SRI RAMACHANDRA
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Category - I Deemed to be University) Porur, Chennai

SRI RAMACHANDRA FACULTY OF ALLIED HEALTH SCIENCES

B.Sc. [Hons] ALLIED HEALTH SCIENCES
(Choice Based Credit System)

PROGRAME OBJECTIVES

The objectives of the entry level graduate programme on B.Sc (Hons) AHS in Sri Ramachandra Institute of Higher Education and Research [Deemed to be University] are to produce competent Allied Health Professional who,

1. As a **healthcare provider** applies the acquired knowledge and skills in prevention, investigations and managing patients under the direction of a medical professional.
2. As a **communicator, leader and team member** advocates effective communication, inter professional and leadership skills in delivering contemporary health care needs of the community
3. As an independent **professional and a lifelong learner** Demonstrates high standards of professional ethics, integrity & continuous learning

PROGRAMME OUTCOMES

Roles:

- ✓ Allied Health Care Provider
- ✓ Critical thinker
- ✓ Professional
  - o Ethical practitioner
  - o Communicator
  - o Team player
- ✓ Reflective practitioner
- ✓ Lifelong learner

Programme outcomes / Competencies:

1. Heath care

i. Demonstrate knowledge of basic medical science subjects required to practice as a Health care technologist
ii. Demonstrate the knowledge in related clinical subjects
iii. Identifies the appropriate investigations/ Procedures required
iv. Demonstrates skills in handling the equipments
v. Performs the procedures skilfully
vi. Documents the results in prescribed format
vii. Provide appropriate patient care considering socio economic and cultural aspects informed by research evidence
viii. Adheres to the safety procedures

2. Critical thinking

i. Demonstrates sound professional judgment and reasoning in decision-making
ii. Synthesizes and analyzes the information in decision making
iii. Integrates relevant information with previous learning, experience, professional knowledge, and current practice models

3. Ethics and accountability

i. Adheres to the Code of Ethics prescribed by the professional body/Faculty/Department
ii. Maintains appropriate relationships and boundaries with patients and care givers

4. Communication

i. Communicates effectively with the patient, inter professional team members, and other stakeholders using patient-centered principles that address physical, social, cultural or other barriers to communication
ii. Delivers information in a respectful, thoughtful manner
iii. Uses a systematic approach to record keeping of service provided
iv. Maintains confidentiality and security in the sharing, transmission, storage, and management of information**.**
v. Demonstrates an appropriate use of information technology relevant to their field

5. Professional Responsibility

i. Practices as an autonomous professional, exercising their own professional judgment
ii. Demonstrates a commitment to their patients, public, and profession
iii. Practices within scope of professional and personal limitations and abilities
iv. Demonstrates professional integrity
v. Practices in a non-discriminatory way
vi. Demonstrates a commitment to the growth of the profession

6. Inter professional relationship

i. Collaborates with inter professional team, and other stakeholders
ii. Demonstrates flexibility within team
iii. Works effectively with inter professional team, and other stakeholders to manage positive professional relationships
iv. Manages differences, misunderstandings, and limitations that may contribute to inter professional tensions in an effective and diplomatic manner

7. Reflective practice

i. Demonstrates the importance of self-awareness and self-reflection
ii. Be able to reflect critically on personal practice in order to be able to improve it.
iii. Takes responsibility for personal and professional development

8. Lifelong learning committed to continuous improvement of skills and knowledge

i. Demonstrates commitment to continuing competence
ii. Apply newly gained knowledge or skills to the care of the patient
iii. Familiar with basic health sciences research methods
iv. Demonstrates the process of evidence based practice (Ask, acquire, appraise, apply and assess)

INTENDED LEARNING OUTCOMES- COMMON FOR ALL SPECIALITY

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy for Health Sciences	1. Define basic technical terminology and language associated with anatomy	**W,P,V** Internal [50]+

	2. Identify the structures of human body 3. Describe the anatomy of human body 4. Describe the structure and features of the organ systems of the human body 5. Identify the anatomical structure in the dissected specimen	university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Physiology for Health Sciences	1. Describe the functional anatomy and histology of various organ systems 2. Describe the basic physiological principles involved in the normal functioning of the human body 3. Apply the physiological principles in comprehending the pathophysiology of disease and its management	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Psychology for Health Sciences	1. Describe the theories and basic principles in psychology 2. Explain the behavior and mental processes 3. Apply the principles of psychology while providing health care and enrich their knowledge and to meet the challenges they encounter in health care profession.	**W** Internal [50]+ university [100] Total marks=100
Biochemistry for Health Sciences	1. Describe chemistry & metabolism of macromolecules, vitamins and minerals 2. Correlate biochemical mechanisms to diseases 3. Discuss the importance of biochemical parameters in clinical decision making	**W** Internal [50]+ university [100] Total marks=100
Medical Terminologies	1. Describe the basic principles of term usage when referring to concepts in the health field. 2. Describe the Greek-and Latin derived basic structures of medical terms 3. Identify the roles of the four types of word parts used in forming medical terms. 4. Describe the steps in locating a term in a medical dictionary. Understand the importance of spelling medical terms correctly	**W** Internal [100] Total marks=100
Micro-Biology for Health Sciences	1. Classify microorganisms, discuss the morphological and growth characteristics and its association with causation of disease 2. Demonstrate and interpret basic laboratory techniques used in the detection of micro organisms 3. Explain principles of antimicrobial therapy and Immunization 4. Demonstrate basic infection control practices	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Patho - Physiology and Treatment of Disease	1. Identify and Describe the causative agent in various disease 2. Comprehend the major signs and symptoms of the various diseases 3. Describe the pathophysiology of various disease related to anesthetic care Apply pathophysiology 4. knowledge in anesthetic care 5. To Analyze the patient pre-operative fit for undergoing procedure	**W** Internal [50]+ university [100] Total marks=100
Pharmacology for Health Sciences	1. Identify the fundamental principles of pharmacokinetics and pharmacodynamics. 2. Apply the pharmacodynamics and pharmacokinetic principles that describe drug actions in humans.	**W** Internal [50]+ university [100]

	3. Compare and contrast the specific pharmacology of the major classes of drugs, important distinctions among members of each class, the risks and benefits, in relation to the organ systems they affect, and the diseases for which they are used therapeutically.	Total marks=100
Preventive Medicine	1. Describe the functions of health care in India 2. Comprehend and explain the concept of health care and their goals 3. Demonstrate the utility of care in prevention and control of common disorder among rural folks of RHTC. 4. Provide the basic care social aspects of health promotion and specific prevention activities in the community.	**W** Internal [50]+ university [100] Total marks=100
Sociology for Health Sciences	1. Describe the development of medical sociology 2. Discuss the sociological approaches of health. 3. Discuss the health issues in socio-cultural perspective. 4. Apply the sociology knowledge in health care decision making	**W** Internal [50]+ university [100] Total marks=100
Research Methodology and Biostatistics for Health Sciences	1. Discuss the process of health sciences research 2. Differentiate various study designs 3. Discuss validity 4. Discuss descriptive and inferential statistics	**W** Internal [50]+ university [100] Total marks=100
Chemistry for Health Sciences	1. Identify the nature of the organic compounds by chemical tests 2. Describe the common chemical reactions 3. Describe the structures of the therapeutic agents	**W** Internal [50]+ university [100] Total marks=100
Physics and Electronics for Health Sciences	1. Describe the basics principles of physics related to allied health care 2. Apply the principles of physics 3. Describe concepts of active and passive devices used in the electronic instrumentation 4. Demonstrate voltage, current and resistance measurements 5. Apply the concepts of safety procedures in bio-medical instrumentation and patient	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Infection Control	1. Explain the process of infection control in health care 2. Apply the infection control knowledge while providing care 3. Demonstrate the procedures of infection control	**W** Internal [100] Total marks=100
Evidence Based Practice	1. Discuss the importance of EBP 2. Describe the process of EBP 3. Ask a relevant clinical question 4. Acquire evidence 5. Appraise evidence	**W** Internal [50]+ university [100] Total marks=100
Quality Assurance in Health Care	1. Discuss the importance of quality assurance in health care delivery 2. Discuss the strategies of planning, implementing and measuring hospital performance 3. Implement quality approaches and tools in healthcare settings	**W** Internal [50]+ university [100]+ Total marks=100
Health Care Safety	1. Discuss quality improvement and patient safety 2. Integrate performance improvement methodologies into health care safety 3. Implement consistent, evidence-based quality and safety practices	**W** Internal [50]+ university [100] Total marks=100
Health professionalism	1. Provide compassionate care to patients while respecting their privacy and dignity.	**W** Internal [50]+

	2. Display honesty, integrity and responsibility in all educational setting and in interactions with patients, their families & colleagues. 3. Explain the basic principles of bioethics and how to balance these principles in practice	university [100] Total marks=100
First aid and emergency care	1. Explain the common first aid procedures 2. Demonstrate basic life support skills	**W** Internal [100] Total marks=100
Project	1. Develop a research question 2. Write a research proposal 3. Collect and analyse data 4. Prepare a concise report	**W** Internal [100] Total marks=100

LEARNING OUTCOMES - ANAESTHESIA TECHNOLOGY

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy & Physiology Related to Anaesthesia Technology	1. Describe the anatomy of the various systems related to anesthetic care. 2. Identify the structures various systems related to anesthetic care 3. Discuss the functions various systems related to anesthetic care 4. Apply the anatomical knowledge in anesthetic care 5. Appreciate the physiological changes during anesthetic care	**W** Internal [50]+ university [100] Total marks=100
Pharmacology Related to Anaesthesia Technology	1. Describe the classification and dosage of drugs used in anesthetic care 2. Describe the pharmacokinetics and pharmacodynamics of commonly used anesthetic drugs 3. Appreciate the effects of anesthetic drugs on various systems including side effects 4. Discuss the clinical usage of anesthetic drugs 5. Apply the basic Pharmacology knowledge during Anesthetic care	**W** Internal [50]+ university [100] Total marks=100
Fundamentals of Anaesthesia Technology	1. Describe the fundamentals of General and Regional anesthesia 2. Demonstrate the airway management techniques in mannequins under supervision 3. Perform pre anesthetic assessment under supervision 4. Describe the procedures of Regional and general anesthesia 5. Observe the regional anesthesia 6. Demonstrate various monitoring skills	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Patho-Physiology of Various Diseases and Pre-Operative Evaluation	1. Identify and Describe the causative agent in various disease 2. Comprehend the major signs and symptoms of the various diseases 3. Describe the pathophysiology of various disease related to anesthetic care Apply pathophysiology 4. knowledge in anesthetic care 5. To Analyze the patient pre-operative fit for undergoing procedure	**W** Internal [50]+ university [100]+ Total marks=100
Instrumentations Related to Anaesthesia Technology	i. Describe the various instrument used in anesthesia ii. Demonstrate the machine check and breathing system iii. Identify the various equipments used in anesthetic care iv. Demonstrate the handling skills of equipments used in	**W,P,V** Internal [50]+ university [100] Total marks=100

	anesthetic care v. Apply the knowledge about Medical gas supply	Internal [50]+ Practical [25]+ orals[25] Total marks=100
Intensive Care Unit and Record Keeping Ethics In Anaesthesia	1.Describe the various modes of ventilation 2.Apply the care of patient under Ventilator support 3.Analyze the monitoring and diagnostic procedure In ICU 4.Demonstrate general care in ICU patient 5.Comprehend the ethical issue in ventilation patient	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Procedure related to Anaesthesia Technology-I	1. Describe various monitoring in cardio thoracic and neuro surgery. 2. Demonstrate ACLS and BLS in emergency life saving support 3. Analyze the special investigations in cardiac thoracic care 4. Apply knowledge e about advance pulmonary support ECMO and ventilation 5. Comprehend the management of cardio thoracic and neuro surgery patient	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Procedure related to Anaesthesia Technology-II	i. Discuss the indication and contraindication of day care anesthesia ii. Describe labor analgesia pain management. iii. Analyze PDPH Cause and management. iv. Apply various type and size calculation tube for pediatric and intra-operative management. v. Demonstrate the competency in handling patients with various disease of aging in geriatric anesthesia.	**W** Internal [50]+ university [100] Total marks=100

