		DTC301A
Course Title		Techniques in Peritoneal Dialysis
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		


Head
Department of Allied Health Sciences
MS Ramiah University of Applied Sciences
Bangalore 560054

Course Specifications: Techniques in Hemodialysis-II

Course Title	Techniques in Hemodialysis-II
Course Code	DTC204A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

II. Course Summary


1. Aim and Summary

The course aims to impart knowledge on hemodialysis and its role in health and diseases, the course is designed to provide an understanding of hemodialysis in chronic kidney disease. The students are oriented to hemodialysis apparatus physiological differences and nutritional support with special emphasis on parental nutrition.

Students learn about sample collection, and different HD apparatus used and they will perform routine HD procedures and blood investigations and interpret and diagnose abnormalities

2. Course Size and Credits:

Number of credits	4
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	40/20
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations


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III. Teaching, Learning and Assessment

1. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Intended Learning Outcomes
1.	Explain the acute and chronic hemodialysis prescription in adult and pediatric patients
2.	Describe the water treatment system and how to Operate and maintain R.O Water treatment plant
3.	Explain the complications and disorders in CKD patients (Anemia, mineral bone disorder, infection and amyloidosis)
4.	Handling the complications during, pre and post dialysis
5.	Demonstration the starting and termination of hemodialysis procedure
6.	Demonstration the reprocessing of dialyzer and CPR

2. Course Contents:

Course content

Theory

1. Acute dialysis prescription
2. Chronic dialysis prescription
3. Water treatment
4. Dialyzer reprocessing
5. Machine disinfections
6. Adequacy of hemodialysis
7. Complications during hemodialysis
8. Home and intensive hemodialysis
9. Infections in dialysis patients
10. Pediatric dialysis
11. Vaccination in CKD dialysis.
12. Renal anemia management: CKD
13. Hypertension in dialysis patients
14. Mineral bone disorders in CKD patients
15. Amyloidosis

Practical

12. Complications management
13. Anemia management (EPO, Iron and Vit B12)
14. Vaccination in dialysis patients
15. Infection control practice in dialysis unit
16. Measurement of URR and Kt/V
17. Demonstration of CPR

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18. Handling the pediatric patient in HD unit
19. Procedures perform with the guidelines
20. Reuse of dialysis apparatus
21. Disinfection protocols
22. Starting and termination of Hemodialysis

3. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3		1					1	2	2		1	3		1	
CO-2	2							1	2	1		1	2			
CO-3	3	2			1			1	3	2		1	3	2		
CO-4	3	2	1		1			1	3	2		1	3	2	1	
CO-5	3	2	1					1	2	1		1	3	2	1	
CO-6	2	2	1					1	2	1		1	2	2	1	

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

4. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		30
Demonstrations		
8. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory	20	
2. Computer Laboratory		

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3. Engineering Workshop/Course Workshop/Kitchen		40
4. Clinical Laboratory	20	
5. Hospital		
6. Model Studio		
Others		10
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		10
Total Duration in Hours		90

5. Method of Assessment

The following is the CE components:

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment;

Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually

accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents

can be of any of the following types:

- p) Online Test
- q) Assignments/Problem Solving
- r) Field Assignment
- s) Open Book Test
- t) Portfolio
- u) Reports
- v) Case Study
- w) Group Task
- x) Laboratory / Clinical Work Record
- y) Computer Simulations
- z) Creative Submission
- aa) Virtual Labs

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- bb) Viva / Oral Exam
- cc) Lab Manual Report
- dd) Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40

6. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
15.	Leadership Skills	Group discussions

IV. Course Resources

1. Essential Reading

- Class notes

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- John T. Daugirdas, Peter G. Blake, Todd S. Ing . Handbook of Dialysis, 5th edition (2014),Lippincott Williams and Wilkins.
- Allen R. Nissenson ,Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley & Belfus
- R. Gokal, Ramesh Khanna, Raymond T. Krediet , K.D. Nolph. Textbook of Peritoneal –Dialysis 2nd ed. edition (2000) Springer.
- Text book of Nephrology –Oxford and Brenner Rector (Reference only)

2. Recommended Reading

- R. Gokal, Ramesh Khanna, Raymond T. Krediet , K.D. Nolph. Textbook of Peritoneal –Dialysis 2nd ed. edition (2000) Springer.
- Text book of Nephrology –Oxford and Brenner Rector (Reference only)

3. Magazines and Journals

- Journal of Renal disorders and management
- Hemodialysis techniques

4. Websites

V. Course Organization

Course Code		DTC204A
Course Title		Techniques in Hemodialysis-II
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		

Course Specifications: Nutrition in Renal Diseases

Course Title	Nutrition in Renal Disease
Course Code	DTC303A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

This course covers the basic aspects of Nutrition for good health. It also includes nutrients and nutrient derivatives relevant to ocular health, nutrition deficiency and ocular disease, Nutrition and ocular aging, and contraindications, adverse reactions and ocular nutritional supplements.

At the end of the course student would have gained the knowledge of the following:

- Balanced diet.
- Protein, carbohydrates, vitamins, Minerals, carotenoids and eye.
- Nutrition and Ocular aging
- Adverse effects of ocular nutritional supplements.

2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

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Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcomes
1.	Define the concepts of balanced diet and its importance
2.	Discuss the functions of food and diet-based disorders
3.	Brief about RDA and its role in diet planning
4.	Explain the functions of carbohydrates, proteins and lipids
5.	Elaborate on the importance of assessing nutritional status
6.	Describe the role of nutrition in CKD patients

4. Course Contents:

Course Content

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Bengaluru University
Bengaluru

Introduction.

- 1.1 History of Nutrition
- 1.2 Nutrition as a science
- 1.3 Food groups, RDA
- 1.4 Balanced diet, diet planning.
- 1.5 Assessment of nutritional status

2. Energy

- 2.1 Units of energy.
- 2.2 Measurements of energy and value of food
- 2.3 Energy expenditure.
- 2.4 Total energy/calorie requirement for different age groups and diseases.
- 2.5 Satiety value
- 2.6 Energy imbalance- obesity, starvation.
- 2.7 Limitations of the daily food guide.

