MOHAN BABU UNIVERSITY

Sree Sainath Nagar, Tirupati – 517 102

MBU
MOHAN BABU
UNIVERSITY
DREAM. BELIEVE. ACHIEVE

SCHOOL OF PARAMEDICAL ALLIED AND HEALTH CARE SCIENCES

B.Sc. Dialysis Technology

CURRICULUM AND SYLLABUS

(From 2022-23 Admitted Batches)

FULLY FLEXIBLE CHOICE BASED CREDIT SYSTEM (FFCBCS)

MOHAN BABU UNIVERSITY

Vision

To be a globally respected institution with an innovative and entrepreneurial culture that offers transformative education to advance sustainability and societal good.

Mission

- Develop industry-focused professionals with a global perspective.
- Offer academic programs that provide transformative learning experience founded on the spirit of curiosity, innovation, and integrity.
- Create confluence of research, innovation, and ideation to bring about sustainable and socially relevant enterprises.
- Uphold high standards of professional ethics leading to harmonious relationship with environment and society.

SCHOOL OF PARAMEDICAL ALLIED AND HEALTH CARE SCIENCES

Vision

To be the global center of excellence for paramedical and allied health science education, research, innovation, incubation, consultancy and public service.

Mission

- Inspire the experts of paramedical and allied health sciences of tomorrow to take on the public health challenges of our society.
- Train the students with fundamental knowledge of paramedical and allied health sciences, skills set and positive attitude for creating innovative solutions to serve industry and community through congenial learning environment with contemporary academic programs, state of the art infrastructure facilities and community health programs.
- Facilitate budding paramedical and allied health science experts with the best research-innovation-incubation-start-up ecosystem to realize their fullest potential for sustainable businesses.
- Encourage faculty and staff to excel in their respective domains of expertise and demonstrate the best of their abilities by way of continuing education, research support and consultancy.

B.Sc. Dialysis Technology

Program Outcomes

On successful completion of the Programs, the graduates of B.Sc. Dialysis Technology will be able to:

PO1. **Knowledge:** Study and apply concepts, theories, and practices of health care system to gain fundamental knowledge.

PO2. **Analysis:** To identify, analyze and evaluate various experiences and perspectives using knowledge of paramedical & Allied Health sciences for substantiated conclusions.

PO3. **Development;** Individual or teamwork skills to support shared goals with the interdisciplinary healthcare team to improve societal health

PO4. **Tools & Techniques:** To create, select, and apply appropriate techniques, resources and modern tools with an understanding of the limitations in Health care system.

PO5. **Environment and Sustainability:** Understand the impact of Health care professionals in environmental contexts and demonstrate the knowledge for sustainable development.

PO6. **Ethics and Society:** Apply the ethical principles of health care practices for sustainable development of society

PO7. **Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, to manage projects and finance in multidisciplinary settings.

PO8. **Effective Communication:** Communicate effectively on Paramedical & allied Health care activities with the treating patient, community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO9. **Entrepreneurship:** Entrepreneur and leadership skills to practice independently as well as in collaboration with the interdisciplinary healthcare team.

PO10. **Life-long learning:** Adapt to the changes and advancements in technology and engage in independent and lifelong learning

B.Sc. Dialysis Technology

Basket Wise - Credit Distribution

S. No.	Basket	Credits (Min. - Max.)
1	SCHOOL CORE	60-80
2	PROGRAM CORE	80-110
3	PROGRAM ELECTIVE	10-36
4	UNIVERSITY ELECTIVE	3-12
	TOTAL CREDITS	**Min. 195**

School Core (60-80 Credits)

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22DF102001	Medical Terminology and Record Keeping	4	1	2	-	6	-
22DF102002	Introduction to Quality and Patient Safety	4	1	2	-	6	-
22CS102402	Basic Computers and Information Sciences	3	-	2	-	4	
22DF105001	Biomedical Waste Management	-	1	2	-	2	-
22LG101406	Professional English	2	-	-	-	2	-
22MG101006	Principles of Management	3	-	-	-	3	-
22PT102006	Human Anatomy	4	1	2	-	6	-
22PT102007	Human Physiology	4	1	2	-	6	-
22PT101004	National Health Care Delivery System	2	-	-	-	2	-
22DF102008	Clinical Microbiology	3	-	2	-	4	-
22DF102009	Pathology	3	-	2	-	4	-
22CC111001	Clinical Posting-I	-	-	-	-	4	-
22CC111002	Clinical Posting-II	-	-	-	-	4	Clinical Posting-I
22CC101019	National Health Care Delivery System and Medical Records Management	4	-	-	-	4	-
22CC111003	Clinical Posting-III	-	-	-	-	4	Clinical Posting-II

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project based Learning	Credits	Pre-requisite
22CC111004	Clinical Posting-IV	-	-	-	-	4	Clinical Posting-III
22DF102025	Research Methodology and Biostatistics	3	-	2	-	4	-
22PT102003	Sociology	3	-	2	-	4	
Mandatory Courses (Min. 8 Credits to be earned, Earned Credits will not be considered for CGPA)							
22CE107601	Environmental Science	2	-	-	-	2	-
22LG101402	Telugu	2	-	-	-	2	-
22LG101404	Sanskrit	2	-	-	-	2	-

Program Core (80-110 Credits)

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22DF102003	Medical Biochemistry	3	-	2	-	4	-
22RT101001	Fundamentals of Medical Physics and Electronics	3	-	-	-	3	-
22CC101004	Basics in Dialysis Technology	3		-	-	3	-
22CC102003	Applied Anatomy and Physiology Related to Dialysis Technology	3	-	2	-	4	Human Anatomy Human Physiology
22CC101009	Concepts of Basic Disease Related to Dialysis Technology-I	5	1	-	-	6	-
22CC101006	Basic Pharmacology and Drug Administration	3	-	-	-	3	-
22CC101013	Applied Pharmacology Related to DT	3	-	-	-	3	Basic Pharmacology and Drug Administration
22CC102005	Concepts Of Disease Related to Dialysis Technology – II	3	1	2	-	5	Concepts of Basic Disease Related to Dialysis Technology-I
22CC102006	Applied Dialysis Technology-I	3	1	2	-	5	-
22CC101015	Medical Psychology	3	-	-	-	3	-
22CC101032	Applied Dialysis Technology-II	4	1	-	-	5	Applied Dialysis Technology-I
22CC102035	Applied Dialysis Technology-III	4		2	-	5	Applied Dialysis Technology-II
22CC111007	DT Internship-I	-	-	-	-	20	Clinical Posting-IV
22CC102036	Principles and Practice of Peritoneal Dialysis	4	1	2	-	6	Applied Dialysis Technology-I
22CC111008	DT Internship-II	-	-	-	-	20	DT Internship-I

Program Elective (10-36 Credits)

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22CC105001	Basic Life Support and First Aid Management	-	1	2	-	2	-
22CC105002	Enhancing Concentration	-	1	2	-	2	-
22DF101002	Design and Interpretation of Clinical Trials	2	1	-	-	3	-
22CC101006	Trauma & cardiac care management	4		2		5	
22CC101006	Pediatric Nephrology	3	1			4	
22DF102008	Nephro-Radiological and imaging sciences	3		2		4	
22CC102034	Principles and Practice of Hemodialysis	5	1	-	-	6	Concepts Of Disease Related to Dialysis Technology – II
22CC102064	Introduction to Renal Dialysis Technology	4	-	2	-	5	-
22CC102069	Recent Advances in Dialysis Technology	4	1	2	-	6	-

University Elective (3-12 Credits)

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22EC101701	AI in Healthcare	3	-	-	-	3	-
22DS101701	Bioinformatics	3	-	-	-	3	-
22SS101701	Constitution of India	3	-	-	-	3	-
22CM101702	Cost Accounting and Financial Management	3	-	-	-	3	-
22MG101701	Entrepreneurship for Micro, Small and Medium Enterprises	3	-	-	-	3	-
22CB101703	Forensic Science	3	-	-	-	3	-
22SS101704	Indian History	3	-	-	-	3	-
22SS101705	Indian Tradition and Culture	3	-	-	-	3	-
22ME101704	Managing Innovation and Entrepreneurship	3	-	-	-	3	-
22LG201701	Personality Development	3	-	-	-	3	-
22CS101702	Web Design Fundamentals	3	-	-	-	3	-
22SS101706	Women Empowerment	3	-	-	-	3	-

Note:

1. If any student has chosen a course or equivalent course from the above list in their regular curriculum then, he/she is not eligible to opt the same course/s under University Elective.
2. The student can choose courses from other disciplines offered across the schools of MBU satisfying the pre-requisite other than the above list.

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102001	**MEDICAL TERMINOLOGY AND RECORD KEEPING**	4	1	2	-	6

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on word roots, prefixes, suffixes basic medical terms, medical abbreviations to human body systems and record-keeping methods in health care and medical ethics and law.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate basic knowledge on roots, prefixes and suffixes to form medical terms in health care system

CO2. Use procedural terms and medical abbreviations to human body for improving communication and reporting between health care providers effectively

CO3. Apply advanced tools and techniques to maintain patient health details in medical system.

CO4. Design a standard protocol by applying medical law and ethics apply to avoid sentinel events.

CO5. Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	3	1	-	-	-
CO2	3	1	-	-	-	-	-	-	3	-
CO3	3	1	3	-	-	-	-	-	-	1
CO4	2	1								1
CO5	3	-	-	-	-	3	1	-	-	-
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**3**	**1**	**-**	**3**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION OF MEDICAL TERMINOLOGY ***(12 Periods)***

Derivation of medical terms, define word roots, prefixes, and suffixes, Conventions for combined morphemes and the formation of plurals, Basic medical terms, Form medical terms utilizing roots, suffixes, prefixes, and combining roots.

Module 2: INTRODUCTION OF MEDICAL TERMINOLOGY-1 ***(12 Periods)***

Interpret basic medical abbreviations/symbols, utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system and musculoskeletal system

Module 3: INTRODUCTION OF MEDICAL TERMINOLOGY-2 ***(12 Periods)***

Interpret basic medical abbreviations/symbols, utilize diagnostic, surgical, and procedural terms and abbreviations related to the Respiratory system, cardiovascular system, nervous system, and endocrine system.

Module 4: RECORD KEEPING ***(12 Periods)***

Standard procedures in record keeping, interpret medical orders/reports, Data entry and management on electronic health record system, Advanced tools to maintain records in Health care.

Module 5: MEDICAL ETHICS AND LAW ***(12 Periods)***

Medical ethics – Definition, Basic principles of medical ethics – Confidentiality, Malpractice and negligence – Rational and irrational drug therapy, Autonomy and informed consent – Right of patients, Care of the terminally ill- Euthanasia, Development of a standardized protocol to avoid sentinel events

Total Periods: 60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstration of role of paramedic in health care system
2. Demonstration of Central Sterile Supply Department (CSSD)
3. Observation and understanding of incinerator complex
4. Demonstration of Immunization section
5. Demonstration of working respective department in health care.

RESOURCES

TEXT BOOKS:

1. Adam Brown, Medical Terminology Easy Guide for Beginners, CreateSpace Independent Publishing Platform, Edition 1, 2016.
2. GD Mogli, Medical records organization and management, Jaypee Brothers Medical Publishers, Edition 2, 2016.

REFERENCE BOOKS:

1. Stedmans, Stedmans pocket Medical Dictionary, Wolters Kluwer India Pvt. Ltd, Edition 1, 2009.
2. Rampi Gupta, CM Francis Medical Ethics, Jaypee Brothers Medical Publishers, Edition 4, 2020.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=_bDatJxhfkQ
2. https://www.youtube.com/watch?v=9iMhc2OU-go
3. https://www.youtube.com/watch?v=sQTrPIwtWaw

WEB RESOURCES:

1. https://blog.ipleaders.in/medical-laws-conflict-ethic
2. https://www.gponline.com/medico-legal-importance-good-records/article/89
3. https://openmd.com/guide/medical-terminology

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102002	**INTRODUCTION TO QUALITY AND PATIENT SAFETY**	4	1	2	-	6

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course is designed to provide an overview on Quality assurance and management, infection control and prevention, Antibiotic resistance and disaster management.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Apply NABH guidelines to improve the quality of patient care in the health care system.
CO2. Identification of suitable evidence-based infections control principles and techniques to control and prevent to disease in the healthcare environment
CO3. Identify barriers and opportunities in the health care system based on contextual knowledge on microbial antibiotic resistance.
CO4. Demonstrate knowledge on different disaster management techniques to make patient health safety
CO5. Work independently or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	3	2	-	-	2
CO2	3	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	1
CO4	3	-	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	3	-	-	-	2
Course Correlation Mapping	**3**	**-**	**-**	**-**	**-**	**3**	**2**	**-**	**-**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: QUALITY ASSURANCE AND MANAGEMENT ***(15 Periods)***

Quality assurance and management - The objective of the course is to help students understand the basic concepts of quality in health care and develop skills to implement sustainable quality assurance programs in the health system: Concepts of Quality of Care, Quality Improvement Approaches, Standards and Norm, Quality Improvement Tools, Introduction to NABH guidelines.

Module 2: INFECTION CONTROL AND PREVENTION ***(15 Periods)***

The objective of this section will be to provide a broad understanding of the core subject areas of infection prevention and control and to equip AHPs with the fundamental skills required to reduce the incidence of hospital-acquired infections and improve health outcomes. Concepts taught should include a. 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

Module 3: ANTIBIOTIC RESISTANCE ***(15 Periods)***

Antibiotic Resistance: History of antibiotics, way of 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.

Module 4: DISASTER PREPAREDNESS AND MANAGEMENT ***(15 Periods)***

The principles of on-site disaster management, Fundamentals of emergency management, psychological impact management, Resource management, Preparedness and risk reduction, Key response functions (including public health, logistics, and governance, recovery, rehabilitation and reconstruction), information management, incident command, and institutional mechanisms

Total Periods: 60

EXPERIENTIAL LEARNING

LIST OF EXERCISES:

1. Demonstration of NABH guidelines
2. Demonstration of Vital signs
3. Demonstration of proper use of Personal protective equipment (PPE)
4. Demonstration of evidence-based infection control principles and practices [such as Sterilization, Disinfection, Effective hand hygiene, and use of Personal Protective Equipment (PPE)
5. Discussion on various types of Antibiotics
6. Demonstration of how Resistance Happens and Spreads

RESOURCES

TEXT BOOKS:

1. Y. Anjaneyulu and R Marayya, Quality Assurance and Quality Management, BSP Books Private Limited, Edition 3, 2018.
2. Deepak Tripathi, Quality management, Jaico Publishing House, Edition 1, 2009.
3. Apurba S Sastry, Deepa shree, Essentials of Hospital infection control, Jaypee Brothers Medical Publisher, Edition 1, 2019.
4. Nidhi Gauba Dhawan and Ambrina Sarar Khan, Disaster management and preparedness, CBS Publisher, Edition 1, 2014.

REFERENCE BOOKS:

1. Gireesh Kumar KP and Eng, Handbook of antibiotics, Paras Medical Books, Edition 1, 2014.
2. Alan R. Hauser, Antibiotics for Clinician, LWW Exclusive NP, Edition 1, 2019.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=zSyICkGZ6iM
2. https://www.youtube.com/watch?v=LZapz2L6J1Q
3. https://www.youtube.com/watch?v=yHs0GyLNSLg
4. https://www.youtube.com/watch?v=KwAKjtkpdP4

WEB RESOURCES:

1. https://www.sciencedirect.com/science/article/pii/B9780123735935000227
2. https://www.who.int/teams/integrated-health-services/infection-prevention-control
3. https://www.uicc.org/what-we-do/thematic-areas-work/antimicrobial-resistance-amr-and-its-impact-cancer-care
4. https://www.techtarget.com/searchsoftwarequality/definition/quality-assurance

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22LG101406	**PROFESSIONAL ENGLISH**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course deals with selected literary works of eminent writers, exercises on speaking, reading comprehension skimming and scanning, vocabulary, grammar, pronunciation, and conversation practice.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate knowledge of literary works of various pieces of eminent writers.

CO2. Adapt general and technical vocabulary in communication.

CO3. Apply grammatically correct English in writing.

CO4. Analyze texts using reading techniques.

CO5. Apply different communication styles in various situations.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	2	-	-	-
CO2	2	2	-	-	-	-	2	-	3	-
CO3	2	2	-	-	3	-	2	-	3	-
CO4	2	3	2	-	2	-	2	-	3	-
CO5	2	2	-	-	3	-	2	-	3	-
Course Correlation Mapping	**2**	**2**	**2**	**-**	**3**	**-**	**2**	**-**	**3**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: BE THE BEST OF WHATEVER YOU ARE BY DOUGLAS MALLOC ***(06 Periods)***

Be the Best of Whatever You Are– A motivational poem, Reading Comprehension, Grammar, Vocabulary, Pronunciation, Language Games, and Conversation Practice, Letter writing.

Module 2: 'ON SAYING PLEASE' SHORT ESSAY BY A. G. GARDINER ***(06 Periods)***

On Saying Please – A Short Essay, Reading Comprehension, Grammar Vocabulary, Pronunciation, Language Games, and Conversation Practice, Email writing.

Module 3: 'IF YOU FORGET ME' POEM BY PABLO NERUDA ***(06 Periods)***

If you Forget Me-A Poem, Reading Comprehension, Grammar, Pronunciation, Language Games and Conversation Practice, essay writing.

Module 4: 'AFTER THE SUNSET' SHORT STORY BY BHOOPAL ***(06 Periods)***

After the Sunset–A Short Story, Reading Comprehension, Grammar, Pronunciation, Language Games, and Conversation Practice, case studies.

Module 5: 'MAN'S PERIL' ESSAY BY BERTRAND RUSSEL ***(06 Periods)***

Man's Peril - An Essay, Reading Comprehension, Vocabulary, Grammar, Pronunciation, Language Games, and Conversation Practice, report writing.

Total Periods: 30

EXPERIENTIAL LEARNING

1. Discuss the role of Health care in nation-building?
2. List out the important vocabulary used most in Health care.
3. Small courtesies play a major role in creating an impression on other people. List out a few examples.
4. Prepare a PowerPoint presentation on the present scenario in higher education and jobs in India.
5. Being a shopkeeper and persuading a customer to buy a product which is introduced newly in the market. Prepare a conversation.
6. The English language has a rich vocabulary. List out the homophones and homonyms and write down the pronunciation and meaning of those words.
7. Describe a situation in your college where teamwork is needed and explain the strategies to manage the team effectively.
8. Write about the importance of IELTS and TOEFL exams.
9. Prepare a report on the medical camp conducted on your campus.
10. Write a letter to the concerned asking permission to attend clinical classes.
11. Prepare a E mail to justify the need of new medical equipment to your hospital.

RESOURCES

TEXT BOOKS:

1. G. Damodar, English Language for Undergraduate Students, Cambridge University, standard edition, 2019.

REFERENCE BOOKS:

1. Meenakshi Raman & Sangeetha Sharma, *Technical Communication*, Oxford University Press, Edition 1, 2012.
2. Ashraf Rizvi*, Effective Technical Communication*, McGraw-Hill Education (India) Pvt. Ltd., Edition 1, 2018

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=WnOOKO0CdaM
2. https://www.youtube.com/watch?v=H6Nlz8qmcFc
3. https://www.youtube.com/watch?v=-lTliZO85YM
4. https://www.youtube.com/watch?v=048YjXwgHWE
5. https://www.youtube.com/watch?v=XLLQm7Grmcc

WEB RESOURCES:

1. https://www.researchgate.net/publication/331773456_RK_Narayan's_A_Snake_in_the_Gra ss_and_Stephen_Leacock's_With_the_Photographer_-_A_Comparative_Study
2. https://smartenglishnotes.com/2020/07/17/on-saying-please-summary-analysis-and-questions-and-answers/
3. http://www.emcp.com/product_catalog/school/litLink/Grade09/U09-04forgetme/
4. https://englishlanguage-lit.blogspot.com/2021/05/after-sunset-short-story-by-bhoopal.html
5. https://www.taylorfrancis.com/chapters/mono/10.4324/9781003090359-31/man-peril-bertrand-russell?context=ubx&refId=1d767e2d-ceb1-4537-9de5-6417eab47d1e

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22MG101006	**PRINCIPLES OF MANAGEMENT**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course enables the students to study the evolution of management; functions and principles of management; application of the principles in an organization; the system and process of effective controlling in the organization.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand managerial functions of business organization.

CO2. Understand the planning process in the organization.

CO3. Describe the principles of Organization.

CO4. Understand the concept and process of staffing.

CO5. Demonstrate the ability to direct, leadership and communicate effectively.

CO6. Work independently or in team to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	1	-	-
CO2	3	1	-	1	-	-	-	1	1	-
CO3	3	1	-	1	-	-	-	1	1	-
CO4	3	1	-	-	-	-	-	1	1	-
CO5	3	1	-	-	-	1	-	-	1	-
CO6	3	-	-	-	-	-	-	1	-	-
Course Correlation Mapping	**3**	**1**	**-**	**1**	**-**	**1**	**-**	**1**	**1**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO MANAGEMENT ***(09 Periods)***

Meaning, Definition, Concept, Scope And Principles of Management; Evolution of Management Thought- Management Theories – Classical, Behaviour, System, Contingency and Contemporary Perspectives on Management. Management Art or Science And Management as Profession. Process And Levels of Management. Introduction to Functions [POSDCORB] of Management.

Module 2: PLANNING – IMPORTANCE ***(11 Periods)***

Planning- Importance, Objectives, Process, Policies, Types of Planning, Decision Making- Process of Decision Making, Types of Decision, Problems involved in Decision Making.

Module 3: ORGANISING ***(09 Periods)***

Meaning, Importance, Principles of Organizing, Spam of Management, Patterns of Organization- Formal And Informal Organizations, Common Organizational Structures; Departmentalization, Authority- Delegation, Centralization Decentralization, Responsibility- Line and Staff Relationship.

Module 4: STAFFING ***(07 Periods)***

Sources of Recruitment, Selection Process, Training, Directing, Controlling- Meaning And Importance, Function, Span of Control, Process And Types of Control, Motivation, Coordination- Need and Types And Techniques Of Coordination- Distinction between Coordination And Cooperation- Requisites for Excellent Coordination-Systems Approaches and Coordination.

Module 5: EMERGING ISSUES IN MANAGEMENT ***(09 Periods)***

Total Quality Management, Technology Management, Talent and Knowledge Management, Leadership, Organizational Change And Development, Corporate Social Responsibility.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXERCISES:

1. Students will be given case studies on management theory and its relevance to contemporary business practices.
2. Case study of Amazon India on planning and staffing personnel for its timely delivery in rural area.
3. Group discussion on technology, organization and management.

   The above all will be detailed in CHO

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

TEXT BOOKS:

1 Charles W.L. Hill And Steven L. McShane, Principles Of Management, Tata Mc-Craw-Hill Company, Edition 1, 2006.

2 Griffin, Ricky W., Management. AITBS Publishers and Distributors, Edition 1, 2010.

REFERENCE BOOKS:

1. Neeru Vasishth, Principles of Management text and cases, Taxmann Publishers, Edition 5, 2019.
2. Robbins, Fundamentals of Management, Pearson Education India, Edition 9, 2016.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=tUrjAn24ZiA
2. https://www.youtube.com/watch?v=vtVJOg_tW4o

WEB RESOURCES:

1. https://byjus.com/commerce/henri-fayol-14-principles-of-management/
2. https://education.stateuniversity.com/pages/cw1ev9e9ib/An-Introduction-to-the-Principles-of-Management.html
3. https://open.lib.umn.edu/principlesmanagement/chapter/1-1-introduction-to-principles-of-management/

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CS102402	BASIC COMPUTERS AND INFORMATION SCIENCES	3	-	2	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion and hands-on experience on basics of computer science and information science concepts of the I/O devices, CPU (central processing unit) memory, Storage devices and Introduction of windows operating systems and MS office and having the knowledge of computer networks, Internet and its applications.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate knowledge on Basics of computer I/O devices, Processor and memory.

CO2. Prepare the Documents using the word processors.

CO3. Prepare the work sheet and Slide Presentations using the Excel and presentation tool.

CO4. Demonstrate the knowledge on Operating Systems usage and its types.

CO5. Interconnect two or more computers for Information sharing and access the Internet.

CO6. Work independently or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-
CO3	3	2	3	-	-	-	-	-	-	-
CO4	2	2	3	-	-	-	-	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	3	3	-
Course Correlation Mapping	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT:

Module 1 INTRODUCTION TO COMPUTERS *(09 Periods)*

Introduction, characteristics of computers, block diagram of computers, generations of computers, computer languages, Input-output devices: Input devices (keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices (monitors, pointers, plotters, screen image projector, voice response systems),Processor and memory: Central Processing Unit (CPU), main memory.

Module 2 STORAGE DEVICES AND WORD PROCESSOR *(09 Periods)*

Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices, Introduction to word processor: Introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.

Module 3 INTRODUCTION TO SPREADSHEET AND PRESENTATIONS *(09 Periods)*

Introduction to Excel: Introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs, Introduction to PowerPoint: Introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.

Module 4 COMPUTER NETWORKS AND INTERNET APPLICATIONS *(09 Periods)*

Computer networks: Introduction, types of networks (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network, Internet and its Applications: Definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet, Application of Computers in clinical settings.

Module 5 INTRODUCTION OF OPERATING SYSTEM *(09 Periods)*

Introduction to Operating System, Characteristics of Operating System, Types of Operating System and its components, Installation of windows OS, History of OS and features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXERCISES

1. Demonstrate of basic hardware of Computers and laptops.
2. Demonstrate about the I/O Devices and CPU.
3. Create and Design Admission/Enquiry Forms.
4. Create Student Id Card using shapes, text and colors.
5. Create Chart and show the product price comparison between years.
6. Insert the Image into various shapes
7. Calculate student's marks percentage using spreadsheet.
8. Create slides about yourself using with all the details.
9. What are the steps to connect Internet
10. How to send an Email? Explain the steps in detail.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

TEXT BOOKS:

1. Priti Sinha and Pradeep K, Computer Fundamentals, BPB Publications, Edition 6, 2004.
2. James Bernstein, Office for the Web Made Easy, Independently published, Edition 1, 2021.

REFERENCE BOOKS:

1. Pete Matheson, Microsoft Office 365 for Beginners, Microsoft, Edition 1, 2021.
2. Dr Sabah Sayed, Fundamentals of Computer Science, Imperial College Press, Edition 1, 2009.

SOFTWARE/TOOLS:

1. Software: MS Office/ Window Operating System

VIDEO LECTURES:

1. Computer Fundamentals - Basics for Beginners - Bing video
2. https://youtu.be/-AP1nNK3bRs

WEB RESOURCES:

1. https://www.udemy.com/**computer**-**basics**/online-course
2. *https://www.educba.com/excel/courses/ms-office-course*

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CE107601	**ENVIRONMENTAL SCIENCE**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on natural resources, ecosystems, biodiversity, environment pollution and control, social issues and environment, human population and environment.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Analyze natural resources to solve complex environmental problems and natural resource management considering society, environment and sustainability.

CO2. Analyze ecosystems and biodiversity to solve complex environmental problems by following environmental ethics considering society, environment and sustainability besides communicating effectively in graphical form.

CO3. Analyze various types of pollution and their control measures to solve environmental problems through appropriate tools and techniques following latest developments considering society, ethics, environment and sustainability.

CO4. Analyze social issues and its impact on environment, environmental acts to solve complex environmental problems considering society, environment and sustainability besides communicating effectively in graphical form.

CO5. Analyze human population and its impact on environment to solve complex environmental problems through team work and using appropriate tools and techniques considering ethics, society, environment and sustainability.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	-	2	-	-	1	-	1
CO2	3	2	-	-	2	2	1	1	-	1
CO3	3	2	2	1	2	2	2	-	-	-
CO4	3	2	2	2	2	-	-	2	-	1
CO5	3	2	2	2	2	2	2	-	-	1
Course Correlation Mapping	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**1**		**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: NATURAL RESOURCES *(07 Periods)*

Multidisciplinary nature of environment; Natural Resources: Renewable and non-renewable resources; Forest, Water, Mineral, Food and Energy resources -Causes, Effects, Remedies, Case studies; Role of an individual in conservation of natural resource and equitable use of resources for sustainable lifestyles.

Module 2: ECOSYSTEMS AND BIODIVERSITY *(07 Periods)*

Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem - Producers, Consumers, Decomposers; Food chains, Food webs, Ecological pyramids – Types; Characteristic features, Structure and functions of forest ecosystem, Desert ecosystem, Aquatic ecosystem.