LEARNING OUTCOMES - NEUROSCIENCE TECHNOLOGY

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Neuroscience Oriented Neuroanatomy & Neurophysiology	1. Describe, identifies the basicorgans, structures and functions of the Central Nervous system 2. Comprehend and explain the physiological functions, processes with understanding. 3. Analyse the neuroanatomical and physiological functions and structures, organs and correlate with the special emphasis to the procedural needs. 4. Apply the basis of the Neuroanatomical and physiological knowledge in patient care and diagnosti during diagnostic procedure. 5. Demonstrate and provide better support during diagnostic procedure and during neurological care with the knowledge of Neuroanatomy and Neurophysiology	**W** Internal [50]+ university [100] Total marks=100

Neuroscience oriented Neuropharmacology	1. Describe, identifies the drugs used in various Neurological Disorders. 2. Comprehend and explain the pharmacodynamics and pharmacokinetics, of administration, benefits, limitations bioavailability, Metabolism ad Adverse effects of the drugs used in the treatment of various Neurological Disorders related to Neuroscience technology.	**W** Internal [50]+ university [100] Total marks=100
Neurological Disorders Disease outlines, Clinical evaluation & Management	1. Identifies and Describe diseases affecting the Peripheral and Central nervous system Explains the aetiopathology, outline of major signs and symptoms of the various Neurological Disorders affecting the Central and Peripheral Nervous system. 2. Discuss the methodologies for treatment of disease in relation to the Peripheral and Central nervous systems. 3. Demonstrate the competency in handling patients with neurological disorders. 4. Support in diagnosing and treatment of neurologically affected patients and provide patient care during the neurophysiological procedures.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Fundamental Instrumentation of Neuroscience Technology	1. Describe and identifies Instruments, variety of Neurophysiological modalities and their clinical applications involved in EEG, NCS, EP & EMG recording. 2. Demonstrates and take necessary steps during procedure, Software applications usage and maintenance of the EEG, NCS, EP& EMG instruments. 3. Outline the use and application and Software used in recording EEG, NCS,EP & EMG.	**W** Internal [50]+ university [100]+ Total marks=100
Neurophysiological Procedure - Electroencephalography	1. Describes the process of Electroencephalography, the procedures, methods involved in Electroencephalography. 2. Demonstrate accurate electrode measurement positioning in accordance to recognized measuring system (10-20 Electrode placements) with high degree of dexterity and accuracy. 3. Describe and identifies the various normal and abnormal findings and reporting involved in Electroencephalography. 4. Analyse the sources and types of artifacts and explore electrode derivation and the design of montages and give factual reports of the EEG findings . 5. Systematically analyze and demonstrates EEG traces in the normal individuals, pediatrics and neonates under a variety of stimulation conditions, activation techniques, drugs induced conditions, level of awareness.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Neurophysiological Procedure – Nerve Conduction Studies	1. Describes the process of Nerve conduction studies, the procedures, methods involved in Nerve conduction studies. 2. Demonstrate Motor, Sensory, Late Reponses, and Repetitive Nerve Stimulation by accurate electrode positioning, measurement in accordance to recognized recording measuring system. 3. Describe and identifies the various normal and abnormal findings and reporting involved in Nerve conduction studies. 4. Analyse the sources and types of artifacts and and special recordings in Motor and Sensory Conductions and employ special studies in various peripheral nerve disorders. 5. Systematically analyze and demonstrates NCS waveforms in the normal individuals, ICU patients, pediatrics and neonates under a variety of stimulation conditions, activation techniques, drugs induced conditions, level of awareness during the Nerve	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100

	conduction procedures.	
Neurophysiological Procedure – Evoked Potentials	1. Describes the process of Evoked Potentials, the procedures, methods involved in Evoked Potentials. 2. Demonstrate Auditory, Visual, Somatosensory, Sacral and Vestibular EP's by accurate electrodes positioning, measurement in accordance to recognized recording and measuring System. 3. Explain and identifies the various normal and abnormal findings and reporting involved in Evoked Potentials. 4. Analyse the sources and types of artifacts and special recordings in Evoked Potentials and employ special Evoked Potential studies in various Neurological disorders. 5. Systematically analyze and demonstrates EP's waveforms in the normal individuals, ICU patients, pediatrics and neonates under a variety of stimulation conditions, activation techniques, drugs induced conditions, level of awareness during the Evoked Potentials procedures.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Neurophysiological Procedure – Electromyography	1. Describes the process of Electromyography, the procedures, methods involved in EMG and Assist Neurologist and EMG machine operation during the EMG procedure. 2. Demonstrates the process, procedure stimulation, interpretation of Blink Reflex study andAutonomic Function Studies (Sympathetic Skin Response & R-R Interval) 3. Demonstrate proper handling of the needle electrodes, muscle identifying and selection offor the EMG procedure, electrodes positioning and measurement of potentials in accordance to recognized recording and measuring System. 4. Describe and identifies the various normal and abnormal findings and reporting involved in EMG. 5. Analyse the sources and types of artifacts and special recordings in EMG and correlate findings in various Neurological disorders. 6. Systematically analyze and assist EMG procedure, identifies waveforms in the normal individuals, pediatrics and neonates under a variety of stimulation conditions, activation techniques during the EMG procedure.	**W** Internal [50]+ university [100] Total marks=100

LEARNING OUTCOMES - PERFUSION TECHNOLOGY

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Perfusion Technology Oriented Anatomy and Physiology	1. To have an in-depth knowledge of the anatomy and physiology of the brain, heart, circulation and lungs, kidney. 2. To show knowledge of the main diseases that affect each system and the clinical signs and symptoms associated with them. 3. To demonstrate a full knowledge and understanding of the cellular composition of blood, including cell types, size and	**W** Internal [50]+ university [100] Total marks=100

	function. 4. To critically evaluate the hazards of transfusion and their application to clinical practice. 5. To discuss in detail blood groups and their antibodies, and evaluate the cross matching procedures required for transfusion. 6. To discuss in depth the mechanisms of haemostasis and critically evaluate methods of manipulating the haemostatic process during perfusion and of reducing blood loss during cardiovascular surgery	
Pharmacology Related to Perfusion Technology	• To describe Medical Terminology as related to pharmacology. • To analyze drug dosages, drug interactions and how drug specificity relates to drug receptors. • To explain nomenclature of drugs. • To describe routes of administration . • To differentiate Pharmaceutical and Pharmacokinetic phase and their components. • To categorize the concepts of Bioavailability/Biological Availability. • To discuss Pharmacodynamic phase and its components. • To differentiate the terms efficacy/affinity/agonist/antagonist in pharmacology • To differentiate the anaesthesia/analgesia/amnesia/sedation. • To contrast the actions of induction/intubation/ventilation. • Outline the use of opioids in anaesthesia. • To assess the uses of: o IV anaesthetics o neuromuscular relaxants in anaesthesia • To asses the uses of inhalation agents in anaesthesia	**W** Internal [50]+ university [100] Total marks=100
Pathophysiologylogy Related to Perfusion Technology	1. To determine the concepts of disease and outlines of clinical evaluation related to perfusion technology 2. To demonstrate skills in the evaluation of clinical data related to cardiac pathology 3. To apply theoretical knowledge on cardiac diseases and to manage the clinical situations 4. To demonstrate perfusion competence in the clinical situation of cardiac surgery	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Instrumentations Specific to Perfusion Technology	1. To analyze the general design of components that constitute the extra corporeal circuit (ECC) 2. To describe priming of the extracorporeal circuit and the solutions used to prime the extracorporeal circuit 3. To differentiate the various cannulation techniques used for cardiopulmonary bypass and cardioplegia delivery 4. To describe the components of the heart lung machine and heater-cooler units 5. To describe the importance of maintaining aseptic and sterile techniques	W Internal [50]+ university [100]+ Total marks=100

Fundamentals of Perfusion Technology-I	1. To describe the systemic effects of the ECC on blood components and the inflammatory response 2. To explain the principles involved in cardiopulmonary bypass (CPB) 3. To analyze the concept of hemodilution and its physiological effects during CPB 4. To apply concepts involved in myocardial protection while on CPB 5. To differentiate the various cannulation techniques used for CPB and cardioplegia delivery 6. To analyze the concept of metabolic demand of the body and myocardium during CPB 7. To determine the effects of Acid-base balance, Flow/pressure, autoregulation, temperature and anesthesia have on metabolism	W,P,V Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Fundamentals of Perfusion Technology-II	1. To describe the systemic effects of the ECC on blood components and the inflammatory response 2. To explain the principles involved in cardiopulmonary bypass (CPB) 3. To analyze the concept of hemodilution and its physiological effects during CPB 4. To apply concepts involved in myocardial protection while on CPB 5. To differentiate the various cannulation techniques used for CPB and cardioplegia delivery 6. To analyze the concept of metabolic demand of the body and myocardium during CPB 7. To determine the effects of Acid-base balance, Flow/pressure, autoregulation, temperature and anesthesia have on metabolism	W,P,V Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Procedures Related to Perfusion Technology- I	1. To determine and use reason, analysis, calculations, problem solving, critical thinking, and other learning skills to acquire knowledge, and to comprehend and synthesize complex situations. 2. To be prepared for achieving and maintaining a high level of knowledge and clinical competence, as well as having a distinct awareness of the consequence of error in judgment and/or skill. 3. To work in often stressful situations	W,P,V Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Procedures Related to Perfusion Technology- II	1. To develop the ability to master complex techniques by thoroughly understanding the principles that govern them and to apply these techniques in designing strategies to investigate problems. 2. To develop judgement and problem solving skills and enhance their ability to critically evaluate data and formulate hypotheses. 3. To develop the knowledge and skills that allow the pursuit of a career in a wide range of environments. 4. To specialize in distinctive areas of Perfusion Science so that they may share their experiences to mutual benefit	W Internal [50]+ university [100] Total marks=100

LEARNING OUTCOMES - UROLOGY TECHNOLOGY

COURSE TITLE	OUTCOMES	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy & Physiology related to Urology	1. Describe the development, structure and functional anatomy and physiology of the genitor urinary system. 2. Comprehend fundamentals of urology anatomy & physiology in patient assessment 3. Analyse patients with urology symptoms 4. Apply appropriate therapy to urology patients . 5. Demonstrate the knowledge of fundamentals of genito urinary anatomy and physiology and to use critical thinking	**W** Internal [50]+ university [100] Total marks=100
Pharmacology and Radiology related to Urology	1. Describe various drugs used in the field of urology . 2. Comprehend Indications, contraindications, drug dosage, pharmacological action, adverse effects, etc. 3. Analyse the need for pharmacotherapy 4. Apply the knowledge of drugs and dosage . 5. Demonstrate clinical skills in drug administration. 6. Awareness about radiation protection. 7. Pre preparation of uro radiological investigations. 8. Learn, to interpret the radiology films & reports related to urology.	**W** Internal [50]+ university [100] Total marks=100
Urological Disorders	1. Describe the aetiopathogenesis of common urological diseases. 2. Differentiate the common urological diseases. 3. Explain the clinical diagnosis and management of urological disease. 4. Knowledge about urological abnormalities & management of the disease.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Clinical evaluation and diagnostic methodologies	1. Get the knowledge about blood bank. 2. Clinical aspect of urine analysis, semen analysis , renal function test . 3. Learn about the signs & symptoms of genitor urinary system & minor procedure.	**W** Internal [50]+ university [100]+ Total marks=100
Endourological instruments related to urology	1. Describe various sterilization used in urology OT. 2. Known the full range of instrumentation in different methods of surgery. 3. Apply the knowledge of handling & maintenance of instruments.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100

Endoscopic, open urology & Introduction to renal transplantation-I	1. Describe various instruments used in urology. 2. Apply the knowledge of handling instruments. 3. Assist in open & endourological procedures.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Extracorporeal shockwave lithotripsy and urodynamics evaluation	1. Describe various electrodes used in ESWL machine. 2. Calibration of ESWL machine. 3. Apply the knowledge of urodynamic evaluation. 4. Techniques of doing urodynamics.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Renal Transplantation	1. Describe various drugs used in the renal transplantation. 2. Comprehend Indications, contraindications, drug dosage, pharmacological action, adverse effects of immunosuppressants. 3. Apply the knowledge of pre and post operative care of transplantation. 4. Explain about haemodialysis.	**W** Internal [50]+ university [100] Total marks=100