3. Proteins

- 3.1 Sources and functions
- 3.2 Essential and non- essential amino- acids.
- 3.3 Incomplete and complete proteins
- 3.4 Supplementary foods.
- 3.5 PEM and the eye
- 3.6 Nitrogen balance
- 3.7 Changes in protein requirement.

4. Fats

- 4.1 Sources and functions
- 4.2 Essential fatty acids
- 4.3 Excess and deficiency
- 4.4 Lipids and the eye.
- 4.5 Hyperlipidemia, heart diseases, atherosclerosis.

5. Minerals

- 5.1 General functions and sources
- 5.2 Macro and micro minerals associated with the eye.
- 5.3 Deficiencies and excess –ophthalmic complications (e.g. iron, calcium, iodine etc.)

6. Vitamins

- 6.1 General functions, and food sources
- 6.2 Vitamin deficiencies and associated eye disorders with particular emphasis to VitaminA
- 6.3 Promoting sound habits in pregnancy, lactation and infancy.
- 6.4 Nutrient with antioxidant.
- 6.5 Properties
- 6.6 Digestion of Proteins, carbohydrates & lipids

7. Essential amino acids.

- 8. Nutrition in CKD and Hemodialysis patients

- 8.1 Nutritional assessment in CKD
- 8.2 Nutrition in CAPD
- 8.3 Nutrition in AKI

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1							1						1			
CO-2		1			1			1						2		
CO-3			1			1									1	
CO-4							1							1		
CO-5	2															2
CO-6	1		1			1							1			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution																

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face-to-Face Lectures		14
Demonstrations		10
13. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems	10	
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		06
Total Duration in Hours		30

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7. Method of Assessment

The following is the CE components:

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 25%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% in case of theory courses.

In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

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8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures

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2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

Course Resources

a. Essential Reading

- Course notes

b. Recommended Reading

- M Swaminathan: Hand book of Food and Nutrition, fifth edition, Bangalore printing & publishing Co.Ltd, Bangalore, 2004
- C Gopalan, BV Rama Sastri, SC Balasubramanian: Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR, Hyderabad, 2004
- Frank Eperjesi & Stephen Beatty: Nutrition and the Eye A practical Approach, Elsevier Butterworth-Heinemann, USA, 2006
- Heinemann, USA, 2006

c. Magazines and Journals

- Journal of Renal disorders and management

Course Organization

Course Code		DTC303A
Course Title		Nutrition in Renal Disease
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		
course Specifications Review		

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Course Specifications: Directed clinical education – III

Course Title	Directed clinical education – III
Course Code	DTC304A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

This course aims to impart basic knowledge and additional skills in clinical procedures, interaction with patients and professional personnel. Students apply knowledge from previous clinical learning experience under the supervision of a nephrologist or senior Dialysis Therapy Technologist. Students are tested on intermediate clinical dialysis therapy technology skills including hemodialysis and peritoneal and peritoneal dialysis Therapy

2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	0
Number of practical/tutorial hours	300
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

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II. Teaching, Learning and Assessment

1. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcomes
1.	Performing PD exchanges manually/cycler device
2.	Train patients and their caregivers in performing peritoneal dialysis
3.	Performing the PET test
4.	Operate hemodialysis machines, water treatment reprocessing machines
5.	Able to do cannulation and decannulation of AVF independently

2. Course Contents:

Course Content tasks Under Supervision

To achieve final competency substantial time will be spent:

Setting up multi field techniques under supervision.

Participating in the quality control procedures in the department in accordance with the protocols.

Simulating and localizing a target volume.

Discussing the role of local rules and outline those in place in the different departments

1. Performing PD procedure
2. Assessing the PET for PD patients
3. Investigate the malfunctioning of the catheter
4. Patient education
5. Nutritional requirement for the CKD patients
6. Monthly investigations of MHD patients
7. Reprocessing of the dialyzer
8. Water treatment maintenance
9. Management of complications in HD unit
10. Basic life support
11. Successfully cannulate arterio-venous fistulae for hemodialysis
12. Pre and Post dialysis sample collections
13. Decannulation
14. Nutritional assessment in CKD

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3. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3															3
CO-2		1					1							3		
CO-3				1		1							3			
CO-4					2			1					3			
CO-5	3						1						3			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution																

4. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face-to-Face Lectures		
Demonstrations		
14. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems	10	10
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		

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1. Course Laboratory	10	180
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory	10	
5. Hospital	160	
6. Model Studio		
Others		40
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry/Field Visit	10	
4. Brain Storming Sessions	10	
5. Group Discussions	10	
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		10
Total Duration in Hours		240

5. Method of Assessment

The following is the CE components:

Theory Component CE	Laboratory Component CE
SC1 (Logbook)	SC2 (Internal viva voice & practical's)
50 marks	50 Marks

In CE there shall be two subcomponents of CE (SC1, SC2,), namely log book and viva-voce assessment. Each subcomponent is evaluated individually accounting to 100% Weightage as indicated in Course Specifications

6. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures

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4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

III. Course Resources

a. Essential Reading

- Course notes
- Allen R. Nissenson, Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley & Belfus
- R. Gokal, Ramesh Khanna, Raymond T. Krediet, K.D. Nolph, Textbook of Peritoneal Dialysis (2000) Springer 2nd ed. edition
- John T. Daugirdas, Peter G. Blake, Todd S. Ing, Handbook of Dialysis, 5th edition (2014), Lippincott Williams and Wilkins;
- NANT and Oxford - Text books of Dialysis for technologists

b. Recommended Reading

- Allen Nissenson Richard Fine, Handbook of Dialysis Therapy, 5th Edition (2016) Elsevier.
- William L. Henrich, Principles and Practice of Dialysis (Principles & Practice of Dialysis), 4th edition (2009) Lippincott Williams and Wilkins

c. Magazines and Journals

- Journal of Renal disorders and management

d. Websites

- www.renal.org.
- Videos in the library

IV. Course Organization

Course Code		DTC304A
Course Title		Directed Clinical Education-III
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		