Biodiversity: Concept and value of biodiversity, Role of biodiversity in addressing new millennium challenges, Hot spots of biodiversity, Threats to biodiversity, Man-wild life conflicts, Endemic, Endangered and extinct species of India, Conservation of biodiversity – In-situ and ex-situ.

Module 3: ENVIRONMENTAL POLLUTION AND CONTROL *(06 Periods)*

Causes, Adverse effects and control measures of pollution - Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, Nuclear pollution, Solid waste management – Urban waste, industrial waste; Latest developments in pollution control, Hazards and disaster management – Floods, Earthquakes, Tsunamis, Case studies.

Module 4: SOCIAL ISSUES AND THE ENVIRONMENT *(06 Periods)*

Sustainable development, Urban problems related to energy, Environmental ethics –Issues, Solutions; Global warming, Acid rain, Ozone layer depletion, Nuclear accidents and case studies, Wasteland reclamation, Consumerism and waste products, Concept of green technologies, Environment justice: National Green Tribunal and its importance; Environment protection act, Air act, Water act, Wildlife protection act, Forest conservation act, Issues involved in enforcement of environmental legislation, Public environmental awareness.

Module 5: HUMAN POPULATION AND THE ENVIRONMENT *(04 Periods)*

Population growth, Population characteristics and variation among nations, Population explosion, Family welfare program, Environment and human health, Human rights, Value education, HIV/AIDS, Women and child welfare, Role of information technology in environment and human health; Case studies - Field Work/Assignment/Seminar on Environmental assets – Water bodies/Forest/Grassland/Hill/Mountain.

Total Periods: 30

EXPERIENTIAL LEARNING

1. Visit a nearby villages and know the status of availability of local resources that can be improved through proper education.
2. Make an awareness program in the villages for the development of natural resources, ecosystems and biodiversity.
3. Prepare a document by visiting a local urban waste dumping yard near to the Tirupati city.
4. Visit a local village and find a barren land and make the land into a useful land by planting plants or providing the soil and fertilizers required to improve the soil.
5. Visit a local zoological park and identify the species variety and variability.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

TEXT BOOKS:

1. AnubhaKaushik and Kaushik, C.P., *Perspectives in Environmental Studies*, New Age International (P) Ltd. Publications, 6th Edition, 2018.
2. ErachBarucha, *Environmental Studies,* Orient Blackswan, 3rd Edition, 2021.

REFERENCE BOOKS:

1. Cunningham, W. P. and Cunningham, M. A., *Principles of Environmental Science*, Tata McGraw-Hill Publishing Company, New Delhi, 8th Edition, 2016.
2. Benny Joseph, *Environmental Studies*, Tata McGraw-Hill, 2nd Edition, 2009.
3. Anji Reddy, M., *Text Book of Environmental Science and Technology*, BS Publications, Revised Edition, 2014.
4. Rajagopalan, R., *Environmental Studies*, Oxford University Press, 3rd Edition, 2015.

VIDEO LECTURES:

1. http:// nptel.ac.in/courses/109/104/109104047
2. https://www.youtube.com/watch?v=mIPBPG-5dUw

WEB RESOURCES:

1. https://nptel.ac.in/courses/122102006
2. https://www.flame.edu.in/academics/ug/program-structure/major-minor courses/environmental-studies
3. https://www.tutorialspoint.com/environmental_studies/environmental_studies_environment.htm

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF105001	**BIOMEDICAL WASTE MANAGEMENT**	-	1	2	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course deals with biomedical waste management and environmental safety. Experimental learning on types of biomedical waste in health care system, waste minimization, General waste control and personal care in health care.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Analyze biomedical waste materials by applying decontamination and disposal techniques to prevent harm to health care professionals.

CO2. Work individually or Teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	-	-	-	-	-	-	-	1
CO2	3	1	2	-	-	-	-	-	-	1
Course Correlation Mapping	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

EXPERIENTIAL LEARNING:

COURSE CONTENT AND LIST OF EXERCISES

Biomedical waste management and environment safety- The aim of this section will be to help prevent harm to workers, property, the environment and the general public. Topics to be covered under the subject are as follows:

1. Definition of Biomedical Waste, Types of waste generated from Health Care Facility
2. Demonstration of various procedures for minimization of Biomedical Waste.
3. Demonstration of Biomedical Waste Segregation, collection, transportation, treatment and disposal (including color coding)
4. Study of Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste
5. Study of BMW Management & methods of disinfection
6. Demonstration of Modern Technology for handling BMW
7. Use of Personal protective equipment (PPE)
8. Monitoring & controlling cross-infection (Protective devices)

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

TEXT BOOK:

1. Shishir Baskar, Hospital waste management A guide for self-assessment and review, Jaypee brothers Medical Publication, Edition 1, 2009.
2. R. Radhakrishna, Biomedical waste management, Sumit Enterprises, Edition 3, 2007.

REFERENCE BOOKS:

1. Anant Preet Singh and Sukhjit, Biomedical waste disposal, Haypee Brothers Medical Publishers (P) Ltd, Edition 1, 2012
2. Dr. Shalini Sharma and Prof. SVS Chauhan, An Analysis of Bio-Medical Waste Management, LAP Lambert Academic Publishing, Edition 1, 2010.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=qsclvnPvr18
2. https://www.youtube.com/watch?v=gKSPSKiB9PE
3. https://www.youtube.com/watch?v=SxkZdmBSkWo

WEB RESOURCES:

1. https://byjus.com/current-affairs/biomedical-waste/
2. https://www.aiims.edu/en/departments-and-centers/central-facilities/265-biomedical/7346-bio-medical-waste-management.html

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT102006	**HUMAN ANATOMY**	4	1	2	-	6

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on the Macroscopic & Microscopic structure and functions of human body and its Development which is essential for clinical studies.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate the anatomical terms & positions used in clinical practice.

CO2. Apply the anatomical knowledge of bones, muscles, and joints of human body in clinical studies.

CO3. Demonstrate the organs of circulatory, digestive, and respiratory system in human body.

CO4. Analyze the structure and functions of uro-genital system, and endocrine system.

CO5. Identify the structure and functions of nervous system, and sense organs.

CO6. Work independently or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	1	-	-	1	1	-	-	1
CO2	3	2	1	-	-	1	1	-	-	1
CO3	3	2	1	-	-	1	1	-	-	1
CO4	3	2	1	-	-	1	1	-	-	1
CO5	3	2	1	-	-	1	1	-	-	1
CO6	3	-	-	-	-	-	-	-	-	1
Course Correlation Mapping	**3**	**2**	**1**	**-**	**-**	**1**	**1**	**-**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

MODULE 1: INTRODUCTION TO HUMAN ANATOMY *(12 Periods)*

Subdivisions of Anatomy, History of Anatomy, Anatomical terms, Positions, Planes& Axis, Movements, Epithelium – Classification, Tissue – Classification, and Applied anatomy.

MODULE 2: SKELETAL, ARTICULATORY AND MUSCULAR SYSTEM *(12 Periods)*

Skeletal system: Skeleton, Bone - Classification, Young bone, adult bone, Blood supply, Nerve supply, Ossification, Bones of – Head & Neck, Upper limb, Thorax, Vertebral column, Bony Pelvis, and Lower limb; Cartilage & its Types,

Articulatory system: Joint – Classification, Synovial joint, Joints of – Head & Neck, Upper limb, Thorax, Vertebral column, Pelvis, and Lower limb;

Muscular system: Muscle – Parts, Types, Structure, Architecture, Nomenclature, Nerve supply, Muscle action, Muscles of – Head & Neck, Upper limb, Thorax, Vertebral column, Pelvis, and Lower limb and Applied anatomy.

MODULE 3: CIRCULATORY SYSTEM, DIGESTIVE SYSTEM, AND RESPIRATORY SYSTEM *(12 Periods)*

Circulatory system: Circulation – Components, Types, Anastomoses, End – Arteries, Heart & Pericardium, Major blood vessels; Lymphatic system - Components, Major Lymphatic vessels; Lymphoid organs - Lymph node, Spleen, Thymus, and Palatine tonsil; Reticulo-Endothelial system, and Applied anatomy.

Digestive system: Oral cavity, Teeth, Tongue, Salivary glands, Pharynx, Oesophagus, Stomach, Small intestine – Duodenum, Jejunum, Ileum, Liver & Gall bladder, Extra-Hepatic Biliary Apparatus Pancreas, Large Intestine – Caecum, Appendix, Colon, Rectum & Anal canal and Applied anatomy.

Respiratory system: External Nose, Nasal cavity, Paranasal air sinuses, Nasopharynx, Oropharynx, Larynx, Trachea, Pleura, Lungs, Diaphragm, and Applied anatomy.

MODULE 4: URO-GENITAL AND ENDOCRINE SYSTEM *(12 Periods)*

Urinary system: Organs - Kidney, Ureter, Urinary bladder, and Urethra; Skin & Its Appendages - Thick skin, and Thin skin, Hair, and Nail.

Male reproductive system: Organs – Scrotal sac &Testis, Epididymis, Vas deferens, Seminal vesicle, Prostate, and Urethra.

Female reproductive system: Organs - Ovary, Uterus, Fallopian tube, Cervix, Vagina, and Mammary gland.

Exocrine glands: Salivary glands, Lacrimal gland, Pancreas, Liver, Mammary gland, Sweat and Sebaceous gland.

Endocrine glands: Hypothalamus, Pineal gland, Pituitary gland, Thyroid gland, Parathyroid gland, Pancreas, Adrenal gland, and Gonads.

MODULE 5: NERVOUS SYSTEM AND SENSE ORGANS (12 Periods)

Nervous system: Neuron, Neuroglia, Classification, Autonomic Nervous system; Brain - Cerebrum, Cerebellum, Basal Ganglia, Limbic system, Thalamus, Hypothalamus, Ventricles, Cerebro-Spinal fluid, and Spinal cord.

Sense organs: Tongue – Taste pathway, Nose – Olfactory pathway, Eye – Visual pathway, Ear – Auditory pathway.

Total Periods: 60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstration of anatomical terms, positions, planes, axis, movements, and tissues.
2. Demonstration of bones, joints, and muscles in human body.
3. Demonstration of heart, blood vessels, lymphoid organs, digestive system, and respiratory system in human body.
4. Demonstration of organs of urogenital system, and endocrine system in human body.
5. Demonstration of parts of nervous system, and sense organs in human body.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

BOOKS:

1. B.D Chaurasia's Human Anatomy-Regional and applied; CBS publishers, Vol 1,2,3,4 Edition 9, 2022.
2. Snell [Richard S], Clinical Anatomy for medical students, Edition 6, 2021
3. Inderbir Singh's, book of Anatomy, Vol 1,2 and 3, Edition 3, 2020
4. Inderbir Singh's Text book of Human Histology, Jaypee Publishers, Edition 10, 2022
5. Inderbir Singh's Text book of Human Embryology, Jaypee Publishers, Edition 12, 2022

REFERENCE BOOKS

1. A. k. Datta, Essentials of human anatomy; Current books international publishers; Volume: 1,2,3,4; Edition 10, 2019.
2. Richard Tunstall and Susan Standring, Gray's Anatomy - The anatomical basis of clinical practice, Elsevier publishers, Edition 42, 2020.
3. Rachel koshi, Cunningham's manual of practical Anatomy, Oxford University Press publishers, Volume - 1,2 and 3, Edition 16, 2017.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=UzPafAvoYH0.
2. https://www.youtube.com/watch?v=Nr6a7kqh4ZM
3. https://www.youtube.com/watch?v=bL_fg1St7Cg
4. https://www.youtube.com/watch?v=aV1cNPJAByo
5. https://www.youtube.com/watch?v=_l-NS4Q3bv0
6. https://www.youtube.com/watch?v=upqjWIElahs
7. https://www.youtube.com/watch?v=849IL6HSMd4
8. https://www.youtube.com/watch?v=mcmUWYzhdzA
9. https://www.youtube.com/watch?v=IvK-UGOI5ZQ
10. https://www.youtube.com/watch?v=-sDoYJOQMFw

WEB RESOURCES:

1. https://medicostimes.com/mbbs-first-year-books-pdf/
2. https://worldofmedicalsaviours.com/anatomy-books-pdf/
3. https://enarm.com.mx/catalogo/31.pdf
4. https://www.freebookcentre.net/medical_books_download/Clinical-Anatomy.html
5. https://www.academia.edu/42079859/ESSENTIAL_CLINICAL_ANATOMY
6. https://emedicodiary.com/book/view/47/kulkarni-clinical-anatomy-a-problem-solving-approach
7. https://textbookequity.org/Textbooks/anatomy+phys+vol2a.pdf
8. https://openstax.org/details/books/anatomy-and-physiology
9. https://www.pdfdrive.com/clinical-anatomy-books.html
10. https://www.goodreads.com/en/book/show/51790563

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT102007	**HUMAN PHYSIOLOGY**	4	1	2	-	6

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on Basic structure and detailed physiology of cell, body fluids, muscles, digestive system, respiratory system and renal system.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the basic concepts of cell physiology, haematology and nerve muscle physiology.

CO2. Analyse the various mechanisms of digestive and renal system.

CO3. Analyse various mechanisms of hormonal action.

CO4. Understand the concepts of cardiovascular and respiratory physiology.

CO5. Understand the nervous physiology and its significance.

CO6. Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	2	-	-	-	-	-	-
CO2	3	-	-	1	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-
CO5	3	2	-	2	-	-	-	-	-	-
CO6	3	-	-	-	-	-	3	3	-	3
Course Correlation Mapping	**3**	**2**	**-**	**2**	**-**	**-**	**3**	**3**	**-**	**3**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

MODULE 1: GENERAL PHYSIOLOGY, BLOOD AND NERVE MUSCULE PHYSIOLOGY ***(12 Periods)***

Concept of Homeostasis, Cell structure and functions, Transports across membranes, Body fluid volumes, compartments and composition, Blood composition and functions, Plasma proteins – Types and functions, Erythrocytes – functions, Erythropoiesis ,anaemia's, Leucocytes – classification and functions, Platelets – morphology and functions, Blood coagulation – Mechanism and name of anticoagulants, Blood groups – Basis of ABO & Rh grouping, Erythroblastosis Fetalis. Muscles – Classification & structure of striated, non-striated &cardiac muscle, Neuromuscular junction& Transmission, Mechanism of skeletal muscle contraction

MODULE 2: DIGESTIVE SYSTEM AND EXCRETORY SYSTEM ***(12 Periods)***

Salivary glands, functions of saliva, Parts of stomach, composition & functions of gastric juice, Pancreatic Juice – composition &functions, Bile – composition & functions of bile &bile salts, Functions of Small intestine &large intestine, Kidney: Basic physiological anatomy (Including JGA), Nephron : structure, types and functions, Formation of urine –GFR, Reabsorption &secretion, Micturition Reflex, Dialysis – Principle, types, Structure & Functions of skin.

MODULE 3: ENDOCRINE SYSTEM AND REPRODUCTIVE SYSTEM ***(12 Periods)***

Hypothalamo-hypophyseal interrelationship, Posterior pituitary hormones and its actions, Anterior pituitary hormones, Growth hormone –Actions ,Dwarfism, gigantism, acromegaly, Thyroid hormones –Actions, Cretinism, Myxoedema, Grave's disease (clinical features), Parathyroid hormones – Functions, Tetany, Insulin, Glucagon's – Actions, Diabetes mellitus, Adrenal medullary hormones &their actions, Adrenal cortex hormones & their actions., Male reproductive organs – Spermatogenesis, Testosterone actions, Female reproductive organs – menstrual cycle (endometrial and ovarian cycles) and its hormonal control, Contraceptive methods in male and female

MODULE 4: RESPIRATORY AND CARDIOVASCULAR SYSTEM ***(12 Periods)***

Basic physiological anatomy, Surfactant, Mechanics of respiration, Oxygen transport, Carbon-di-oxide transport, Nervous and chemical regulation, Pulmonary function tests, Basic physiological anatomy, innervations of heart, ECG – normal waves, intervals and their significance, Cardiac cycle – mechanical events, Heart sounds, Blood pressure – Definition, measurement, normal values, factors maintaining BP Regulation.

MODULE 5: NERVOUS SYSTEM AND SPECIAL SENSES ***(12 Periods)***

Structure of neuron, neuroglial cells, synapse and transmission across it, Reflex – Components of reflex arc, examples, Functions of ascending tracts – anterior, lateral spino-thalamic tracts, Dorsal column, Functions of Cortico-spinal (Pyramidal) tract-Descending tract, Functional areas of cerebral cortex, Functions of basal ganglia, thalamus, hypothalamus, limbic system and cerebellum, Receptors for various special senses.

Total Periods: 60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Study of Microscope and its uses
2. Collection of blood sample
3. Determination of RBC count
4. Determination of WBC count
5. Differential leukocyte count
6. Estimation of haemoglobin
7. Determination of blood groups
8. Determination of bleeding time clotting time
9. Determination of ESR
10. Determination of PCV
11. Clinical Examination of cardiovascular system
12. Clinical examination of reflexes
13. Clinical examination respiratory system
14. Determination of Pulse
15. Demonstration of Blood Pressure

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES BOOKS

1. Guyton & Hall, Text book of Medical Physiology, Saunders publisher, Edition 13, 2015.
2. K Sembulingam, Essentials of Medical Physiology, Jaypee Medical Publishers, Edition 9, 2022.
3. G.K. Pal and G.K Pravati, Textbook of Practical Physiology, Orient Longman, Edition 1, 2003

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=xyhbIPSLBsA
2. https://www.youtube.com/watch?v=0f9p9JX4qJk
3. youtube.com/watch?v=JZhJI6rfFzg

WEB RESOURCES:

1. https://books.google.co.in/books?id=CcJvIiesqp8C&lpg=PP1&pg=PP1#v=twopage&q&f=false
2. https://books.google.co.in/books?id=KNpN_jvbmAIC&lpg=PP1&pg=PP1#v=onepage&q&f=false

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT101004	**NATIONAL HEALTH CARE DELIVERY SYSTEM**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on Health care system, AYUSH, vital events of life and epidemiology in India.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understand the basic concepts in health care delivery system.

CO2 Acquire knowledge on various AYUSH systems.

CO3 Analyse the Vital events of life and its impact on demography.

CO4 Understand the principles and methods of epidemiology.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	1	-		-	-	-
CO2	3	1	-	-	2	-	1	-	-	-
CO3	3	2	-	-	1	-	1	-	-	-
CO4	3	-	-	-	1	-		-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**-**	**1**	**-**	**1**	**-**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

MODULE 1: NATIONAL HEALTHCARE DELIVERY SYSTEM *(07 Periods)*

Healthcare delivery system in India at primary, secondary and tertiary care Community participation in healthcare delivery system, Health system in developed countries, Private Sector

MODULE 2: AYUSH SYSTEM OF MEDICINE *(08 Periods)*

Introduction to Ayurveda, Naturopathy, Unani, Siddha, Homeopathy, Need COURSE for integration of various system of medicine.

MODULE 3: DEMOGRAPHY AND VITAL STATISTICS *(07 Periods)*

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

MODULE 4: NATIONAL HEALTH POLICIES *(08 Periods)*

National Health Mission, National Health Policy Issues in Health Care Delivery System in India achievements and constraints in various National Heath Programme. National Health Programme-Background objectives, action plan, targets, operations,

Total Periods: 30

EXPERIENTIAL LEARNING

1. Demonstration of various levels of health care system.
2. Presentation of health care programs.
3. Illustration on ayush system of medicine and it's practice.
4. A clinical overview on demography and vital statistics.
5. A clinical based epidemiological study and survey of communicable and non-communicable diseases.

Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

BOOKS:

1. Francis, Hospital Care Management, Jones & Bartleft Learning, Edition 4, 2019.
2. Sharon B .Buchbinder, Introduction to Health Care Management, Jones & Bartleft Learning, Edition 2, 2011.
3. Fandis S, Health Service Management, Analysis& Management, Wasworth publishing, Edition 2, 2019.

VIDEO LECTURES:

1. https://youtu.be/It_cV56Dxtk
2. https://youtu.be/VIrdH_3RKKk

WEB RESOURCES:

1. https://library.medschl.cam.ac.uk/e-books/
2. https://www.ncbi.nlm.nih.gov/

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22DF102003	**MEDICAL BIOCHEMISTRY**	3	-	2	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on basic concepts of Biochemistry and understand the structural, functional and metabolic properties of biomolecules.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the Basic knowledge of carbohydrates and lipids and its metabolisms

CO2. Acquire basic knowledge on proteins and DNA structure

CO3. Analyse the functional and structural concepts of Vitamins and Minerals

CO4. Analyze different types of enzymes and nutrients

CO5. Understand the nature and types of Acid base Balance and Clinical Chemistry

CO6. Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	1	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	1	-	-	-	-
CO4	3	2	-	2	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-
CO6	3	-	-	1	-	-	-	-	-	2
Course Correlation Mapping	**3**	**2**	**-**	**1**	**-**	**1**	**-**	**-**	**-**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

MODULE 1 CARBOHYDRATE AND LIPIDS *(12 Periods)*

Introduction, Cell structure, Cell membrane structure and function, Carbohydrate Chemistry – Definition, general classification with examples, Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides. Metabolism of carbohydrates Lipid Chemistry – Definition, general classification and functions of Lipids, Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol, Essential fatty acids and their importance, Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies. Metabolism of lipids.

MODULE 2: PROTEINS AND NUCLEIC ACID *(10 Periods)*

Amino-acid Chemistry – Amino acid chemistry: Definition, Classification, Peptide bonds, Peptides: Definition, biologically important peptides, Protein chemistry: Definition, Classification, Functions of proteins, properties and structure of proteins. Metabolisms Proteins. Nucleotide and Nucleic acid Chemistry - Nucleic acids: Purines and pyrimidine-Structure of DNA – Watson & Crick model of DNA Structure of RNA – Types of RNA

MODULE 3: VITAMINS AND MINERALS *(10 Periods)*

Fat soluble vitamins(A,D,E,K) – Water soluble vitamins – B-complex vitamins. Definition, classification - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity. Mineral -Definition, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorder of Individual minerals - Calcium, phosphate, iron, Magnesium, fluoride, selenium, molybdenum, copper.

MODULE 4: ENZYMES AND NUTRITION *(08 Periods)*

Enzymes – Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. Classification with examples, Factors effecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymology (clinical significance of enzymes) Nutrition – Introduction, Importance of nutrition Calorific values, Respiratory quotient Definition, and its significance Energy requirement of a person - Basal metabolic rate: Definition, Normal values, factor affecting BMR Special dynamic action of food. Balanced diet, Nutritional disorders. Marasmus – Kwasoirkar

MODULE 5: ACID BASE BALANCE AND CLINICAL CHEMISTRY *(05 Periods)*

Acid-Base balance – Definition of Acids, bases and buffers, pH. Buffer systems of the body, bicarbonate buffer system Role of lungs and kidneys in acid base balance, Acid base imbalance. Clinical Biochemistry - Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

QUALITATIVE TESTS OF MONOSACCHARIDES (GLUCOSE AND FRUCTOSE)

1. Molisch's test
2. Fehling's test
3. Benedict's test
4. Seliwanoff's test

QUALITATIVE TESTS OF LIPIDS

5. *Solubility tests*
6. *Emulsification tests*
7. *Saponification tests*

QUALITATIVE TESTS OF PROTEINS

8. Isoelectric precipitation tests
9. Heat coagulation tests

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

TEXT BOOKS:

1. U. Satyanarayana, U. Chakrapani, Biochemistry, Elsevier, Edition 3, 2020.
2. Vasudevan DM, Textbook of Biochemistry for Medical Students, Jaypee Brothers Medical Publishers, Edition 1, 2019
3. Indumati V, Sowbhagya Lakshmi, Integrated Textbook of Biochemistry, Paras Medical Publishers, Edition 1, 2021.
4. Naik Pankaja, Essentials of Biochemistry, Jaypee Brothers Medical Publishers, 3rd Edition, 2017.
5. Agrawal Poonam, Concepts In Biochemistry With Clinical Approach For Undergraduate Medical Students, CBS Publishers & Distributors Pvt Ltd, Edition 1, 2020.

REFERENCE BOOKS:

1. MN Chatterjee and Rana Shinde, Textbook of Medical Biochemistry, JPB, Edition 8, 2012.
2. Denise R Ferrier, Lippincott's Illustrated Reviews Biochemistry, Lippincot Williams and Wilkins, Edition 7, 2016
3. Prasad R Manjeshwar, Textbook of Biochemistry for Physiotherapy Students, Sheetal Distributors, Edition 1, 2020.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=F59RwK9hya8
2. https://www.youtube.com/watch?v=OKLxwCdkBn8
3. https://www.youtube.com/watch?v=jcz99_-JcZ8

WEB RESOURCES:

1. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/medicalbiochemistry.pdf
2. https://www.qmul.ac.uk/library/media/library/using-the-library/media-folder-images-library/Principles-Of-Biochemistry-Introductory-Series.pdf
3. https://rajneeshrajoria.weebly.com/uploads/4/9/0/6/49069889/biochemistry_bicm101.pdf

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22RT101001	**FUNDAMENTALS OF MEDICAL PHYSICS AND ELECTRONICS**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on Semiconductors, digital and analog circuit, lesser and optical fibers, electricity and electromagnetism.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Acquire knowledge about the semiconductor materials.

CO2. Analyze analog and digital components, sensors and output actuators to assemble simple electrical systems.

CO3. Acquire adequate knowledge about Medical applications of Lasers.

CO4. Understand concepts of electric and magnetic fields

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-		2	-	-	-	-	-	-
CO2	3	-	-	2	-	-	-	-	-	-
CO3	3	-	-	2	-	-	-	-	-	-
CO4	3	-	-	2	-	-	-	-	-	-
Course Correlation Mapping	**3**	-	-	**2**	-	-	-	-	-	-

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

MODULE 1: INTRODUCTION TO SEMICONDUCTORS ***(10 Periods)***

Electronics Introduction to Semiconductors- Extrinsic and Intrinsic Semiconductors- Formation of p-n Junction, p-n Junction diode-Half wave and Full wave rectifiers using diodes, Efficiency: Bipolar Junction Transistor-Forward and reverse bias characteristics.

MODULE2: INTRODUCTION TO DIGITAL AND ANALOG CIRCUITS ***(10 Periods)***

Digital Fundamentals: Logic gates, Universal gates, Laws of Boolean Algebra, De Morgan's Theorem, Sum of products and product of sums. Operational Amplifiers: Op-Amp Definition, Op-Amp characteristics, differential and Common mode operation, Inverting & Non-Inverting Amplifier and Op-Amp applications.

MODULE 3: INTRODUCTION TO LASERS AND OPTICAL FIBERS ***(10 Periods)***

LASERS: Introduction, Characteristics of Laser, Absorption, Spontaneous and Stimulated emissions, Population and Population inversion, Laser pumping, Lasing action, Types of laser: Nd-YAG Laser and Semiconductor laser (Construction, working and advantages), Lasers in Medical Application (Ophthalmology, Gastroenterology, Dermatology and Urology). OPTICAL FIBERS: Introduction, Basic Principles and structure of optical fibers, acceptance angle and numerical aperture, Types of optical fibers (Qualitative), Applications of optical fibers in Medical industry.

MODULE 4: INTRODUCTION TO ELECTRICITY ***(10 Periods)***

Electricity & Electromagnetism - Electric charge- Conductors and insulators- Coulomb`s law- Electric field-Electric lines of force properties of lines of force- Electric field strength-Capacity- Units of capacity- Potential energy of a charged conductor-Principle of a condenser- Capacity of a parallel plate condenser-Electric current and its units- Potential difference-Electromotive Force-Ohm’s law.

MODULE 5: INTRODUCTION TO ELECTROMAGNETISM ***(05 Periods)***

Magnetic Field and Magnetic Induction-Magnetic Flux-Direction of Magnetic Field and Current - Ampere’s Law-Application of Ampere’s Law. Electromagnetic induction, laws of mutual induction and self-induction.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Use simulation tools to design and analyze p-n junction diodes, half wave, and full wave rectifiers.
2. Design and implement simple digital circuits
3. With a case study, elaborate the importance of operational amplifier in the medical equipment.
4. Construct a simple circuit with a battery, wires, and resistors. Measure current, voltage, and resistance using multimeters and observe the relationship between them.

RESOURCES

TEXT BOOKS:

1. S. Salivahanan, N. Sureshkumar, Electronic Devices and Circuits, McGraw Hill, Edition 3, 2012.
2. Jacob Millman and D. Halkias, Integrated Electronics Analog Digital Circuits, McGraw Hill, Edition 1, 1977.
3. EKannatey-Asibu,y, Principles of Laser Materials Processing, Wiley Publication, Edition 3, 2023.