LEARNING OUTCOMES - NUCLEAR MEDICINE TECHNOLOGY

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy & Physiology Related to Nuclear Medicine	**Describe** the basic anatomy and physiology of human body. **Describe** physiological processes and correlate these to medical imaging appearances and functional nuclear medicine studies at an introductory level. **Analyse** a variety of organ systems, including the circulatory, skeletal, immune and central nervous system. **Demonstrate** the specific organ structures and chemical make-ups that relate to nuclear medicine imaging. **Apply** and Communicate anatomical knowledge of 2D and 3D medical imaging data	**W** Internal [50]+ university [100] Total marks=100
Nuclear Physics and Introduction to Nuclear Medicine	**Apply** the basic science aspects of radiation physics and its application to diagnostic/Therapeutic Nuclear Medicine. **Demonstrate** the knowledge of radiation safety precautions and ALARA Concepts **Analyse** the basic Mathematical concepts, counting statistics,	**W** Internal [50]+ university [100] Total marks=100

	probabilityDistribution. **Describe** the practical's related to Physics, Instrumentation and its quality Control.	
Nuclear Medicine instrumentation & Quality Control	**Apply** the basic science aspects of radiation physics and its application to diagnostic/Therapeutic Nuclear Medicine. **Demonstrate the** knowledge, understanding, and appropriate uses of instrumentation used in a nuclear medicine department. **The student will be able to Demonstrate the** knowledge of quality control procedures for instrumentation used in nuclear medicine **Describe** the components of the various machines **Analyse** the general design of components that constitute Gamma camera and radiation survey meters **Differentiate** the various quality control procedures	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Radiobiology & Radiation Safety In Nuclear Medicine	**Demonstrate** the knowledge of radiation safety precautions and ALARA concepts. **Demonstrate** proficiency in providing patient care. **Comprehend** the ICRP recommendations and their amendments from time to time and other international recommendations, environmental regulations regarding limits of radiation exposure, handling of radioactive patients, transport of radioactivity material and disposal of radioactive wastes. **Analyse** the importance of radiation effects.	**W** Internal [50]+ university [100]+ Total marks=100
Radiochemistry & Radiopharmacy	**Analyse** the Physico chemical and biological tests of radiopharmaceuticals **Demonstrate** knowledge of various radiopharmaceuticals and their uses in nuclear medicine imaging and the quality control of radiopharmaceuticals. **Demonstra**te the biological behaviour of radiopharmaceuticals **Describe** the mechanism of localisation of various radiopharmaceuticals **Comprehend** the good Manufacturing Practice (GMP) and Laws pertaining to in-house manufacturing of Radiopharmaceuticals. **Apply** the appropriate Physical and chemical characteristics of radionuclide used in diagnostic Nuclear Medicine	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Nuclear Medicine Techniques	**Analyse** the diagnostic Nuclear Medicine and its applications **Apply** the suitable radiopharmaceuticals used for diagnostic/Therapeutic Nuclear Medicine **Demonstrate** the various invivo /In vitro procedures. **Demonstrate** proficiency in obtaining a relavant patient history **Describe** the Specific topics on Radiopharmaceuticals: Bone seeking, hepatobiliary, brain and cerebrospinal fluid (CSF), renal, thyroid, parathyroid,	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100

	infection imaging, Tumor Seeking, cardiac imaging etc. **Describe** the importance of maintaining aseptic and sterile techniques.	
Molecular Imaging	**Analyse** the components of a clinical PET scanner. **Describe** the radionuclide production, radiopharmaceutical synthesis, patient positioning and data analysis **Describe** theindications for use of PETimaging in oncology, cardiology, neurosciences and psychiatricdisorders. **Demonstrate** the Principals of the commonly used medical imaging modalites with emphasis on PET and computed tomography (CT),MRI. **Demonstrate** the Quality control tests for PET- CT scanners **Comprehend** the positron Emitting radionuclides, target reactions and their radiopharmaceuticals chemistry, various synthetic modules	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Diagnostic & Therapeutic Procedures In Nuclear Medicine	**Analyse** the diagnostic Nuclear Medicine and its applications. **Applying**the ALARA principle in therapeutic and in diagnostic imaging **Demonstrate** the knowledge of radiation therapy procedures used in nuclear medicine. **Demonstrate** the therapy in thyroid disorders; aetiopathology, classification anddiagnosis of thyroid nodules and malignancies **Describe** the Characteristics of Radionuclides/Radiopharmaceuticals for radionuclide therapy**.** **Describe the** Principles of OPD and in-door therapy administration**.**	**W** Internal [50]+ university [100] Total marks=100

LEARNING OUTCOMES - PLASTIC RECONSTRUCTIVE AND COSMETIC TECHNOLOGY

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Fundamentals of General Plastic Surgical Technology	1. Has ability to keep records in appropriate and accepted formats 2. Trains to counsel patients for plastic surgery.	**W** Internal [50]+ university [100] Total marks=100
Fundamentals of Wound Healing, Skin cover and Instruments in Plastic Surgery	1. Has ability to write preop and post surgery instructions 2. Has ability to assist in use of instruments.	**W** Internal [50]+ university [100] Total marks=100
Basic principles of Pre Operative and Post Operative Treatment of Hand	1. Has ability to write preop and post surgery instruction 2. Has ability to use instruments.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+

		Practical [25]+ orals[25] Total marks=100
Fundamentals of Burn Management, Rehabilitation and Counseling	1. To manage burns except surgery 2. with ability counsel burn patient	**W** Internal [50]+ university [100]+ Total marks=100
Reconstructive Technology -I	1. To write preop and post surgery instruction for all reconstructive procedures including microsurgery. 2. To handle suture and instruments in microsurgery	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Reconstructive Technology - II	1. Write preop and post surgery instruction for all cleft and craniofacial procedures. 2. Handle cleft and craniofacial instruments	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Cosmetic Technology -I	1. Write preop and post surgery instruction for all cosmetic procedures. 2. Handle instruments in cosmetic procedure	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Cosmetic Technology -II	1. Write preop and post surgery instruction for all cosmetic procedures. 2. Handle instruments in cosmetic procedure 3. Assist in hair transplant.	**W** Internal [50]+ university [100] Total marks=100

LEARNING OUTCOMES - CRITICAL CARE TECHNOLOGY

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy and Physiology related to Critical Care	1. Cardiovascular, respiratory and metabolic physiology related to critical care. 2. Apply the anatomy and physiology knowledge in clinical scenarios	**W** Internal [50]+ university [100]

		Total marks=100
Microbiology and Pharmacology related to Critical Care	1. Discuss the pharmacology of drugs used in Critical illness 2. Identify and differentiate various micro organisms responsible for critical care infection 3. Appreciate the roles of antibiotics in critical care	**W** Internal [50]+ university [100] Total marks=100
Basic ICU monitoring and Procedures	1. Organize the monitoring systems in ICU 2. Define various monitoring parameters 3. Appreciate the normal and abnormal values 4. Handle the monitoring system	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Airway and Ventilator management	1. Demonstrate the ability to initiate invasive and non invasive ventilation. 2. Demonstrate the ability to monitor and trouble shoots ventilator crises. 3. Prepare for RSI and assist in airway management.	**W** Internal [50]+ university [100]+ Total marks=100
Core cases in critical care-I	Demonstrates the ability to identify clinical status and criticare management of the following patients 1. Neurological 2. Respiratory 3. Cardio vascular	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Hemodynamic and Neuromonitoring in ICU	1.Identify the monitoring system pertaining to the patient need 2.Explain the process of monitoring (Setup,troubleshoots and clinical application) 3.Intiate the monitoring system under the supervison 4.Collect and interepret the data collected from the monitors	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Core cases in critical care -II	Demonstrates the ability to identify clinical status changes in the following patients 1. Obstetrics and surgery 2. Oncology 3. Poisoning	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
ICU administration, Ethics and EOL Care	1. Demonstrates ability to assist in the management of the terminally ill 2. Demonstrates ability to assist in the management of the brain dead organ donor 3. Demonstrate ability to communicate with families	**W** Internal [50]+ university [100] Total marks=100

LEARNING OUTCOMES - ORTHOPEDIC TECHNOLOGY

COURSE TITLE	OUTCOMES	ASSESSMENT METHODS V-Verbal W-Written P-Practical
Fundamentals of General Orthopaedic surgery	1. Describe the causes, signs and symptoms, of basic orthopaedic conditions 2. Explain the principles of diagnosis and management of basic orthopaedic conditions 3. Take a proper history 4. Document the assessment findings in prescribed format	**W** Internal [50]+ university [100] Total marks=100
Fracture Healing, Regional orthopaedics	1. Identify stage of fracture healing and its complications under the supervison of a orthopaedician 2. Identify regional conditions under the supervison of a Orthopedic Surgeon	**W** Internal [50]+ university [100] Total marks=100
Traction,Pop technique, Orthopaedic implants and instrumentation	1. Able to apply plaster, splints 2. To apply traction 3. To identify and utilize orthopaedic instruments	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Orthopaedic surgeries and Rehabilitation	1. Prepare,,position and drape patients by using accepted practices and techniques in order to prepare the patient for surgery. 2. Assist the surgeon as first or second assistant by using accepted surgical practices and techniques. 3. Assist the surgeon during reductions by supplying and applying the appropriate instruments and implant. 4. Apply and manage post-operative dressings on wounds following aseptic techniques as per the instructions. 5. Assist in rehabilitating patients	**W** Internal [50]+ university [100]+ Total marks=100
Upper limb Trauma	1. Identify complications associated with important fractures and dislocations of upper limb 2. Assist the Orthopedic Surgeon in the management of fractures and dislocations of upper limb by reduction and splintage	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Lowerlimb Trauma	1. identify complications associated with important fractures and dislocations of lower limb 2. Assist the Orthopedic Surgeon in the management of fractures and dislocations of lower limb by reduction and splintage	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100

Arthroplasty, Spine	1. Assist in the diagnosis of spinal disorders 2. Assist basic spinal surgery 3. Handle instruments in arthoplasty procedures	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Paediatric ortho, Hand Surgery	1. Identify infective conditions of the joints and bones (septic arthritis and Osteomyelitis) in children 2. Performs primary assessment and assist in collection of data necessary to diagnose the hand disorders	**W** Internal [50]+ university [100] Total marks=100

LEARNING OUTCOMES - GERIATRIC CARE TECHNOLOGY

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Aging and Geriatric care - concepts and theory	1. Understand the principles of aging of the human body 2. Understand Anatomical, physiological and biochemical changes in the elderly 3. Introduce the Concepts and challenges of caregiving.	**W** Internal [50]+ university [100] Total marks=100
Elderly and the Law	1. Legal issues in geriatric care 2. Rights of the elderly 3. Service providers for the elderly	**W** Internal [50]+ university [100] Total marks=100
Institutional and Home-based care of the elderly	1. stepped-up care of the elderly 2. Learning Home based care skills and management 3. To gain knowledge about Nursing home care 4. To differentiate services as assisted living, adult day care, long term care, nursing homes (often referred to as residential care), hospice care, and home care.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Multi-disciplinary care in geriatrics	1. Understand the concept of multi-disciplinary care. 2. Understand Bio-psycho-social model of illnesses in the elderly 3. Introduction to medical and allied health specialists in geriatric care	**W** Internal [50]+ university [100]+ Total marks=100

Common Medical and Psychological disorders in the elderly	1. Understand medical disorders in the elderly 2. Understand Psychological disorders in the elderly	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Cognitive disorders	1. Understand cognitive disorders and its early signs 2. Functional decline in cognitive disorders.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Geriatric Nursing – principles and practice	1. Introduce the Principles and practice of Nursing care in geriatric patients 2. Understand Monitoring health parameters and vital signs.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Fundamentals of Counselling	1. Understand the Principles and practice of medical and psychological counselling 2. Introduce the concepts of Practice of active listening	**W** Internal [50]+ university [100] Total marks=100