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Course Specifications: Project Management

Course Title	Project Management
Course Code	AHM305A
Department	Directorate of Transferable Skills and Leadership Development
Faculty	Faculty of Life and Allied Health Sciences

1. Course Summary

1. Aim and Summary

With the advent of technology, changing business environments, varying economic conditions and prevailing political situations, a varied types of projects are being undertaken. This is seen in different segments such as infrastructure, construction, Information Technology, Manufacturing, Engineering, Health Care, Hospitality, Logistics and Services. Along with these, there is a big need for manpower with competencies in Managing different types and sizes of projects. A Project Management Professional equipped with,

- appropriate tools and techniques,
- an ability to apply appropriate methods and processes
- appropriate project leadership skills and
- a structured approach to manage a project in its entirety will be in a better position to
- ensure a project's defined success.

The course aims at imparting knowledge and developing competencies on various aspects of Project Management as per International Project Management Association's framework. This course also provides a glimpse of tools, techniques, methods and process for managing a project effectively. This course offers a structured approach which are derived from the experiences of a large number of successful global organizations.

2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	45
Number of practical hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50 The distribution of marks for theory and laboratory/clinical component for

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	continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations
No.	Course outcome
1.	CO 1: Explain the characteristics of projects, Operations and principles of Project Management
2.	CO 2: Discuss the Project Management Competency Elements as per PMA's Individual Competence Baseline Ver 4.0
3.	CO 3: Discuss the tools for Project Execution, Monitoring and control
4.	CO 4: Apply the tools for project planning and Create a Project Management Plan covering Project Charter, Work Breakdown Structure, Project Organisation, Time Management Plan and Risk Management Plan

4. Course Contents:

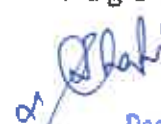
- **Section 1:** Introduction to Project, Programmes, Portfolio and Operations, Project Organization and Permanent Organization, Project Management Success, KRA, Creation of project, Need analysis, Business Case, Project Charter.
- **Section 2:** Requirements, Objectives & Benefits Scope WBS, Scope baseline, Change Management, Time Management, Lifecycle, AOA (ADM), AON (PDM), CPM, Floats, Network Exercises, Gantt Charts, Bar Charts, Resources, Resource Calendar
- **Section 3:** Controlling, Handling Changes, Phase end and Close out, Earned Value Management System, Variances, SPI & CPI, Numerical Exercises, Quality Management, Quality Planning, Quality Assurance, Quality Control, Quality Tools (Pareto Chart, Control Chart, Inspections, Benchmarking), Risk & Opportunity, Risk categories, Identification, Risk Analysis
- **Section 4:** Organization and Information, Stakeholder Management, Power and Interest, Culture and Values, Personal integrity and reliability, Personal communication, Communication Planning, Communication methods, Communication barriers, Conflict and crisis, Resourcefulness, Result Orientation

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	1			2			2			3			1

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CO-2	3	2						1					2		2	
CO-3	3							2					3	2		
CO-4	3	2		1	2		2	2					3	2		2
CO-5	3	3					2	3					3	2		2
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution																

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		20
Demonstrations		00
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
Numeracy		00
1.Solving Numerical Problems	-	
Practical Work		
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
Others		25
1.Case Study Presentation	05	
2.Guest Lecture	-	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	20	
6.Discussing Possible Innovations	-	
Written Examination (Mid-Term tests and SEE)		05
Total Duration in Hours		50

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7. Method of Assessment

Focus of COs on each Component or Subcomponent of Evaluation				
		Component 1: CE (50%Weightage)		Component 2: SEE (50% Weightage)
Subcomponent ▶		SC1	SC2	
Subcomponent Type ▶		Mid Term Exam	Assignment	50 Marks
Maximum Marks ▶		25	25	

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% in case of theory courses. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

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8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

SL.no	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

9. Course Resources

1. Essential Reading

- Course Notes
- Pinto Jeffrey K. (2019) Project Management: Achieving Competitive Advantage, 5th Edition, Pearson

b. Recommended Readings

- Meredith, J.R. and Mantel, S.J. (2005) Project Management – a managerial approach, 6th edition, Wiley
- Ghattas, R. G. and Sandra L. McKee (2001) Practical Project Management, New Jersey, Prentice Hall

c. Magazines and Journals

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- Project Manager Today
- PM network
- International Journal of Project and Operation Research, Inderscience
- Journal of Operation Management, Project and Operation Research, INFORMS

d. Websites

- <http://www.providence.edu/mcs/rbg/mba.htm>
- <http://library.kent.ac.uk/library/exampapers/deptcourses.php?dept=Business%20Studies>
- http://homepages.stmartin.edu/fac_staff/dstout/MBA631/lecture_notes.htm

10. Course Organization

Course name		Project Management
Course code		AHM305A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		June 2022
Next Course Specifications Review		June 2026

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**Programme Structure and Course Details of BSc (HONS) Dialysis Therapy Technology
(DTT 2024-2028)**



**BSc. (HONS) Dialysis Therapy Technology
(DTT 2024-2028)**

SEMESTER 6



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Course Specifications: Extracorporeal therapies other than hemodialysis & Renal Transplantation

Course Title	Extracorporeal therapies other than hemodialysis & Renal Transplantation
Course Code	DTC305A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The aim of the course is to introduce students of dialysis therapy technology to the advanced extracorporeal renal procedures and renal transplantation. This will help them to understand the principals involved in different advanced therapeutics procedures.

The students are oriented about the importance of renal transplantation and advanced renal therapeutic interventions in the presentscenario.