REFERENCE BOOKS:

1. BL Theraja, Principles of Electronic Devices & Circuits: Analog and Digital, Schand Publications, Revised Edition, 2005.
2. John Dirk Walecka, Introduction to Electricity and Magnetism, World Scientific Publishing Co Pte Ltd, Edition 1, 2014.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=JA3sCmrv11M&list=PLgMDNELGJ1CaNcuuQv9xN07ZWkXE-wCGP&index=2
2. https://www.youtube.com/watch?v=WgWozOgMXKo&list=PLp6ek2hDcoNCj_QQA2CmW1JIHAm5aD7o_&index=2
3. https://www.youtube.com/watch?v=x1-SibwIPM4&list=PLyQSN7X0ro2314mKyUiOILaOC2hk6Pc3j&index=2

WEB RESOURCES:

1. https://ncert.nic.in/ncerts/l/leph206.pdf
2. https://www.sitams.org/assets/pages/hands/material/AP/unit-II%20Lasers%20and%20Fibre%20Optics.pdf
3. https://www.careerlauncher.com/cbse-ncert/images/revision/class-XII/physics.pdf

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC101004	**BASICS IN DIALYSIS TECHNOLOGY**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on basic concepts and technology used in the dialysis department. This course also to practice independently on dialyzer extracorporeal blood circuit priming and setting up the machine for dialysis procedure.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the basic concepts of Dialysis

CO2. Ability to perform the vascular accesses for Dialysis

CO3. Acquire knowledge on Dialysis Instruments

CO4. Understand the peritoneal Dialysis

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	3	-	-	2	-	3	-
CO2	3	-	-	3	-	1	-	-	-	-
CO3	3	-	-	3	-	1	3	-	-	-
CO4	3	-	-	2	-	-	-	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**3**	**-**	**1**	**2**	**-**	**3**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

MODULE 1: INTRODUCTION TO DIALYSIS *(08 Periods)*

History of Dialysis, indications of dialysis, Basic chemistry of body fluids and electrolytes balance, Dialysis Team-rights-responsibilities-patient doctor relationship, different Types of dialysis, Principles of Dialysis, quantification of adequacy.

MODULE 2: VASCULAR ACCESS FOR HAEMODIALYSIS *(08 Periods)*

History, types of access, temporary and permanent, fistula, sinus, Access care, Vascular Access complications management, Vascular access recirculation, Types of vascular access for haemodialysis. Vascular access infections.

MODULE 3: EQUIPMENT USED FOR DIALYSIS *(10 Periods)*

History of Haemodialysis, Haemodialysis equipment, Dialyzer and its types and mechanism of dialyzer, working principles, dialyzer membrane, composition of dialysate, methods and complications of dialyzer re-use, Tubing for the transport of blood and dialysis solution. Complications of Haemodialysis– Acute & chronic Complications of Haemodialysis

MODULE 4: GENERAL ASPECTS IN DIALYSIS TECHNOLOGY *(09 Periods)*

Infection control and universal precautions in dialysis department, psychosocial aspects of dialysis, roles and responsibilities of dialysis technologist, behavior of technologist with patients and attendees. Dialysis patient management in different wards. Preparation and positioning of patient for dialysis, Patient Assessment – Pre, intra & post dialysis & Machine and patient monitoring during Hemodialysis Diet management for dialysis patient

MODULE 5: INTRODUCTION TO PERITONEAL DIALYSIS *(10 Periods)*

History, definition, Anatomy of peritoneum, models of peritoneal transport, physiology of peritoneal transport, Fluid absorption, Clinical assessment and implications of peritoneal transport, Residual renal function.PD – Transport kinetics, ultrafiltration, UF, Intermittent PD, Continuous Ambulatory Peritoneal Dialysis, Automated Peritoneal Dialysis. Infectious and non-infectious complications of PD Introduction to complications in peritoneal dialysis.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS

1. Setting up dialysis machine for dialysis.
2. AV cannulation
3. A V fistula/A V graft cannulation
4. Initiation of dialysis through central venous catheters like internal jugular, femoral & subclavian vein.
5. Packing & sterilization of dialysis trays
6. Reuse of dialysis apparatus
7. Isolated ultra filtration
8. Performance of dialysis exchange manually
9. First assistant in minor procedures

RESOURCES

TEXT BOOKS:

1. Pranaw Kumar Jha, Vijay Kher, Manual of Nephrology, Jaypee Brothers Medical Publishers, Edition 6, 2018
2. Dr Jigar Shrimali, Textbook of Dialysis therapy, Notion Press, Edition 1, 2018.
3. Gokal, Ram, Textbook of peritoneal dialysis, Springer Science & Business Media, Valum 1, 2013.

REFERENCE BOOKS:

1. Allen R. Nissenson, Handbook of Dialysis Therapy, Elsevier Health Scieces, Edition 6, 2022
2. Hidetomo Nakamoto, Recent Advances in Dialysis Therapy in Japan (Contributions to Nephrology), S Karger Ag Publishers, Edition 1, 2018.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=Z_ZcDE-PTgI
2. https://www.youtube.com/watch?v=EU2skU3bgS8
3. https://www.youtube.com/watch?v=HbC0eUWg_sY

WEB RESOURCES:

1. https://www.nsdcindia.org/scmp/assets/image/494650646-Preview_DIALYSIS_TECHNICIAN.pdf
2. https://dialysistech.net/images/stories/files/Basic-Dialysis-Theory-Sweeny.pdf
3. https://www.studocu.com/in/document/kerala-university-of-health-sciences/bsc-nursing/8-dialysis-lecture-notes/43842887

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22LG101402	తెలుగు	2	-	-	-	2

Pre-Requisite -
Anti-Requisite -
Co-Requisite -

COURSE DESCRIPTION: తుమ్మల సీతారామమూర్తి-**ఎక్కట్లు,** తిక్కన-**నాడీజంఘోపాఖ్యానం,** పోతన-**ధ్రువోపాఖ్యానం,** దువ్వూరి రామిరెడ్డి - **కృషీ వలుడు, మరియు తెలుగు వ్యాకరణం మీద అవగాహన.**

COURSE OUTCOMES: కోర్సు విజయవంతంగా పూర్తిచేసిన తర్వాత ,విద్యార్థులు వీటిని చేయగలరు:

CO1. విద్యార్థులలో మానవీయ విలువలు పెరిగి నైతిక వలువలతో జీవించడం

CO2. సమాజంలో మనకు చేతనైన సాయం చెయ్యడం ప్రతి మనిషి బాధ్యత అనే సందేశం

CO3. త్రికరణ శుద్ధితో కృషి చేస్తే ఏదైనా సాధించ వచ్చు అనే సందేశం

CO4. వ్యవసాయ రంగం గూర్చి విద్యార్థులలో అవగాహన కలగడం

CO5. తెలుగు వ్యాకరణం

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-
CO4	3	-	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

పాఠ్య ప్రణాళిక

Module 1: **ఎక్కట్లు** – తుమ్మల సీతారామమూర్తి ***(06 Periods)***

సత్ప్రవర్తన, సచ్ఛీలత, సన్మార్గం, సమసమానత్వం గూర్చి వివరించడం.

Module 2: **నాడీజంఘోపాఖ్యానం** – తిక్కన ***(06 Periods)***

సహాయం చేసినివారిని మరచి పోరాదు. చేసిన మేలు మరచిన వారి జీవితం ఎంత హీనంగా ఉంటుందో తెలియజేయడం.

Module 3: **ధ్రువోపాఖ్యానం** – పోతన ***(06 Periods)***

ఎటువంటి కష్టాలకు సమస్యలకు కుంగి పోకుండా దీక్షతో పట్టుదలతో కృషితో అనుకున్నది సాధించాలని తెలియజేయడం.

Module 4: **కృషీ వలుడు** – దువ్వూరి రామిరెడ్డి ***(06 Periods)***

సమాజానికి వెన్నెముక అయిన రైతు యొక్క కష్టాలను త్యాగాలను వివరించడం.

Module 5: **సంధులు, సమాసాలు, అలంకారాలు.** ***(06 Periods)***

తెలుగు భాష యొక్క మూలాలను తెలుసుకోవడం.

Total Periods: 30

RESOURCES

TEXT BOOKS:

1. **ఎక్కట్లు – కవి తుమ్మల సీతారామమూర్తి చౌదరి.**
2. **నాడీజంఘోపాఖ్యానం – కవి తిక్కన. (మహాభారతం – శాంతి పర్వం – తృతీయా శ్వాసం – 472 నుండి 511 పద్యాల** వరకు).
3. **ధ్రువోపాఖ్యానం** – కవి పోతన (ఆంధ్ర మాహాభాగవతం – చతుర్థ స్కంధం – 216 నుండి 277 పద్యాల వరకు)
4. కృషీ వలుడు – కవి దువ్వూరి రామిరెడ్డి

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=5jX20h6HWzg
2. https://www.youtube.com/watch?v=FFtPSPByBmk
3. https://www.youtube.com/watch?v=nQHF_pgTfL8
4. https://www.youtube.com/watch?v=IEERKL3Q2Cs

Web Resources:

1. http://teluguvignanamvinodam1.blogspot.com/2021/06/maha-bharatam-in-telugu-pdf-free-download_25.html
2. https://www.freegurukul.org/blog/ramayanam-pdf/

EXPERIENTIAL LEARNING

The experiential learning components will be detailed in CHO.

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC102003	**APPLIED ANATOMY AND PHYSIOLOGY RELATED TO DIALYSIS TECHNOLOGY**	3	-	2	-	4

Pre-Requisite 22PT102006 Human Anatomy
22PT102007 Human Physiology

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: An Outline of Renal Anatomy and Physiology will be provided to improve the students understanding of Technical and Diagnostic procedures used with Special emphasis on Applied aspects. Develop in depth knowledge on Anatomy and Physiology of Renal system.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Explain the structure and development of renal system.

CO2. Understand the vascular supply of renal system.

CO3. Learn the various steps involved in urine formation.

CO4. Gain the knowledge of Metabolic and Endocrine functions of kidney and bladder disorder

CO5. Proficiency on the investigations in the overall Renal disorder.

CO6. Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	-	-	-	-	-	-	3	-
CO2	3	1	-	-	-	-	-	-	-	1
CO3	3	1	1	-	-	-	-	-	-	1
CO4	3	-	-	-	-	3	1	-	-	-
CO5	3	-	-	2	-	-	-	-	-	-
CO6	3	1	-	1	-	-	2	-	-	-
Course Correlation Mapping	**3**	**1**	**1**	**2**	**-**	**3**	**2**	**-**	**3**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: STRUCTURES OF EXCRETORY SYSTEM ***(07 periods)***

Structure of kidney, Ureter, Urinary Bladder and Nephron, Embryology of Kidney, Histology of Kidney

Module 2: VASCULAR SUPPLY OF EXCRETORY SYSTEM ***(08 Periods)***

Renal artery & Renal vein, Jugular vein, Subclavian vein, Femoral vein, Artery & Veins used for creation of AV Fistula, Innervations of Kidney and Urinary Bladder, Peritoneum in general

Module 3: MECHANISM OF URINE FORMATION ***(07 periods)***

Mechanism of Urine formation: Filtration, Reabsorption, Concentration, Dilution and Acidification

Module 4: FUNCTIONS OF EXCRETORY SYSTEM ***(08 periods)***

Excretory and Regulatory functions of kidney, Metabolic and Endocrine functions of kidney, Physiology of Micturition, Types of Bladder dysfunction, Renal function Test

Module 5: REGULATORY FUNCTIONS OF EXCRETORY SYSTEM ***(15 periods)***

Role of Kidney in Blood Pressure regulation in health and diseases, Mechanism of Blood formation and regulation, Role of Kidney in Bone formation, Role of Kidney in Acid – Base balance, Other Endocrine functions of the Kidney, Body fluids and Electrolytes & their regulation in health and diseases, Disorders of Water Metabolism (Potassium, Sodium, Phosphate, Calcium), Role of Peritoneum in Peritoneal Dialysis.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstration of anatomical terms, positions, planes, axis, movements, and tissues.
2. Observation of physiology of Mechanism of Urine formation.
3. Demonstration of Renal related blood vessels in Excretory system in human body.
4. Demonstration of Functions of Excretory system.
5. Demonstration of organs of urogenital system in human body.

RESOURCES

TEXT BOOKS:

1. Anatomy and Physiology in Health and Illness – Ross and Wilson, 12th Edition, Elsevier Health Sciences, 2014.
2. Fundamentals of Medical Physiology - L.Prakasam Reddy, 5th Edition, Paras Medical Publishers,
3. Human Anatomy – B D Chaurasia, 6th Edition, CBS, 2013

REFERENCE BOOKS:

1. K. Sembulingam, Essentials of Medical Physiology, Jaypee brothers Medical publishers, Edition 6, 2019.
2. Guyton and Hall, Text Book of Medical Physiology, Saunders Publications, Edition 12, 2010.
3. Brenner and Rector's, The Kidney, Elsevier Health Sciences, Edition 9, 2012

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=_bDatJxhfkQ
2. https://www.youtube.com/watch?v=9iMhc2OU-go
3. https://www.youtube.com/watch?v=sQTrPIwtWaw
4. https://www.youtube.com/watch?v=aV1cNPJAByo
5. https://www.youtube.com/watch?v=_l-NS4Q3bv0
6. https://www.youtube.com/watch?v=upqjWIElahs

WEB RESOURCES:

1. https://medlineplus.gov/metabolicdisorders.html
2. https://www.pacehospital.com/kidney-biopsy-indications-preparation-and-procedure
3. https://www.sciencedirect.com/science/article/abs/pii/B9780723609162500228
4. https://blog.ipleaders.in/medical-laws-conflict-ethic
5. https://www.gponline.com/medico-legal-importance-good-records/article/89
6. https://openmd.com/guide/medical-terminology

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC101009	**CONCEPTS OF DISEASE RELATED TO DIALYSIS TECHNOLOGY – I**	5	1		-	6

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: An outline of concepts of various Kidney Diseases will be provided to improve the students in-depth understanding of the causes, pathophysiology, diagnosis and management used with special emphasis on applied aspects and also assists in disease diagnosis, based on observed changes in tissue structure or biochemistry, while the focus of investigative pathology is the elucidation of the underlying mechanisms related to tissue injury and disease processes.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Extend the knowledge on Glomerular Diseases.

CO2. Learn the various basic pathological conditions of kidney disease.

CO3. Understand concept of the Acid– Base, fluids and Electrolyte Disorders.

CO4. Understanding on Systemic diseases and its Nutritional Management.

CO5. Gain the therapeutic approach for the management of Congenital & inherited renal diseases.

CO6. Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	-	-	-	-	-	-	3	-
CO2	3	1	3	-	-	-	-	-	-	1
CO3	3	1	-	-	-	-	-	-	-	1
CO4	3	-	-	-	-	3	1	-	-	-
CO5	3	-	-	-	-	-	-	-	-	-
CO6	3	-	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**3**	**1**	**-**	**3**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: GLOMERULAR DISEASES ***(20 periods)***

Primary glomerular Diseases- Acute GN, Rapidly progressive GN, Minimal change disease, Membranous GN, Membrano – proliferative GN ,Focal proliferative GN ,Focal segmental glomerulosclerosis, IgA nephropathy, Chronic glomerulonephritis., Secondary glomerular Diseases- Lupus nephritis (SLE), Diabetic nephropathy, Amyloidosis, Polyarteritis nodosa, Wegener's granulomatosis, Goodpasture's syndrome, Henoch – Schoenlein purpura, Systemic infectious diseases, Post Infectious Glomerulonephritis.

Module 2: BASIC RENAL DISORDERS ***(15 Periods)***

Acute Renal Failure-Definition, etiology, pathophysiology of each type, medical and surgical management, Chronic Renal Failure – Chronic Kidney Disease (CKD)-Definition, etiology, pathophysiology of each type, medical and surgical management.Diabetic Nephropathy, Epidemiology, Pathogenesis, Diagnosis, Management, Prevention.

Module 3: ACID– BASE, FLUIDS AND ELECTROLYTE DISORDERS ***(10 periods)***

Metabolic Acidosis, Metabolic Alkalosis & Respiratory Acidosis, Respiratory Alkalosis, Disorders Of Sodium, Disorders Of Potassium Metabolism, Disorders Of Calcium And Phosphorus Homeostasis Edema and The Clinical Use Of Diuretics.

Module 4: SYSTEMIC DISEASES &NUTRITIONAL MANAGEMENT ***(15 periods)***

Renal function in Congestive heart failure, Renal function in Liver diseases, Renal involvement in Systemic vasculitis, Renal manifestations in SLE and Rheumatic disorders., Dietary management in diabetes, Dietary management in hypertension. Dietary management in cardiovascular diseases. Dietary management in renal diseases., Planning of diets, Need for planning of diet Concepts of balanced diet, Food groups and balanced diet, Influence of age, sex, occupation & physiological state, Recommended dietary intake, Steps in planning balanced diet, Concepts of balanced diet for dialysis patients, Recommended dietary intake for dialysis patients, Planning diet for dialysis patients, Steps in planning balanced diet for dialysis patients.

Module 5: CONGENITAL & INHERITED RENAL DISEASES ***(15 periods)***

Congenital & inherited renal diseases- polycystic kidney disease (Autosomal dominant polycystic kidney disease (ADPKD) and Autosomal recessive polycystic kidney disease (ARPKD), Alport syndrome, Hydronephrosis, Pyelonephritis, Renal agenesis, Renal hypoplasia, Renal dysplasia , Horseshoe kidney. Tumors of kidney, Pregnancy associated renal diseases, Renal vascular disorders & hypertension associated renal diseases.

Total Periods: 75

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Understanding of inculcate knowledge on various pathological conditions.
2. Understanding of Renal diseases and disorders.
3. Observation and understanding of diagnosis of renal diseases.
4. Demonstration of therapeutic techniques in dialysis patients.
5. Demonstrate the competency in handling patients with Renal disorders

RESOURCES

TEXT BOOKS:

1. Robbins, Basic Pathology, Saunders publications, Edition 9, 2012.
2. Greenberg, Primer on Kidney diseases, Elsevier Health Sciences, Edition 5, 2009.

REFERENCE BOOKS:

1. Harsh Mohan, Textbook of Pathology, Jaypee Brothers Medical Publishers, Edition 7, 2014.
2. K. Mandal and Stanley, Kidney Diseases in Primary Care, Dorrance Publishing Co, Edition 3, 2008.
3. Brain R Walker, Davidson's Principle and Practice of Medicine, Churchill Livingston, Edition 22, 2014.
4. David Goldsmith, ABC of Kidney Diseases, BMJ books, Edition 22, 2011.

VIDEO LECTURES:

1. https://www.niddk.nih.gov/health-information/kidney-disease/glomerular-disease
2. https://www.msdmanuals.com/home/kidney-and-urinary-tract-disorders/kidney-filtering-disorders/glomerulonephritis
3. https://www.msdmanuals.com/en-in/professional/genitourinary-disorders/acute-kidney-injury/acute-kidney-injury-aki

WEB RESOURCES:

1. https://medlineplus.gov/metabolicdisorders.html
2. https://www.pacehospital.com/kidney-biopsy-indications-preparation-and-procedure
3. https://www.sciencedirect.com/science/article/abs/pii/B9780723609162500228

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC101006	**BASIC PHARMACOLOGY AND DRUG ADMINISTRATION**	3	-		-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: The Course will cover General Pharmacology with Special Emphasis on common drugs used, Route of Administration, Type of formulations, Dose and frequency of administration, Side effects and Toxicity, Management of Toxic effects, Drug interactions, Knowledge of chemical and trade names, Importance of Manufacturing and expiry dates and instruction about handling each drug.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Acquire knowledge on principles of basic pharmacology.

CO2. Understand the General considerations of Cholinergic Drugs

CO3. Gain knowledge on anesthetic and Analgesics drugs.

CO4. Identify the mechanism of various drugs related to Cardiovascular& Respiratory system.

CO5. Learn about various drugs related to microbial infections and other diseases

CO6. Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	3	1	-	-	-
CO2	3	1	-	-	-	-	-	-	-	-
CO3	3	1	3	-	-	-	-	-	-	-
CO4	2	1	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	3	1	-	-	-
CO6	3	-	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**3**	**1**	**-**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION ***(10 periods)***

General pharmacological principles - Definition - Routes of drug administration Pharmacokinetics, Pharmacodynamics - Adverse drug effects, Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system.

Module 2: CHOLINERGIC DRUGS ***(05 Periods)***

General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs.

Module 3: ANAESTHETICS & ANALGESICS ***(10 periods)***

Skeletal muscle relaxants-Local anaesthetics, General anaesthetics-Ethyl & Methyl alcohol-Sedatives - Hypnotics- Antiepileptics - Drugs used in mental illness - Opioid analgesics and Non opioid Analgesics - Nonsteroidal Anti inflammatory drugs.

Module 4: CARDIOVASCULAR & RESPIRATORY DRUGS ***(10 periods)***

Cardiovascular drugs - Cardiac glycosides, Antiarrhythmic drugs, Antianginal drugs, Antihypertensives and Diuretics, Erythropoietin, Drugs affecting-coagulation, Fibrinolytic and Antiplatelet drugs, Treatment of cough and Antiasthmatic drugs. Drugs on Respiratory system.

Module 5: ANTIMICROBIAL AND OTHER DRUGS ***(10 periods)***

General consideration-Antibiotics-Antibacterial agents- -Antifungal- -Antiviral- Antiseptic-Disinfectant-.Corticosteroids, Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting, Constipation, Diarrhoea and Treatment of peptic ulcer, Vitamins, Vaccines.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Understanding of inculcate knowledge on various drugs.
2. Understanding the terminologies and basic principles of pharmacokinetic.
3. Observation and understanding the pharmacological action and mechanism of action of common drugs used for different disease conditions.
4. Understanding therapeutic uses and adverse effects of common drugs.
5. Demonstrate the intended to discuss the various modalities of drug delivery and instruments.

RESOURCES

TEXT BOOKS:

1. Tara V Shanbag, Pharmacology: Prep Manual for Undergraduates, Elsevier Publications, Edition 2, 2012.
2. Padmaja Uday kumar, Pharmacology for Dental and Allied Health Sciences, Jaypee Brothers Medical Publishers, Edition 4, 2016.

REFERENCE BOOKS:

1. KD Tripathi, Essentials of Medical Pharmacology, Jaypee Brothers Medical Publishers, Edition 8, 2018.
2. R S Sataskar, Pharmacology and Pharmacotherapeutics, Popular Prakashan Ltd, Edition 21, 2015.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=LLv29S7Hm3U
2. https://www.youtube.com/watch?v=r-gJaMoMon0
3. https://www.youtube.com/watch?v=oKtIzV2T69Y

WEB RESOURCES:

1. https://www.slideshare.net/specialclass/antibiotics-2173921
2. http://www.harpercollege.edu/ls-hs/nur/120/sdolezal/lesson8_files/lesson8.ppt
3. https://repo.knmu.edu.ua/bitstream/123456789/10408/1/Anti-inflammatory

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102008	**CLINICAL MICROBIOLOGY**	3	-	2	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides details on Morphology of Bacteria, Principles & Practices of Sterilization, Basic knowledge on Immunology, Identification of Bacteria, Diseases caused by bacteria, Viruses, Fungi, its Laboratory Diagnosis & Preventive Measures to be taken.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Identify the bacteria by using various cultural methods and apply sterilization techniques in the health care.

CO2. Understand Morphology, cultural characteristics, Infections caused, Laboratory Diagnosis, Treatment of various Disease-causing bacteria in Humans.

CO3. Learn Morphology, disease caused and lab diagnosis of various fungi effecting Humans.

CO4. Understand general properties of viruses, diseases caused, lab diagnosis and prevention of Various viruses effecting Humans.

CO5. Understand classification, pathogenesis, lab diagnosis and prevention of various disease causing parasites in humans.

CO6. Work individually or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	2	2	-	2	1	-	-	1
CO2	3	2	2	-	1	2	-	-	-	-
CO3	3	2	-	-	-	2	-	-	-	1
CO4	3	2	2	-	-	-	-	-	-	1
CO5	3	2	2	-	1	2	-	-	-	1
CO6	3	2	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**2**	**2**	**2**	**1**	**2**	**1**	**-**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module :1 GENERAL MICROBIOLOGY ***(10 Periods)***

Morphology and classification of microorganisms, Growth, nutrition and multiplication of bacteria, Sterilization and Disinfection - Principles and use of equipment's of sterilization namely hot air oven, autoclave and serum inspissator, pasteurization, antiseptics and disinfectants. Culture Media, Methods of Identification of Bacteria. Immunology - antigen, Antibodies, Immunity, vaccines, types of vaccine and immunization schedule. Hospital acquired infection - Causative agents, transmission methods, prevention and control of hospital Acquired infections.

Module: 2 SYSTEMIC BACTERIOLOGY ***(10 Periods)***

Classification of bacteria, morphology, infections caused, lab diagnosis, treatment and prevention of common bacterial infections. Staphylococcus, Streptococcus, Pneumococcus, Neisseria, Corynebacterium diphtheriae, Clostridium, Enterobacteriaceae - Shigella, Salmonella, Klebsiella, E.coli, Proteus, Vibrio cholerae, Pseudomonas ,Spirochetes, Mycobacteria.

Module 3: MYCOLOGY ***(08 Periods)***

Morphology, disease caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi (Aspergillus, Zygomycetes and Penicillium)

Module 4: VIROLOGY ***(10 Periods)***

General properties of viruses, diseases caused lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Dengue, Influenza, Chikungunya, Rabies and Poliomyelitis.

Module :5 PARASITOLOGY **(07 Periods)**

Classification, pathogenesis, lab diagnosis and prevention of Entamoeba, Giardia, Malaria, Hookworm, Roundworm and Filarial worms.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF Practical's:

1. Compound microscope and its application in microbiology.
2. 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, MacConkey agar with LF & NLF, Nutrient agar with staph colonies. Anaerobic culture, Methods and Antibiotic susceptibility test.
3. Demonstration of common serological tests: Widal, VDRL, ASLO, CRP, RF, Rapid tests for HIV, Hbsag and HCV.
4. Gram staining.
5. Acid fast staining.
6. Principles and practice of Biomedical waste management.

RESOURCES

TEXT BOOKS:

1. Anathanarayana & Panikar, Medical Microbiology, University Press, Edition 10, 2018.
2. CP Bhaveja, Textbook of Microbiology, Arya Publications, Edition 5, 2021.
3. Ramnik Sood, Textbook for Laboratory technicians, Jaypee Publishers, Edition 1, 2022.

REFERENCE BOOKS:

1. Bailey & Scott's Diagnostic Microbiology, Elsevier publisher, Edition 15, 2021.
2. Jagdish Chaner, Textbook of Medical Mycology, Jaypee brothers Medical Publishers, Edition 4, 2018

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=_Fk1D7FIIg4
2. https://www.youtube.com/watch?v=F7TBfCJTZ54
3. https://www.youtube.com/watch?v=_waCHq1AaNk

WEB RESOURCES:

1. https://www.cdc.gov/infectioncontrol/index.html
2. https://www.who.int/teams/integrated-health-services/infection-prevention-control
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8325443/

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102009	**PATHOLOGY**	3	-	2	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on basic pathology of cell injury, inflammation, Immunopathology, Environmental and nutritional disorders, and Neoplasia.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate the concept of cell Injury and events in cell injury

CO2. Understand Basic knowledge on Inflammation

CO3. Gain knowledge on concept of Immune System & Immunity Disorders.

CO4. Learn the different types of Environmental and Nutritional Disorders.

CO5. Understand the nature and types of Neoplasia and its evolution.

CO6. Work individually or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	3	1	-	-	-
CO2	3	1	-	-	-	-	-	-	3	-
CO3	3	1	3	-	-	-	-	-	-	1
CO4	2	1	-	-	-	-	-	-	-	1
CO5	3	-	-	-	-	3	1	-	-	-
CO6	3	-	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**3**	**1**	**-**	**3**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: CELL INJURY ***(09 Periods)***

Cellular adaptation, Cell injury & cell death. Introduction to pathology. Overview: Cellular response to stress and noxious stimuli. Cellular adaptations of growth and differentiation. Overview of cell injury and cell death. Causes of cell injury. Mechanisms of cell injury. Reversible and irreversible cell injury. Examples of cell injury and necrosis.