LEARNING OUTCOMES - PEDIATRIC SURGICAL TECHNOLOGY

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy and Physiology related to Paediatric surgery	1. To learn the anatomy of abdominal and thoracic organs 2. To understand the physiological aspects of abdomino-thoracic structures 3. To know the basis of developmental anomalies	**W** Internal [50]+ university [100] Total marks=100
Pharmacology and Radiology related to Paediatric surgery	1. To learn about the antibiotics, analgesics and other medications used in Paediatric Surgery 2. To know the basis of Paediatric radiology and nuclear scans 3. To assist in basic diagnostic and therapeutic imaging in Paediatric Surgery	**W** Internal [50]+ university [100] Total marks=100
Paediatric surgical	1.To learn the clinical aspects of common Paediatric surgical ailments	**W,P,V**

disorders Part-1	2. To learn the symptoms of upper gastro intestinal pathology 3. To learn the features of anomalies of head, neck, thorax and abdominal wall	Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Paediatric surgical disorders Part-2	1. To learn the clinical aspects of Paediatric hepato-biliary, lower gastrointestinal, urologic problems, solid tumours and foreign body aspirations/ingestions 2. To learn the technical aspects of dealing the post operative patients with hepato-biliary, complex lower gastrointestinal, urological anomalies and solid tumours 3. To learn the tricks of counseling the parents for continuous care of children with complex anomalies	**W** Internal [50]+ university [100]+ Total marks=100
Clinical evaluation and diagnostic methods	1. To know the basics of blood and urine investigations in Paediatric Surgical children 2. To learn to interpret the clinical aspects of Paediatric Surgical diseases on out-patient set-up 3. To learn about transfusion of blood products and pecautions	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Minor out-patient procedures in paediatric surgery	1. To consel the parents regarding the use, effects, side effects of out-patient procedures 2. To be able to perform all minor outpatient procedure with guidance from Paediatric Surgeon 3. To be able to assist the Paediatric Surgeon in the skillful out-patient procedures	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Open paediatric surgical procedures	1. To learn the principles of operating room, Sterilization 2. To learn to assist in the open Paediatric surgical procedures 3. To learn to operate and troubleshooting of all allied equipments used in open Paediatric Surgical procedures	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Minimally invasive paediatric surgical procedures	1. To learn about setting up the laparoscopy unit 2. To learn to assist the Paediatric Surgeon in minimally invasive procedures 3. To learn about troubleshooting of equipments used in Paediatric minimally inavasive surgery	**W** Internal [50]+ university [100] Total marks=100

BACHELOR OF OCCUPATIONAL THERAPY

COURSE OUTCOMES

- A candidate who successfully completes the program is eligible to practice independently.
- A wide range of opportunities to work in multi-speciality hospitals, mental health centres, de-addiction centres, various Rehabilitation centres, special schools/mainstream schools, Industries, community based rehabilitation as well as teaching institutions.

Can pursue Post graduate degree (M.O.T) in various specialties and Ph.D program

B.Sc. [Hons]] RADIOTHERAPY TECHNOLOGY
(Choice Based Credit System)

PROGRAME OBJECTIVES

The RTT's operate radiation equipment to deliver high energy ionising radiation treatments. In addition to delivering treatment to patients, they demonstrate care and empathy to guide the patients through the treatment process. They are the crucial link between the clinicians (Radiation Oncologists), physical scientists (Medical Physicists) and delivery of radiation to the cancer patients.. The objectives of the entry level graduate programme on BSc Radiotherapy Technology (AHS) in Sri Ramachandra Institute of Higher Education and Research [Deemed to be University] are to produce competent Radiotherapy Technologists with sound scientific and theoretical foundation of the profession and enable them, as practitioners, to be able to synthesize, evaluate and apply their knowledge in a clinical setting. The Radiotherapy Technologist should be able to perform the following roles -

4. As a **healthcare provider** he should be competent in handling the radiotherapy equipment, be well versed in patient immobilization and set-up, monitor the patients for radiation related visible effects and handle the radiological equipment also needed for patient simulation. He / she should also have a good knowledge of radiation safety and protocols to be followed to ensure the same in day to day practise and during radiation emergencies.
5. As a **communicator, leader and team member he / she must** advocate effective communication, inter professional and leadership skills in delivering contemporary health care needs of the community

6. It is an independent **professional and a lifelong learner** Demonstrates high standards of professional ethics, integrity & continuous learning.

PROGRAMME OUTCOMES

Roles:

- ✓ Radiotherapy Technologist
- ✓ Critical thinker
- ✓ Professional
- o Ethical practitioner
- o Communicator
- o Team player
- ✓ Reflective practitioner
- ✓ Lifelong learner

Programme outcomes / Competencies:

1. Heath care

(i) Should be a good communicator to effectively interact with not only the staff/other categories of professionals but also with the patients and their relatives

(ii) He/she should have knowledge of the clinical aspects of cancer, its treatment and visible side-effects especially related to radiotherapy

(iii) should have knowledge of the various types of radiations, radiation generating equipment and their functioning

(iv) Should have knowledge of radiation interactions, and dosimetry techniques

(v) Should have knowledge of the various steps/processes involved in treatment planning

(vi) Should be competent to operate the radiotherapy equipment

(vii) Should be competent in patient handling, immobilization techniques and patient positioning/set-up for treatment/simulation

(viii) Should be competent in handling and checking the treatment related data and data transfer among the various radiotherapy systems.

(ix) Should be competent in monitoring the radiation treatment delivery in terms of both equipment and patient parameters that include data acquisition related to patient QA, and daily machine QA as per the departmental protocol.

(x) Should have knowledge about radiological safety issues in radiotherapy and also about the procedures/processes adopted in an emergency situation. He/she should be competent to perform his/her role effectively in an emergency situation

(xi) Should be competent to handle data/record keeping and documentation, and patient management that includes providing treatment slots.

2. **Critical thinking**

1. Demonstrates sound professional judgment and reasoning in decision-making
2. Synthesizes and analyzes the information in decision making
3. Integrates relevant information with previous learning, experience, professional knowledge, and current practice models

3. Ethics and accountability

1. Adheres to the Code of Ethics prescribed by the professional body/Faculty/Department
2. Maintains appropriate relationships and boundaries with patients and care givers

4. Communication

1. Communicates effectively with the patient, inter professional team members, and other stakeholders using patient-centered principles that address physical, social, cultural or other barriers to communication
2. Delivers information in a respectful, thoughtful manner
3. Uses a systematic approach to record keeping of service provided
4. Maintains confidentiality and security in the sharing, transmission, storage, and management of information**.**
5. Demonstrates an appropriate use of information technology relevant to their field

5. Professional Responsibility

1. Practices as an autonomous professional, exercising their own professional judgment
2. Demonstrates a commitment to their patients, public, and profession
3. Practices within scope of professional and personal limitations and abilities
4. Demonstrates professional integrity
5. Practices in a non-discriminatory way
6. Demonstrates a commitment to the growth of the profession

6. Inter professional relationship

1. Collaborates with inter professional team, and other stakeholders
2. Demonstrates flexibility within team
3. Works effectively with inter professional team, and other stakeholders to manage positive professional relationships
4. Manages differences, misunderstandings, and limitations that may contribute to inter professional tensions in an effective and diplomatic manner

7. Reflective practice

1. Demonstrates the importance of self-awareness and self-reflection
2. Be able to reflect critically on personal practice in order to be able to improve it.
3. Takes responsibility for personal and professional development

8. Lifelong learning committed to continuous improvement of skills and knowledge

1. Demonstrates commitment to continuing competence
2. Apply newly gained knowledge or skills to the care of the patient
3. Familiar with basic health sciences research methods
4. Demonstrates the process of evidence based practice (Ask, acquire, appraise, apply and assess)

INTENDED LEARNING OUTCOMES

COURSE TITLE	OUTCOMES	ASSESSMENT METHODS V-Verbal W-Written P-Practical
Anatomy for Health Sciences	**1.** Define basic technical terminology and language associated with anatomy 2. Identify the structures of human body 3. Describe the anatomy of human body **4.** Describe the structure and features of the organ systems of the human body **5.** Identify the anatomical structure in the dissected specimen.	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Physiology for Health Sciences	1. Describe the functional anatomy and histology of various organ systems 2. Describe the basic physiological principles involved in the normal functioning of the human body **3.** Apply the physiological principles in comprehending the pathophysiology of disease and its management	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Psychology for Health Sciences	1. Describe the theories and basic principles in psychology 2. Explain the behavior and mental processes 3. Apply the principles of psychology while providing health care and enrich their knowledge and to meet the challenges they encounter in health care profession.	**W** Internal [50]+ university [100] Total marks=100
Biochemistry for Health Sciences	1. Describe chemistry & metabolism of macromolecules, vitamins and minerals 2. Correlate biochemical mechanisms to diseases 3. Discuss the importance of biochemical parameters in clinical 4. decision making	**W** Internal [50]+ university [100] Total marks=100
Medical Terminologies	1. Describe the basic principles of term usage when referring to concepts in the health field. 2. Describe the Greek-and Latin derived basic structures of medical terms 3. Identify the roles of the four types of word parts used in forming medical terms. 4. Describe the steps in locating a term in a medical dictionary. 5. Understand the importance of spelling medical terms correctly	**W** Internal [100] Total marks=100
Micro-Biology for Health Sciences	1. Classify microorganisms, discuss the morphological and growth characteristics and its association with causation of disease 2. Demonstrate and interpret basic laboratory techniques used in the detection of micro organisms 3. Explain principles of antimicrobial therapy and Immunization 4. Demonstrate basic infection control practices	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)

Patho - Physiology and Treatment of Disease	1. Identify and Describe the causative agent in various disease 2. Comprehend the major signs and symptoms of the various diseases 3. Describe the pathophysiology of various disease related to anesthetic care Apply pathophysiology 4. knowledge in anesthetic care 5. To Analyze the patient pre-operative fit for undergoing procedure	**W** Internal [50]+ university [100] Total marks=100
Pharmacology for Health Sciences	1. Identify the fundamental principles of pharmacokinetics and pharmacodynamics. 2. Apply the pharmacodynamics and pharmacokinetic principles that describe drug actions in humans. 3. Compare and contrast the specific pharmacology of the major classes of drugs, important distinctions among members of each class, the risks and benefits, in relation to the organ systems they affect, and the diseases for which they are used therapeutically.	**W** Internal [50]+ university [100] Total marks=100
Preventive Medicine	1. Describe the functions of health care in India 2. Comprehend and explain the concept of health care and their goals 3. Demonstrate the utility of care in prevention and control of common disorder among rural folks of RHTC. 4. Provide the basic care social aspects of health promotion and specific prevention activities in the community.	**W** Internal [50]+ university [100] Total marks=100
Sociology for Health Sciences	1. Describe the development of medical sociology 2. Discuss the sociological approaches of health. 3. Discuss the health issues in socio-cultural perspective. 4. Apply the sociology knowledge in health care decision making	**W** Internal [50]+ university [100] Total marks=100
Technology oriented Anatomy & Physiology	1. Describe the anatomy of the various systems related to radiotherapy technology 2. Identify the surface anatomy of structures related to radiotherapy technology 3. Discuss the functions of various systems related to radiotherapy treatment. 4. Appreciate the physiological changes during radiotherapy treatment	**W** Internal [50]+ university [100] Total marks=100
Basic Physics and Principles	1. Gain knowledge and understanding on the basic units and measurement of physics 2. Acquire a conceptual understanding about structure of matter 3. Acquire a conceptual understanding about Radioactive and electromagnetism 4. Understand an insight into interaction of radiation with matter	**W** Internal [50]+ university [100] Total marks=100
Research Methodology and Biostatistics for Health Sciences	1. Discuss the process of health sciences research 2. Differentiate various study designs 3. Discuss validity 4. Discuss descriptive and inferential statistics	**W** Internal [50]+ university [100] Total marks=100
Radiography Imaging and applications.	The objective of this module is to enable the student to know the basics behind functioning and operation of the following radiological equipment – 1) conventional radiographs and Digital Radiography 2) Mammography 3) Computed Tomography (CT) and 4D-CT 4) Magnetic Resonance Imaging (MRI) 5) Ultrasound	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25]