2. Course Size and Credits:

Number of credits	03
Total hours of classroom interactionduring the semester	30
Number of practical/tutorial hours	60
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

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II. Teaching, Learning and Assessment

1. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Intended Learning Outcomes
1.	Explain the Continuous renal replacement therapy,
2.	Explain the protocols and procedures for Continuous renal replacement therapy, Hemoperfusion, Plasmapheresis and Liver dialysis
3.	Importance of renal transplantation in CKD patients
4.	Demonstrate the Continuous renal replacement therapy, Hemoperfusion
5.	Demonstrate the Plasmapheresis/SLED/SCUF and Liver dialysis procedure.

2. Course Contents:

Course Content

1. Continuous Renal Replacement Therapies (CRRT)

- Introduction of CRRT
- Read the history of CRRT
- List the indications for CRRT and its benefits
- Define CRRT and List its modalities
- Compare CRRT with Hemodialysis
- CRRT apparatus
- Explain and identify CRRT apparatus (Machine, Vascular access, extracorporeal circuit, anticoagulant and fluids used) and procedure
- Explain the anticoagulation techniques and fluids used for CRRT
- CRRT modalities
- Explain the CRRT modalities and principals involved (SLED, SCUF, Continuous arteriovenous therapies & Continuous venovenous therapies)
- List the indications and contraindications for each modality of CRRT
- Compare the CRRT modalities with each other
- List the factors affecting CRRT modalities
- List the complications of each modality and explain their prevention and management measures
- List the advantages & disadvantages of CRRT modalities

2. Hemadsorption (Hemoperfusion)

- Principles of Hemadsorption
- Read the history of hemoperfusion
- Define adsorption, molecular weight, surface area, protein binding, the volume of distribution, half-life, molecular redistribution, clearance
- Handling of drug overdose (poisoning) cases
- Explain immediate care

- Explain the basic care at hospital setup
- List the therapies used for poison or drug removal (HD, HP, PD, PP, CRRT)
- Explain the features of drugs/poison and role of extracorporeal therapies used for the treatment (Barbiturates, Paraquat, Alcohol, Digoxin, Acetaminophen, Aspirin)

3. Hemadsorption apparatus

- List the apparatus required for Hemadsorption
- Describe the structure of adsorbent
- Explain the principals involved in drug removal
- Explain the indication and contraindication for hemadsorption
- Explain hemadsorption procedure steps
- List the complications and explain their prevention and management
- Compare all blood therapies involved in poison removal
- List the advantages & disadvantages of hemadsorption
- MARS

Kidney Transplantation

- Evaluation of the living donor and recipients
- Transplantation immunobiology
- Surgical management of the renal transplant recipient
- biological agents in kidney transplantation
- immunosuppressant's
- infection in renal transplantation

3. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	2			2	2				2				2			2
CO-2	2			1	2				2				2			1
CO-3	2				2				2				2			
CO-4	3				2			1	3			1	3			
CO-5	2				2			1	2			1	2			

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

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4. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face-to-Face Lectures		26
Demonstrations		04
15. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems	04	
3. Demonstration on a Computer		
Numeracy		50
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory	30	
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	20	
6. Model Studio		
Others		8
1. Case Study Presentation	5	
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions	3	
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		02
Total Duration in Hours		90

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5. Method of Assessment

The following is the CE components:

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%


In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60%Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva- Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

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6. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Case study and group discussions
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	Case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Case discussions, Seminars
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

III. Course Resources

a. Essential Reading

- Course notes
- Allen R. Nissenson, Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley & Belfus
- R. Gokal, Ramesh Khanna, Raymond T. Krediet, K.D. Nolph, Textbook of Peritoneal Dialysis (2000) Springer 2nd ed. edition
- John T. Daugirdas, Peter G. Blake, Todd S. Ing, Handbook of Dialysis, 5th edition (2014), Lippincott Williams and Wilkins;
- NANT and Oxford -Text books of Dialysis for technologists

b. Recommended Reading

- Allen Nissenson Richard Fine, Handbook of Dialysis Therapy, 5th Edition(2016) Elsevier.
- William L. Henrich, Principles and Practice of Dialysis (Principles & Practice of Dialysis), 4th edition (2009) Lippincott Williams and Wilkins

c. Magazines and Journals

- Journal of Renal disorders and management

d. Websites

- www.renal.org
- Videos in the library

IV. Course Organization

Course Code		DTC305A
Course Title		Extracorporeal therapies other than hemodialysis
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		



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Course Specifications: Clinical Practice Guidelines in Dialysis

Course Title	Clinical Practice Guidelines in Dialysis
Course Code	DTC302A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

The course aims to impart knowledge on Guidelines in Dialysis and its role in health and diseases, the course is designed to provide an understanding of guidelines in chronic kidney disease. The students are oriented to clinical practices. Students learn about all the hemodialysis and peritoneal dialysis guidelines. They will practice routine guidelines and based on performing the procedures

2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

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Bangalore 560054

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Intended Learning Outcomes
1.	Explain the KDOQI and KDIGO guidelines
2.	Describe the guidelines for adequacy in both HD and PD
3.	Explain the guidelines for CKD evaluation
4.	What guidelines should or should not be: implications for guideline production
5.	Endorsement of the KDIGO guidelines on kidney transplantation

4. Course Contents:

Course Content

Overview of guidelines

- Anaemia in CKD
- Assessment of potential kidney transplant recipients
- Blood borne viruses
- Cardiovascular disease in CKD
- CKD-mineral and bone disorders
- Detection monitoring and care of patients with CKD
- Haemodialysis
- Nutrition in CKD
- Peritoneal access
- Peritoneal dialysis
- Planning, initiation and withdrawal of RRT
- Post-operative care of kidney transplant recipients
- Water treatment facilities, dialysis water and dialysis fluid quality
- Vascular access for haemodialysis.KDOQI and KDIGO

guidelines

Diabetes and CKD

- Anaemia in CKD
- CKD evaluation
- Bone metabolism and disease in CKD
- Hypertension in CKD
- Dyslipidaemia in CKD
- Nutrition in children with CKD