Module 2: INFLAMMATION ***(09 Periods)***

General features of inflammation, Acute inflammation, Chemical mediators of inflammation Outcomes of acute inflammation, Morphologic patterns of acute inflammation, Chronic inflammation. Granulomatous Inflammation, Healing By Repair, Scar formation And Fibrosis, Cutaneous Wound Healing, Healing By First Intention, Healing By Second Intention, Edema, Hemostasis and Thrombosis, Infarction, Shock

Module 3: IMMUNE SYSTEM & IMMUNITY DISORDERS ***(11 Periods)***

Immunopathology – a. Immune system: General concepts. b. Hypersensitivity: type and examples, antibody and cell mediated tissue injury with examples. Secondary immunodeficiency including HIV infection. Auto-immune disorders: Basic concepts and classification, SLE. c. AIDS-Aetiology, Modes of transmission, Diagnostic procedures, handling of infected material and health education.

Module 4: ENVIRONMENTAL AND NUTRITIONAL DISORDERS & INFECTIOUS DISEASE ***(09 Periods)***

Environmental and nutritional disorders. Occupational Hazards, Radiationinjury, Marasmus Kwashiorkar, Immunopathology –Infectious diseases –Mycobacterial diseases: Tuberculosis, Leprosy and Syphilis. b. Bacterial disease: Pyogenic, Diphtheria, Gram negative infection, Bacillary dysentery. c. Viral diseases: Poliomyelitis, Herpes, Rabies, Measles, Rickttsia, Chlamydial infection, HIV infection. d. Fungal disease and opportunistic infections. e. Parasitic diseases: Malaria, Filaria, Amoebiasis, Kala-azar, Cysticercosis, Hydatid cyst.

Module 5: NEOPLASIA ***(07 Periods)***

Neoplasia: Definition, classification, Biological behaviour : Benign and Malignant, Carcinoma and Sarcoma. d. Malignant Neoplasia: Grades and Stages, Local & Distant spread. e. Carcinogenesis: Environmental carcinogens, chemical, viral, occupational. Benign & Malignant epithelial tumoursEg. Squamous papilloma, Squamous cell carcinoma, Malignant melanoma. Benign & Malignant mesenchymal tumoursEg: Fibroma, Lipoma, Neurofibroma, Fibrosarcoma, Liposarcoma, Rhabdo-myosarcoma, Teratoma

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Collection of blood and anticoagulants used.
2. Discussion different types of microscopic disease conditions in pathology.
3. Staining of slide by Leishman method.
4. Studies of peripheral blood smear.
5. Estimation of hemaglobin by Sahli's method and discussion of other methods used.
6. Erythrocyte sedimentation Rate
7. Identification of various instruments in pathology lab & their uses
8. Bleeding Time, Clotting Time.
9. Demonstration of Pathological specimens

RESOURCES

TEXT BOOKS:

1. Harsh Mohan, Textbook of Pathology with Pathology Quick Review, Jaypee Brothers Medical Publishers, Edition 8, 2019.
2. Ramadas Nayak, Textbook of Pathology for Allied Health Sciences, Jaypee Brothers Medical Publishers, Edition 1, 2018
3. Ramadas Nayak, Sharada Rai, Essentials in Hematology and Clinical Pathology, Jaypee Brothers Medical Publishers, Edition 2, 2018

REFERENCE BOOKS:

1. David J. Magee, James E. Zachazewski, William S. Quillen, Robert C. Manske, Pathology and Intervention in Musculoskeletal Rehabilitation, Saunders Publisher Pvt. Ltd., Edition 2, 2018.
2. Vinay Kumar, Abul K. Abbas, Jon C. Aster, Manoj K. Singh. Robbins and Cotran Pathologic Basis of Disease (Two Vol Set), Publisher Elsevier Health Science, South Asia Edition 10, 2020.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=-Ph2uhw9BhE
2. https://www.youtube.com/watch?v=JcGKDDvk5AQ
3. https://www.youtube.com/watch?v=LaG3nKGotZs

WEB RESOURCES:

1. https://www.aai.org/AAISite/media/Education/HST/Archive/Riina_Caroline_Presentation.pdf
2. https://drnaitiktrivedi.com/wp-content/uploads/2020/04/1.-CELL-INJURY-AND-CELLULAR-ADAPTATION.pdf
3. https://www.pearson.com/content/dam/one-dot-com/one-dot-com/us/en/higher-ed/en/products-services/course-products/fremgen-6e-info/pdf/Sample_ch04_final.pdf

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CC111001	**CLINICAL POSTING-I**	-	-	-	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides basic knowledge on hospital setup, care of patient, primary illness observation, and handling basic clinical instruments at training hospital.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Develop communication skills to deal with patients and health care professionals.

CO2. Apply appropriate medical devices and techniques to diagnose the patient illness.

CO3. Develop skills in formulating various medical documentation procedures.

CO4. Work individually and in teams following ethical practice.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	2	-	1
CO2	3	1	1	3	-	-	-	-	-	1
CO3	3	-	-	2	-	-	3	1	-	-
CO4	3	-	1	2	-	1	1	1	-	1
Course Correlation Mapping	**3**	**1**	**1**	**3**	**-**	**1**	**2**	**2**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

Note:

1. Students will attend to clinical posting weekly two days in 3rd semester.
2. The Evaluation process is day to day, based on logbook and viva.

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC101013	**APPLIED PHARMACOLOGY RELATED TO DT**	3	-	-	-	3

Pre-Requisite 22CC101006 Basic Pharmacology and Drug Administration

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: The Course will understand the pharmacological action and mechanism of action of common drugs used for different disease conditions and to know the therapeutic uses and adverse effects of common drugs used for different disease conditions.

COURSE OUTCOMES: To introduce the Importance of Pharmacology in Dialysis Emergencies.

CO1 Will be able to explain the drug mechanisms, classification, formulations, dose, uses of antihypertensive drugs.

CO2 Will be able to develop understanding of Common Drugs used in Renal Medicine.

CO3 Will be able to recognize drug actions in their regimes in relation to Drugs affecting Coagulation.

CO4 Will be able to identify and support Physicians in diagnosis and treatment of renal disease conditions with competency.

CO5 Will be able to explain the side effects and toxicity with understanding.

CO6 Work individually or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	3	1	-	-	-
CO2	3	1	-	-	-	-	-	-	3	-
CO3	3	1	3	-	-	-	-	-	-	1
CO4	3	1								1
CO5	2	-	-	-	-	3	1	-	-	-
CO6	3	-	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**3**	**1**	**-**	**3**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: COMMON DRUGS USED IN RENAL MEDICINE - I (10 Periods)

Diuretics: Loop Diuretics, Thiazides and Thiazide-Like Diuretics, Carbonic Anhydrase Inhibitors Potassium-Sparing Diuretics, Osmotic Diuretics, Antihypertensive: Beta blocker, Calcium channel blocker, ACE inhibitors, Alpha blockers, Angiotensin receptor blockers, Vasodilators, Renin inhibitors, Adrenergic receptor antagonists, Antibiotics, Steroids.

Module 2: COMMON DRUGS USED IN RENAL MEDICINE - II (10 Periods)

IV Fluids in Renal patient, Iron therapy in Dialysis, Erythropoietin, Chemicals used in Dialysis unit, Haemodialysis Concentrates, Peritoneal Dialysis Fluids, Replacement Fluids used for CRRT., Vaccines used in Dialysis patients – Hepatitis B. Immunosuppressive medications used in Renal Transplantation.

Module 3: DRUGS AFFECTING COAGULATION (10 Periods)

Heparin including Low Molecular Weight heparin, Warfarin , Protamine Sulphate , Regional Citrate., Anticoagulation: direct thrombin inhibitors , Indirect thrombin inhibitors ,Antiplatelet drugs , Thrombolytic agents. , Vitamin-D analogues, Phosphate binders.

Module 4: CARDIOVASCULAR DRUGS & INOTROPIC DRUGS (08 Periods)

Digoxin, Beta – blockers, Dopamine, Dobutamine, Adrenalin, Isoprenaline, Vasodilators: direct vasodilator, indirect vasodilator, Nitroglycerine, Nitroprusside.

Module 5: OTHER DRUGS (07 Periods)

Antihistamine, Lipid Lowering agents, Dialyzable drugs, Bicarbonate, Potassium & Exchange resins, Magnesium

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstration of inculcate knowledge on Drugs used in hypertension.
2. Understanding the Common Drugs used in Renal Medicine.
3. Observation and understanding the pharmacological action and mechanism of action of common drugs used for Coagulation.
4. Understanding therapeutic uses and adverse effects of Cardiovascular drugs & Inotropic Drugs.
5. Demonstrate the intended to discuss the various drug delivery for Dialysis patients.

RESOURCES

TEXT BOOKS:

1. Tara V Shanbag, Pharmacology: Prep Manual for Undergraduates, Elsevier Publications, Edition 2, 2012.
2. Padmaja Uday kumar, Pharmacology for Dental and Allied Health Sciences, Jaypee Brothers Medical Publishers, Edition 4, 2016.

REFERENCE BOOKS:

1. KD Tripathi, Essentials of Medical Pharmacology, Jaypee Brothers Medical Publishers, Edition 8, 2018.
2. R S Sataskar, Pharmacology and Pharmacotherapeutics, Popular Prakashan Ltd, Edition 21, 2015.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=LLv29S7Hm3U
2. https://www.youtube.com/watch?v=r-gJaMoMon0
3. https://www.youtube.com/watch?v=oKtIzV2T69Y

WEB RESOURCES:

1. https://www.slideshare.net/specialclass/antibiotics-2173921
2. http://www.harpercollege.edu/ls-hs/nur/120/sdolezal/lesson8_files/lesson8.ppt
3. https://repo.knmu.edu.ua/bitstream/123456789/10408/1/Anti-inflammatory

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC102005	CONCEPTS OF DISEASE RELATED TO DIALYSIS TECHNOLOGY – II	3	1	2	-	5

Pre-Requisite 22CC101009 Concepts of disease related to dialysis technology – I

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: An outline of concepts of various kidney diseases will be provided to improve the students in-depth understanding of the causes, pathophysiology, diagnosis and management used with special emphasis on applied aspects and also assists in disease diagnosis, based on observed changes in tissue structure or biochemistry, while the focus of investigative pathology is the elucidation of the underlying mechanisms related to tissue injury and disease processes.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Acquired knowledge on kidney disease, types of Kidney disorders, its etiopathology, presentation and skilled to do clinical evaluation.

CO2 Understand diagnostic modalities and approach to Obstructive Renal Disorders.

CO3 Applying various therapeutic options to approach for the management of Infectious Diseases.

CO4 Gain knowledge on various Drug therapy for Kidney failure.

CO5 Understand Renal Hypertension and their diagnostic techniques.

CO6 Work individually or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	-	-	-	-	-	-	-	1
CO2	3	1	-	-	-	-	-	-	3	-
CO3	3	1	3	-	-	-	-	-	-	1
CO4	3	1	-	-	-	-	-	-	-	1
CO5	3	-	-	-	-	3	1	-	-	-
CO6	3	-	-	-	-	-	-	-	-	-
Overall	**3**	**1**	**3**	**-**	**-**	**3**	**1**	**-**	**3**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: THE KIDNEY IN SYSTEMIC DISEASE ***(10 periods)***

Amyloidosis: Definition, etiology, pathophysiology, clinical features, medical management, Hyperoxaluria, Hemolytic Uremic Syndrome/Thrombotic Thrombocytopenic Purpura,
Hereditary Renal disorders: Definition, clinical features, medical management, Kidney disorders in Pregnancy: Definition, etiology, pathophysiology, clinical features and medical management.

Module **2: OBSTRUCTIVE RENAL DISORDERS** ***(10 Periods)***

Obstructive Uropathy: Definition, etiology, pathophysiology, medical and surgical management, Vesico Ureteric Reflux: Definition, etiology, pathophysiology, medical and surgical management and Reflux Nephropathy: Definition, etiology, pathophysiology, medical and surgical Management, Nephrolithiasis: Definition, type, etiology, pathophysiology of each type, medical and surgical management.

Module 3: INFECTIOUS DISEASES ***(10 periods)***

Renal diseases associated with HIV infection: Human immunodeficiency virus (HIV), mode of transmission, universal precautions, Opportunistic infections, etiology, pathophysiology, clinical features, medical management, Urinary Tract Infection (UTI): Definition, etiology, clinical features, pathophysiology, medical management. Hepatotrophic viruses: mode of transmission, universal precautions vaccinations,

Module 4: DRUGS AND THE KIDNEY ***(10 periods)***

Analgesics and The Kidney: drug interactions, Definitions, adverse drug reactions, therapeutic uses, Principles of Drug therapy in Kidney failure, Drugs & dialysis: dose & duration of administration of drugs in neonate and infant, the pregnant and elderly.

Module 5: RENAL HYPERTENSION ***(05 periods)***

Renal Hypertension: Definition, etiology Pathogenesis, Essential HTN, Reno vascular HTN, Therapy of HTN., Recommended dietary intake for dialysis patients, Planning diet for dialysis patients, Steps in planning balanced diet for Reno vascular HTN.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Understanding on inculcate knowledge about various pathological conditions.
2. Understanding of Renal diseases and disorders.
3. Observation and understanding of diagnosis of renal disorders.
4. Demonstration of therapeutic techniques in dialysis patients.
5. Demonstrate the competency in handling patients with Renal disorders

RESOURCES

TEXT BOOKS:

1. Vinay Kumar, Robbins Basics Pathology, Saunders publishers, Edition 9, 2012.
2. Greenberg, Primer on Kidney diseases, Elsevier Health Sciences, Edition 5, 2009.

REFERENCE BOOKS:

1. K. Mandal and Stanley, Kidney Diseases in Primary Care, Dorrance Publishing Co, Edition 3, 2008.
2. Brain R Walker, Davidson's Principle and Practice of Medicine, Churchill Livingston, Edition 22, 2014.
3. Harsh Mohan, Textbook of Pathology, Jaypee Brothers Medical Publishers, Edition 7, 2014.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=kOv827pMBi8
2. https://www.youtube.com/watch?v=_SugHiJcKt0
3. https://www.youtube.com/watch?v=sSCIWo3cQbM

WEB RESOURCES:

1. https://www.pennmedicine.org/for-patients-and-visitors/patient-information/conditions-treated-a-to-z/renovascular-hypertension
2. https://www.msdmanuals.com/en-in/professional/genitourinary-disorders/obstructive-uropathy/obstructive-uropathy
3. https://www.sciencedirect.com/science/article/abs/pii/B9780723609162500228

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC102006	**APPILED DIALYSIS TECHNOLOGY-I**	3	1	2	-	5

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on basic concepts and technology used in the dialysis department. This course also to practice independently on dialyzer extracorporeal blood circuit priming and setting up the machine for dialysis procedure.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the Principles of Dialysis and Skills necessary to give safe.

CO2 Perform the Haemodialysis treatments and effective care.

CO3 Acquire knowledge on Dialysis Instruments

CO4 Understand Operating Procedure, Routine maintenance, Identification of Malfunction and Trouble shooting in Dialysis Equipment.

CO5 Understand the peritoneal Dialysis

CO6 Work individually or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	3	-	-	2	-	3	-
CO2	3	-	-	3	-	1	-	-	-	-
CO3	3	-	-	3	-	1	3	-	-	-
CO4	3	-	-	2	-	-	-	-	-	-
CO5	3	-	-	3	-	-	-	-	-	-
CO6	3	-	-	3	-	-	-	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**3**	**-**	**1**	**2**	**-**	**2**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION TO DIALYSIS ***(10 Periods)***

Dialysis Team (Doctors, Technologist, Nurses, Technician, Renal Dietician – Rights, Responsibilities and Relationship with Patients), History of Hemodialysis, History of Peritoneal Dialysis, History of Vascular Access, Principles of Peritoneal Dialysis, Indications for Dialysis, Types of dialysis.

Module 2: EQUIPMENT'S USED IN HEMODIALYSIS-I ***(10 periods)***

Principles of Hemodialysis, Indications for Dialysis, Types of Hemodialysis, HD machine Components and function, HD machine – Blood Circuit, Cleaning and disinfection of HD machine, Trouble shooting equipment related problems during HD. types of access, temporary and permanent, fistula, Access care.

Module 3: EQUIPMENT'S USED IN HEMODIALYSIS-II ***(07 Periods)***

Composition of dialysate, Dialyzer and its types and mechanism of dialyzer, working principles, dialyzer membrane, Introduction to dialyzer, types, uses and sizes of the various membranes, structure, characteristics.

Module 4: PATIENT ASSESSMENT ***(10 Periods)***

Infection control and universal precautions in dialysis department, Patient Assessment – Pre, intra & post dialysis & Machine and patient monitoring during Hemodialysis Diet management for dialysis patient, Principle of ICU care- Ventilator – Mode and operation, Dialysis in ICU, Basics of ICU management, Basics of ECG.

Module 5: EQUIPMENT'S USED IN PERITONEAL DIALYSIS ***(08 Periods)***

Anatomy of peritoneum, models of peritoneal transport, physiology of peritoneal transport, Fluid absorption, Clinical assessment and implications of peritoneal transport, Residual renal function. PD – Transport kinetics, ultrafiltration, UF, Intermittent PD.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstrate the dialysis team rights and responsibilities.
2. Demonstrate the peritoneal dialysis procedure.
3. Determine the types and principles of dialysis instrument
4. Demonstrate and prepare dialysate with accurate composition.

RESOURCES

TEXT BOOKS:

1. Pranaw Kumar Jha, Vijay Kher, Manual of Nephrology, Jaypee Brothers Medical Publishers, Edition 6, 2018
2. Gokal, Ram, Textbook of peritoneal dialysis, Springer Science & Business Media, Edition 1, 2013.
3. Daugirdas, Handbook of dialysis, Lippincott Williams & Wilkins, Vol. 236, 2007.
4. Dr Anjani Sharma, Handbook for Dialysis Technician, Emmess Medical Publishers, Edition 1, 2017

REFERENCE BOOKS:

1. Allen R. Nissenson, Handbook of Dialysis Therapy, Jaypee Brothers Medical publishers, Edition 6, 2022.
2. B.C. Bhagavan, Text book on Renal Dialysis, Springer Sciecnes, Edition 4, 2017.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=Z_ZcDE-PTgI
2. https://www.youtube.com/watch?v=EU2skU3bgS8
3. https://www.youtube.com/watch?v=HbC0eUWg_sY

WEB RESOURCES:

1. https://www.nsdcindia.org/scmp/assets/image/494650646-Preview_DIALYSIS_TECHNICIAN.pdf
2. https://dialysistech.net/images/stories/files/Basic-Dialysis-Theory-Sweeny.pdf
3. https://www.studocu.com/in/document/kerala-university-of-health-sciences/bsc-nursing/8-dialysis-lecture-notes/43842887

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CC105001	**BASIC LIFE SUPPORT AND FIRST AID MANAGEMENT**	-	1	2	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: The Course will cover various aspects of basic life support and first aid essential for health care and allied health sciences professionals.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Acquire knowledge on Basic life support techniques.

CO2. Perform basic first aid to minimize the maximum risk.

CO3. Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	3	1	-	-	-
CO2	3	1	-	-	-	-	-	-	-	-
CO3	3	1	3	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**3**	**1**	**-**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstrate the procedure of Choking and Drowning
2. Perform the Asthmatic attack
3. Demonstrate the first aid for Shock, from blood and fluid loss
4. Determine the Heart attack and Wound bleeding
5. Demonstrate first aid for foreign bodies in eyes, nose and ear, bites and stings
6. Perform first aid for fainting, hypoglycemic coma and Head injury
7. Demonstrate the first aid for Skin Burns.
8. Perform cardio pulmonary resuscitation for adult and pediatric.
9. Determine the following recovery position, bandages, lifting, carrying and moving causality

RESOURCES

TEXT BOOKS:

1. Dr. Mekkanti Manasa, A Hand Book on First ais Practices: First Aid Saves Life, Notion Press, Edition 1, 2022
2. Rai Pv, Manual of First Aid: Management of General injuries, Sports injuries and Common Ailments, JPB publishers, Edition 1, 2012.

REFERENCE BOOKS:

1. Dhruva Chaudhry, ISCCM Textbook of Critical Care Medicine, Jaypee Brothers Medical Publishers, Edition 2, 2023.
2. C. Manivannam, Textbook of First Aid and Emergency Nursing, EMMESS Medical Publishers, Edition 3, 2020.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=6THKEJ_Ciag
2. https://www.youtube.com/watch?v=DE45ks9miIw
3. https://www.youtube.com/watch?v=XJGPzl3ENKo
4. https://www.youtube.com/watch?v=x1oo76Y_87A

WEB RESOURCES:

1. https://cpr.heart.org/en/cpr-courses-and-kits/healthcare-professional/basic-life-support-bls-training
2. https://www.verywellhealth.com/basic-first-aid-procedures-1298578

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CC1025002	ENHANCING CONCENTRATION	-	1	2	-	2

Pre-Requisite -
Anti-Requisite -
Co-Requisite -

COURSE DESCRIPTION: The Course will cover use of meditation as a tool to shift from purely an IQ Orientation, towards a balance between IQ (Intelligent Quotient) and EQ (Emotional Quotient) leading to holistic being which is the demand and need in the industry and society.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Acquire knowledge on Focus, Concentration and conducive environment.
CO2. Understand importance of meditation.
CO3. Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	-	-	-	-	3	1	-	-	-
CO2	3	1	-	-	-	-	-	-	-	-
CO3	3	1	3	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**3**	**1**	**-**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstrate the Enhancing concentration-decluttering the mind-create
2. Understand the time-ambition vs Aspiration-making choices.
3. Demonstrate the Joy at work-connectivity with people with people-prepare for exams.
4. Determine the Power of Observation-self within- power of the heart.
5. Perform the physical relaxation to completely relax all the parts of the body.
6. Perform the remove tension and improve the readiness to start the meditation session.
7. Demonstrate Self-observation to gain insight into once inner experiences during the meditation.

RESOURCES

TEXT BOOKS:

1. Aditi Singhal, "How to Improve Your Concentration", 1st Edition, Ebury Press Publisher, 2020.
2. Dr. S k Tiwari, "Essentials of Repertorizatio", 6th Edition, B Jain Publishers Pvt Ltd. 2022.

REFERENCE BOOKS:

1. Marus Aurelius, Meditations: The Annotated Edition, Basic Book Publisher, 2022.
2. Eric Phillips, Focus, Increase your focus, Better Concentration and Free from Distraction-Focus on Your Goals and What Really Matters, 2015.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=VjCGOjRPFiw
2. https://www.youtube.com/watch?v=Hzi3PDz1AWU
3. https://www.youtube.com/watch?v=thcEuMDWxoI
4. https://www.youtube.com/watch?v=Hu4Yvq-g7_Y

WEB RESOURCES:

1. https://www.health.harvard.edu/mind-and-mood/tips-to-improve-concentration
2. https://www.healthline.com/health/mental-health/how-to-improve-concentration

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC101015	**MEDICAL PSYCHOLOGY**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on various behavioral patterns of individuals, theories of development, normal and abnormal aspects of motor, social, emotional, and language development, and communication and interaction skills appropriate to various age groups.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understand the fundamental concepts of psychology and its branches.

CO2 Acquire knowledge of basic concepts of growth and development of personality.

CO3 Apply the concepts of Attention, Perception, and Sensation to assess the psychology of humans.

CO4 Understand the fundamental concepts of conflicts, frustration, and its type.

CO5 Analyse the theoretical concepts of Intelligence and Emotions.

CO6 Acquire knowledge of basic theories of learning and types of personality.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	2	-	-	1	-	-	-	-
CO2	3	3	-	-	-	-	-	-	-	-
CO3	2	3	1	-	-	1	-	-	-	-
CO4	3	2	2	-	-	-	-	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-
CO6	2	2	-	-	-	2	-	-	-	-
Course Correlation Mapping	**3**	**2**	**2**	-	**-**	**1**	-	-	-	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION TO PSYCHOLOGY ***(07 Periods)***

Schools: Structuralism, functionalism, behaviourism, Psychoanalysis.

Methods: Introspection, observation, inventory, and experimental method.

Branches: pure psychology and applied psychology; Psychology and physiotherapy

Module 2: GROWTH AND DEVELOPMENT **(08 Periods)**

Life span: Different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age). **Heredity and environment:** Role of heredity and environment in physical and psychological development, "Nature v/s Nurture controversy

Module 3: ATTENTION, PERCEPTION AND SENSATION **(08 Periods)**

Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium, and visceral sense. **Attention:** Types of attention, Determinants of attention (subjective determinants and objective determinants). **Perception:** Gestalt principles of organization of perception (principle of figure-ground and principles of grouping), factors influencing perception (experience and context). **Illusion and hallucination**: Different types.

Module 4: MOTIVATION, FRUSTRATION AND CONFLICT **(08 Periods)**

Motivation: Motivation cycle (need, drive, incentive, reward), Classification of motives, Abraham Maslow's theory of need hierarchy

Frustration: sources of frustration

Conflict: types of conflict, Management of frustration, and conflict

Module 5: INTELLIGENCE AND EMOTIONS **(08 Periods)**

Three levels of analysis of emotion (physiological level, subjective state, and overt behavior).

Theories of emotion

Stress and management of stress.

Intelligence: Theories of intelligence, Distribution of intelligence, Assessment of Intelligence

Reasoning: Deductive and inductive reasoning.

Problem-solving: Rules in problem-solving (algorithm and heuristic)

Creative thinking: Steps in creative thinking, traits of creative people.

Module 6: INTELLIGENCE AND EMOTIONS **(06 Periods)**

Factors affecting learning.

Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory.

The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods.

Personality

Approaches to Personality: type & trait, behaviouristic, psychoanalytic, and humanistic approach.

Personality Assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques.

Defence Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out

Total Periods: 45

EXPERIENTIAL LEARNING

1. Demonstration of various behavioral patterns and disorders.
2. Illustration on psychosocial disorders.
3. Demonstration of different personalities and disorders.
4. Analysis of intelligence quotient.
5. A clinical study on counselling the patient.
6. Demonstrating the concepts of problem-solving in psychosocial problems.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

BOOKS:

1. Robert A Baron, Text Book Psychology, Jaypee Publishers, Edition 1, 2020
2. T. Ramalingam, Psychology for Physiotherapist, Jaypee Publishers, Edition 2, 2019.
3. Niraj Ahuja, Text Book of Psychiatry, Jaypee Publishers, Edition 4, 2019

VIDEO LECTURES:

1. www.britannica.com
2. www.alliant.edu

WEB RESOURCES:

1. www.psychology.com
2. http://www.guides.lib.uw.edu

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CC101019	**NATIONAL HEALTH CARE DELIVERY SYSTEM AND MEDICAL RECORDS MANAGEMENT**	4	-	-	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on word roots, prefixes, suffixes basic medical terms, medical abbreviations to human body systems and record-keeping methods in health care and medical ethics and law. Health care system, AYUSH, vital events of life and epidemiology in India.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate basic knowledge on roots, prefixes and suffixes to form medical terms in health care system

CO2. Apply advanced tools and techniques to maintain patient health details in medical system and Design a standard protocol by applying medical law and ethics.

CO3. Understand the basic concepts in health care delivery system and health policies

CO4. Acquire knowledge on various AYUSH systems and Analyze the Vital events of life and its impact on demography.

CO5. Work individually or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	-	-	-	-	-	-	-
CO2	3	2	-	1	-	1	-	-	1	-
CO3	3	2	-	-	-	1	-	-	1	-
CO4	3	2	-	1	-	1	-	-	1	1
CO5	3	2	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**1**	**-**	**1**	**-**	**-**	**1**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module1: INTRODUCTION TO MEDICAL TERMINOLOGY (15 Periods)

Derivation of medical terms, define word roots, prefixes, and suffixes, Conventions for combined morphemes and the formation of plurals, Basic medical terms, Form medical terms utilizing roots, suffixes, prefixes, and combining roots. Interpret basic medical abbreviations/ symbols , utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, Respiratory system, cardiovascular system, nervous system, and endocrine system.

Module2: MEDICAL ETHICS & RECORD KEEPING (15 Periods)

Medical ethics – Definition, Basic principles of medical ethics – Confidentiality, Malpractice and negligence – Rational and irrational drug therapy, Autonomy and informed consent – Right of patients, Care of the terminally ill- Euthanasia, Development of a standardized protocol to avoid sentinel events, Standard procedures in record keeping, interpret medical orders/reports, Data entry and management on electronic health record system, Advanced tools to maintain records in Health care.

Module3: NATIONAL HEALTHCARE DELIVERY SYSTEM & NATIONAL HEALTH POLICIES (15 Periods)

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 Issues in Health Care Delivery System in India achievements and constraints in various National Heath programme. National Health Programme, Background objectives, action plan, targets, operations.