	6) SPECT and PET-CT Practical: At the end of this course the candidate should be able to perform the following tasks – 1) Congruence of Radiation and Optical field and beam. 2) Take a CT scan of relevant slice thickness and defined site. 3) Evaluation of Total filtration of the tube. 4) K.V. and Exposure time testing. 5) Consistency in X-ray output.	Total marks=100
Chemistry for Health Sciences	1. Identify the nature of the organic compounds by chemical tests 2. Describe the common chemical reactions 3. Describe the structures of the therapeutic agents	**W** Internal [50]+ university [100] Total marks=100
Radiotherapy Physics and Principles	The objective of this module is to help the students understand the principles of the following topics 1) Atomic Structure, Isotopes and isobars 2) Radioactivity, Radioactive decay, Half-life, 3) Basics of radiation therapy physics 4) Interaction of radiation with matter 5) Beam Limiting and immobilization devices. Practical: 6. Describe the concept of SAD and SSD and apply in clinical scenario. 7. Identify the different parts of LINAC and Brachytherapy unit 8. Discuss the functions of different immobilization devices used in treatment planning 9. Apply the knowledge in interaction of radiation with matter 10. Understand the concept of Time and dose calculation in SSd and SAD Techniques	**W** Internal [50]+ university [100] Total marks=100
Basics of Oncopathology	The objective of this module is to help the students understand the significance of the following topics in oncopathology. - 1) General pathology of tumours 2. Malignancies- local and general effects of tumours and its spread 3. Carcinogenesis 4. Co-morbidities 5. Etiology and epidemiology 6. Genetics of cncer 7. Prevention of cancer 8. Early detection of cancer	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Radiotherapy Equipments and clinical applications	In this paper, the students acquire knowledge about various teletherapy machines, and the student learns about the operational and functional aspects of accelerators along with machine properties. 1) Brachytherapy- Design features, Radiation sources, Technique, High dose-rate (HDR),Low dose-rate (LDR),Pulsed dose-rate (PDR), various types of applicators. 2) Teletherapy Machines & Accessories: a.Telecobalt Machines b. Medical linear accelerators. c. Tomotherapy d. Machine properties. e. Beam directing, modifying and defining devices. f. Other accessories	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100

	Practical: 1. Describe the quality assurance test for LINAC and Telecobalt Unit 2. Identify the structures various systems related radiation generating equipment. 3. Discuss the functions of various systems related to Brachytherapy unit. Apply the knowledge in Handling the radioactive materials and understand their properties.	
Infection Control	1. Explain the process of infection control in health care 2. Apply the infection control knowledge while providing care 3. Demonstrate the procedures of infection control	**W** Internal [100] Total marks=100
Radiotherapy Techniques and Quality assurance	Quality assurance (QA) refers to the systematic activities implemented in a quality system so that quality requirements for a product or service will be fulfilled. It is the systematic measurement, comparison with a standard, monitoring of processes and an associated feedback loop that confers error prevention and provides accuracy of treatment. The following topics will be covered: 1. To make Thermoplast mould of different clinical sites 2. To make double shell mould for SRS and SRT techniques 3. To make VACLOK immobilization for thorax, abdomen, pelvis and for pediatric patient. 4. To make Body- fix for SBRT patients. 5. To use Electron form cutters for electron therapy 6. Beam shaping blocks, Beam shaping jaws, Patient support system, 7. Beam on and off mechanisms, 8. Technician's role in QA tests on telecobalt /Linear Accelerator / Brachytherapy/ Gamma knife/Simulator/CT Simulator machines. Practical: The following topics will be covered here – 1. QA on X-Ray, Simulator, and Radiotherapy equipments 2. Radiation protection survey, in and around of radiotherapy Premises 3. Procedures followed for calibration of measuring and monitoring instruments. 4. Familiarization of radiation survey meters and their functional performance checks 5. Understand various types of radiation treatment techniques and their importance	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Radiobiology & Patient care relevant to Radiotherapy	The following topics will be covered here – 1) The Cell 2) Effect of ionising radiation on cell, 3) Chromosomal aberration and its application for the biological dosimetry, 4) Somatic effects and hereditary effects, 5) Stochastic and deterministic effects, 6) Acute exposure and Chronic exposure, 7) LD50/60. Role of RTT in managing the acute effects of radiation.	**W** Internal [50]+ university [100] Total marks=100
Quality Assurance in Health Care	1. Discuss the importance of quality assurance in health care delivery. 2. Discuss the strategies of planning, implementing and measuring	**W** Internal [50]+ university [100]+

	hospital performance 3. Implement quality approaches and tools in healthcare settings	Total marks=100
Health Care Safety	1. Discuss quality improvement and patient safety 2. Integrate performance improvement methodologies into health care safety 3. Implement consistent, evidence-based quality and safety practices	**W** Internal [50]+ university [100] Total marks=100
Recent Advances in Radiotherapy Techniques	1. Recent trends in radiotherapy (from conventional technique to VMAT) 2. Stereotactic radiosurgery, 3. Stereotactic radiotherapy,Cranial Extra cranial 4. Stereotactic body radiotherapy SBRT, 5. Total Body Irradiation (TBI),Total Skin Electron Irradiation (TSEI) 6. Radiation therapy with neutrons, protons, and heavy ions 7. Understand the concept of Proton therapy and Carbon ion therapy Practical: 1. Treatment delivery of different types of radiotherapy techniques 2. Recent Positioning techniques for SRS and SRT techniques 3. Advantages of using Body fix in delivery of SRS,SRT and SBRT techniques 4. Positioning of Total Body Irradiation (TBI),Total Skin Electron Irradiation (TSEI) techniques with different immobilization devices 5. Uses of fraxtion based immobilization technique for SRS and SRT delivery.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Radiation Safety	The radiation therapy needs to be carried out carefully with adequate measuring system for the radiation workers, such as technologists, which helps in knowing the dose level he/she has received while working in the radiation area. 1. Radiation Hazard evaluation and control- 2. Philosophy of radiation protection, Effect of Time, Distance and Shielding, Calculation of workload, 3. Calculation of Weekly dose to the radiation worker and general public, good work practices in diagnostic radiology and/or radiotherapy practices (including teletherapy and Brachytherapy), 4. Planning consideration for radiology and/or radiotherapy installation including work load, use factor & occupancy factors, effect of different shielding material. 5. Radiation Emergency Preparedness - Safety and security of radiation sources, case histories of emergency situations and preparedness, 6. Equipments and tools including role of Gamma Zone Monitor 7. Regulatory requirements and prevention of emergency, Preventive maintenance and Safety Culture, Role of RTT in handling radiation emergencies. 8. Regulatory requirements National Regulatory Body, Responsibilities, organization, Safety Standards, Codes and Guides, 9. Responsibilities of licensees, registrants and employers and	**W** Internal [50]+ university [100] Total marks=100

	Enforcement of Regulatory requirements 10. Demonstration: time, Distance and Shielding, measurement of HVT & TVT 11. Familiarization of radiation survey meters and their functional performance checks 12. Radiological Protection Survey of Radiotherapy, Simulator and CT Simulator Installations 13. QA on X-ray, Simulator and Radiotherapy Equipment(s)	
Health professionalism	1. Provide compassionate care to patients while respecting their privacy and dignity. 2. Display honesty, integrity and responsibility in all educational setting and in interactions with patients, their families & colleagues. 3. Explain the basic principles of bioethics and how to balance these principles in practice	**W** Internal [50]+ university [100] Total marks=100
First aid and emergency care	1. Explain the common first aid procedures 2. Demonstrate basic life support skills	**W** Internal [100] Total marks=100
Project	1. Develop a research question 2. Write a research proposal 3. Collect and analyse data 4. Prepare a concise report	**W** Internal [100] Total marks=100

B.Sc. [Hons] RESPIRATORY THERAPY

(Choice Based Credit System)

PROGRAME OBJECTIVES

The objectives of the entry level graduate programme on B.Sc. [Hons] Respiratory Therapy in Sri Ramachandra Institute of Higher Education and Research [Deemed to be University] are to produce competent Allied Health Professional who,

1. As a **healthcare provider** applies the acquired knowledge and skills in prevention, investigations and managing patients under the direction of a medical professional.
2. As a **communicator, leader and team member** advocates effective communication, inter professional and leadership skills in delivering contemporary health care needs of the community
3. As an independent **professional and a lifelong learner** Demonstrates high standards of professional ethics, integrity & continuous learning

PROGRAMME OUTCOMES

Roles:

- ✓ Allied Health Care Provider
- ✓ Critical thinker
- ✓ Professional
- ○ Ethical practitioner
- ○ Communicator
- ○ Team player
- ✓ Reflective practitioner
- ✓ Lifelong learner

Programme outcomes / Competencies:

1. Heath care

1. Demonstrate knowledge of basic medical science subjects required to practice as a Health care technologist
2. Demonstrate the knowledge in related clinical subjects
3. Identifies the appropriate investigations/ Procedures required
4. Demonstrates skills in handling the equipments
5. Performs the procedures skilfully
6. Documents the results in prescribed format
7. Provide appropriate patient care considering socio economic and cultural aspects informed by research evidence
8. Adheres to the safety procedures

2. **Critical thinking**

1. Demonstrates sound professional judgment and reasoning in decision-making
2. Synthesizes and analyzes the information in decision making
3. Integrates relevant information with previous learning, experience, professional knowledge, and current practice models

3. Ethics and accountability

1. Adheres to the Code of Ethics prescribed by the professional body/Faculty/Department
2. Maintains appropriate relationships and boundaries with patients and care givers

4. Communication

1. Communicates effectively with the patient, inter professional team members, and other stakeholders using patient-centered principles that address physical, social, cultural or other barriers to communication
    a. Delivers information in a respectful, thoughtful manner
2. Uses a systematic approach to record keeping of service provided
3. Maintains confidentiality and security in the sharing, transmission, storage, and management of information**.**
4. Demonstrates an appropriate use of information technology relevant to their field

5. Professional Responsibility

1. Practices as an autonomous professional, exercising their own professional judgment
2. Demonstrates a commitment to their patients, public, and profession
3. Practices within scope of professional and personal limitations and abilities
4. Demonstrates professional integrity
5. Practices in a non-discriminatory way
6. Demonstrates a commitment to the growth of the profession

6. Inter professional relationship

1. Collaborates with inter professional team, and other stakeholders
2. Demonstrates flexibility within team
3. Works effectively with inter professional team, and other stakeholders to manage positive professional relationships
4. Manages differences, misunderstandings, and limitations that may contribute to inter professional tensions in an effective and diplomatic manner

7. Reflective practice

1. Demonstrates the importance of self-awareness and self-reflection
2. Be able to reflect critically on personal practice in order to be able to improve it.
3. Takes responsibility for personal and professional development

8. Lifelong learning committed to continuous improvement of skills and knowledge

1. Demonstrates commitment to continuing competence
2. Apply newly gained knowledge or skills to the care of the patient
3. Familiar with basic health sciences research methods
4. Demonstrates the process of evidence based practice (Ask, acquire, appraise, apply and assess)

INTENDED LEARNING OUTCOMES

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy for Health Sciences	1. Define basic technical terminology and language associated with anatomy 2. Identify the structures of human body 3. Describe the anatomy of human body 4. Describe the structure and features of the organ systems of the human body 5. Identify the anatomical structure in the dissected specimen	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100

		(Internal)
Physiology for Health Sciences	1. Describe the functional anatomy and histology of various organ systems 2. Describe the basic physiological principles involved in the normal functioning of the human body 3. Apply the physiological principles in comprehending the pathophysiology of disease and its management	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Psychology for Health Sciences	1. Describe the theories and basic principles in psychology 2. Explain the behavior and mental processes 3. Apply the principles of psychology while providing health care and enrich their knowledge and to meet the challenges they encounter in health care profession.	**W** Internal [50]+ university [100] Total marks=100
Biochemistry for Health Sciences	1. Describe chemistry & metabolism of macromolecules, vitamins and minerals 2. Correlate biochemical mechanisms to diseases 3. Discuss the importance of biochemical parameters in clinical decision making	**W** Internal [50]+ university [100] Total marks=100
Medical Terminologies	1. Describe the basic principles of term usage when referring to concepts in the health field. 2. Describe the Greek-and Latin derived basic structures of medical terms 3. Identify the roles of the four types of word parts used in forming medical terms. 4. Describe the steps in locating a term in a medical dictionary. Understand the importance of spelling medical terms correctly	**W** Internal [100] Total marks=100
Micro-Biology for Health Sciences	1. Classify microorganisms, discuss the morphological and growth characteristics and its association with causation of disease 2. Demonstrate and interpret basic laboratory techniques used in the detection of micro organisms 3. Explain principles of antimicrobial therapy and Immunization 4. Demonstrate basic infection control practices	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Patho - Physiology and Treatment of Disease	1. Identify and Describe the causative agent in various disease 2. Comprehend the major signs and symptoms of the various diseases 3. Describe the pathophysiology of various disease related to anesthetic care Apply pathophysiology 4. knowledge in anesthetic care 5. To Analyze the patient pre-operative fit for undergoing procedure	**W** Internal [50]+ university [100] Total marks=100
Pharmacology for Health Sciences	1. Identify the fundamental principles of pharmacokinetics and pharmacodynamics. 2. Apply the pharmacodynamics and pharmacokinetic principles that describe drug actions in humans. 3. Compare and contrast the specific pharmacology of the major classes of drugs, important distinctions among members of each class, the risks and benefits, in relation to the organ systems they affect, and the diseases for which they are used therapeutically.	**W** Internal [50]+ university [100] Total marks=100