Handwritten notes:

- H D adequacy
- PD adequacy
- Vascular access

CV disease in dialysis patientsEuropean Renal Best practice

International Society of Peritoneal DialysisMeasurement for adequacy of PD and HD

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Vascular access – KDOQI guidelines
 Monitoring of HD and CAPD patients- KDOQI guidelines Cardiovascular
 disease in dialysis patients- KDOQI guidelines Anaemia in dialysis patients -
 KDOQI guidelines
 Bone disease in dialysis patients - KDOQI guidelines Kidney
 transplantation- KDOQI guidelines Endorsement of the KDIGO CKD-
 MBD guidelines

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	1								1				1			
CO-2	2		1							2		1	2		1	
CO-3		3			1				1					3		
CO-4	1										3		1			
CO-5			2	3						2					2	3

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face-to-Face Lectures		20
Demonstrations		
12. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory	08	
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		

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3. Industry/Field Visit	
4. Brain Storming Sessions	
5. Group Discussions	
6. Discussing Possible Innovations	
Written Examination (Mid-Term tests and SEE)	02
Total Duration in Hours	30

7. Method of Assessment

The following is the CE components:

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 25%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other



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Bangalore 560054

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% in case of theory courses. In summary, the ratio of Formative (Continuous Evaluation-CE)

Vs Summative (Semester End Examination-SEE) should be 60:40.

8. Achieving learning outcomes

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The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

Course Resources

a. Essential Reading

- John T. Daugirdas, Peter G. Blake, Todd S. Ing . Handbook of Dialysis, 5th edition (2014), Lippincott Williams and Wilkins
- Oxford Handbook of Dialysis FOURTH EDITION
- Allen R. Nissenson ,Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley & Belfus
- R. Gokal, Ramesh Khanna, Raymond T. Krediet , K.D. Nolph. Textbook of Peritoneal

–Dialysis 2nd ed. edition (2000) Springer.

- Text book of Nephrology –Oxford and Brenner Rector (Reference only)

b. Recommended Reading

- R. Gokal, Ramesh Khanna, Raymond T. Krediet , K.D. Nolph. Textbook of Peritoneal

–Dialysis 2nd ed. edition (2000) Springer.

- Text book of Nephrology –Oxford and Brenner Rector (Reference only)

c. Magazines and Journals

- Journal of Renal disorders and management
- www.kidney.org/professionals/KDOQI/guidelines commentaries

d. Websites

- www.renal.org
- www.kdigo.org

Course Organization

Course Code		DTC302A
Course Title		Clinical Practice Guidelines in Dialysis
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		

Head

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Dean - Academics

Course Specifications: Directed clinical education – IV

Course Title	Directed clinical education – IV
Course Code	DTC308A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

a. Aim and Summary

The course aims to impart basic knowledge and additional skills in clinical procedures, interaction with patients and professional personnel. Students apply knowledge from previous clinical learning experience under the supervision of a nephrologist or senior Dialysis Therapy Technologist. Students are tested on intermediate clinical dialysis therapy technology skills including hemodialysis and peritoneal and peritoneal dialysis Therapy. The student will perform these procedures with more responsibility and with minimal supervision.

b. Course Size and Credits:

Number of credits	12
Total hours of class room interaction during the semester	
Number of practical/tutorial hours	360
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Head

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II. Teaching, Learning and Assessment

a. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Intended Learning Outcomes
1.	Demonstrating the dialysis in ICU setups
2.	Performing CPR & administering drugs in emergency situation
3.	Performing blood and other blood products transfusion during dialysis
4.	Assisting minor procedures (central line insertions, renal biopsies, PD catheter insertion)
5.	Start and terminate hemodialysis sessions independently
6.	Perform the preparation for CRRT, hemoperfusion and plasmapheresis

b. Course Contents:

Course Content:

To achieve final competency substantial time will be spent:

Setting up multi field techniques under supervision.

Participating in the quality control procedures in the department in accordance with the protocols.

Simulating and localizing a target volume.

Discussing the role of local rules and outline those in place in the different departments

Hemodialysis and peritoneal dialysis;

- Initiating hemodialysis through central lines
- Dialysis therapy in various special groups of patients e.g., unstable patients in the intensive care unit, children, cardiac patients etc.;
- Plasmapheresis
- Administer various drugs in emergencies and as a routine
- Perform blood transfusion during procedure
- Start and terminate hemodialysis sessions independently
- Successfully cannulate arterio-venous fistulae for hemodialysis
- Maintain hemodialysis machines with respect to regular disinfection
- Participate in Conduct of renal transplant programme
- Use pulse oximeters, pressure monitors defibrillators correctly
- demonstration
- Assisting minor procedures like central line insertions, renal biopsies, PD catheter insertion
- Basics in transplant immunology, donor selection, recipient evaluation
- Problems encountered in transplant recipient- rejection, infection, drug toxicity,

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Dean Academics

dyslipidemias, diabetes, cosmetic changes, impaired graft function.

- Watching transplant inside the operation theatre
- Demonstrate the patient assessment, identify the clinical features of medical tests
- modification in the HD prescription
- Record maintenance and documentation
- Continuous Renal Replacement Therapies (CRRT)
- Hemadsorption (Hemoperfusion)
- Sustained low-efficiency dialysis (SLED)
- Slow continuous ultrafiltration and isolated ultra-filtration (SCUF & IUF)
- BLS, ACLS and Crash-cart management
- Single blood pathway ("single-needle") devices

c. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3							2					2			3
CO-2	3							2					2			3
CO-3	3							2					2			3
CO-4	3							2					2	1		3
CO-5	3							2					3			3
CO-6	3	1					1	2					2			3

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

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Department of Allied Health Sciences
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4. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face-to-Face Lectures		
Demonstrations		
17. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems	10	10
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		270
4. Clinical Laboratory	100	
5. Hospital	170	
6. Model Studio		
Others		
1. Case Study Presentation	5	
2. Guest Lecture		
3. Industry/Field Visit		10
4. Brain Storming Sessions	5	
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Mid-Term tests and SEE)		10
Total Duration in Hours		300