Module4: AYUSH SYSTEM OF MEDICINE, DEMOGRAPHY & VITAL STATISTICS (15 Periods)

Ancient scientists of bharat, introduction to Ayurveda, Naturopathy, Unani, Siddha, Homeopathy, Need Course for integration of various system of medicine. Demography & its concept, Vital events of life & its impact on demography, Significance and recording of vital statistics, Census & its impact on health policy.

Total Periods:60

EXPERIENTIAL LEARNING

1. Demonstration of various levels of health care system
2. Presentation of health care programs.
3. Illustration on ayush system of medicine and it's practice.
4. A clinical overview on demography and vital statistics.
5. Discussion on medical terminology of different body systems.
6. Write about basic principles of medical ethics.
7. Write about electronic health record system.

RESOURCES

TEXTBOOKS:

1. Adam Brown, Medical Terminology Easy Guide for Beginners, Create Space Independent Publishing Platform, Edition 1, 2016.
2. GD Mogli, Medical records organization and management, Jaypee Brothers Medical Publishers, Edition 2, 2016.

REFERENCE BOOKS:

1. Francis, Hospital Care Management, Edition 4, 2019
2. Sharon B. Buchbinder, Introduction to Health Care Management, Edition 2, 2011

VIDEOLECTURES:

1. https://www.youtube.com/watch?v=_bDatJxhfkQ
2. https://www.youtube.com/watch?v=9iMhc2OU-go
3. https://youtu.be/It_cV56Dxtk
4. https://youtu.be/VIrdH_3RKKk

WEB RESOURCES:

1. https://library.medschl.cam.ac.uk/e-books/
2. https://www.ncbi.nlm.nih.gov/
3. https://blog.ipleaders.in/medical-laws-conflict-ethic
4. https://www.gponline.com/medico-legal-importance-good-records/article/89

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22LG101404	**SANSKRIT**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: अस्मिन् पाठ्यक्रमे संस्कृत गद्य, पद्य, व्याकरमेन सह महाभारतम् अपि च रामायणस्य कान्श्चन खण्डानां मेलनं भवति। अयं पाठ्यक्रमः छात्राणां कृते विभिन्न संस्कृत ग्रन्थानां अपि च साहित्यस्य समालोचनात्मक विश्लेषण करणमपि शिक्षयति। संपूर्ण पाठ्यक्रमे अस्मिन्, छात्राः देवनागरी लिपेः लिखनं अधिगच्छति, संस्कृतस्य शब्दानां उच्चारणं तथा हृदिस्थं करिष्यति, अपि च प्राथमिक व्याकरण पठिष्यति तेन ते संस्कृते सरल वाक्यानां निर्माणं कर्तुं प्रभवन्ति।

COURSE OUTCOMES: पाठ्यक्रमस्य सफलसमाप्तेः अनन्तरं छात्राः

CO1 कर्तव्यपरक शैक्षणिक वृत्तिपरक तथा शोधकर्तृणां निर्माणार्थं छात्राणां संज्ञानात्मक, प्रभावशाली तथा व्यवहारिक क्षमतानां आकार प्रदानार्थं सहायतां करोति।

CO2 सामाजिक परिवर्तने भागग्रहणार्थं सक्षमाः भवितुं छात्रेषु सेवायाः धारणा संचारः करोति।

CO3 समकालीन समस्या-समाधान स्थितिषु प्राचीन भारतीय ज्ञानस्य अनुप्रयोगस्य ज्ञानप्राप्तिः। सामान्य रूपेण तथा विशेष रूपेण अभ्यसने तथा तस्य मूल्यांकनस्य संदर्भे च नैतिक उपयुक्ततायाः एकः दृढतर भावनायाः विकासनार्थम्।

CO4 प्राचीन साहित्यतः प्राथमिक जीवनं तथा अवधारणानां ज्ञानप्रदानं यत् कालातीतः जातः तथापि इदानीमपि समाजाय अनुवर्तते।

आवेदनस्य प्रमुख क्षेत्रेषु प्राथमिक कौशलस्य अधिग्रहणे सुगमकरणम् उदा- नेतृत्वे, संचारे, अनुसंधान योग्यतायां, व्यवहार संशोधने इत्यादि।

CO5 सामाजिक विविधतायाः कृते सम्मान-विकसितं करनं तथा सामाजिक अपि च सांस्कृतिक प्रासंगिकतायाः अध्ययने अभिवृद्धि करनम्।

CO-PO Mapping Table:

Course Outcomes	Program Outcomes								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-
CO4	3	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module-1: प्राचीन पद्यसाहित्यम् **(06 Periods)**

1.आर्य पादुका पट्टाभिषेकः - वल्मीकिः – श्रीमद्रामायणम्

2. यक्षप्रश्नाः - वेदव्यासः – महाभारतम्

Module-2: चम्पूकाव्यम् **&** आधुनिक पद्यकाव्यम् **(06 Periods)**

3.गङ्गावतरणम् - भोजराजः - चम्पूरामायणम्

4. मोहापनोदः - श्री पमिडिपाटि पट्टाभिरामारावः – मूलकथा-'धर्मसौहृदम्' इति संस्कृत पद्यकाव्यम्

Module-3: गद्यसाहित्यम् **(06 Periods)**

5. अत्युत्कटैः पापपुण्यैः इहैव फलमश्नुते - नारायणपण्डितः - हितोपदेशः

6. शूद्रकवीरवरकथा - हितोपदेशः

Module-4: शब्दाः **(6 Periods)**

देव, कवि, भानु, पितृ, धातृ, गो, रमा, मति

Module 5: महाकवि, शास्त्रकाराः **(6 Periods)**

1.पाणिनिः 2.कौटिल्यः 3.भरतमुनिः 4.भारविः 5.माघः 6.भवभूतिः 7.शङ्कराचार्यः 8.दण्डी

Total Periods: 30

EXPERIENTIAL LEARNING:

The experiential learning components will be detailed in CHO.

RESOURCES

TEXT BOOKS:

1.विश्वभारती 2,संस्कृत भारती 3.अमृतवाणी

REFERENCE BOOKS:

1.रामायणम् 2.महाभारतम् 3.अष्टाध्यायी 4.अमरकोशः

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=bh-14xfMeYk
2. https://www.youtube.com/watch?v=6xFkoOpzsvs

Web Resources:

1. https://www.forum.universityupdates.in/threads/ou-sanskrit-2nd-semester-study-material.33659/
2. https://cbpbu.ac.in/study_mat_sanskrit.php

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CC111002	**CLINICAL POSTING-II**	-	-	-	-	4

Pre-Requisite 22CC111001 Clinical Posting-I

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides basic knowledge on hospital setup, care of patient, primary illness observation, and handling basic clinical instruments at training hospital.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO2. Develop communication skills to deal with patients and health care professionals.

CO3. Apply appropriate medical devices and techniques to diagnose the patient illness.

CO4. Develop skills in formulating various medical documentation procedures.

CO5. Work individually and in teams following ethical practice.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	2	-	1
CO2	3	1	1	3	-	-	-	-	-	1
CO3	3	-	-	2	-	-	3	1	-	-
CO4	3	-	1	2	-	1	1	1	-	1
Course Correlation Mapping	**3**	**1**	**1**	**3**	**-**	**1**	**2**	**2**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

Note:

1. Students will attend to clinical posting weekly two days in 4th semester.
2. The Evaluation process is day to day, based on logbook and viva.

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CC105002	ENHANCING CONCENTRATION	-	1	2	-	2

Pre-Requisite -
Anti-Requisite -
Co-Requisite -

COURSE DESCRIPTION: The Course will cover use of meditation as a tool to shift from purely an IQ Orientation, towards a balance between IQ (Intelligent Quotient) and EQ (Emotional Quotient) leading to holistic being which is the demand and need in the industry and society.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Acquire knowledge on Focus, Concentration and conducive environment.
CO2. Understand importance of meditation.
CO3. Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	-	-	-	-	3	1	-	-	-
CO2	3	1	-	-	-	-	-	-	-	-
CO3	3	1	3	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**3**	**1**	**-**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstrate the Enhancing concentration-decluttering the mind-create
2. Understand the time-ambition vs Aspiration-making choices.
3. Demonstrate the Joy at work-connectivity with people with people-prepare for exams.
4. Determine the Power of Observation-self within- power of the heart.
5. Perform the physical relaxation to completely relax all the parts of the body.
6. Perform the remove tension and improve the readiness to start the meditation session.
7. Demonstrate Self-observation to gain insight into once inner experiences during the meditation.

RESOURCES

TEXT BOOKS:

1. Aditi Singhal, How to Improve Your Concentration, Ebury Press Publisher, Edition 1, 2020.
2. Dr. S k Tiwari, Essentials of Repertorizatio, B Jain Publishers Pvt Ltd., Edition 6, 2022.

REFERENCE BOOKS:

1. Marus Aurelius, Meditations: The Annotated Edition, Basic Book Publisher, Edition 1, 2022.
2. Eric Phillips, Focus, Increase your focus, Better Concentration and Free from Distraction-Focus on Your Goals and What Really Matters, Edition 3, 2015.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=VjCGOjRPFiw
2. https://www.youtube.com/watch?v=Hzi3PDz1AWU
3. https://www.youtube.com/watch?v=thcEuMDWxoI
4. https://www.youtube.com/watch?v=Hu4Yvq-g7_Y

WEB RESOURCES:

1. https://www.health.harvard.edu/mind-and-mood/tips-to-improve-concentration
2. https://www.healthline.com/health/mental-health/how-to-improve-concentration

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC101032	**APPILED DIALYSIS TECHNOLOGY-II**	4	1	-	-	5

Pre-Requisite 22CC102006 Applied Dialysis Technology-I

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on basic concepts and technology used in the dialysis department. This course also to practice independently on dialyzer extracorporeal blood circuit priming and setting up the machine for dialysis procedure.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the Principles of Dialysis and Skills necessary to give safe.

CO2 Ability to perform the effective care during Hemodialysis treatments.

CO3 Acquire knowledge on Dialysis Instruments

CO4 understand Operation, Routine maintenance, Identification of Malfunction and Trouble shooting in Dialysis Equipment.

CO5 Understand the peritoneal Dialysis

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	3	-	-	2	-	3	-
CO2	3	-	-	3	-	1	-	-	-	-
CO3	3	-	-	3	-	1	3	-	-	-
CO4	3	-	-	2	-	-	-	-	-	-
CO5	3	2	-	3	-	-	3	-	3	-
Course Correlation Mapping	**3**	**2**	**-**	**3**	**-**	**1**	**3**	**-**	**3**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

MODULE 1: INTRODUCTION TO HEMODIALYSIS *(10 Periods)*

Hemodialysis-,History of Hemodialysis, Principles of hemodialysis- Diffusion, Ultrafiltration, convention , Indications for hemodialysis-Clinical Indication, Biochemical Indication ,Emergency Indications , Types of hemodialysis- Acute Hemodialysis, Chronic Hemodialysis, conventional Dialysis, Nocturnal Dialysis, Home Dialysis, Short Daily Dialysis .

MODULE 2: DIALYZER *(15 periods)*

Dialyzers-Introduction to dialyzer, types, uses and sizes of the various membranes, structure, characteristics, High Flux and High Efficiency Dialyzers-Definition of high flux / high efficiency dialysis, molecular weight cut off, ultrafiltration coefficient (Kuf), mass transfer coefficient (KoA), clearance (K)], Bio-compatibility, differences between high flux dialysis and hemodialysis , uses and indications for high flux dialysis, complications of high flux dialysis, precautions and contraindications, care during a high flux dialysis, Dialyzer reprocessing and reuse of dialyzers.

MODULE 3: WATER TREATMENT *(15 Periods)*

Purpose of Water Treatment- Water contaminations, Quality Requirements, AAMI Hemodialysis Water Contamination Standards, Distribution System , Filtration, Softener and Carbon Filtration, Deionizer-Iron Exchange , Ultraviolet Radiation, RO system, Ultrafiltration.

MODULE 4: VASCULAR ACCESS *(10 Periods)*

History of Vascular Access , Types of Access-AV fistula, AV graft, IJV & Femoral cannulation , Access care, Access complications-Stenosis, Thrombosis, Steal syndrome, Aneurysm and Pseudoaneurysm, venous hypertension, Management of Vascular Access, Vascular Access Recirculation, Cannulation techniques .

MODULE 5: HAEMODIALYSIS APPARATUS *(10 Periods)*

Composition of Dialysate, Components and Functions of HD Equipment's, Machine monitoring during Hemodialysis. Anticoagulation –Heparin, Reginal citrate anticoagulante, Hemodialysis Adequacy-Assessment, Measurements, Sign and symptoms of Inadequate dialysis, Sampling, Factors affecting Hemodialysis adequacy, Increase in Adequacy, Online clearance monitoring (OCM)

Total Periods: 60

EXPPERIANTIAL LEARNING:

LIST OF EXPERIMENTS:

1. Demonstration the hemodialysis process.
2. Understand the dialyzer characteristics.
3. Understand the Purpose of Water Treatment.
4. Demonstration the Vascular Access in hemodialysis patient.
5. Demonstration of Functions of HD Equipment's.

RESOURCES

TEXT BOOKS:

1. Pranaw Kumar Jha, Vijay Kher, Manual of Nephrology, Jaypee Brothers Medical Publishers, Edition 6, 2018.
2. Gokal, Ram, et al., eds., Textbook of peritoneal dialysis, Springer Science & Business Media, Edition 1, 2013.
3. Daugirdas, John T., Handbook of dialysis, Lippincott Williams & Wilkins, Vol. 236, 2007.

REFERENCE BOOKS:

1. Allen R. Nissenson, PhD Zaritsky, Joshua, MD, et al., HANDBOOK OF DIALYSIS THERAPY, Jaypee Medical Publishers, Edition 6, 2022
2. Dr Anjani Sharma, Faswal Pichan, Handbook for Dialysis Technician, Emmess Medical Publishers, Edition 1, 2017.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=Z_ZcDE-PTgI
2. https://www.youtube.com/watch?v=EU2skU3bgS8
3. https://www.youtube.com/watch?v=HbC0eUWg_sY

WEB RESOURCES:

1. https://www.nsdcindia.org/scmp/assets/image/494650646-Preview_DIALYSIS_TECHNICIAN.pdf
2. https://dialysistech.net/images/stories/files/Basic-Dialysis-Theory-Sweeny.pdf
3. https://www.studocu.com/in/document/kerala-university-of-health-sciences/bsc-nursing/8-dialysis-lecture-notes/43842887

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22C102034	**PRINCIPLES AND PRACTICE OF HEMODIALYSIS**	**5**	**1**	**-**	**-**	**6**

Pre-Requisite	22CC102005 Concepts of diseases related to dialysis technology-II
Anti-Requisite	-
Co-Requisite	-

COURSE DESCRIPTION: This course provides a detailed discussion on to be able to assess the patient for any complications with an understanding of the problem and recognize the need to report the complications to the Physician or Nephrologist and to respond effectively to the Physical and Emotional needs of the patient undergoing Dialysis treatment..

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the Renal Diseases to prevent.

CO2 Acquire knowledge on Complications during Hemodialysis.

CO3 Evaluation associate with patient assessment of hemodialysis.

CO4 Understand the Special procedures to access the patients in the complicated conditions.

CO5 Understand the Maintenance Haemodialysis

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	3	-	-	2	-	2	-
CO2	3	-	-	3	-	1	-	-	-	-
CO3	3	-	-	3	-	1	3	-	-	-
CO4	3	-	-	2	-	-	-	-	-	-
CO5	3	2	-	3	-	-	2	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**3**	**-**	**1**	**2**	**-**	**2**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

MODULE 1: PREVENTION OF RENAL DISEASE *(18 Periods)*

Prevention of Renal Disease -Staging and causes of chronic kidney disease, Early diagnosis of CKD, Counselling on adequate control of diabetes and hypertension, Methods to control the progression of CKD, Avoiding nephrotoxic drugs, Community counselling and awareness about kidney disease, Importance of annual master health checkups after 40 years of age, Diet and medication counseling for CKD patients, Early diagnosis and management of complications of CKD (anemia, malnutrition, mineral bone disease), Preparing a patient before ESRD (e.g. early creation of AV fistula etc.)

MODULE 2: COMPLICATIONS DURING HEMODIALYSIS - I (18 Periods)

Acute complications during Hemodialysis- Patient related complications-Blood related complications, Dialysate related complications, Access related complications,Chronic complications during Hemodialysis- Cardio vascular disease-Amyloidosis, Anemia,Vascular access complication,Bone disease Psychological disorders, Nutritional disorders, Infections ,Endocrine disorders, Sleep disorder, Sodium profiling and ultrafiltration profiling .

MODULE 3: COMPLICATIONS DURING HEMODIALYSIS-II (18 Periods)

Hemodialysis in Infants and Children-Introduction, Indication, dialyzer used for Infants and Children Dialysis, complications, access , Psychosocial Aspects of Dialysis-types of psychological disorders, psychosocial rehabilitation , Infection Control and Universal Precautions-positive bay, access care, personal protective equipment's used in dialysis unit . Basic chemistry of Body fluids and Electrolytes, Lab data analysis-tests done for a patient on Hemodialysis, interpretation of tests and normal values

MODULE 4: SPECIAL PROCEDURES (18 Periods)

Special procedures – Slow Continuous Therapies- SCUF - Slow Continuous Ultra Filtration ,CVVHF - Continuous Veno-Venous Hemofiltration ,CVVHD - Continuous Veno-Venous Hemo Dialysis, CVVHDF - Continuous Veno-Venous Hemodiafiltration ,SLED - Sustained low-efficiency dialysis, Plasmapheresis- Indications, Contraindication, procedural Care, Equipment, Patient Preparation, Monitoring & Follow-up, Hemoperfusion, MAR.

MODULE 5: MAINTENANCE HAEMODIALYSIS (18 Periods)

Drugs & dialysis-emergency drugs used for dialysis patients, drugs used to treat the acute and chronic complications, Quality assurance in Dialysis, Current Research in Haemodialysis-ISO RO water standard for hemodialysis, Wearable Artificial Kidney, Novel markers of AKI, Online Hemodiafiltration, Online Hemofiltration, Online Hemodialysis, Extracorporeal Therapies in Special Situations.

Total Periods: 60

TEXT BOOKS

1. Jha, P. K., & Kher, V. (2018). *Manual of Nephrology* (6th ed.). Jaypee Brothers Medical Publishers.
2. Gokal, R., et al. (2013). *Textbook of Peritoneal Dialysis* (1st ed.). Springer Science & Business Media.
3. Daugirdas, J. T. (2007). *Handbook of Dialysis* (4th ed.). Lippincott Williams & Wilkins.

REFERENCE BOOKS

1. Nissenson, A. R., Zaritsky, J., et al. (2022). *Handbook of Dialysis Therapy* (6th ed.). Jaypee Medical Publishers.
2. Sharma, A., & Pichan, F. (2017). *Handbook for Dialysis Technician* (1st ed.). Emmess Medical Publishers.

VIDEO LECTURES

1. Introduction to Hemodialysis
2. Dialyzer and Hemodialysis Apparatus
3. Vascular Access in Hemodialysis

WEB RESOURCES

1. NSDC Dialysis Technician Training Manual (NSQF)
2. Basic Dialysis Theory – Sweeny
3. Dialysis Lecture Notes – B.Sc Nursing (KUHS)

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
	Trauma & Cardiac Care Management	4	-	2	-	5
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					
COURSE DESCRIPTION: This course is designed to train the skills of CPR for victims of all ages, use of an automated external defibrillator and relief of emergency conditions.						
COURSE OUTCOMES: After successful completion of the course, students will be able to:						
CO1	Promptly recognize several life- threatening emergencies, give high – quality cardiopulmonary resuscitation and delivery appropriate ventilations and early use of an AED					
CO2	Identify the arrhythmias and apply high performance team management					
CO3	demonstrate the use a defibrillator in event of a cardiac emergency					
CO4	Understand types of tachyarrhythmia and understand the principles of treatment and know how to perform.					
CO5	Apply invasive and non invasive cardiac pacing safely and effectively .					

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	2	-	-	1	2	1	3
CO2	3	1	-	3	-	-	2	2	1	3
CO3	3	-	-	3	-	-	-	2	-	1
CO4	2	-	-	2	-	-	-	1	-	1
CO5	2	-	-	2	-	-	-	-	-	1
Course Correlation Mapping	2	1		2	-	**-**	1	1	1	1

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1:	**HEAD INJURIES**	***(10 Periods)***
Head injury, Clinical features, Management, Maxillofacial injury, types, treatment, epidural hematoma, subdural hematoma, Subarachnoid Hemorrhage, pathophsiology, treatment.		
Module 2:	**THORACIC**	***(10 Periods)***
Chest injuries, primary injuries, secondary injuries, Management, hemothorax, pnemothorax and tension pnemothorax, pathophysiology, treatment, cardiac tamponade, fail chest.		
Module 3:	**ABDOMINAL INJURIES**	***(15 Periods)***
Abdominal trauma, Pathophysiology Clinical features, Management, mechanism of injury, treatment, kidney injury, degree, investigation, treatment, retroperitoneal injury, liver injury, spleenic injury, investigation, treatment .		
Module 4:	**BASIC LIFE SUPPORT AND ADVANCED CARDIAC LIFE SUPPORT**	***(15 Periods)***
Introduction CPR, Airway, Barrier devices for giving breaths, Adult Basic life support, Pediatric Basic life support, Introduction of ACLS, Respiratory arrest Vs Cardiac arrest, Bradycardia, Rhythm, Managemet., Tachycardia, Stable and Unstable, Management, Shockable rhythm, Ventricular fibrillation, Pulseless ventricular Tachycardia, Non Shockable rhythm, Pulseless electrical activity, Asystole, Management., Selected.		
Module 5:	**INTERNATIONAL TRAUMA LIFE SUPPORT**	***(10 Periods)***
Introduction, primary survey, airway, breathing, circulation, disability, exposure, secondary survey, head to toe assessment.		
		Total Periods:60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:	
6.	Demonstration of BASIC LIFE SUPPORT
7.	Demonstration of ADVANCED CARDIAC LIFE SUPPORT
8.	Demonstration of defibrillator
9.	Demonstration of cardioversion
10.	Understanding the pacing procedure

RESOURCES

TEXT BOOKS:	
3.	AHA "Basic life support"
4.	AHA "Advance cardiac life support"
REFERENCE BOOKS:	
3.	Monstenbjork M.D. "basic life support provider manual " medical creation (2020)
4.	Monstenbjork M.D "Advance cardiovascular life support provider manual" medical creation (2021)
VIDEO LECTURES:	
1.	https://youtu.be/fb29LCjX4-E?si=gCgciS4RhXBb4rD2
2	https://youtu.be/qMR0WFByy4c?si=WuHf3gefmXF3c6rU
3.	https://youtu.be/S7dm1-1WBww?si=xteqpxWLeXK4eRGo
4.	https://youtu.be/fooQi2PRSZk?si=1o1dTfCpQPv1o8nX
Web Resources:	
4.	https://emedicine.medscape.com/article/1344081-overview
5.	https://cpr.heart.org/en/resuscitation-science/cpr-and-ecc-guidelines/algorithms

EXPERIANTIOAL LEARNING:

LIST OF EXPERIMENTS:

1. Understand the of Renal Disease.
2. Understand the Complications during Hemodialysis.
3. Understand the hemodialysis treatment.
4. Demonstration the Special procedures in renal diseases patient.
5. Demonstration of standard for hemodialysis.

RESOURCES

TEXT BOOKS:

1. J. T. Daugirdas, Handbook of Dialysis, Lippincott Williams & Wilkins, Edition 5, 2014.
2. Allen R.Nissenson, Richard N.Fine, Dialysis Therapy, Hanley & Belfus, Edition 4, 2007.

3. Dr Anjani Sharma, Faswal Pichan, Handbook for Dialysis Technician, Emmess Medical Publishers, Edition 1, 2017.

REFERENCE BOOKS:

1. Tood S. Ing, Dialysis History Development and Promise, World Scientific Publishing Company, Edition 1, 2011.
2. William L. Henrich, Principles and Practice of Dialysis, Lippincott Williams & Wilkins, Edition 4, 2009.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=Z_ZcDE-PTgI
2. https://www.youtube.com/watch?v=EU2skU3bgS8
3. https://www.youtube.com/watch?v=HbC0eUWg_sY

WEB RESOURCES:

1. https://www.nsdcindia.org/scmp/assets/image/494650646-Preview_DIALYSIS_TECHNICIAN.pdf
2. https://dialysistech.net/images/stories/files/Basic-Dialysis-Theory-Sweeny.pdf
3. https://www.studocu.com/in/document/kerala-university-of-health-sciences/bsc-nursing/8-dialysis-lecture-notes/43842887

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC102035	**APPLIED DIALYSIS TECHNOLOGY-III**	5	-	2	-	**6**

Pre-Requisite 22CC101032 Applied Dialysis Technology-II

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed understand and apply the Principles of Dialysis and skills necessary to give safe and effective care to the individual undergoing Dialysis Therapy and to assess the patient for any long term complications with an understanding of the problem and recognize the need to report the complications to the Physician or Nephrologist.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the Systemic diseases in Dialysis Patients

CO2 Acquire knowledge on Infectious diseases in Dialysis Patients

CO3 Evaluation associate with Special problems of dialysis patients.

CO4 Understand the Special procedures to access the patients in the complicated conditions.

CO5 Understand the renal nutrition diet in dialysis patients.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	3	-	-	2	-	2	-
CO2	3	-	-	3	-	1	-	-	-	-
CO3	3	-	-	3	-	1	3	-	-	-
CO4	3	-	-	2	-	-	-	-	-	-
CO5	3	2	-	3	-	-	2	-	-	2
Course Correlation Mapping	**3**	**2**	**-**	**3**	**-**	**1**	**2**	**-**	**2**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

MODULE 1: SYSTEMIC DISEASES IN DIALYSIS PATIENTS (18 Periods)

Nutrition in Dialysis Patients-Introduction to nutrition and RDA's. Renal diet. Teaching for a patient on renal diet. Foods to avoid, method of cooking to be employed. Planning a renal diet for a patient with chronic kidney disease. Screening for under nutrition among dialysis patients, Diabetes in Dialysis Patients, Hypertension in Dialysis Patients, Serum enzyme levels, Haematological abnormalities.

MODULE 2: SYSTEMIC & INFECTIOUS DISEASES IN DIALYSIS PATIENTS (18 Periods)

Infections in Dialysis Patients, Endocrine disturbances, Bone disease-pathophysiology, causes, diagnosis, management, A dynamic bone disease , Aluminum toxicity pathophysiology, causes, diagnosis, management, Sleep disorders- pathophysiology, causes, diagnosis, management, Genito urinary tract and male organ infections.

MODULE 3: SPECIAL PROBLEMS (18 Periods)

Musculoskeletal & Rheumatologic diseases in CRF patients, Special problems pertaining to Heart & Circulatory system in CRF patients, Special problems pertaining to Digestive tract in CRF patients, Special problems pertaining to Genitourinary tract and Male Reproductive oragns in CRF patients, Special problems pertaining to Obstetrics & Gynecology in CRF patients, Special problems pertaining to Nervous system in CRF patients.

MODULE 4: SPECIAL PROCEDURES (18 Periods)

Common Urosurgical Procedures- Antegrade pyelogram, Computer Tomography scan for kidney, Cystography for prostate conditions and women's, Intravenous Pyelogram, Kidney Biopsy, Prostate Biopsy, Kidney Transplant Procedure, kidney Ultrasound, Lithotripsy, Radial Prostectomy, Nephrectomy, Arteriovenous fistula, Arteriovenous graft , instruments & their management, ESWL.

MODULE 5: RENAL NUTRITION (18 Periods)

Nutritional anthropometric measurements ,Nutritional biochemical assessment, Clinical signs & symptoms, Dietary assessment Dietary management in diabetes, Dietary management in hypertension, Dietary management in cardiovascular diseases, Dietary management in renal diseases, Dietary management in cancer, Principles of ICU care, Current Research in PD and Transplantation.

Total Periods: 90

EXPERIANTIOAL LEARNING:

LIST OF EXPERIMENTS:

1. Understand the of Systemic diseases in Dialysis Patients.
2. Understand the Infectious diseases in Dialysis Patients.
3. Understand the Special problems in hemodialysis patients.
4. Demonstration the Special procedures in renal diseases patient.
5. Demonstration of Nutritional biochemical assessment

RESOURCES

TEXT BOOKS:

1. J. T. Daugirdas, Handbook of Dialysis, Lippincott Williams & Wilkins, Edition 5, 2014.
2. Allen R.Nissenson, Richard N.Fine, Dialysis Therapy, Hanley & Belfus, Edition 4, 2007.
3. Dr Anjani Sharma, Faswal Pichan, Handbook for Dialysis Technician, Emmess Medical Publishers, Edition 1, 2017.