Preventive Medicine	1. Describe the functions of health care in India 2. Comprehend and explain the concept of health care and their goals 3. Demonstrate the utility of care in prevention and control of common disorder among rural folks of RHTC. 4. Provide the basic care social aspects of health promotion and specific prevention activities in the community.	**W** Internal [50]+ university [100] Total marks=100
Sociology for Health Sciences	1. Describe the development of medical sociology 2. Discuss the sociological approaches of health. 3. Discuss the health issues in socio-cultural perspective. 4. Apply the sociology knowledge in health care decision making	**W** Internal [50]+ university [100] Total marks=100
Anatomy & Physiology Respiratory Therapist	**1.** Describe the structure and functional anatomy and physiology of the respiratory and cardiovascular system **2.** Identify the anatomical structures related to respiratory care practice **3.** Discuss the physiology of respiratory and cardiovascular system pertaining to respiratory care 4. Application of integrated knowledge of structure and function to determine functioning of the cardiopulmonary systems.	**W** Internal [50]+ university [100] Total marks=100
Pharmacology for Respiratory Therapists	1. Describe various drugs used in the field of Respiratory Care 2. Discuss Indications, contraindications, drug dosage, pharmacological action and adverse effects of commonly used respiratory drugs 3. Discuss the need for pharmacotherapy in respiratory care 4. Identify appropriate drug delivery device	**W** Internal [50]+ university [100] Total marks=100
Research Methodology and Biostatistics for Health Sciences	1. Discuss the process of health sciences research 2. Differentiate various study designs 3. Discuss validity 4. Discuss descriptive and inferential statistics	**W** Internal [50]+ university [100] Total marks=100
Fundamentals of Respiratory Therapists	1. Describe the role of a Respiratory Care provider 2. Discuss the range of respiratory and sleep physiology investigations commonly undertaken 3. Demonstrate basic clinical assessment skills 4. Observe the investigation procedures performed by respiratory care technologist 5. Comprehend the normal and abnormal laboratory findings **6.** Discuss various physical principles commonly used related to respiratory care	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100 (Internal)
Chemistry for Health Sciences	1. Identify the nature of the organic compounds by chemical tests 2. Describe the common chemical reactions 3. Describe the structures of the therapeutic agents	**W** Internal [50]+ university [100] Total marks=100
Respiratory Diseases	**1.** Describe the diseases affecting Upper and lower respiratory tract, diseases of the lungs, pleura, mediastinum, chest wall, etc. **2.** Comprehend disease pathogenesis, clinical features and available therapy 3. Analyse clinical signs and symptoms and differentiate the respiratory disorders.	**W** Internal [50]+ university [100]+ Total marks=100
Instrumentations & Troubleshooting	1. Identify the equipment used in respiratory care **2.** Describe the function and working principle of equipment **3.** Identify the common trouble shoots 4. Apply knowledge on initiation, set up, monitor/perform	**W,P,V** Internal [50]+ university [100] Total marks=100

	procedures 5. Demonstrate competency in handling equipments under supervision	Internal [50]+ Practical [25]+ orals[25] Total marks=100
Physics and Electronics for Health Sciences	1. Describe the basics principles of physics related to allied health care 2. Apply the principles of physics 3. Describe concepts of active and passive devices used in the electronic instrumentation 4. Demonstrate voltage, current and resistance measurements 5. Apply the concepts of safety procedures in bio-medical instrumentation and patient	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Infection Control	1. Explain the process of infection control in health care 2. Apply the infection control knowledge while providing care 3. Demonstrate the procedures of infection control	**W** Internal [100] Total marks=100
Respiratory Care – I	1. Describe the range of respiratory and sleep physiology investigations. 2. Comprehend the role of Respiratory Technologists in physician performed invasive procedures 3. Demonstrate ability to perform Respiratory care diagnostic procedures under supervision 4. Demonstrate pulmonary function tests & sleep studies under supervision 5. Recognize normal and abnormal spirometry & sleep studies.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Evidence Based Practice	1. Discuss the importance of EBP 2. Describe the process of EBP 3. Ask a relevant clinical question 4. Acquire evidence 5. Appraise evidence	**W** Internal [50]+ university [100] Total marks=100
Quality Assurance in Health Care	1. Discuss the importance of quality assurance in health care delivery 2. Discuss the strategies of planning, implementing and measuring hospital performance 3. Implement quality approaches and tools in healthcare settings	**W** Internal [50]+ university [100]+ Total marks=100
Health Care Safety	1. Discuss quality improvement and patient safety 2. Integrate performance improvement methodologies into health care safety 3. Implement consistent, evidence-based quality and safety practices	**W** Internal [50]+ university [100] Total marks=100
Respiratory Care – II	1. Describe the different artificial airways, airway clearance techniques, goals of mechanical ventilations. 2. Comprehend various modes and types of mechanical ventilation. 3. Assess life-threatening situations and administer necessary patient care in a simulated environment 4. Demonstrate skills in monitoring of critically ill patients in a simulated environment 5. Demonstrate competency in handling and managing artificial airways, mechanical ventilation initiation & management, cardiopulmonary Resuscitation techniques, and transporting critically ill patients under supervision in a simulated environment	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100

Critical care and pulmonary rehabilitation		**W** Internal [50]+ university [100] Total marks=100
Health professionalism	1. Provide compassionate care to patients while respecting their privacy and dignity. 2. Display honesty, integrity and responsibility in all educational setting and in interactions with patients, their families & colleagues. 3. Explain the basic principles of bioethics and how to balance these principles in practice	**W** Internal [50]+ university [100] Total marks=100
First aid and emergency care	1. Explain the common first aid procedures 2. Demonstrate basic life support skills	**W** Internal [100] Total marks=100
Project	1. Develop a research question 2. Write a research proposal 3. Collect and analyse data 4. Prepare a concise report	**W** Internal [100] Total marks=100

B.Sc. [Hons] RADIOLOGY AND IMAGING SCIENCE TECHNOLOGY
(Choice Based Credit System)

PROGRAME OBJECTIVES

The objectives of the entry level graduate programme on B. Sc (Hons) Radiology And Imaging Science Technology in Sri Ramachandra Institute of Higher Education and Research [Deemed to be University] are to produce competent Allied Health Professional who,

1. As a **healthcare provider** applies the acquired knowledge and skills in prevention, investigations and managing patients under the direction of a medical professional.
2. As a **communicator, leader and team member** advocates effective communication, inter professional and leadership skills in delivering contemporary health care needs of the community
3. As an independent **professional and a lifelong learner** Demonstrates high standards of professional ethics, integrity & continuous learning

PROGRAMME OUTCOMES

Roles:

- ✓ Allied Health Care Provider
- ✓ Critical thinker
- ✓ Professional
  - Ethical practitioner
  - Communicator
  - Team player
- ✓ Reflective practitioner
- ✓ Lifelong learner

Programme outcomes / Competencies:

1. Heath care

1. Demonstrate knowledge of basic medical science subjects required to practice as a Health care technologist
2. Demonstrate the knowledge in related clinical subjects
3. Identifies the appropriate investigations/ Procedures required
4. Demonstrates skills in handling the equipments
5. Performs the procedures skilfully
6. Documents the results in prescribed format
7. Provide appropriate patient care considering socio economic and cultural aspects informed by research evidence
8. Adheres to the safety procedures

2. Critical thinking

1. Demonstrates sound professional judgment and reasoning in decision-making
2. Synthesizes and analyzes the information in decision making
3. Integrates relevant information with previous learning, experience, professional knowledge, and current practice models

3. Ethics and accountability

1. Adheres to the Code of Ethics prescribed by the professional body/Faculty/Department
2. Maintains appropriate relationships and boundaries with patients and care givers

4. Communication

1. Communicates effectively with the patient, inter professional team members, and other stakeholders using patient-centered principles that address physical, social, cultural or other barriers to communication
2. Delivers information in a respectful, thoughtful manner
3. Uses a systematic approach to record keeping of service provided
4. Maintains confidentiality and security in the sharing, transmission, storage, and management of information**.**
5. Demonstrates an appropriate use of information technology relevant to their field

6. Professional Responsibility

1. Practices as an autonomous professional, exercising their own professional judgment
2. Demonstrates a commitment to their patients, public, and profession
3. Practices within scope of professional and personal limitations and abilities
4. Demonstrates professional integrity
5. Practices in a non-discriminatory way
6. Demonstrates a commitment to the growth of the profession

7. Inter professional relationship

1. Collaborates with inter professional team, and other stakeholders
2. Demonstrates flexibility within team
3. Works effectively with inter professional team, and other stakeholders to manage positive professional relationships
4. Manages differences, misunderstandings, and limitations that may contribute to inter professional tensions in an effective and diplomatic manner

8. Reflective practice

1. Demonstrates the importance of self-awareness and self-reflection
2. Be able to reflect critically on personal practice in order to be able to improve it.
3. Takes responsibility for personal and professional development

9. Lifelong learning committed to continuous improvement of skills and knowledge

1. Demonstrates commitment to continuing competence
2. Apply newly gained knowledge or skills to the care of the patient
3. Familiar with basic health sciences research methods
4. Demonstrates the process of evidence based practice (Ask, acquire, appraise, apply and assess)

INTENDED LEARNING OUTCOMES

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy for Health Sciences	1. Define basic technical terminology and language associated with anatomy 2. Identify the structures of human body 3. Describe the anatomy of human body 4. Describe the structure and features of the organ systems of the human body	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+

	5. Identify the anatomical structure in the dissected specimen	orals[25] Total marks=100 (Internal)
Physiology for Health Sciences	1. Describe the functional anatomy and histology of various organ systems 2. Describe the basic physiological principles involved in the normal functioning of the human body 3. Apply the physiological principles in comprehending the pathophysiology of disease and its management	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Psychology for Health Sciences	1. Describe the theories and basic principles in psychology 2. Explain the behavior and mental processes 3. Apply the principles of psychology while providing health care and enrich their knowledge and to meet the challenges they encounter in health care profession.	**W** Internal [50]+ university [100] Total marks=100
Biochemistry for Health Sciences	1. Describe chemistry & metabolism of macromolecules, vitamins and minerals 2. Correlate biochemical mechanisms to diseases 3. Discuss the importance of biochemical parameters in clinical decision making	**W** Internal [50]+ university [100] Total marks=100
Medical Terminologies	1. Describe the basic principles of term usage when referring to concepts in the health field. 2. Describe the Greek-and Latin derived basic structures of medical terms 3. Identify the roles of the four types of word parts used in forming medical terms. 4. Describe the steps in locating a term in a medical dictionary. 5. Understand the importance of spelling medical terms correctly	**W** Internal [100] Total marks=100
Micro-Biology for Health Sciences	1. Classify microorganisms, discuss the morphological and growth characteristics and its association with causation of disease 2. Demonstrate and interpret basic laboratory techniques used in the detection of micro organisms 3. Explain principles of antimicrobial therapy and Immunization 4. Demonstrate basic infection control practices	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Patho - Physiology and Treatment of Disease	1. Identify and Describe the causative agent in various disease 2. Comprehend the major signs and symptoms of the various diseases 3. Describe the pathophysiology of various disease related to anesthetic care Apply pathophysiology 4. knowledge in anesthetic care 5. To Analyze the patient pre-operative fit for undergoing procedure	**W** Internal [50]+ university [100] Total marks=100
Pharmacology for Health Sciences	1. Identify the fundamental principles of pharmacokinetics and pharmacodynamics. 2. Apply the pharmacodynamics and pharmacokinetic principles that describe drug actions in humans. 3. Compare and contrast the specific pharmacology of the major classes of drugs, important distinctions among members of each class, the risks and benefits, in relation to the organ systems they	**W** Internal [50]+ university [100] Total marks=100