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5. Method of Assessment

The following is the CE components:

Theory Component CE	Laboratory Component CE
SC1 (Logbook)	SC2 (Internal viva voice & practical's)
50 marks	50 Marks

In CE there shall be two subcomponents of CE (SC1, SC2,), namely log book and viva-voce assessment. Each subcomponent is evaluated individually accounting to 100% Weightage as indicated in Course Specifications

6. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions

14.	Leadership Skills	Group discussions
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III. Course Resources

a. Essential Reading

- Course notes
- Allen R. Nissenson, Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley & Belfus
- R. Gokal, Ramesh Khanna, Raymond T. Krediet, K.D. Nolph, Textbook of Peritoneal Dialysis (2000) Springer 2nd ed. edition
- John T. Daugirdas, Peter G. Blake, Todd S. Ing, Handbook of Dialysis, 5th edition (2014), Lippincott Williams and Wilkins;
- NANT and Oxford - Text books of Dialysis for technologists

b. Recommended Reading

- Allen Nissenson Richard Fine, Handbook of Dialysis Therapy, 5th Edition (2016) Elsevier.
- William L. Henrich, Principles and Practice of Dialysis (Principles & Practice of Dialysis), 4th edition (2009) Lippincott Williams and Wilkins

c. Magazines and Journals

- Journal of Renal disorders and management

D. Websites

- www.renal.org.
- Videos in the library

IV. Course Organization

Course Code		DTC308A
Course Title		Directed Clinical Education IV
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		
Course Specifications Review		

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**Programme Structure and Course Details of BSc (HONS) Dialysis Therapy Technology
(DTT2024-2028)**



**BSc. (HONS) Dialysis Therapy Technology
(DTT 2024-2028)**



Head

Department of Allied Health Sciences
M S Ramaiah University of Applied Sciences
Bangalore 560054

SEMESTER 7

Course Specifications: Research Project

Course Title	Research Project
Course Code	DTP401A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

1. Course Summary

1. Aim and Summary

The aim of this course is to give students an experience of addressing a real time problem in **Optometry**. The students are expected to work in a team of not more than 4 members and are required to develop an appropriate solution by identifying a problem for which a better or new solution is required. The team need to propose a solution / develop a physical product and write a project report.

2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	290
Number of practical hours	00
Number of semester weeks	29
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100 The distribution of marks for theory and laboratory/clinical component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations


Head

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Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	CO1: Refine the problem in Allied Health Science
2.	CO2: Identify appropriate methodology to solve the problem
3.	CO3: Propose solutions to the problem identified
4.	CO4: Prepare a project report as per the specified guidelines
5.	CO5: Presentation of the research finding in an appropriate forum

4. Course Contents:

- Identifying a problem for which a better or new solution is required, through literature review
- To learn PICO search and evidence
- Defining the scope of the problem followed by aim and objectives
- Identifying the methodology to meet the objectives
- Data collection, analysis and interpretation
- Preparing/ writing a project report and presentation in appropriate forum

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8			PSO-1	PSO -2	PSO -3	PSO -4
CO -1	2							2			1			
CO -2	2	2									2			
CO -3	2							2						2
CO -4	2						2				2		2	
CO -5		3				2	2						2	2
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

Teaching and Learning Methods		Duration in hours
1.	Refining Problem, Aim, Objective & Methodology in concurrence with academic guide	50
2.	Review Plan, design and execution of experiments	50
3.	Data collection, Analysis and Interpretation	150
4.	Discussion with supervisor	10
5.	Propose Solution	20
6.	Report Presentation	10
Total Duration Hours		60

6. Course Teaching and Learning Methods

7. Method of Assessment

The following is the CE components

Laboratory Component CE	SEE
SC1 (Protocol presentation, Data collection, Analysis)	SEE
60 Marks	40 (Thesis Presentation)

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam

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- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% in case of theory courses. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

SL.no	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

Head

9. Course Resources

1. Essential Reading

- Gurumani, N., 2006, Research methodology for biological sciences, MJP Publishers
- Gurumani, N., 2010, *Scientific Thesis Writing And Paper Presentation*, 1st Edition, MJP Publishers.
- <https://www.ncbi.nlm.nih.gov/pubmed>
- <https://www.sciencedirect.com/>
- <https://www.biomedcentral.com/>
- <http://www.nature.com/>

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- <https://www.cell.com/>
- Journals related to the respective topics of research

10. Course Organization

Course name		Research Project
Course code		DTP401A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		June 2022
Next Course Specifications Review		June 2026


Head
 Department of Allied Health Sciences
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 Dean - Academics
 M.S. Ramalah University of Applied Sciences
 Bangalore - 560 054

Course Specifications: Internship

Course Title	Internship
Course Code	DTI401A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

This internship training deals with postings in various specialty units of the Nephrology [dialysis unit]. The students are trained to acquire skills for the actual conduct of all the clinical services entrusted to them in those specialty units leading to the emergence of fully trained dialysis therapy technologist.