REFERENCE BOOKS:

1. Tood S. Ing , Dialysis History Development and Promise, World Scientific Publishing Company, Edition 1, 2011.
2. William L. Henrich, Principles and Practice of Dialysis, Lippincott Williams & Wilkins, Edition 4, 2009.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=Z_ZcDE-PTgI
2. https://www.youtube.com/watch?v=EU2skU3bgS8
3. https://www.youtube.com/watch?v=HbC0eUWg_sY

WEB RESOURCES:

1. https://www.nsdcindia.org/scmp/assets/image/494650646-Preview_DIALYSIS_TECHNICIAN.pdf
2. https://dialysistech.net/images/stories/files/Basic-Dialysis-Theory-Sweeny.pdf
3. https://www.studocu.com/in/document/kerala-university-of-health-sciences/bsc-nursing/8-dialysis-lecture-notes/43842887

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CC102036	**PRINCIPLES AND PRACTICE OF PERITONEAL DIALYSIS**	5		2	-	**6**

Pre-Requisite 22CC102006 Applied Dialysis Technology – I

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion to understand the management of patients requiring Peritoneal Dialysis and technical aspects of Dialysis related equipment and to contribute to a new generation of academic dialysis professional equipped to address the challenging problems in Renal Replacement Therapy.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Independently train the patients on Peritoneal Dialysis.

CO2 Ability to perform the effective care during peritoneal dialysis treatments.

CO3 Acquire knowledge on Dialysis Instruments.

CO4 Access the skill to administer required protocols and interpret the clinical findings with reference to the patients.

CO5 Assess and evaluate the patient waiting for Renal Transplant and Donor.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	3	-	-	2	-	2	-
CO2	3	-	-	3	-	1	-	-	-	-
CO3	3	-	-	3	-	1	3	-	-	-
CO4	3	-	-	2	-	-	-	-	-	-
CO5	3	2	-	3	-	1	3	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**3**	**-**	**1**	**3**	**-**	**2**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

MODULE 1: INTRODUCTION TO PERITONEAL DIALYSIS ***(18 Periods)***

Peritoneal Dialysis -,History of Peritoneal Dialysis, Principles of Peritoneal Dialysis - Diffusion, Ultrafiltration, convention , Indications for Peritoneal Dialysis -Clinical Indication, Biochemical Indication , Types of Peritoneal Dialysis - Acute Peritoneal Dialysis, Chronic Peritoneal Dialysis, conventional Dialysis, Nocturnal Dialysis, Home Dialysis, Short Daily Dialysis Physiology of PD – Kinetics of PD, Contraindications for Chronic PD.

MODULE 2: PD APPARATUS **(18 Periods)**

PD Apparatus – Solutions-process, volume, types of PD solution, concentration, dialysis solution PH, glucose degradation products, Transfer set-Straight transfer set, Y transfer set, Double bag system, Connectologies- Design, Exchange procedure, various connectors of Peritoneal Dialysis, Specialized connection device – Mechanical device, Ultraviolet light sterilization device , Access for CAPD-Acute versus chronic catheter, chronic catheter, placement, removal methods, catheter problems, management, Catheter and Exit site care.

MODULE 3: PD PROCESS &THERAPIES **(18 Periods)**

PD Therapies – Types-continuous ambulatory Peritoneal Dialysis, Automated Peritoneal Dialysis – continuous cycling Peritoneal Dialysis, Nocturnal intermittent Peritoneal Dialysis, Tidal Peritoneal Dialysis, Advantages and contraindications of PD Therapies , Assessment of Peritoneal membrane permeability, Adequacy of Peritoneal Dialysis-Assessment of adequate dialysis, Frequency of measurement, Factors determining clearance in PD, prescription factors, Transporters.

MODULE 4: PD COMPLICATIONS &MANAGEMENT **(18 Periods)**

PD Complications &Management - Infectious complications of PD-peritonitis, Exit site infection, Tunnel Infection-continuous initial antimicrobial therapy, Diagnosis, Management , Non-infectious complications of PD –surgical related complications, PD catheter complications, Intra-abdominal pressure complication, PD procedure related complications, Mechanical and Metabolic, Patient education guidelines.

MODULE 5: TRANSPLANTATION AND CURRENT RESEARCH **(18 Periods)**

Transplantation and Current Research - Types of Renal Donor , Donor workup, inclusion and exclusion criteria for long living kidney donors, Recipient workup-HLA typing, cross matching, Role of Transplant coordinators, Cadaver Donor maintenance – Brain death, Transplantation, Principles of Post-transplant management and follow up, Transplantation rejection & complication, Human organ transplant act.

Total Periods: 90

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstration the of Peritoneal Dialysis.
2. Understand the PD Apparatus.
3. Demonstration the PD Process &Therapies in renal failure patients.
4. Demonstration the PD Complications &Management in renal failure patient.
5. Understand the renal Transplantation.

RESOURCES

TEXT BOOKS:

1. J.T.Daugirdas, Handbook of Dialysis, Lippincott Williams & Wilkins, Edition 5, 2014.
2. Gabriel M. Danovitch, Handbook of Kidney Transplantation, Lippincott Williams & Wilkins, Edition 5, 2009.

REFERENCE BOOKS:

1. Nolph and Gokals, Textbook of Peritoneal Dialysis, Martinus Neuhoff Publishers, Edition 3, 2009.
2. Sir Peter J.Morris, Kidney transplantation, Saunders Publications, Edition 6, 2014.
3. Claudio Ponticelli, Medical Complications of Kidney Transplantation, CRC Press, Edition 1, 2005.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=Z_ZcDE-PTgI
2. https://www.youtube.com/watch?v=EU2skU3bgS8
3. https://www.youtube.com/watch?v=HbC0eUWg_sY

WEB RESOURCES:

1. https://www.nsdcindia.org/scmp/assets/image/494650646-Preview_DIALYSIS_TECHNICIAN.pdf
2. https://dialysistech.net/images/stories/files/Basic-Dialysis-Theory-Sweeny.pdf
3. https://www.studocu.com/in/document/kerala-university-of-health-sciences/bsc-nursing/8-dialysis-lecture-notes/43842887

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
	Paediatric Nephrology	3	1	-	-	4
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion on newer advancement in dialysis techniques for pediatrics. This course also to practice independently on dialyzer extracorporeal blood circuit priming and setting up the machine for dialysis procedure for pediatrics.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1	Knowledge on principles of innovation process for establishing Industrial ventures.
CO2	Apply the knowledge on nutritional considerations for the infants during dialysis.
CO3	Understand the psychological aspects of transplantation and hemodialysis in children's.
CO4	Understand types of renal replacement the in infancy.
CO5	Demonstrate knowledge on preparation for infant transplant, post transplantation care in infants.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	1	-	1	1	1	1	-	-
CO2	3	2	1	-	1	-	-	-	-	-
CO3	3	3	1	1	1	-	-	-	-	-
CO4	3	2	1	1	1	1	-	-	-	-
CO5	3	3	3	1	1	1	-	-	-	-
Course Correlation Mapping	**3**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1:	**Pediatric HD**	***(6 Periods)***
Introduction, HD in ARF causes of ARF in children, Indication for Dialysis, principles of Dialysis in ARF, HD in acute poisonings, HD for in born error soft metabolism, acute vascular assess. Chronic HD- vascular access, AV fistula, bridge grafts, catheters, complication of vascular access, HD equipment.		
Module 2:	**Nutritional Management of Pediatric patients on chronic Dialysis**	***(10 Periods)***
Introduction, Nutritional Assessment, Anthropometrics parameters ,Biochemical assessment, Radiological assessment, Dietary recommendations, Energy requirements, protein require, Lipid require, sodium, Potassium, water, renal osteodystrophy, Vit D therapy, vitamins, Trace elements: Iron, Zinc and Copper, Nutritional considerations for the infant receiving CAPD or CCPD treatment.		
Module 3:	**Psychosocial problems related to dialysis in pediatric patients**	***(8 Periods)***
Introduction, Adjustment, compliance, neuro psychological development, rehabilitation. Common problem associated with long term HD, preparation of a child for eventual kidney Transplantation.		
Module 4:	**Transplantation In Infancy**	***(16 Periods)***
Introduction, indications for renal replacement the in infancy, renal failure in infancy, growth in infants with renal failure, neurologic development in infants with renal failure, dialysis in infants, PD in infancy, complication of PD in infancy, immunologic effects of PD in the infant hemodialysis in infancy.		
Module 5:	**Post Transplantation Care**	***(5 Periods)***
Renal transplantation in infancy, preparation for infant transplant, post transplantation complication, immunosuppression protocols, identification and treatment of allograft rejection, growth post-transplant in the infant, co stand (RE) hospitalization in the infant with ESRD, Summary.		
		Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:	
11.	Setting up dialysis machine for pediatric dialysis.
12.	Demonstrate the AV cannulation for Infants.
13.	Understanding the Common psychological problem associated with HD in Infants.
14.	Initiation of dialysis through central venous catheters like internal jugular, femoral & subclavian vein in Infants.
15.	Demonstrate the post transplantation care.

RESOURCES

TEXT BOOKS:	
5.	Pranaw Kumar Jha, Vijay Kher, Manual of Nephrology, Jaypee Brothers Medical Publishers, Edition 6, 2018
6.	Dr Jigar Shrimali, Textbook of Dialysis therapy, Notion Press, Edition 1, 2018.
REFERENCE BOOKS:	
5.	Allen R. Nissenson, Handbook of Dialysis Therapy, Elsevier Health Scieces, Edition 6, 2022
6.	Hidetomo Nakamoto, Recent Advances in Dialysis Therapy in Japan (Contributions to Nephrology), S Karger Ag Publishers, Edition 1, 2018.
VIDEO LECTURES:	
1.	https://www.youtube.com/watch?v=Z_ZcDE-PTgI
2	https://www.youtube.com/watch?v=EU2skU3bgS8
3.	https://www.youtube.com/watch?v=HbC0eUWg_sY
4.	https://youtu.be/fooQi2PRSZk?si=1o1dTfCpQPv1o8nX
Web Resources:	
6.	https://www.nsdcindia.org/scmp/assets/image/494650646-Preview_DIALYSIS_TECHNICIAN.pdf
7.	https://dialysistech.net/images/stories/files/Basic-Dialysis-Theory-Sweeny.pdf

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
	Nephro-Radiological and imaging sciences	3	-	2	-	4
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					
COURSE DESCRIPTION: This course is designed to learn about techniques involved in the radiological instruments.						
COURSE OUTCOMES: After successful completion of the course, students will be able to:						
CO1	Evaluation of renal function and diagnostic tests involved in renal system through the radiation therapy.					
CO2	Apply the elementary ultrasound methodology to evaluate the anatomic abnormalities.					
CO3	Demonstrate the radio nuclide renography for renal emergency conditions.					
CO4	Understand the computed tomography techniques and understand the principles CT and know how to perform.					
CO5	Understanding and demonstration of cross sectional anatomy of urinary system using magnetic resonance.					

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	1	-	-	-	1	-	1
CO2	3	2	-	1	-	-	-	1	-	1
CO3	3	2	-	1	-	-	-	1	-	1
CO4	3	2	-	1	-	-	-	1	-	1
CO5	3	2	-	1	-	-	-	1	-	1
Course Correlation Mapping	-	-	-	-	-	-	-	1	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1:	**EVALUATION OF RENAL FUNCTION AND DIAGNOSTIC TESTS**	***(10 Periods)***
Evaluation of GFR & real plasma flow– glomerular filtrations rate– methodology of estimating clearance of solutes– endogenous creating in clearance– radio nuclide clearance– plasma disappearance methodology– GFR by non-radioactive clearance markers– renal blood flow and renal plasma flow.		
Module 2:	**ULTRASOUND**	***(10 Periods)***
Elementary ultrasound methodology– sonographic imaging characteristics– Doppler ultrasound– scanning techniques– ultrasound of the normal kidney– acute renal failure– surgical– medical renal disease– renal masses– cysts- solid renal masses– calculi– intrarenal hematomas– renal transplant evaluation– rejection– renal infections– ultrasound versus intravenous contrast studies– percutaneous vs guided interventions – Doppler ultrasound in evaluation of renal vascular disease– evaluation of anatomic abnormalities.		
Module 3:	**RADIO NUCLIDE RENOGRAPHY**	***(10 Periods)***
Methodology– selection of radionuclide– the gamma camera– indications– limitations– quantifications of renal function– GFR–effective renal plasma flow– obstructive uropathy – vesicoureteral reflux– renal transplantation– acute renal failure– Reno vascular HT– captopril Reno grapy – static renal imaging		
Module 4:	**COMPUTED TOMOGRAPHY OF THE KIDNEY**	***(10 Periods)***
Anatomy– technique–renal masses– cystic masses– solid renal masses– tumors of the renal pelvis– renal calculi– obstructive uropathy– infarction– acute renal cortical necrosis– renal vein thrombosis– renal artery stenosis– acute pyelonephritis– renal and perinephric abscess– emphysematous pyelonephritis– pylonephrosis– xanthogranulomatous pyelonephritis– tuberculous pyelonephritis–congenital anomalies– renal trauma– transplant kidneys		
Module 5:	**MAGNETIC RESONANCE IMAGING**	***(5 Periods)***
Technical aspects– magnetic resonance with IV contrast – normal kidney– congenital anomalies– obstruction– injection– renal parenchymal disease–Hypertension and renal vascular disease– renal cysts– benign neoplasm's– malignancies of kidney– Transplantation– magnetic resonance spectroscopy.		
		Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:	
16.	Apply your knowledge on evaluation of GFR & real plasma flow.
17.	Identify cross sectional anatomy using sonographic imaging of kidney.
18.	Identify diseases conditions of kidney by radio nuclide renography.
19.	Identify diseases conditions of kidney by computed tomography.
20.	Understand the technical aspects of magnetic resonance with IV contrast.

RESOURCES

TEXT BOOKS:	
7.	Jacob Mandell, Core Radiology A Visual Approach to Diagnostic Imaging, Jaypee brothers and Medical Publishers, Edition 1, 2013.
8.	Torsten B. Moeller, MD, Pocket Atlas of Sectional Anatomy, Jaypee Brothers Medical Publishers, Edition 1, 2007.
REFERENCE BOOKS:	
7.	Sumeet Bhargava & Satish K Bargava, Textbook of Radiology for residents & Technicians, PEEPEE Publications & Distributors (P) Ltd, Edition 5, 2020.
8.	Dr.K.B. Galhat, Lalit Agarwal, Concise, Text Book on Imaging Modalities & Recent Advances In Diagnostic Radiology, JBD publications, Edition 2, 2010.
VIDEO LECTURES:	
1.	https://youtu.be/xqbHczUVhcU?si=p_tsquooFYKPTFlT
2	https://youtu.be/npKkYlejqvs?si=E_9cBZSAG7dn2X0U
3.	https://youtu.be/1ITlknuwW0A?si=F6WZlgFnUZDVihPv
4.	https://youtu.be/uLpnUp2SBiw?si=Do-3tK5HWVzQhlap
Web Resources:	
8.	https://www.medicalbuyer.co.in/recent-advancements-in-mri-technology-improving-accuracy-speed-and-safety/ .
9.	https://www.neurologica.com/blog/advances-ct-scan-technology

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CC111003	**CLINICAL POSTING-III**	-	-	-	-	4

Pre-Requisite 22CC1111002 Clinical Posting-II

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides basic knowledge on hospital setup, care of patient, primary illness observation, and handling basic clinical instruments at training hospital.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Develop communication skills to deal with patients and health care professionals.

CO2 Apply appropriate medical devices and techniques to diagnose the patient illness.

CO3 Develop skills in formulating various medical documentation procedures.

CO4 Work individually and in teams following ethical practice.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	2	-	1
CO2	3	1	1	3	-	-	-	-	-	1
CO3	3	-	-	2	-	-	3	1	-	-
CO4	3	-	1	2	-	1	1	1	-	1
Course Correlation Mapping	**3**	**1**	**1**	**3**	**-**	**1**	**2**	**2**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

Note:

1. Students will attend to clinical posting weekly two days in 5th semester.
2. The Evaluation process is day to day, based on logbook and viva.

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CC111004	**CLINICAL POSTING-IV**	-	-	-	-	4

Pre-Requisite 22CC111003 Clinical Posting-III

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides basic knowledge on hospital setup, care of patient, primary illness observation, and handling basic clinical instruments at training hospital.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Develop communication skills to deal with patients and health care professionals.

CO2 Apply appropriate medical devices and techniques to diagnose the patient illness.

CO3 Develop skills in formulating various medical documentation procedures.

CO4 Work individually and in teams following ethical practice.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	2	-	1
CO2	3	1	1	3	-	-	-	-	-	1
CO3	3	-	-	2	-	-	3	1	-	-
CO4	3	-	1	2	-	1	1	1	-	1
Course Correlation Mapping	**3**	**1**	**1**	**3**	**-**	**1**	**2**	**2**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

Note:

1. Students will attend to clinical posting weekly two days in 6th semester.
2. The Evaluation process is day to day, based on logbook and viva.

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC111007	**DT INTERNSHIP-I**	-	-	-	-	20

Pre-Requisite 22CC111004 Clinical Posting-IV

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides basic knowledge on hospital setup, care of patient, primary illness observation, and handling basic clinical instruments at training hospital.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Develop communication skills to deal with patients and health care professionals.

CO2. Apply appropriate medical devices and techniques to diagnose the patient illness.

CO3. Develop skills in formulating various medical documentation procedures.

CO4. Work individually and in teams following ethical practice.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	2	-	1
CO2	3	1	1	3	-	-	-	-	-	1
CO3	3	-	-	2	-	-	3	1	-	-
CO4	3	-	1	2	-	1	1	1	-	1
Course Correlation Mapping	**3**	**1**	**1**	**3**	**-**	**1**	**2**	**2**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

Guidelines:

The DT Internship-I will be one semester. This will include 8 hours of practice a day, totaling to 720 hours for one semester.
As a part of this, the students will choose a relevant subject and prepare an in-depth project report of not less than 1000 words which will be handed over to the supervisor or trainer. The report can include objective, scope of the project and an in-depth report.
The internship time period provides the students the opportunity to continue to develop confidence and increased skill in simulation and treatment delivery. Students will demonstrate competence in beginning and intermediate procedures. Students will observe the advanced and specialized treatment procedures. The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction. The students are expected to work for minimum 8 hours per day and this may be more depending on the need and the healthcare setting.

1. Demonstrate ability to formulate and implement a plan for examination
2. Demonstrate ability to manage acute emergent complications on dialysis
3. Perform peritoneal dialysis
4. Administer medications under the supervision of nephrologist
5. Demonstrates ability to provide safe and effective care to the individual
6. Understands the process of operating dialysis equipment and how to perform alternate dialysis procedures.
7. Assesses the patient for any complications with an understanding of the problem and recognizes the need to report the complications to the physician or nephrologist

S. No.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
1	Formulation and implementation of an examination plan	Knowledge of vascular access procedures and tests which will efficiently provide the information required for diagnosis	Determines tests and procedures appropriate to the patient's condition and abilities with nephrologist, performs the tests and progressively modifies them (if needed) on the basis of findings
2	Managing acute emergent complications on dialysis	Knowledge of allergic reactions to medication	Responds properly to patient complaints and takes appropriate measures including emergency termination of dialysis if needed
3	Performs peritoneal dialysis	Knowledge and understanding of the principles of peritoneal dialysis and the different types of PD	Ability to assess a patient for PD, troubleshoot PD problems, prepare for and initiate peritoneal dialysis therapy
4	Administration of medication under the supervision of nephrologists	Knowledge of documenting the administration of medications on flow sheet and use of proper aseptic techniques to prepare and administer medications	Recognizes signs and symptoms of adverse reactions; properly administers drugs as prescribed by the doctors during, before and after dialysis procedure; provides adequate education to patients on various medications used
5	Provides safe and effective care to the individual	Factual knowledge of the principles of dialysis; hemodialysis preparations, methods and techniques; and quality control measures	Demonstrates appropriate use of barrier precautions and cleaning and disinfection procedures

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC111008	**DT INTERNSHIP-II**	-	-	-	-	20

Pre-Requisite 22CC111007 DT Internship-I

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides basic knowledge on hospital setup, care of patient, primary illness observation, and handling basic clinical instruments at training hospital.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Develop communication skills to deal with patients and health care professionals.

CO2. Apply appropriate medical devices and techniques to diagnose the patient illness.

CO3. Develop skills in formulating various medical documentation procedures.

CO4. Work individually and in teams following ethical practice.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	2	-	1
CO2	3	1	1	3	-	-	-	-	-	1
CO3	3	-	-	2	-	-	3	1	-	-
CO4	3	-	1	2	-	1	1	1	-	1
Course Correlation Mapping	**3**	**1**	**1**	**3**	**-**	**1**	**2**	**2**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

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Guidelines:

The DT Internship-II will be one semester. This will include 8 hours of practice a day, totaling to 720 hours for one semester.
As a part of this, the students will choose a relevant subject and prepare an in-depth project report of not less than 1000 words which will be handed over to the supervisor or trainer. The report can include objective, scope of the project and an in-depth report.
The internship time period provides the students the opportunity to continue to develop confidence and increased skill in simulation and treatment delivery. Students will demonstrate competence in beginning and intermediate procedures. Students will observe the advanced and specialized treatment procedures. The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction. The students are expected to work for minimum 8 hours per day and this may be more depending on the need and the healthcare setting.

1. Responds effectively to the physical and emotional needs of the patient undergoing dialysis treatment.
2. Demonstrates a sensitive and caring attitude towards the patient
3. Demonstrates knowledge and ability to operate and maintain all equipment in the dialysis unit.
4. Communicates relevant information to other members and completes accurate documentation
5. Demonstrates ability to correctly position the patient
6. Demonstrates professional behavior

S. No.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
1.	Understands the process of operating dialysis equipment and how to perform alternate dialysis procedures .	Determines tests and procedures appropriate to the patient's condition and abilities, with nephrologist	Formulates an examination plan based on the patient history
2.	Assesses the patient for any complications with an understanding of the problem and recognizes the need to report the complications to the physician or nephrologist	Knowledge of possible complications and ways to treat them, ability to recognize dialyzer reaction and involve appropriate supervisory support if needed	Responds properly to patient complaints and takes appropriate measures including emergency termination of dialysis if needed
3.	Responds effectively to the physical and emotional needs of the patient undergoing dialysis treatment	Ensures a structured, efficient, rational and comfortable exchange of information	Communicates with the patient taking into account his/her physical, emotional, intellectual and cultural background
4.	Operation and Maintenance of all equipment	Factual knowledge of the appropriate system start up procedure and alarm systems function test	Performs basic operator troubleshooting, appropriately initiates, monitors and terminates chemical disinfect procedure for machine, dialyser and tubing. Instructs and supervises the dialysis technician.

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22EC101701	**AI IN HEALTHCARE**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on Concepts of Artificial Intelligence (AI) in Healthcare; The Present State and Future of AI in Healthcare Specialties; The Role of Major Corporations in AI in Healthcare; Applications of AI in Healthcare.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understand the fundamental concepts of AI in Healthcare sector.

CO2 Analyse the present state and future of AI in Healthcare specialties for different scenarios.

CO3 Apply design concepts and metrics for AI in Healthcare.

CO4 Demonstrate basic concepts and terminologies of future applications of Healthcare in AI.

CO5 Develop AI applications through AI techniques for healthcare

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	2	2	-	-	-	-	-	-
CO2	2	3	-	2	-	2	2	-	-	-
CO3	2	-	2	2	-	-	-	-	-	-
CO4	2	-	-	-	2	2	-	-	-	-
CO5	-	-	3	-	-	-	-	-	-	-
Course Correlation Mapping	2	-	3	2	2	2	2	-	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO ARTIFICIAL INTELLIGENCE IN HEALTHCARE ***(08 Periods)***

Introduction to AI in Healthcare, Benefits & Risks, AI in the health sector, AI versus human intelligence, The future of AI in health sector, AI & Neural networks.

Module 2: THE PRESENT STATE & FUTURE OF AI IN HEALTHCARE SPECIALTIES ***(10 Periods)***

Artificial Intelligence in: preventive healthcare, Radiology, Pathology, Surgery, Anesthesiology, Psychiatry, Cardiology, Pharmacy, Dermatology, Dentistry, Orthopedics, Ophthalmology.

Module 3: THE ROLE OF MAJOR CORPORATIONS IN AI IN HEALTHCARE ***(08 Periods)***

IBM Watson, The role of Google & Deep mind in AI in Healthcare, Baidu, Facebook & AI in Healthcare, Microsoft & AI in Healthcare.

Module 4: FUTURE OF HEALTHCARE IN AI ***(10 Periods)***

Evidence-based medicine, personalized medicine, Connected medicine, Virtual Assistants, Remote Monitoring, Medication Adherence, Accessible Diagnostic Tests, Smart Implantables, Digital Health and Therapeutics, Incentivized Wellness, Block chain, Robots, Robot-Assisted Surgery, Exoskeletons, Inpatient Care, Companions, Drones, Smart Places, Smart Homes, Smart Hospitals.

Module 5: APPLICATIONS OF AI IN HEALTHCARE ***(09 Periods)***

Case Study 1: AI for Imaging of Diabetic Foot Concerns and Prioritization of Referral for Improvements in Morbidity and Mortality.

Case Study 2: Outcomes of a Digitally Delivered, Low-Carbohydrate, Type 2 Diabetes Self-Management.

Case Study 3: Delivering A Scalable and Engaging Digital Therapy.

Case Study 4: Improving Learning Outcomes for Junior Doctors through the Novel Use of Augmented and Virtual Reality for Epilepsy.

Case Study 5: Big Data, Big Impact, Big Ethics: Diagnosing Disease Risk from Patient Data.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Analyze how the artificial intelligence is used to predict the disease result and Prognosis Assessment of a patient.
2. How does drug discovery happen and how does AI is helping in drug discovery and Labs.
3. Justify that artificial intelligence provide engineering solutions for early detection and Diagnosis of diseases.
4. Demonstrate the prediction of bladder volume of a patient.

(Note: It's an indicative one. Course Instructor may change activities and shall be reflected in course Handout)

RESOURCES

TEXT BOOKS:

1. Dr. Parag Mahajan, *Artificial Intelligence in Healthcare*, Med Manthra Publications, First Edition 2019.
2. Arjun Panesar, *Machine Learning and AI for Healthcare Big Data for Improved Health*, Apress Publications, 2019.

REFERENCE BOOKS:

1. Michael Matheny, Sonoo Thadaney Israni, Mahnoor Ahmed, and Danielle Whicher, *Artificial Intelligence in Health Care: The Hope, the Hype, the Promise, the Peril*, National Academy of Medicine Publication, First Edition 2019.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=-aHBwTQQyNU
2. https://intellipaat.com/blog/artificial-intelligence-in-healthcare/

WEB RESOURCES:

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6616181/
2. https://www.ibm.com/topics/artificial-intelligence-healthcare
3. https://builtin.com/artificial-intelligence/artificial-intelligence-healthcare

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22DS101701	**BIOINFORMATICS**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course focus on Biological Data Acquisition, Databases, Data Processing, Methods of Analysis, Applications of Bio-informatics.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understand basic biological data acquisition in bioinformatics.

CO2 Identify the proper databases for the information search by choosing the biological databases and also submission and retrieval of data from databases.

CO3 Analyze the results of bioinformatics data using text and sequence-based searching techniques.

CO4 Analyze the secondary and tertiary structures of proteins by applying different alignment programs

CO5 Design biological databases by using contextual knowledge on bioinformatics.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	-	-	-
CO2	2	3	-	-	-	-	-	-	-	-
CO3	2	3	-	-	-	-	-	-	-	-
CO4	2	3	-	-	-	-	-	-	-	-
CO5	3	2	3	3	3	-	-	-	-	-
Course Correlation Mapping	**3**	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: BIOLOGICAL DATA ACQUISITION ***(09 Periods)***

Biological information, Retrieval methods for DNA sequence, protein sequence and protein structure information

Module 2: DATABASES ***(09 Periods)***

Format and Annotation: Conventions for database indexing and specification of search terms, Common sequence file formats. Annotated sequence databases - primary and secondary sequence databases, protein sequence and structure databases.