	affect, and the diseases for which they are used therapeutically.	
Preventive Medicine	1. Describe the functions of health care in India 2. Comprehend and explain the concept of health care and their goals 3. Demonstrate the utility of care in prevention and control of common disorder among rural folks of RHTC. 4. Provide the basic care social aspects of health promotion and specific prevention activities in the community.	**W** Internal [50]+ university [100] Total marks=100
Sociology for Health Sciences	1. Describe the development of medical sociology 2. Discuss the sociological approaches of health. 3. Discuss the health issues in socio-cultural perspective. 4. Apply the sociology knowledge in health care decision making	**W** Internal [50]+ university [100] Total marks=100
Anatomy, Physiology, Pathology related to Radiology & Imaging Technology	1. Describe the basic anatomy and physiology of human system 2. Comprehend the radiological cross-sectional anatomy 3. Analyze and interpret the images 4. Choose and apply the appropriate protocol 5. based on clinical indications 6. Demonstrate the anatomy and pathological findings with correct annotations	**W** Internal [50]+ university [100] Total marks=100
Positioning Radiography & Special Radiographic procedures	1. Describe all contrast procedures and all positioning radiographic techniques clearly. 2. Comprehend the situation and act accordingly. 3. Analyse the clinical requirement, apply appropriate techniques and acquire images 4. Demonstrate the correct pathology and relevant document.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Research Methodology and Biostatistics for Health Sciences	1. Discuss the process of health sciences research 2. Differentiate various study designs 3. Discuss validity 4. Discuss descriptive and inferential statistics	**W** Internal [50]+ university [100] Total marks=100
Chemistry for Health Sciences	1. Identify the nature of the organic compounds by chemical tests 2. Describe the common chemical reactions 3. Describe the structures of the therapeutic agents	**W** Internal [50]+ university [100] Total marks=100
Radiological Physics, Instrumentation & Safety	1. Describe the various properties and interaction of X-ray with matter 2. Explain the radiation safety policies and 3. Explain and demonstrate the safe handling of X-Ray equipment under supervision	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Physics, Instrumentation and clinical applications of Ultrasonography	1. Describe the basis of ultrasound technology 2. Comprehend the working principle and physics behind the technology 3. Analyse the representation and quality of ultrasound images 4. Apply the acquired knowledge for clinical purpose 5. Demonstrate the technical skills in operating the ultrasound equipment	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+

		orals[25] Total marks=100
Physics and Electronics for Health Sciences	1. Describe the basics principles of physics related to allied health care 2. Apply the principles of physics 3. Describe concepts of active and passive devices used in the electronic instrumentation 4. Demonstrate voltage, current and resistance measurements 5. Apply the concepts of safety procedures in bio-medical instrumentation and patient	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Infection Control	4. Explain the process of infection control in health care 5. Apply the infection control knowledge while providing care 6. Demonstrate the procedures of infection control	**W** Internal [100] Total marks=100
Physics & Instrumentation of Computed Tomography and Interventional Radiology	1. Describe the principle and Instrumentation of CT equipment 2. Describe the principle and Instrumentation of Interventional Radiology equipment 3. Should have an idea about the Radiation safety aspects and safe handling of CT and Interventional Radiology equipment 4. Able to apply the concepts and demonstrate during the CT Procedure & Interventional Procedure	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Techniques and clinical applications of Computed Tomography and Interventional Radiology	1. Describe the procedures of CT and cathlab in detail. 2. Comprehend the situation and take part. 3. Analyse the clinical condition and act accordingly. 4. Apply the correct protocol. 5. Demonstrate the pathology and to document.	**W** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Evidence Based Practice	1. Discuss the importance of EBP 2. Describe the process of EBP 3. Ask a relevant clinical question 4. Acquire evidence 5. Appraise evidence	**W** Internal [50]+ university [100] Total marks=100
Quality Assurance in Health Care	1. Discuss the importance of quality assurance in health care delivery. 2. Discuss the strategies of planning, implementing and measuring hospital performance 3. Implement quality approaches and tools in healthcare settings	**W** Internal [50]+ university [100]+ Total marks=100
Health Care Safety	1. Discuss quality improvement and patient safety 2. Integrate performance improvement methodologies into health care safety 3. Implement consistent, evidence-based quality and safety practices	**W** Internal [50]+ university [100] Total marks=100
Physics & Instrumentation of Magnetic Resonance Imaging	1. Describe the principle and Instrumentation of MRI equipment 2. Knowledge about the various pulse sequences & its application 3. Should have an idea about the magnetic safety aspects and safe handling of MRI equipment 4. Able to apply the concepts and demonstrate during MRI Procedure	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25]

		Total marks=100
Techniques and clinical applications of Magnetic Resonance Imaging	1. Describe the MR principle, patient positioning and safety measures. 2. Comprehend the MRI protocols 3. Analyse the quality of MRI images. 4. Apply the acquired knowledge appropriate for the clinical scenario. 5. Demonstrate the technical skills in operating the MR equipment safely.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Health professionalism	1. Provide compassionate care to patients while respecting their privacy and dignity. 2. Display honesty, integrity and responsibility in all educational setting and in interactions with patients, their families & colleagues. 3. Explain the basic principles of bioethics and how to balance these principles in practice	**W** Internal [50]+ university [100] Total marks=100
First aid and emergency care	1. Explain the common first aid procedures 2. Demonstrate basic life support skills	**W** Internal [100] Total marks=100
Project	1. Develop a research question 2. Write a research proposal 3. Collect and analyse data 4. Prepare a concise report	**W** Internal [100] Total marks=100

B.Sc. [Hons] RENAL AND DIALYSIS TECHNOLOGY
(Choice Based Credit System)

PROGRAME OBJECTIVES

The objectives of the entry level graduate programme on **B. Sc. (Hons) Renal and Dialysis Technology** in Sri Ramachandra Institute of Higher Education and Research [Deemed to be University] are to produce competent Allied Health Professional who,

1. As a **healthcare provider** applies the acquired knowledge and skills in prevention, investigations and managing patients under the direction of a medical professional.
2. As a **communicator, leader and team member** advocates effective communication, inter professional and leadership skills in delivering contemporary health care needs of the community
3. As an independent **professional and a lifelong learner** Demonstrates high standards of professional ethics, integrity & continuous learning

PROGRAMME OUTCOMES
Roles:

- ✓ Allied Health Care Provider
- ✓ Critical thinker
- ✓ Professional
- o Ethical practitioner
- o Communicator
- o Team player
- ✓ Reflective practitioner
- ✓ Lifelong learner

Programme outcomes / Competencies:

1. Heath care

1. Demonstrate knowledge of basic medical science subjects required to practice as a Health care technologist
2. Demonstrate the knowledge in related clinical subjects
3. Identifies the appropriate investigations/ Procedures required
4. Demonstrates skills in handling the equipments
5. Performs the procedures skilfully
6. Documents the results in prescribed format
7. Provide appropriate patient care considering socio economic and cultural aspects informed by research evidence
8. Adheres to the safety procedures

2. Critical thinking

1. Demonstrates sound professional judgment and reasoning in decision-making
2. Synthesizes and analyzes the information in decision making
3. Integrates relevant information with previous learning, experience, professional knowledge, and current practice models

3. Ethics and accountability

1. Adheres to the Code of Ethics prescribed by the professional body/Faculty/Department
2. Maintains appropriate relationships and boundaries with patients and care givers

4. **Communication**

1. Communicates effectively with the patient, inter professional team members, and other stakeholders using patient-centered principles that address physical, social, cultural or other barriers to communication

2. Delivers information in a respectful, thoughtful manner
3. Uses a systematic approach to record keeping of service provided
4. Maintains confidentiality and security in the sharing, transmission, storage, and management of information**.**
5. Demonstrates an appropriate use of information technology relevant to their field

5. Professional Responsibility

1. Practices as an autonomous professional, exercising their own professional judgment
2. Demonstrates a commitment to their patients, public, and profession
3. Practices within scope of professional and personal limitations and abilities
4. Demonstrates professional integrity
5. Practices in a non-discriminatory way
6. Demonstrates a commitment to the growth of the profession

6. Inter professional relationship

1. Collaborates with inter professional team, and other stakeholders
2. Demonstrates flexibility within team
3. Works effectively with inter professional team, and other stakeholders to manage positive professional relationships
4. Manages differences, misunderstandings, and limitations that may contribute to inter professional tensions in an effective and diplomatic manner

7. Reflective practice

1. Demonstrates the importance of self-awareness and self-reflection
2. Be able to reflect critically on personal practice in order to be able to improve it.
3. Takes responsibility for personal and professional development

8. Lifelong learning committed to continuous improvement of skills and knowledge

1. Demonstrates commitment to continuing competence
2. Apply newly gained knowledge or skills to the care of the patient
3. Familiar with basic health sciences research methods
4. Demonstrates the process of evidence based practice (Ask, acquire, appraise, apply and assess)

INTENDED LEARNING OUTCOMES

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy for Health Sciences	1. Define basic technical terminology and language associated with anatomy 2. Identify the structures of human body 3. Describe the anatomy of human body 4. Describe the structure and features of the organ systems of the human body 5. Identify the anatomical structure in the dissected specimen	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100

		(Internal)
Physiology for Health Sciences	1. Describe the functional anatomy and histology of various organ systems 2. Describe the basic physiological principles involved in the normal functioning of the human body 3. Apply the physiological principles in comprehending the pathophysiology of disease and its management	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Psychology for Health Sciences	1. Describe the theories and basic principles in psychology 2. Explain the behavior and mental processes 3. Apply the principles of psychology while providing health care and enrich their knowledge and to meet the challenges they encounter in health care profession.	**W** Internal [50]+ university [100] Total marks=100
Biochemistry for Health Sciences	1. Describe chemistry & metabolism of macromolecules, vitamins and minerals 2. Correlate biochemical mechanisms to diseases 3. Discuss the importance of biochemical parameters in clinical decision making	**W** Internal [50]+ university [100] Total marks=100
Medical Terminologies	1. Describe the basic principles of term usage when referring to concepts in the health field. 2. Describe the Greek-and Latin derived basic structures of medical terms 3. Identify the roles of the four types of word parts used in forming medical terms. 4. Describe the steps in locating a term in a medical dictionary. Understand the importance of spelling medical terms correctly	**W** Internal [100] Total marks=100
Micro-Biology for Health Sciences	1. Classify microorganisms, discuss the morphological and growth characteristics and its association with causation of disease 2. Demonstrate and interpret basic laboratory techniques used in the detection of micro organisms 3. Explain principles of antimicrobial therapy and Immunization 4. Demonstrate basic infection control practices	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Patho - Physiology and Treatment of Disease	1. Identify and Describe the causative agent in various disease 2. Comprehend the major signs and symptoms of the various diseases 3. Describe the pathophysiology of various disease related to anesthetic care Apply pathophysiology 4. knowledge in anesthetic care 5. To Analyze the patient pre-operative fit for undergoing procedure	**W** Internal [50]+ university [100] Total marks=100
Pharmacology for Health Sciences	1. Identify the fundamental principles of pharmacokinetics and pharmacodynamics. 2. Apply the pharmacodynamics and pharmacokinetic principles that describe drug actions in humans. 3. Compare and contrast the specific pharmacology of the major classes of drugs, important distinctions among members of each class, the risks and benefits, in relation to the organ systems they affect, and the diseases for which they are used therapeutically.	**W** Internal [50]+ university [100] Total marks=100
Preventive	1. Describe the functions of health care in India	**W**