2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	880
Number of practical/tutorial hours	
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

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Bangalore 560054

Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Intended Learning Outcomes
1.	Initiate, monitor and close of hemodialysis procedure independently.
2.	Identify and manage complications during hemodialysis and
3.	peritoneal dialysis
4.	Able to do plasmapheresis
5.	Starting termination of the hemodialysis procedure in various types of

4. Course Contents:

Content
Main tasks- <ul style="list-style-type: none">A. Assess the patient's chart and vitalsB. Manage dialysis machine set up and assemble the extracorporeal circuitC. Prepare and position the patient for treatmentD. Connect patient to the dialysis machineE. Monitor technical/ clinical vitals during the treatmentF. Unhook patient from the machineG. Record the treatmentH. Conduct pre and post dialysis evaluationI. Maintain and disinfect the delivery systemJ. Evaluate and prepare the site for cannulation
Details <ul style="list-style-type: none">1. To take patients vitals like pulse, BP, weight, respiratory rate2. Read and understand the patients' reports3. Understand the mechanics and functioning of all parts of the dialysis machine4. Calibrate the machine5. Sterilization of dialysis machine6. To assemble and check the extracorporeal circuit parts i.e. the patient connectors, Dialyzer connectors, Drip chamber and bubble trap, Blood pump segment, Heparin infusion line, and saline infusion line7. Positioning and draping of patient

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5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3							2					2			3
CO-2	3							2					2			3
CO-3	3							2					2	1		3
CO-5	3							2					2			3
CO-5	3							2					2			3

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models/ Systems		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		

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Written Examination (Mid-Term tests and SEE)	
Total Duration in Hours	

7. Method of Assessment

The following is the CE components:

Laboratory Component CE	SEE
SC1 (Log book & Formative Laboratory performance assessment)	SEE
60 Marks	60 Marks

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S.No	Curriculum and Capabilities	How imparted during the course
1.	Knowledge	Clinical postings
2.	Understanding	Clinical postings
3.	Critical Skills	Clinical postings
4.	Analytical Skills	Clinical postings
5.	Problem Solving Skills	Clinical postings
6.	Practical Skills	Clinical postings
7.	Group Work	Clinical postings
8.	Self-Learning	Clinical postings
9.	Written Communication Skills	Clinical postings
10.	Verbal Communication Skills	Clinical postings
11.	Presentation Skills	Clinical postings
12.	Behavioral Skills	Clinical postings
13.	Information Management	Clinical postings

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15.	Leadership Skills	Clinical postings
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Head

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 Bangalore - 560084

Course Resources

9. Essential Reading

- World Health Organization (2016). Global Report on Diabetes. WHO Press, Switzerland
- Course notes
- Allen R. Nissenson, Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley & Belfus
- R. Gokal, Ramesh Khanna, Raymond T. Krediet, K.D. Nolph, Textbook of Peritoneal Dialysis (2000) Springer 2nd ed. edition
- John T. Daugirdas, Peter G. Blake, Todd S. Ing, Handbook of Dialysis, 5th edition (2014), Lippincott Williams and Wilkins;
- NANT and Oxford - Text books of Dialysis for technologists

10. Recommended Reading

- Nutrition Allen Nissenson Richard Fine, Handbook of Dialysis Therapy, 5th Edition (2016) Elsevier.
- William L. Henrich, Principles and Practice of Dialysis (Principles & Practice of Dialysis), 4th edition (2009) Lippincott Williams and Wilkins

11. Magazines and Journals

- Journal of Renal disorders and management

12. Websites

- www.renal.org.
- Videos in the library
- <http://bmj.com>

Course Organization

Course		Internship
Course		DTI401A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		


Head
Department of Allied Health Sciences
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**Programme Structure and Course Details of BSc (HONS) Dialysis Therapy Technology
(DTT2024-2028)**



**RAMAIAH
UNIVERSITY**
OF APPLIED SCIENCES

**BSc. (HONS) Dialysis Therapy Technology
(DTT 2024-2028)**

SEMESTER 8

A handwritten signature in blue ink, likely belonging to the Head of the Department of Applied Health Sciences.

Head

Department of Applied Health Sciences

Applied Health Sciences

Course Specifications: Research Project

Course Title	Research Project
Course Code	DTP402A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

1. Course Summary

1. Aim and Summary

The aim of this course is to give students an experience of addressing a real time problem in Optometry. The students are expected to work in a team of not more than 4 members and are required to develop an appropriate solution by identifying a problem for which a better or new solution is required. The team need to propose a solution / develop a physical product and write a project report.

2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	290
Number of practical hours	00
Number of semester weeks	29
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100 The distribution of marks for theory and laboratory/clinical component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations


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3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	CO1: Refine the problem in Allied Health Science
2.	CO2: Identify appropriate methodology to solve the problem
3.	CO3: Propose solutions to the problem identified
4.	CO4: Prepare a project report as per the specified guidelines
5.	CO5: Presentation of the research finding in an appropriate forum

4. Course Contents:

- Identifying a problem for which a better or new solution is required, through literature review
- To learn PICO search and evidence
- Defining the scope of the problem followed by aim and objectives
- Identifying the methodology to meet the objectives
- Data collection, analysis and interpretation
- Preparing/ writing a project report and presentation in appropriate forum

5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8			PSO-1	PSO-2	PSO-3	PSO-4
CO -1	2							2			1			
CO -2	2	2									2			
CO -3	2							2						2
CO -4	2						2				2		2	
CO -5		3				2	2						2	2

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

6. Course Teaching and Learning Methods

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Teaching and Learning Methods		Duration in hours
1.	Refining Problem, Aim, Objective & Methodology in concurrence with academic guide	50
2.	Review Plan, design and execution of experiments	50
3.	Data collection, Analysis and Interpretation	150
4.	Discussion with supervisor	10
5.	Propose Solution	20
6.	Report Presentation	10
Total Duration Hours		60

8. Method of Assessment

Laboratory Component CE	SEE
SC1 (Protocol presentation, Data collection, Analysis)	SEE
60 Marks	40 (Thesis Presentation)

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage

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of 40% in case of theory courses. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

SL.no	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

9. Course Resources

1. Essential Reading

- Gurumani, N., 2006, Research methodology for biological sciences, MJP Publishers
- Gurumani, N., 2010, *Scientific Thesis Writing And Paper Presentation*, 1st Edition, MJP Publishers.
- <https://www.ncbi.nlm.nih.gov/pubmed>
- <https://www.sciencedirect.com/>
- <https://www.biomedcentral.com/>
- <http://www.nature.com/>
- <https://www.cell.com/>
- Journals related to the respective topics of research

10. Course Organization

Course name		Research Project
Course code		DTP402A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		June 2022
Next Course Specifications Review		June 2026

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Course Specifications: Internship

Course Title	Internship
Course Code	DTI402A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

I. Course Summary

1. Aim and Summary

This course aims to give a background of scientific research principles, and emphasizes on the methodologies that are used to conduct research specifically in the field of public health. The students will be introduced to important components of research paradigm (ontology, epistemology, methodology and ethics), principles, process and approaches to research methodologies relevant to public health research. They will be also trained to conduct systematic and rigorous literature review and use appropriate methods (quantitative, qualitative and mixed-method), tools, techniques and technologies to conduct research in public health.