Module 3: DATA PROCESSING ***(09 Periods)***

Data – Access, Retrieval and Submission: Standard search engines; Data retrieval tools – Entrez, DBGET and SRS; Submission of (new and revised) data; Sequence Similarity Searches: Local and global. Distance metrics. Similarity and homology. Scoring matrices, PAM and BLOSUM

Module 4: METHODS OF ANALYSIS ***(09 Periods)***

Dynamic programming algorithms, Needleman-Wunsch and Smith-waterman.Heuristic Methods of sequence alignment, FASTA and BLAST; Multiple Sequence Alignment and software tools for pair wise and multiple sequence alignment, CLUSTAL program, Prediction of Tertiary structure of proteins.

Module 5: APPLICATIONS ***(09 Periods)***

Genome Annotation and Gene Prediction; ORF finding; Phylogenetic Analysis, Genomics, Proteomics, Genome analysis – Genome annotation, DNA Microarray, computer aided drug design (CADD).

Total Periods: 45

EXPERIENTIAL LEARNING

1. Calculate the dynamic programming matrix and one or more optimal alignment(s) for the sequences GAATTC and GATTA, scoring +2 for a match, −1 for a mismatch and with a linear gap penalty of d = 2.
2. Determine whether the RNA string GGACCACCAGG should be folded into two substructures.
3. Discuss how to carry out the multiple sequence alignment of the following three sequences: TTTTAAAA, AAAACCCC, CCCCTTTT.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXT BOOKS:

1. Lesk, A. K., *Introduction to Bioinformatics*, Oxford University Press, 4th Edition, 2013
2. Dan Gusfield, *Algorithms on Strings, Trees and Sequences: Computer Science and Computational Biology*, Cambridge University Press, 1997.

REFERENCE BOOKS:

1. Baldi, P. and Brunak, S., *Bioinformatics: The Machine Learning Approach*, MIT Press, 2nd Edition, 2001.
2. Mount, D.W., *Bioinformatics Sequence and Genome Analysis*, Cold Spring Harbor Laboratory Press, 2nd Edition, 2004.
3. Tindall, J., *Beginning Perl for Bioinformatics: An introduction to Perl for Biologists*, O'Reilly Media, 1st Edition, 2001.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=liNblw4x50E
2. https://www.youtube.com/watch?v=eZfyWdHnzR0

WEB RESOURCES:

1. https://www.britannica.com/science/bioinformatics
2. https://www.ebi.ac.uk/training/online/courses/bioinformatics-terrified/what-bioinformatics/

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22SS101701	**CONSTITUTION OF INDIA**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides and in-depth knowledge about Constitution of India's Preamble and its Philosophy; Union Legislature; Federalism in India; Judiciary and Public Services; Nation Building. The students can gain first-hand information and knowledge about these dynamics and accordingly act based on these sources in their professional and routine activities.

COURSE OUTCOMES: After successful completion of this course, the students will be able to:

CO1: Demonstrate knowledge in the Parliamentary proceedings, Election Commission, Public Services and Foreign Policy of India.

CO2: Apply the reasoning informed by the various aspects of the Constitution and its provisions to assess societal issues and the consequent responsibilities relevant to the professional engineering practice.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	1	-	-	-	-	3	2	-	-	-
CO2	2	-	-	-	-	3	-	3	-	-
Course Correlation Mapping	**2**	**-**	**-**	**-**	**-**	**3**	**2**	**3**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: PREAMBLE AND ITS PHILOSOPHY ***(09 Periods)***

Introduction to Indian Constitution; Evolution of Indian Constitution; preamble and its philosophy

Module 2: UNION LEGISLATURE ***(09 Periods)***

The Parliament, Parliamentary Structure, Process of Legislation; President of India – Powers and Functions; Prime Minister and Council of Ministers; Constitution Amendment Procedure.

Module 3: FEDERALISM IN INDIA ***(09 Periods)***

Centre-State Administrative Relationship; Governors – Powers and Functions; State Legislature - Composition and powers; Chief Ministers - Powers and Functions; The Election Commission – Powers and Functions.

Module 4: JUDICIARY AND PUBLIC SERVICES ***(09 Periods)***

The Union Judiciary - Supreme Court and High Court; Fundamental Rights and Duties All India Services - Central Civil Services -State Services - Local Services.

Module 5: INTERNATIONAL PARTICIPATION ***(09 Periods)***

Foreign Policy of India; International Institutions Influence: UNO, WTO, WHO, SAARC, International Summits: BRICS, NSS, UNEP – India's Role in International Negotiations; Environmentalism in India.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Review newspapers and submit a report on critical analysis of Indian Civil Servants exercise of powers, in the awake of constitutionally assigned authority.
2. Visit your village Panchayat office or Municipality office and generate a report on your observations about maintained Constitutional symbolism.
3. Watch few videos on recent Indian Independence Day and Republic Day celebrations as marked in New Delhi and present a detailed report, by considering the following aspects:
   a) Comparatively analyze the speeches of the President of India and Prime Minister of India as delivered on these two occasions.
   b) Compare these two events relevance in terms of Indian Armed Forces presence.
   c) Observe, compare and analyse 'flag code' relevance as marked in these two events.
4. Watch a few videos on recent 'proceedings' of any state Legislative Assembly session and submit a detailed report.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXT BOOKS:

1. Briji Kishore Sharma, *Introduction to the Constitution of India*, Prentice Hall of India, 2005

REFERENCE BOOKS:

1. Mahendra Pal Singh,V. N. Shukla's, *Constitution of India*, Eastern Book Company, 2011.
2. Pandey J. N., *Constitutional Law of India*, Central Law Agency, 1998

VIDEO LECTURES:

1. Doctrine of Basic Structure: https://www.youtube.com/watch?v=cvUf9ZeEe8Y
2. Significance of the Constitution: https://www.youtube.com/watch?v=vr1Dc_-ZKbQ

WEB RESOURCES:

1. The Constitution of India: https://www.youtube.com/watch?v=of2SoO8i8mM
2. Protection of Constitutional Democracy: https://www.youtube.com/watch?v=smJ99cdPrns

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CM101702	**COST ACCOUNTING AND FINANCIAL MANAGEMENT**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: Cost accounting; cost sheet & preparation of cost sheet; standard costing & variance analysis; financial management & ratio analysis; introduction to investment**.**

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Demonstrate the concepts of Cost Accounting and Management Accounting and the elements of costing.

CO2 Determine the Cost of Production for pricing decisions.

CO3 Apply the Standard Costing and Variance techniques for the control of the cost of production

CO4 Analyze the Profitability and financial condition of an organization using Ratios.

CO5 Apply Capital Budgeting techniques for making investment decisions in an organization.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	2	-	-	1	-	-
CO2	3	-	-	-	2	-	-	1	-	-
CO3	3	-	-	-	2	-	-	1	-	-
CO4	3	-	-	-	2	-	-	1	-	-
CO5	3	-	-	-	2	-	-	1	-	-
Course Correlation Mapping	**3**	-	-	-	**2**	-	-	**1**	-	-

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: COST ACCOUNTING ***(09 Periods)***

Meaning of Cost and Cost Accounting, Objectives, Scope, Advantages, and Disadvantages – Cost Accounting *Vs* Management Accounting – Elements of Costing – Installation of costing system – Material Control, Labor Control, Overhead Control.

Module 2: COST SHEET & PREPARATION OF COST SHEET (09 Periods)

Analysis of Cost – Preparation of cost sheet, estimate, tender, and quotation (Simple problems) – Importance of Costing while pricing the products

Module 3 STANDARD COSTING & VARIANCE ANALYSIS (09 Periods)

Introduction to Standard Costing & Variances – Variance Analysis: Material variances, Labor variances (Simple Problems).

Module 4 FINANCIAL MANAGEMENT & RATIO ANALYSIS (09 Periods)

Meaning, Objectives - Nature and Scope, Importance of FM – Ratio Analysis**:** Types of Ratios: Solvency Ratios, Liquidity Ratios, Turnover Ratios, and Profitability Ratios - Financial Statement Analysis through Ratios (Simple Problems).

Module 5 INTRODUCTION TO INVESTMENT ***(09 Periods)***

Investment - Meaning and Definition- concept of risk and returns - Capital budgeting techniques – Security Analysis and Portfolio Management (Basic concepts).

Total Periods: 45

EXPERIENTIAL LEARNING

1. Prepare a report on the role of cost accountants in the growth of a company.
2. To visit the manufacturing unit to observe how they used various techniques for analyzing the financial health of a company.
3. Prepare a report on factors influencing the form of business organization.
4. Prepare the cost sheet with practical examples of any two manufacturing companies.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXT BOOKS:

1. S.P. Jain and K.L. Narang: *Cost Accounting*, Kalyani Publishers, Ludhiana, 10th edition, 2016.
2. I.M. Pandey, *Financial Management*, Vikas Publishing House Pvt. Ltd., 14th edition, 2016.

REFERENCE BOOKS:

1. The Institute of Company Secretaries of India, *Cost and Management Study Material*, New Delhi.
2. CA Saravana Prasath, *Cost Accounting and Financial management*, Wolters Kluwer India Pvt. Ltd., New Delhi, 2018.

VIDEO LECTURES:

1 https://www.youtube.com/watch?v=ESqO8sFgQa0&list=PLLhSIFfDZcUVE2kzOhEubO9rkvUOAgZbz

2 https://www.youtube.com/watch?v=tzasFmP1CpAhttps://www.youtube.com/watch?v=tzasFmP1CpA

WEB RESOURCES:

1 https://www.tutorialspoint.com/accounting_basics/management_versus_cost_accounting.htm

2 https://www.netsuite.com/portal/resource/articles/financial-management/financial-management.shtml

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22MG101701	**ENTREPRENEURSHIP FOR MICRO, SMALL AND MEDIUM ENTERPRISES**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: To understand the setting up and management of MSMEs and initiatives of Government and other institutions support for growth and development of MSMEs

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the basic of SME and challenges of MSMEs

CO2. Explain the opportunities to Set-Up SSI/SME Units and role of rural & women entrepreneurship.

CO3. Illustrate roles of various institutions supporting MSMEs.

CO4. Understand Management of MSME, NPA & sickness units

CO5. Evaluate role of Government in Promoting Entrepreneurship

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	2	1	2	1	-	-	-	-	-	-
CO2	1	1	2	-	-		2		1	
CO3	2	2	1	-	-	-	-	1	-	-
CO4	3	1	2	-	-	-	-	-	-	-
CO5	2	2	1	-	-	1	-	-	-	-
Course Correlation Mapping	**2**	**2**	**2**	**2**	**1**	**1**	**2**	**1**	**1**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION2 ***(07 Periods)***

Concept & Definition, Role of Business in the modern Indian Economy SMEs in India, Employment and export opportunities in MSMEs. Issues and challenges of MSMEs

Module 2: MSME SETTING ***(09 Periods)***

Identifying the Business opportunity, Business opportunities in various sectors, formalities for setting up an enterprise - Location of Enterprise – steps in setting up an enterprise – Environmental aspects in setting up, Incentives and subsidies.

Module 3: MSMES SUPPORTING INSTITUTIONS ***(09 Periods)***

Forms of Financial support, Long term and Short term financial support, Sources of Financial support, Development Financial Institutions, Investment Institutions, Central level institutions, State level institutions, Other agencies, Commercial Bank – Appraisal of Bank for loans

Module 4: MANAGEMENT OF MSME ***(10 Periods)***

Management of Product Line; Communication with clients – Credit Monitoring System - Management of NPAs - Restructuring, Revival and Rehabilitation of MSME, Problems of entrepreneurs – sickness in SMI – Reasons and remedies –– Evaluating entrepreneurial performance

Module 5: ENTREPRENEURSHIP PROMOTION ***(10 Periods)***

MSME policy in India, Agencies for Policy Formulation and Implementation: District Industries Centers (DIC), Small Industries Service Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship & Small Business Development (NIESBUD), National Entrepreneurship Development Board (NEDB)

Total Periods: 45

EXPERIENTIAL LEARNING

1. Present a case study on MSMEs Business Strategies.
2. Collect the data about nearby MSMEs and Present their structures in a PPT
3. Discuss in the group MSMEs opportunities in terms of Orientation and Develop mentation.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXT BOOKS:

1. Vasant Desai, *Small Scale Industries and Entrepreneurship*, Himalaya Publishing House, 2003..
2. Poornima M Charanthimath, *Entrepreneurship Development Small Business Enterprises*, Pearson, 2006.

REFERENCE BOOKS:

1. Suman Kalyan Chaudhury, *Micro Small and Medium Enterprises in India Hardcover*, Raj Publications, 2013.
2. Aneet Monika Agarwal, *Small and medium enterprises in transitional economies, challenges and opportunities*, DEEP and DEEP Publications
3. Paul Burns & Jim Dew Hunt, *Small Business Entrepreneurship*, Palgrave Macmillan publishers, 2010.

VIDEO LECTURES:

1. https://sdgs.un.org/topics/capacity-development/msmes
2. https://blog.tatanexarc.com/msme/msme-schemes-in-india-for-new-entrepreneurs-and-start-ups/

WEB RESOURCES:

1. ncert.nic.in/textbook/pdf/kebs109.pdf
2. https://www.jetir.org/papers/JETIR1805251.pdf

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CB101703	FORENSIC SCIENCE	3	-		-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on Concepts of Forensic Science, Tools and Techniques in Forensic Science, Forensic Photography, Crime Scene Management, Crime Scene Management Laws and Forensic Science.

COURSE OUTCOMES: *After successful completion of the course, students will be able to*:

CO1 Understand the basic concepts of Forensic science.
CO2 Apply various tools and techniques in forensic science for crime investigation.
CO3 Understand Forensic Photography fundamentals.
CO4 Perform Crime scene investigation, scene reconstruction and prepare reports.
CO5 Understand Legal aspects of Forensic Science.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	-	-	-
CO2	3	3	2	2	2	-	-	-	-	-
CO3	3	3	-	-	-	-	-	-	-	-
CO4	3	3	2	2	2	-	-	-	-	-
CO5	3	3	2	2	2	-	-	-	-	-
Course Correlation Mapping	**3**	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION ***(09 Periods)***

Introduction, Need, Scope, Concepts and Significance of Forensic Science, History and Development of Forensic Science, Laws and Basic principles of Forensic Science, Branches of forensic science, Organizational set-up of a Forensic Science Laboratory. Investigative strategies. Expert testimony and eye-witness report.

Module 2: TOOLS AND TECHNIQUES IN FORENSIC SCIENCE ***(09 Periods)***

Basic principles of microscopy, spectroscopy, chromatography, Electrophoresis, Enzyme_Linked Immunosorbent Assay (ELISA), Radio Immuno Assay (RIA). Measuring and optical instruments. Research methodologies; Formation of research design on a specific problem. Central tendency and Dispersion. Test of significance. Analysis of variance, Correlation and Regression.

Module 3: FORENSIC PHOTOGRAPHY ***(8 Periods)***

Basic principles of Photography, Techniques of black & white and color photography, cameras, lenses, shutters, depth of field, film; exposing, development and printing techniques; Different kinds of developers and fixers; UV, IR, fluorescence illumination guided photography; Modern development in photography- digital photography, working and basic principles of digital photography; Surveillance photography. Videography and Crime Scene & laboratory photography.

Module 4: CRIME SCENE MANAGEMENT ***(11 Periods)***

Crime scene investigations, protecting and isolating the crime scene; Documentation, sketching, field notes and photography. Searching, handling and collection, preservation and transportation of physical evidences, Chain of custody and Reconstruction of scene of crime. Report writing.

Module 5: LAW AND FORENSIC SCIENCE ***(8 Periods)***

Legal aspects of Forensic Science: Forensic Science in the Criminal Justice System, The Criminal Investigation Process, Production of Evidence: The Subpoena, The Rules of Evidence, Authentication of Evidence: The Chain of Custody, The Admissibility of Evidence, Laboratory Reports, Examples of Analysis and Reports, Expert Testimony, Getting into Court, Testifying, Being a Witness and an Expert, Considerations for Testimony.

Total Periods: 45

EXPERIENCIAL LEARNING

1. Study of Computer Forensics and different tools used for forensic investigation
2. Identify and list the steps for hiding and extract any text file behind an image file/ Audio file using Command Prompt

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXT BOOKS:

1. Houck M.M and Siegel J.A, *Fundamentals of Forensic Science*, Elsevier, 2nd edition, 2010.

2. Sharma B.R, *Forensic Science in Criminal Investigation and Trials*, Universal Publishing Co., New Delhi, 2003.

REFERENCE BOOKS:

1. Nanda B.B and Tewari, R.K, *Forensic Science in India- A vision for the Twenty First Century*, Select Publisher, New Delhi, 2001.
2. James, S.H and Nordby, J.J, *Forensic Science- An Introduction to Scientific and Investigative Techniques*, CRC Press, USA, 2003.
3. Saferstein, Criminalistics, *An Introduction of Forensic Science*, Prentice Hall Inc, USA,2007.
4. Barry, A.J. Fisher, *Techniques of Crime Scene Investigation*, CRC Press, NewYork, 7th edition, 2003.

VIDEO LECTURES:

1. https://nptel.ac.in/courses/106106178
2. https://www.youtube.com/watch?v=X5fo1H7bc0g

WEB RESOURCES:

1. https://www.nist.gov/forensic-science
2. https://www.coursera.org/learn/forensic-science

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22SS101704	**INDIAN HISTORY**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: Introduction; Ancient India; Classical and Medieval era; Modern India; India after independence.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Demonstrate contextual knowledge in the evolution of ancient and medieval Indian History and acquire an awareness of societal and cultural transformation.

CO2 Analyze the situations before and after Independence and assess the societal reforms implemented in India after Independence.

CO3 Practice culture transformations and appreciate its influence to adapt themselves in global scenarios.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	2	-	-	-	-	1	-	-	-	-
CO2	1	2	-	-	-	1	-	-	-	-
CO3	1	1	-	-	-	2	-	-	-	-
Course Correlation Mapping	**2**	**1**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO INDIAN HISTORY ***(08 Periods)***

Elements of Indian History; History Sources: Archaeology, Numismatics, Epigraphy & Archival research; Methods used in History; History & historiography; Sociological concepts-structure, system, organization, social institutions, Culture and social stratification (caste, class, gender, power), State& Civil Society.

Module 2: ANCIENT INDIA ***(09 Periods)***

Mohenjo-Daro civilization; Harappa civilization; Mauryan Empire.

Module 3: CLASSICAL & MEDIEVAL ERA ***(12 Periods)***

Classic Era (200 BC - 1200 AD); Hindu - Islamic Era (1200 - 1800 AD).

Module 4: MODERN INDIA ***(06 Periods)***

Age of Colonialism (17th - 19th centuries); First war of Indian Independence; Freedom Struggle (1857-1947)

Module 5: INDIA AFTER INDEPENDENCE (1947 -) ***(10 Periods)***

The Evolution of the Constitution and Main Provisions; Consolidation of India as a Nation; Politics in the States; Indian economy; Modernization and globalization, Secularism and communalism, Nature of development, Processes of social exclusion and Inclusion, Changing Nature of Work and Organization.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Prepare a write-up on how to safeguard ancient monuments.
2. Analyze the most famous historically important place you visited.
3. Prepare a presentation on the ancient Seven Wonders of the World with their significance and how they are destroyed.
4. Prepare a presentation on "Wars of the past not only destroyed people and their livelihood but also the people's tradition and culture."
5. Prepare a poster on " Continents that No Longer Exist" with causes

(Note: It's an indicative one. Course Instructor may change activities and shall be reflected in course Handout)

RESOURCES

TEXT BOOKS:

1. K. Krishna Reddy, *Indian History,* Tata McGraw-Hill, 21st reprint, 2017.

REFERENCE BOOKS:

1. Guha, Ramachandra, *India after Gandhi*, Pan Macmillan, 2007.
2. Romila Thapar, *Early India***,** Penguin India, New Delhi 2002.

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22SS101705	**INDIAN TRADITION AND CULTURE**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: Basic traits of Indian Culture; Humanistic Reforms under Jainism and Buddhism; Culture in the medieval period; Socio Religious reforms in Indian Culture; Reform movements for harmonious relations.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Demonstrate knowledge of Vedic and Upanishadic culture and society to consider human aspirations, values and theories.

CO2 Understand the contributions of Buddhism and Jainism to Indian culture.

CO3 Examine the cultural conditions and achievements of India under Mouryas and Guptas.

CO4 Analyze social religious reforms and reform movements.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	1	-	-	-	-
CO2	3	-	-	-	-	1	-	-	-	-
CO3	2	-	-	-	-	3	-	-	-	-
CO4	2	-	-	-	-	3	-	-	-	-
Course Correlation Mapping	**3**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: BASIC TRAITS OF INDIAN CULTURE ***(08 Periods)***

Meaning and definition and various interpretations of culture - Culture and its features - The Vedic and Upanishad culture and society - Human aspirations and values in these societies - Chaturvidha purushardhas, Chaturashrma and Chaturvarna theory.

Module 2: HUMANISTIC REFORMS UNDER JAINISM AND BUDDHISM ***(09 Periods)***

Salient features of Jainism - contributions of Jainism to Indian culture - Contributions of Aachaarya and Mahaapragya - Buddhism as a humanistic culture - The four noble truths of Buddhism - Contributions of Buddhism to Indian culture.

Module 3: CULTURE IN THE MEDIEVAL PERIOD ***(09 Periods)***

Unifications of India under Mouryas and Guptas and their cultural achievements - Cultural conditions under satavahanas - Contributions to Pallavas and cholas to art and cultural achievements of Vijayanagara rulers

Module 4: SOCIO RELIGIOUS REFORMS IN INDIAN CULTURE ***(09 Periods)***

Western impact on India - Introduction of Western education - social and cultural awakening and social reform movements of Rajaramohan Roy - Dayanandha Saraswathi - Anne Besant (theosophical society).

Module 5: REFORM MOVEMENTS FOR HARMONIOUS RELATIONS ***(09 Periods)***

Vivekananda, Eswarchandravidyasagar and Veeresalingam - emancipation of women and struggle against caste - Rise of Indian nationalism - Mahatma Gandhi – Non-violence and satyagraha and eradication of untouchability.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Identify different cultural festivals of Indian States and prepare a write-up on their uniqueness.
2. India has a rich history with numerous architectural wonders. Prepare a report on any three famous architectural wonders in India.
3. Explore the diverse flavors of Indian cuisine and prepare a poster on the different dishes and their distinctiveness.
4. India is a country of Unity in Diversity. Make a PowerPoint presentation on different traditional dresses of various cultural people.

(Note: It's an indicative one. Course Instructor may change activities and shall be reflected in course Handout)

RESOURCES

TEXT BOOKS:

1. Valluru Prabhakaraiah, *Indian Heritage and Culture*, Neelkamal Publications Pvt. Ltd. Delhi, 1/e, reprint 2015.

REFERENCE BOOKS:

1. L. P. Sharma, *History of Ancient India*, Konark Publishers, Pvt. Ltd. New Delhi, 2010.
2. L. P. Sharma, *History of Medieval India*, Konark Publishers, Pvt. Ltd. New Delhi, 2010.
3. The Cultural Heritage of India Vol-I, II, III, IV, V, The Ramakrishna Mission Institute of Culture, Calcutta

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22ME101704	MANAGING INNOVATION AND ENTERPRENEURSHIP	3	-	-	-	3

Pre-Requisite -
Anti-Requisite -
Co-Requisite -

COURSE DESCRIPTION:
Evolution of entrepreneurship from economic theory Managerial and entrepreneurial competencies; Concepts of Shifting Composition of the Economy Purposeful Innovation & Sources of Innovative Opportunity; The Innovation Process; Innovative Strategies; Entrepreneurial Motivation; Entrepreneurs versus inventors; Ethics and International Entrepreneurship; Strategic Issues in International Entrepreneurship; Problem solving Innovation and Diversification

COURSE OUTCOMES:
After successful completion of the course, students will be able to:

CO1. Demonstrate the principles of innovation process for establishing Industrial ventures.
CO2. Identify and analyze the gaps in an organization for innovation in the context of developed economies
CO3. Develop a comprehensive and well-planned business structure for a new venture.
CO4. Demonstrate knowledge on intellectual property rights, patents, trademarks, copyrights, trade secrets and commercialization of intellectual property.
CO5. Apply ethics in constructive innovation framework and problem solving.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	1	-	1	1	1	1	-	-
CO2	3	2	1	-	1	-	-	-	-	-
CO3	3	3	1	1	1	-	-	-	-	-
CO4	3	2	1	1	1	1	-	-	-	-
CO5	3	3	3	1	1	1	-	-	-	-
Course Correlation Mapping	**3**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	-	-

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: CREATIVITY AND INNOVATION ***(09 Periods)***

Introduction, Levels of innovation, Purposeful innovation and the sources of innovative opportunity, The innovation process, Innovative strategies, Strategies that aim at introducing and innovation, Dynamics of ideation and creativity – Inbound, Outbound; Context and process of new product development, Theories of outsourcing.

Module 2: PARADIGMS OF INNOVATION ***(09 Periods)***

Systems approach to innovation, Innovation in the context of developed economies and Emerging economies, Examining reverse innovation and itsapplication,Performancegap,Infrastructuregap,Sustainabilitygap,Regulatory gap, Preference gap, organizational factors effecting innovation at firm level.

Module 3: SOUCES OF FINANCE AND VENTURE CAPITAL ***(09 Periods)***

Importance of finance, Comparison of venture capital with conventional development capital, Strategies of venture funding, Investment phases, Investment process, Advantages and disadvantages of venture capital, Venture capital developments in India.

Module 4: INTELLECTUAL PROPERTY INNOVATION AND ENTREPRENEURSHIP ***(09 Periods)***

Introduction to Entrepreneurship, Evolution of entrepreneurship from economic theory, Managerial and entrepreneurial competencies, Entrepreneurial growth and development, Concepts, Ethics and Nature of International Entrepreneurship, Intellectual property – forms of IP, Patents, Trademarks, Design registration, Copy rights, Geographical indications, Patent process in India.

Module 5: OPEN INNOVATION FRAME WORK & PROBLEM SOLVING ***(09 Periods)***

Concept of open innovation approach, Difference between open innovations and Cloud innovation approaches, Limitations and Opportunities of open innovation frame work, Global context of strategic alliance, Role of strategic alliance, Problem Identification and Problem Solving, Innovation and Diversification

Total Periods:45

EXPERIENTIAL LEARNING

1. Identify the Innovative Marketing Strategies for Startups
2. Identify the Coca-cola Company Intellectual Property Rights

(Note: It's an indicative one. Course instructor may change the activities and the same shall be reflected in course handout)

CASE STUDIES/ARTICELS:

Contemporary relevant case studies/ Articles will be provided by the course instructor at the beginning.

1. Tesla Inc.: Disrupting the Automobile Industry
   This case study examines how Tesla Inc. disrupted the traditional automobile industry through its innovative electric vehicles and sustainable energy solutions. It discusses the sources of innovative opportunity that Tesla leverages, the ideation and creativity dynamics involved in new product development, and the strategies that the company uses to introduce and market its innovations.
2. Google Inc.: Innovation in Developed Economies
   This case study explores how Google Inc. became a global leader in the technology industry through its innovative search engine, advertising, and cloud computing solutions. It highlights the performance gap that Google addressed, the regulatory and sustainability gaps that it leveraged, and the impact of its innovation strategies on the company's growth and profitability.

3. Flipkart: From Startup to Unicorn
   This case study examines how Flipkart, an Indian e-commerce company, secured venture capital funding to become one of the largest online marketplaces in India. It discusses the importance of finance in entrepreneurship, the advantages and disadvantages of venture capital, and the strategies that Flipkart used to attract venture funding.

4. Patanjali Ayurved: Building a Brand through Intellectual Property
   This case study explores how Patanjali Ayurved, an Indian consumer goods company, built a strong brand through its intellectual property strategies. It discusses the forms of IP that Patanjali leverages, the patent process in India, and the impact of IP on the company's growth and profitability.

5. Procter & Gamble: Innovation through Open Innovation
   This case study analyzes how Procter & Gamble, a global consumer goods company, leveraged open innovation to achieve unprecedented success in product development and marketing. It discusses the difference between open and cloud innovation approaches, the limitations and opportunities of open innovation, and the role of strategic alliances in global innovation.

RESOURCES

TEXT BOOKS:

1. Vinnie Jauhari, Sudhanshu Bhushan, *Innovation Management*, Oxford University Press, 1st Edition, 2014.
2. Drucker, P.F., *Innovation and Entrepreneurship*, Taylor & Francis, 2nd Edition, 2007.

REFERENCE BOOKS:

1. Robert D Hisrich, Claudine Kearney, *Managing Innovation and Entrepreneurship,* Sage Publications, 1st Edition, 2014.
2. V.K. Narayanan, *Managing Technology and Innovation for Competitive Advantage,* Pearson India, 1st Edition, 2002.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=wWsl48VLfVY
2. https://www.youtube.com/watch?v=dDpQ9ALKX0U
3. https://www.youtube.com/watch?v=Eu_hkxkJGTg

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22LG201701	**PERSONALITY DEVELOPMENT**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course gives awareness to students about the various dynamics of personality development.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate knowledge in Self-Management and Planning Career

CO2. Analyze the functional knowledge in attitudes and thinking strategies

CO3. Learn and apply soft skills for professional success.

CO4. Function effectively as an individual and as a member in diverse teams

CO5. Communicate effectively in public speaking in formal and informal situations.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	2	1	-	-	-	-	-	-	-	-
CO2	2	3	-	-	-	-	-	-	-	-
CO3	2	2	-	-	3	-	-	-	-	2
CO4	1	1	-	-	-	-	-	-	3	3
CO5	-	-	-	-	-	-	-	-	-	3
Course Correlation Mapping	**2**	**2**	**3**	**-**	**3**	**-**	**-**	**-**	**3**	**3**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: SELF-ESTEEM & SELF-IMPROVEMENT ***(09 Periods)***

Know Yourself – Accept Yourself; Self-Improvement: Plan to Improve - Actively Working to Improve Yourself- Exercises- case studies

Module 2: DEVELOPING POSITIVE ATTITUDES ***(09 Periods)***

How Attitudes Develop – Attitudes are Catching – Improve Your Attitudes – Exercises- case studies

Module 3 SELF-MOTIVATION & SELF-MANAGEMENT ***(09 eriods)***

Show Initiative – Be Responsible Self-Management; Efficient Work Habits – Stress Management – Employers Want People Who can Think – Thinking Strategies- Exercises- case studies

Module 4 GETTING ALONG WITH THE SUPERVISOR ***(09 Periods)***

Know your Supervisor – Communicating with your Supervisor – Special Communication with your Supervisor – What Should you Expect of Your Supervisor? – What your Supervisor expe of you - Moving Ahead Getting Along with your Supervisor- Exercises- case studies

Module 5 WORKPLACE SUCCESS ***(09 Periods)***

First Day on the Job – Keeping Your Job – Planning Your Career – Moving Ahead- Exercises- case studies

Total Periods: 45

EXPERIENTIAL LEARNING

1. List out the self-improvements in you on the charts and explain in detail.
2. Discuss different famous personalities and their attitudes.
3. Describe different personalities with respect to self-motivation and self-management.
4. Imagine you are a supervisor and illustrate different special communications.
5. Assume and Interpret different experiences on the first day of your job.

(Note: It's an indicative one. Course instructor may change the activities and the same shall be reflected in course handout)

RESOURCES

TEXTBOOK:

1. Harold R. Wallace and L. Ann Masters, *Personal Development for Life and Work*, Cengage Learning, Delhi, 10th edition Indian Reprint, 2011. (6th Indian Reprint 2015)
2. Barun K. Mitra, *Personality Development and Soft Skills,* Oxford University Press, 2011.

REFERENCE BOOKS:

1. K. Alex, *Soft Skills*, S. Chand & Company Ltd, New Delhi, 2nd Revised Edition, 2011.
2. Stephen P. Robbins and Timothy A. Judge*, Organizational Behaviour*, Prentice Hall, Delhi, 16th edition, 2014

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=6Y5VWBLi1es
2. https://www.youtube.com/watch?v=H9qA3inVMrA

WEB RESOURCES:

1. https://www.universalclass.com/.../the-process-of-perso...
2. https://www.ncbi.nlm.nih.gov/pubmed/25545842
3. https://www.youtube.com/watch?v=Tuw8hxrFBH8

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CS101702	**WEB DESIGN FUNDAMENTALS**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course is designed to introduce the student to the technologies and facilities of web design: CSS, javascript, and jquery. Students will understand the web design process and use these software technologies together to produce web design projects.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the fundamentals of HTML 5 and the principles of web design.

CO2. Construct basic websites using HTML and Cascading Style Sheets.

CO3. Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.

CO4. Learn how to use HTML5 and other Web technologies to develop interactive and responsive web pages.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	3	-	-	-	-	-	-	-
CO2	3	3	-	-	-	-	2	-	-	-
CO3	3	3	3	-	-	-	-	-	-	-
CO4	2	3	3	-	-	-	-	2	-	-
Course Correlation Mapping	**3**	**3**	**3**	**-**	**-**	**-**	**2**	**2**	-	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION ***(09 Periods)***

Elements – Data types - Working with Text - Arranging Text - Displaying Lists - VAR Element - BDO Element - SPAN Element – DIV Element.

Module 2: LINKS AND URLS ***(09 Periods)***

Hyperlinks – URLs - Linking to a Mail System - Creating Tables - Inserting Images in a Web Page – Colors – Form Elements - Multiple-Choice Elements – Multimedia

Module 3: DYNAMIC HTML ***(09 Periods)***

Features of JavaScript - Programming Fundamentals - JavaScript Functions, Events, Image Maps, and Animations – JS Objects - Document Object - Validation, Errors, Debugging, Exception Handling, and Security

Module 4: CASCADING STYLE SHEET ***(09 Periods)***

CSS Syntax - CSS Selectors - Backgrounds and Color Gradients - Fonts and Text Styles - Creating Boxes and Columns - Displaying, Positioning, and Floating an Element - Table Layouts - : Effects, Frames, and Controls in CSS

Module 5: ADVANCED FEATURES OF HTML5 ***(09 Periods)***

Creating Editable Content - Checking Spelling Mistakes - Custom Data Attributes - Client-Side Storage - Drag and Drop Feature - Web Communication –**jQuery -** Fundamentals of jQuery - Callback Functions - jQuery Selectors - jQuery Methods to Access HTML Attributes.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Design a blog layout that includes header, navigation menu, content area, sidebar. Apply appropriate styling to each section.
2. Develop a java script based quiz that presents MCQs to the user and provides immediate feedback on their answers. Keep track of the score and display the final results at the end.
3. Build a web page that displays and image gallery. Each image should be a clickable link that opens the image in a larger view when clicked.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXTBOOKS

1. DT Editorial Services, *HTML 5 Black Book*, Dreamtech Press, 2nd Edition, 2016.

REFERENCE BOOKS

1. Jennifer Niederst Robbins, *HTML5 Pocket Reference,* O'Reilly, 5th Edition, 2018.
2. Ben Frain, *Responsive Web Design with HTML5 and CSS3*, Packt, 2nd Edition, 2020.

VIDEO RESOURCES

1. https://www.youtube.com/watch?v=h_RftxdJTzs
2. https://www.youtube.com/watch?v=dlkWNdnO8ek

WEB RESOURCES

1. https://www.w3schools.com/html/
2. https://www.w3schools.com/css/
3. https://www.geeksforgeeks.org/web-technology/
4. https://www.smashingmagazine.com/2021/03/complete-guide-accessible-front-end components/
5. https://css-tricks.com/
6. https://davidwalsh.name/css-optional

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22SS101706	**WOMEN EMPOWERMENT**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: Concept & Framework, Status of Women, Women's Right to Work, International Women's Decade, and Women Entrepreneurship.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Demonstrate the knowledge of the characteristics and achievements of empowered women and women's empowerment techniques by analyzing women's legal and political status.

CO2 Apply the knowledge of women's rights by analyzing various societal issues and obstacles in different fields, including science and technology.

CO3 Demonstrate the knowledge of the significance of women's participation in policy debates, National conferences, and common forums for equality and development by identifying and analyzing issues.

CO4 Analyze the concept of women's entrepreneurship, government schemes, and entrepreneurial challenges and opportunities.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	-	-	1	3	-	1	–	–
CO2	3	1	-	-	-	2	-	-	-	–
CO3	3	1	-	-	-	2	-	-	-	3
CO4	3	1	-	-	-	-	-	-	-	-
Course Correlation Mapping	3	1	-	-	1	3	-	1	–	3

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: CONCEPT & FRAMEWORK ***(09 Periods)***

Introduction– Empowered Women's Characteristics – Achievements of Women's Empowerment **Concept of Empowerment:** Meaning & Concept – Generalizations about Empowerment – Empowerment Propositions – Choices women can make for empowerment – Women's participation in decision making, development process & in Governance. **Framework for Empowerment** – Five levels of equality – Tenets of Empowerment– Elements – Phases and aspects – Techniques – Categories and Models – Approaches.

Module 2: STATUS OF WOMEN ***(09 Periods)***

Legal Status: Present Scenario – Call for Social Change – Significant Trends – Legal & Schemes – Personal Law – Joint Family – Criminal Law – Shift towards Dowry – Deterrent Punishment – Criminal Law (II Amendment) – Discrimination in Employment.

Political Status: Present Scenario – Political Participation & its NatureSocio–economic Characteristics – Political Mobilization: Mass Media – Campaign Exposure – Group Orientation – Awareness of issues and participation – Progress & Future Thrust.

Module 3: WOMEN'S RIGHT TO WORK ***(09 Periods)***

Introduction – Present Scenario – Changes in Policy & Programme – National Plan of Action– Women's Cells and Bureau – Increase in the work participation rate – Discrimination in the labour market – Women in unorganized sector – Issues and Obstacles– Women in Education – Women in Science & Technology – Case Study: Linking Education to Women's Access to resources.

Module 4: WOMEN'S PARTICIPATORY DEVELOPMENT ***(09 Periods)***

Dynamics of social change – conscious participation – Information Explosion – Organized Articulation – National Conference – Common Forums – Participatory Development – New Issues Identified – Role of other Institutions.

Module 5: WOMEN ENTREPRENEURSHIP ***(09 Periods)***

Introduction – Definition – Concept – Traits of women Entrepreneurs – Role of Women Entrepreneurs in India – Reasons for Women Entrepreneurship – Government schemes & Financial Institutions to develop Women Entrepreneurs – Key policy recommendations – Project Planning – Suggestions and measures to strengthen women entrepreneurship – Growth & Future challenges – Training and Opportunities – Case Study: Training Women as Hand–pump Mechanics– Case Study: Literacy for Empowering Craftswomen

Total Periods: 45

EXPERIENTIAL LEARNING

1. Prepare poster presentation on "impact of women's self-help groups on their empowerment and socio-economic development."
2. Prepare a comparative analysis chart on the status of women in various countries.
3. Prepare a presentation on women and cultural responsibilities in different societies.
4. Prepare a presentation on the women of the past, present and future in terms of responsibilities and duties.
5. Prepare a presentation on the great women entrepreneurs of India.

(Note: It's an indicative one. Course Instructor may change activities and shall be reflected in course Handout)

RESOURCES

TEXT BOOKS:

1. SahaySushama, *Women and Empowerment,* Discovery Publishing House, New Delhi, 2013.
2. NayakSarojini, Jeevan Nair, *Women's Empowerment in India*, Pointer Publishers, Jaipur, 2017.

REFERENCE BOOKS:

1. Baluchamy. S, *Women's Empowerment of Women*, Pointer Publishers, Jaipur, 2010.
2. Khobragade Grishma, *Women's Empowerment: Challenges and Strategies Empowering Indian Women*, Booksclinic Publishing, Chhattisgarh, 2020.

WEB RESOURCES:

1. https://www.economicsdiscussion.net/entrepreneurship/women–entrepreneurs–in–india
2. https://www.businessmanagementideas.com/entrepreneurship–2/women entrepreneurs

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102025	**RESEARCH METHODOLOGY AND BIOSTATISTICS**	3	-	2	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed Knowledge on the basic principles of research and methods applied to draw inferences from the research findings. The students will also be made aware of the need of biostatistics and understanding of data, sampling methods, in addition to being given information about the relation between data and variables.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understand concepts of research methodology.

CO2 Collect data for research in various methods.

CO3 Understand fundamentals of biostatistics.

CO4 Analyse research data by using biostatistics.

CO5 Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	1	-	3	1	-	-	-
CO2	1	1	2	-	2	-	-	-	3	-
CO3	1	1	2	-	1	-	-	1	-	1
CO4	2	1	2		2					1
CO5	1	2	2	-	3	2	1	-	-	-
Course Correlation Mapping	**1**	**1**	**2**	**1**	**2**	**3**	**1**	**1**	**3**	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO RESEARCH METHODOLOGY ***(12 Periods)***

Introduction to research methods, Identifying research problem, Ethical issues in research, Research design, Basic Concepts of Biostatistics

Module 2: TYPES OF DATA AND COLLECTION ***(11 Periods)***

Types of Data, Research tools and Data collection methods, Sampling methods, Developing a research proposal.

Module 3: INTRODUCTION TO BIOSTATISTICS ***(11 Periods)***

Need of biostatistics, What is biostatistics: beyond definition, Understanding of data in biostatistics, How & where to get relevant data, Relation between data & variables, Type of variables: defining data set.

Module 4: STATICAL ANALYSIS ***(11 Periods)***

Collection of relevant data: sampling methods, Construction of study: population, sample, normality and its beyond (not design of study, perhaps), Summarizing data on the pretext of underlined study, Understanding of statistical analysis.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. To practice problems on various biostatistics tools
2. Demonstrate types of data collection from hospital.
3. To determine research statistics tools.
4. Analyze data by using SPSS.

RESOURCES

TEXT BOOKS:

1. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, Edition 46,2023.
2. C.R. Kothari, Research Methodology, New age International Publisher, Edition 4, 2019.

REFERENCE BOOKS:

1. Himanshu Tyagi, Biostatistics Buster, Jaypee Brothers Medical Publishers, Edition 1,2011.
2. Bratati Banerjee, Mahajans Methods in Biostatistical for medical students and research workers, Jaypee Brothers Medical Publishers, Edition 9, 2018.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=d77eQz0_Sfk
2. https://www.youtube.com/watch?v=yOU_s0xzc-Y
3. https://www.youtube.com/watch?v=txIS0N0l9xU&list=PLEIbY8S8u_DK7i4Fj6Hgq8sn_l42k9H1L
4. https://www.youtube.com/watch?v=1Q6_LRZwZrc

WEB RESOURCES

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8764821/
2. https://www.scribbr.com/category/methodology/
3. https://www.easybiologyclass.com/biostatistics-introduction-significance-applications-and-limitations-of-statistics/

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22DF101002	DESIGN AND INTERPRETATION OF CLINICAL TRIALS	2	1	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on design and interpretation of clinical trails.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understand the features of randomized clinical trials

CO2 Analysis clinical trials by data

CO3 Understand the ethics of experimentation in humans

CO4 Apply the Consolidated Standards of Reporting Trials to publish research

CO5 Analyze clinical repots as evidence.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	-	-	-	-	3	1	-	-	-
CO2	3	1	-	-	-	-	-	-	3	-
CO3	3	1	3	-	-	-	-	-	-	1
CO4	3	1								1
CO5	3	-	-	-	-	3	1	-	-	-
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**3**	**1**	**-**	**3**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: RANDOMIZATION AND MASKING ***(09 Periods)***

Different types of trial designs, including parallel, crossover, group allocation, factorial, large simple, equivalency, non-inferiority, and adaptive designs., Discuss two key design features of randomized clinical trials used to protect against bias, randomization and masking.

Module 2: OUTCOMES AND ANALYSIS ***(09 Periods)***

Focuses on a key design issue - selecting the primary outcome. We will also cover the gold standard for analysis of clinical trials, which is including all the participants in the analysis regardless of their actual treatment.

Module 3: ETHICS ***(09 Periods)***

focuses on a key issue in the field of clinical trials, the ethics of experimentation in humans.

Module 4: REPORTING RESULT ***(09 Periods)***

Focus on reporting results of clinical trials in publications. We cover the Consolidated Standards of Reporting Trials (CONSORT) guidelines.

Module 5: RANDOMIZED CLINICAL TRAILS ***(09 Periods)***

Focus on whether RCTs are still the gold standard for evaluating evidence.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstrate sample variable in health care.
2. Observation of outcomes and analysis
3. Understand ethics in clinical trails
4. Learn report and result.
5. Identification of clinical trails

RESOURCES

TEXT BOOKS:

1. Proschan, Statistical Thinking in clinical Trails, chapman & Hall/CRC Biostatistics Series, Edition 1, 2021.
2. David Machin, Textbook of Clinical Trails, Wiley India pvt Ltd, Edition 2, 2010.
3. Jane Nikles, The Essential Guide to N-of-1 Tarils in Health, Springer Nature, Edition 1, 2015.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=bctaWQTYHJc
2. https://www.youtube.com/watch?v=k40iNSRzdEU
3. https://www.youtube.com/watch?v=MIHQxzSrFjo

WEB RESOURCES:

1. https://www.coursera.org/learn/clinical-trials
2. https://online.stanford.edu/courses/som-xche0030-clinical-trials-design-strategy-and-analysis

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT102003	SOCIOLOGY	3	-	2	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: Sociology will introduce student to the basic sociology concepts, principles and social process, social institutions in relation to the individual, family and community and the various social factors affecting the family in rural and urban communities in India will be studied.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand concepts and relation to anthropology and phycology.

CO2. Identify and understand basics of nature of socialization, Social Groups and Family with clinical aspects.

CO3. Analyse the concepts of Health hazards to Community and culture.

CO4. Understand the social problems of disabled & Social Security.

CO5. Work independently or in team to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO 1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10
CO1	3	2	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	1	-	-	-	-
CO3	3	2	-	-	-	1	-	-	-	-
CO4	3	2	-	-	-	1	-	-	-	-
CO5	-	-	-	-	-	3	3	-	-	1
Course Correlation Mapping	**3**	**2**	**1**	**-**	**-**	**2**	**3**	**-**	-	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO SOCIOLOGY ***(10 Periods)***

Introduction: Meaning, Definition and scope of sociology, Its relation to Anthropology, Psychology, Social Psychology. Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods. Importance of sociology with special reference to Health Care Professionals.

Social Factors in Health and disease situations: Meaning of social factors, Role of social factors in health and illness.

Module 2: SOCIALIZATION AND SOCIAL GROUPS ***(12 Periods)***

Socialization: Meaning and nature of socialization, Primary, Secondary and Anticipatory socialization, Agencies of socialization.

Social Groups: Concepts of social groups, influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in the hospital rehabilitation setup.

Family: The family, meaning and definitions, Functions of types of family, Changing family patterns, Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.

Module 3: COMMUNITY AND CULTURE ***(11 periods)***

Community: Rural community, Meaning and characteristics, Health hazards in rural areas, health hazards among tribal communities

Urban community: Meaning and characteristics, Health hazards in urban areas.

Culture and Health: Concept of Health, Concept of Culture

Module 4: SOCIAL PROBLEMS OF DISABLED AND SOCIAL SECURITY ***(12 Periods)***

Social Problems of disabled: Consequences with reference to sickness and disability, remedies; Population explosion, Poverty and unemployment, Beggary, Juvenile delinquency, Prostitution, Alcoholism, Problems of women in employment, Geriatric problems, Problems of underprivileged, social welfare programs.

Social Security: Social security and social legislation in relation to the disabled.

Social worker: Meaning of Social Work, The role of a Medical Social Worker.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXERCISES:

1. Survey on Social Economic Status of Rural areas
2. Field work on Life style and Social Groups in Rural areas
3. Awareness Programs on Hygienic and Disease in Community

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

REFERENCE BOOKS

1. P. Ganesh, Textbook of Socialogy, EMMESS Publisher, 1st Edition, 2021
2. K.P. Neeraja, Textbook of Socialogy for Phisiotheraphy, Jaypee Publishers, 2nd Edition, 2021
3. Neelam Kumari, Socialogy for Phisiotheraphy, Jaypee Publishers, 2nd Edition, 2021
4. Özkaya, N., Leger, D. L. Fundamentals of Biomechanics: Equilibrium, Motion, and Deformation, India: 4th Edition, 2019

VIDEO LECTURES:

1. https://youtu.be/Hom9MUgy-Vc
2. https://youtu.be/tqPTvnXXzKs

WEB RESOURCES:

1. https://www.asanet.org/wp-content/uploads/savvy/introtosociology/Documents/Field%20of%20sociology033108.htm
2. https://pressbooks.bccampus.ca/socialprocesses/chapter/chapter-1-an-introduction-to-sociology/

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22CC102064	**INTRODUCTION TO RENAL DIALYSIS TECHNOLOGY**	4	-	2	-	5

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides an introduction to the fundamental concepts of renal dialysis technology. Students will learn about the principles of dialysis, types of dialyzers and membranes, haemodialysis machines, patient monitoring, and infection control measures. The course also covers renal data maintenance, nutritional and medication management, and preparation of dialysis patients for surgical procedures.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Describe the principles of dialysis, dialyzers, and membranes.

CO2 Demonstrate understanding of vascular access, hemodialysis machine components, and priming procedures.

CO3 Maintain renal data and monitor patients during dialysis.

CO4 Explain the role of medications, nutrition, and infection control in dialysis patients.

CO5 Apply knowledge in preparing patients for surgery and providing post-operative dialysis support.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	3	-	-	2	-	3	-
CO2	3	-	-	3	-	1	-	-	-	-
CO3	3	-	-	3	-	2	2	-	-	-
CO4	3	2	-	2	-	-	2	-	-	-
CO5	3	1	-	2	-	-	2	-	2	-
Course Correlation Mapping	**3**	**2**	**-**	**3**	**-**	**1**	**2**	**-**	**2**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO DIALYSIS ***(10 Periods)***

Indications of dialysis - Acute and chronic renal failure indications- Uremic symptoms, electrolyte imbalance, fluid overload- Types of dialysis- Hemodialysis- Peritoneal dialysis - Principles of dialysis – Diffusion- Osmosis- Ultrafiltration – Convection - Quantification of adequacy- Urea Reduction Ratio (URR) - Kt/V and its interpretation

Module 2: HEMODIALYSIS APPARATUS ***(12 Periods)***

Hemodialysis apparatus – Components of the dialysis machine and extracorporeal circuit- Blood and dialysate pathways- types of dialyzer and membrane - Types of vascular access for hemodialysis - Arteriovenous (AV) fistula, AV graft, and central venous catheters- Indications, care, and complications- Introduction to hemodialysis machine - Basic operating principles- Control systems, alarms, and monitoring- Priming of dialysis apparatus- Step-by-step procedure- Air removal and leak testing- Infection control during setup

Module 3: PATIENT MONITORING & DATA MANAGEMENT ***(12 Periods)***

Monitoring of patients during dialysis - Pre-, intra-, and post-dialysis assessment- Vital signs, weight, and fluid balance monitoring- Managing complications (hypotension, cramps, clotting,

Renal data maintenance - Laboratory data analysis

Module 4: PATIENT MANAGEMENT & SUPPORTIVE CARE ***(13 Periods)***

Medications in dialysis patients - Commonly used drugs: Erythropoietin, phosphate binders, antihypertensives- Drug dosing adjustments in renal failure- Nutrition management in dialysis patients - Dietary restrictions- protein, sodium, potassium, phosphorus, and fluid- Role of dietitian and patient education-Preparation of dialysis patients for various surgical procedures - Post-operative dialysis support

Module 5: INFECTION CONTROL & SAFETY ***(13 Periods)***

Infection control and universal precautions - Hand hygiene, PPE use, and aseptic techniques- Safe handling of blood and body fluids- Safety protocols in dialysis units - Equipment safety checks- Electrical and water safety guidelines- Emergency preparedness- Prevention of cross-infections in dialysis patients - Psychosocial aspects and patient care considerations

Total Periods: 60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. History taking
2. General physical examination (demonstration of pulse, BP, temperature, pallor, icterus, edema)
3. Laboratory data analysis

RESOURCES

TEXT BOOKS:

1. Nissenson & Fine, Dialysis Therapy.
2. Daugirdas, Blake & Todd, Handbook of Dialysis
3. Heinrich, Principles and Practice of Dialysis.

VIDEO LECTURES:

1. Introduction to Hemodialysis
2. Dialysis Explained
3. Dialysis Procedure Overview

WEB RESOURCES:

1. NSDC Dialysis Technician Resource
2. Basic Dialysis Theory – Sweeney

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CC102069	**RECENT ADVANCES IN DIALYSIS TECHNOLOGY**	4	1	2	-	6

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course focuses on the latest technological advancements and innovations in dialysis therapy. Students will explore modern approaches such as MARS dialysis, nocturnal and home hemodialysis, online hemodiafiltration, wearable artificial kidneys, and newer peritoneal dialysis solutions. The course also provides an overview of renal transplantation principles, patient management, and ethical guidelines in organ donation.

COURSE OUTCOMES: After After successful completion of the course, students will be able to:

CO1 Describe the principles, indications, and techniques of MARS dialysis and its use in advanced liver disease.

CO2 Explain the concepts and advantages of nocturnal and short daily dialysis modalities.

CO3 Discuss newer peritoneal dialysis solutions and their clinical significance.

CO4 Summarize current advances in dialysis technologies, including online hemodiafiltration, wearable artificial kidneys, and home dialysis systems.

CO5 Explain the key aspects of renal transplantation, donor and recipient management, immunosuppression, and ethical considerations.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	3	-	1	-	-	2	-
CO2	3	-	-	2	-	-	2	-	-	-
CO3	3	2	-	2	-	-	-	-	2	-
CO4	3	3	-	3	-	2	2	-	-	-
CO5	3	2	-	3	-	2	2	-	2	2
Course Correlation Mapping	**3**	**2**	**-**	**3**	**-**	**2**	**2**	**-**	**2**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: MARS DIALYSIS AND ADVANCED LIVER DISEASE ***(12 Periods)***

MARS dialysis – concept and clinical application- components and mechanism of toxin removal- clinical benefits in hepatic failure- Indications in advanced liver disease - Acute and chronic liver failure- hepatic encephalopathy- drug-induced liver injury- Circuit setup, anticoagulation, and technique - procedure workflow and monitoring parameters during therapy- Complications and management- Potential complications such as hypotension- clotting- bleeding- hypocalcemia

Module 2: EXTENDED AND FREQUENT DIALYSIS MODALITIES ***(12 Periods)***

Nocturnal hemodialysis – procedure and benefits- Performed overnight 5–6 times per week- improves solute clearance- blood pressure control- patient comfort- Short daily dialysis – indications and advantages- Short sessions (1.5–3 hours) performed frequently- indicated for fluid overload- poor dialysis tolerance- Patient outcomes and lifestyle impact- Enhances cardiac stability- nutritional status- quality of life with improved treatment flexibility.

Module 3: NEWER PERITONEAL DIALYSIS SOLUTIONS ***(12 Periods)***

Evolution of PD solutions- Overview of the development from conventional glucose-based to biocompatible and low-glucose degradation product (GDP) solutions- Composition, osmotic agents, and biocompatibility- components of PD fluids- use of icodextrin and amino acid–based solutions- importance of pH and buffering agents in maintaining membrane health- Advantages and disadvantages of newer PD fluids- Effect on peritoneal membrane and patient quality of life- Reduced inflammation and fibrosis- enhanced ultrafiltration efficiency- improved overall patient tolerance- satisfaction.

Module 4: ADVANCES IN DIALYSIS TECHNOLOGY AND HOME DIALYSIS ***(12 Periods)***

Online hemodiafiltration and On-line Clearance Monitoring (OCM)- Wearable artificial kidney – concept and recent developments- Home hemodialysis – setup, apparatus, and RO system- Infection control: hand hygiene, environmental cleanliness- Record maintenance and patient follow-up

Module 5: INFECTION CONTROL & SAFETY ***(14 Periods)***

Indications and contraindications for transplantation- Donor and recipient evaluation and maintenance- Post-transplant principles and immunosuppressive medications- Patient education and counselling (live donor, recipient, cadaver donor family)- Concept of brain death- Transplantation of Human Organs and Tissues Rules & Amendments

Total Periods: 60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstration or video on MARS dialysis system setup
2. Case discussion on nocturnal or home dialysis patient management
3. Review of recent research on wearable artificial kidneys or OCM & Observation of transplant counselling and ethical case scenarios

RESOURCES

TEXT BOOKS:

1. *Handbook of Dialysis* – Daugirdas, Blake & Todd
2. *Dialysis Therapy* – Nissenson & Fine
3. *Principles and Practice of Dialysis* – Heinrich

VIDEO LECTURES:

1. MARS Dialysis and Liver Support Systems
2. Nocturnal and Home Hemodialysis Demonstration
3. Online Hemodiafiltration and OCM Overview & Renal Transplantation and Ethical Practices

WEB RESOURCES:

1. National Kidney Foundation – https://www.kidney.org
2. International Society for Peritoneal Dialysis – https://ispd.org