2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	880
Number of practical/tutorial hours	
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations

Attendance requirement	As per the Academic Regulations
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Teaching, Learning and Assessment

3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Intended Learning Outcome
1	Perform special hemodialysis techniques like SLED, CRRT, perform CAPD exchange and train the patient / relative for CAPD exchange procedure
2	Perform dialysis machine maintenance, sterilization procedure of dialysis unit
3	Prepare dialyzer reuse technique, maintain RO plant
4	Counsel dialysis patients regarding transplantation and able to monitoring transplant patient in immediate post-transplant period
5	Identify and manage complications during hemodialysis and peritoneal dialysis.


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4. Course Contents

Content
<p>Main tasks-</p> <p>Respond to dialysis related emergencies in patient and equipment</p> <p>Reprocess dialysers</p> <p>Operate and maintain water treatment plant</p> <p>Follow infection control policies and procedures</p> <p>Work effectively with others</p> <p>Maintain a safe, healthy, and secure working environment</p> <p>Biomedical waste disposal</p> <p>Monitor and assure quality</p>
<ul style="list-style-type: none">• Follow protocol for dialysis initiation.• Monitor various indicators, alarms and sensors of the dialysis machine. To take corrective measures for the same.• To inform in case of medical emergency to the concerned person. Detach all connections between patient and unit• Carefully remove IV cannulas with minimum discomfort to patient Suitably dress the canula/ catheter to keep it sterile and comfortable• Document dialysis on the patient's chart in the right format


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1. Noticing any change or distress in the patient during or after dialysis
2. Communicate effectively with patient, doctors and nurses to enable quick remedial action
3. To replace dialysate, dialyzer or other constituents as per need
4. Follow standard sterilisation and cleaning procedure for the unit
5. See how catheters are placed and assist in the various methods of catheter placement
6. Clean up any spillage
7. Operate and maintain water treatment plant
8. Record all checks, including time and initials, on the Daily Dialysis Water Equipment Monitoring Log Sheet
9. Perform the standard precautions to prevent the spread of infection in accordance with organisation requirements
10. Document and report activities and tasks that put patients and/or other workers at risk
11. Maintain hand hygiene before and after patient contact and/or after any activity likely to cause contamination
12. Clean all work surfaces
13. Decontaminate equipment

Main tasks for peritoneal dialysis:

- C. Able to train the patient / relative for CAPD exchange procedure
- D. Able to identify peritonitis / exit site infection
- E. Able to perform PET test

Details:

6. Explain the steps of access, performing the exchanges and maintenance of catheter to the patient and attenders
7. Explain to the patient and attenders the features of peritonitis
8. Collect PD fluid for analysis
9. Perform PET test
10. Understand the main features of PET test results
11. Catheter exit site care
12. Instill IP antibiotics

Main tasks regarding renal transplantation:

- A. Able to counsel dialysis patients regarding transplantation
- B. Be well versed with HOTA
- C. Be aware of monitoring transplant patient in immediate post-transplant period

Details:

1. Understand the advantages of renal transplantation and explain the same to the patient and attenders

5. Course Map (CO-PO-PSO Map) RM

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3							2					2			3
CO-2	3							2					2			3
CO-3	3							2					2			3
CO-4	3							2					2	1		3
CO-5	3							2					2			3

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		
Demonstrations		
2. Demonstration using Videos		
2. Demonstration using Physical		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		
3. Industry/Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Written Examination (Term tests and SEE)		
Total Duration in Hours		

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7. Method of Assessment

The following is the CE components:

Theory Course CE			Theory Course SEE
SC1 (Written Assignment)	SC2 (Innovative assignment)	SC3 (Mid-term test)	40 marks
20 marks	20 Marks	20 Marks	

8. Achieving learning outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods

S.No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Clinical postings
2.	Understanding	Clinical postings
3.	Critical Skills	Clinical postings
4.	Analytical Skills	Clinical postings
5.	Problem Solving Skills	Clinical postings
6.	Practical Skills	Clinical postings
7.	Group Work	Clinical postings
8.	Self-Learning	Clinical postings
9.	Written Communication Skills	Clinical postings
10.	Verbal Communication Skills	Clinical postings
11.	Presentation Skills	Clinical postings
12.	Behavioral Skills	Clinical postings
13.	Information Management	Clinical postings
15.	Leadership Skills	Clinical postings

2. Essential Reading

- Course notes
- Allen R. Nissenson, Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley & Belfus
- R. Gokal, Ramesh Khanna, Raymond T. Krediet, K.D. Nolph, Textbook of Peritoneal Dialysis (2000) Springer 2nd ed. edition
- John T. Daugirdas, Peter G. Blake, Todd S. Ing, Handbook of Dialysis, 5th edition (2014), Lippincott Williams and Wilkins;
- NANT and Oxford -Text books of Dialysis for technologists

3. Recommended Reading

- Allen R. Nissenson, Richard N. Fine Dialysis Therapy 3 edition (2001) Hanley &
- William L. Henrich, Principles and Practice of Dialysis (Principles & Practice of Dialysis), 4th edition (2009) Lippincott Williams and Wilkins

4. Magazines and Journals

- Journal of Renal disorders and management

Websites:

- www.renal.org.
- Videos in the library
- <http://bmj.com>

Course Organization

Course		Internship
Course		DTI402A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		
Next Course Specifications Review		



Head

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