Medicine	2. Comprehend and explain the concept of health care and their goals 3. Demonstrate the utility of care in prevention and control of common disorder among rural folks of RHTC. 4. Provide the basic care social aspects of health promotion and specific prevention activities in the community.	Internal [50]+ university [100] Total marks=100
Sociology for Health Sciences	1. Describe the development of medical sociology 2. Discuss the sociological approaches of health. 3. Discuss the health issues in socio-cultural perspective. 4. Apply the sociology knowledge in health care decision making	**W** Internal [50]+ university [100] Total marks=100
Anatomy and Physiology Related to Dialysis Technology	1. Describe appropriate terminology to effectively communicate information related to anatomy and physiology related to kidney, ureter and bladder. 2. Describe the anatomical structures and explain the physiological functions of renal system. 3. Application of integrated knowledge of structure and function to determine functioning of the renal system.	**W** Internal [50]+ university [100] Total marks=100
Pharmacology Related to Dialysis Technology	1. Describe the major classifications of pharmacotherapeutics used in the treatment of kidney disease. 2. Describe the principles of pharmacodynamics, pharmacokinetics, adverse effects and contraindications of drugs in renal medicine. 3. Describe the correct measures to ensure the prevention of medication errors. 4. Describe the potential drug-drug interactions and drug-food interactions based on physiologic responses to pharmacological agents in relation to kidney. 5. Apply knowledge of pharmacology and its effect on the renal dialysis technology.	**W** Internal [50]+ university [100] Total marks=100
Research Methodology and Biostatistics for Health Sciences	1. Discuss the process of health sciences research 2. Differentiate various study designs 3. Discuss validity 4. Discuss descriptive and inferential statistics	**W** Internal [50]+ university [100] Total marks=100
Fundamentals of Dialysis Technology	1. Describe the principles of dialysis, techniques and assessments related to dialysis technology 2. Demonstrate temporary and permanent vascular access care in dialysis on a mannequin 3. Demonstrate the process of selecting and administering various anticoagulation techniques in dialysis patients under simulated environment. 4. Explain the various techniques of dialyser reprocessing and describe their merits and demerits.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Chemistry for Health Sciences	1. Identify the nature of the organic compounds by chemical tests 2. Describe the common chemical reactions 3. Describe the structures of the therapeutic agents	**W** Internal [50]+ university [100] Total marks=100
Pathophysiology and Management Related to Dialysis Technology	1. Describe diagnosis and management of end stage renal disease 2. Describe the pathophysiology, differential diagnosis, investigation, treatment (including preventive measures and complications of treatment) and prognosis of the renal disease in the context of renal dialysis technology 3. Discuss the role of renal technologist in assisting the renal biopsy	**W** Internal [50]+ university [100]+ Total marks=100

	procedure 4. Discuss the role of renal technologist in assisting assessment of a patient presenting with a suspected nephrological problem Comprehend the pathological reports.	
Instrumentation Specific to Dialysis Technology	1. Describe the terminologies and components used in the dialysis water treatment system. 2. Describeabout various components of dialysis machine and its functions. 3. Demonstrate the operation and maintenance of HD machine under supervision 4. Apply skills in operating and maintenance of a water treatment system under supervision. 5. Demonstrate proficiency in performing reuse of dialyser and blood tubing's under supervision	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Physics and Electronics for Health Sciences	1. Describe the basics principles of physics related to allied health care 2. Apply the principles of physics 3. Describe concepts of active and passive devices used in the electronic instrumentation 4. Demonstrate voltage, current and resistance measurements 5. Apply the concepts of safety procedures in bio-medical instrumentation and patient	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Infection Control	1. Explain the process of infection control in health care 2. Apply the infection control knowledge while providing care 3. Demonstrate the procedures of infection control	**W** Internal [100] Total marks=100
Procedures Related to Dialysis Technology - 1	1. Demonstrate knowledge on various composition of dialysate used for hemodialysis. 2. Demonstrate skills in performing hemodialysis procedure with aseptic precautions in simulated environment 3. Describe about various complications during hemodialysis 4. Discuss the emergency management of complications during treatment in a simulated environment 5. Demonstrate different dialysis techniques used for hemodynamically unstable patients requiring renal replacement therapy in intensive care unit. 6. Demonstrate the infection control process of haemodialysis in a simulated environment. Demonstrate skills in performing hybrid dialysis, CRRT and other extra corporeal procedures such as Liver dialysis, therapeutic plasma exchange, Hemoperfusion and immunoadsorption procedure under supervision	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Evidence Based Practice	1. Discuss the importance of EBP 2. Describe the process of EBP 3. Ask a relevant clinical question 4. Acquire evidence 5. Appraise evidence	**W** Internal [50]+ university [100] Total marks=100
Quality Assurance in Health Care	1. Discuss the importance of quality assurance in health care delivery 2. Discuss the strategies of planning, implementing and measuring hospital performance 3. Implement quality approaches and tools in healthcare settings	**W** Internal [50]+ university [100]+ Total marks=100
Health Care Safety	1. Discuss quality improvement and patient safety 2. Integrate performance improvement methodologies into health	**W** Internal [50]+

	care safety 3. Implement consistent, evidence-based quality and safety practices	university [100] Total marks=100
Procedures Related to Dialysis Technology - 2	1. Demonstrate on various PD peritoneal dialysis solutions 2. Performperitoneal dialysis procedure under supervision with aseptic precautions. 3. Describe about various patient complications associated with peritoneal dialysis and apply skills in the management of patient complications. 4. Demonstrate methods to provide adequate dialysis to the PD patient, assess their peritoneal membrane characteristics and prepare strategy to handle patients who are at risk for complications. 5. Describe about infections, mode of transmissionand standard precautions in the peritoneal dialysis. 6. Demonstrate skills in training the patients to perform PD exchanges and to troubleshoot the problems.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Procedures Related to Dialysis Technology - 3	1. Discuss on principles of ICU care for patients with kidney disease. 2. Describe about indications, contraindications, complications and management of kidney transplantation. 3. Demonstrate ability to counsel and communicate the process of renal transplantation. 4. Demonstrate ability to function as a renal transplant coordinator 5. Identify current "at risk" groups within dialysis population and understand the diagnosis, management and preventive strategies.	**W** Internal [50]+ university [100] Total marks=100
Health professionalism	1. Provide compassionate care to patients while respecting their privacy and dignity. 2. Display honesty, integrity and responsibility in all educational setting and in interactions with patients, their families & colleagues. 3. Explain the basic principles of bioethics and how to balance these principles in practice	**W** Internal [50]+ university [100] Total marks=100
First aid and emergency care	1. Explain the common first aid procedures 2. Demonstrate basic life support skills	**W** Internal [100] Total marks=100
Project	1. Develop a research question 2. Write a research proposal 3. Collect and analyse data 4. Prepare a concise report	**W** Internal [100] Total marks=100

B.Sc. [Hons] CARDIAC TECHNOLOGY
(Choice Based Credit System)

PROGRAME OBJECTIVES

The objectives of the entry level graduate programme on B.Sc. [Hons] Cardiac Technology in Sri Ramachandra Institute of Higher Education and Research [Deemed to be University] are to produce competent Allied Health Professional who,

1. As a **healthcare provider** applies the acquired knowledge and skills in prevention, investigations and managing patients under the direction of a medical professional.
2. As a **communicator, leader and team member** advocates effective communication, inter professional and leadership skills in delivering contemporary health care needs of the community
3. As an independent **professional and a lifelong learner** Demonstrates high standards of professional ethics, integrity & continuous learning

PROGRAMME OUTCOMES

Roles:

- ✓ Allied Health Care Provider
- ✓ Critical thinker
- ✓ Professional
  - o Ethical practitioner
  - o Communicator
  - o Team player
- ✓ Reflective practitioner
- ✓ Lifelong learner

Programme outcomes / Competencies:

1. Heath care

1. Demonstrate knowledge of basic medical science subjects required to practice as a Health care technologist
2. Demonstrate the knowledge in related clinical subjects
3. Identifies the appropriate investigations/ Procedures required
4. Demonstrates skills in handling the equipments
5. Performs the procedures skilfully
6. Documents the results in prescribed format
7. Provide appropriate patient care considering socio economic and cultural aspects informed by research evidence
8. Adheres to the safety procedures

2. **Critical thinking**

1. Demonstrates sound professional judgment and reasoning in decision-making
2. Synthesizes and analyzes the information in decision making
3. Integrates relevant information with previous learning, experience, professional knowledge, and current practice models

3. Ethics and accountability

1. Adheres to the Code of Ethics prescribed by the professional body/Faculty/Department
2. Maintains appropriate relationships and boundaries with patients and care givers

4. Communication

1. Communicates effectively with the patient, inter professional team members, and other stakeholders using patient-centered principles that address physical, social, cultural or other barriers to communication
2. Delivers information in a respectful, thoughtful manner
3. Uses a systematic approach to record keeping of service provided
4. Maintains confidentiality and security in the sharing, transmission, storage, and management of information**.**
5. Demonstrates an appropriate use of information technology relevant to their field

5. Professional Responsibility

1. Practices as an autonomous professional, exercising their own professional judgment
2. Demonstrates a commitment to their patients, public, and profession
3. Practices within scope of professional and personal limitations and abilities
4. Demonstrates professional integrity
5. Practices in a non-discriminatory way
6. Demonstrates a commitment to the growth of the profession

6. Inter professional relationship

1. Collaborates with inter professional team, and other stakeholders
2. Demonstrates flexibility within team
3. Works effectively with inter professional team, and other stakeholders to manage positive professional relationships
4. Manages differences, misunderstandings, and limitations that may contribute to inter professional tensions in an effective and diplomatic manner

7. Reflective practice

1. Demonstrates the importance of self-awareness and self-reflection
2. Be able to reflect critically on personal practice in order to be able to improve it.
3. Takes responsibility for personal and professional development

8. Lifelong learning committed to continuous improvement of skills and knowledge

1. Demonstrates commitment to continuing competence
2. Apply newly gained knowledge or skills to the care of the patient
3. Familiar with basic health sciences research methods
4. Demonstrates the process of evidence based practice (Ask, acquire, appraise, apply and assess)

INTENDED LEARNING OUTCOMES

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy for Health Sciences	1. Define basic technical terminology and language associated with anatomy 2. Identify the structures of human body 3. Describe the anatomy of human body 4. Describe the structure and features of the organ systems of the human body	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+

	5. Identify the anatomical structure in the dissected specimen	orals[25] Total marks=100 (Internal)
Physiology for Health Sciences	1. Describe the functional anatomy and histology of various organ systems 2. Describe the basic physiological principles involved in the normal functioning of the human body 3. Apply the physiological principles in comprehending the pathophysiology of disease and its management	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Psychology for Health Sciences	1. Describe the theories and basic principles in psychology 2. Explain the behavior and mental processes 3. Apply the principles of psychology while providing health care and enrich their knowledge and to meet the challenges they encounter in health care profession.	**W** Internal [50]+ university [100] Total marks=100
Biochemistry for Health Sciences	1. Describe chemistry & metabolism of macromolecules, vitamins and minerals 2. Correlate biochemical mechanisms to diseases 3. Discuss the importance of biochemical parameters in clinical decision making	**W** Internal [50]+ university [100] Total marks=100
Medical Terminologies	1. Describe the basic principles of term usage when referring to concepts in the health field. 2. Describe the Greek-and Latin derived basic structures of medical terms 3. Identify the roles of the four types of word parts used in forming medical terms. 4. Describe the steps in locating a term in a medical dictionary. 5. Understand the importance of spelling medical terms correctly	**W** Internal [100] Total marks=100
Micro-Biol ogy for Health Sciences	1. Classify microorganisms, discuss the morphological and growth characteristics and its association with causation of disease 2. Demonstrate and interpret basic laboratory techniques used in the detection of micro organisms 3. Explain principles of antimicrobial therapy and Immunization 4. Demonstrate basic infection control practices	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Patho - Physiology and Treatment of Disease	1. Identify and Describe the causative agent in various disease 2. Comprehend the major signs and symptoms of the various diseases 3. Describe the pathophysiology of various disease related to anesthetic care Apply pathophysiology 4. knowledge in anesthetic care 5. To Analyze the patient pre-operative fit for undergoing procedure	**W** Internal [50]+ university [100] Total marks=100
Pharmacology for Health Sciences	1. Identify the fundamental principles of pharmacokinetics and pharmacodynamics. 2. Apply the pharmacodynamics and pharmacokinetic principles that describe drug actions in humans. 3. Compare and contrast the specific pharmacology of the major classes of drugs, important distinctions among members of each class, the risks and benefits, in relation to the organ systems they affect, and the diseases for which they are used therapeutically.	**W** Internal [50]+ university [100] Total marks=100
Preventive	1. Describe the functions of health care in India	**W**

Medicine	2. Comprehend and explain the concept of health care and their goals 3. Demonstrate the utility of care in prevention and control of common disorder among rural folks of RHTC. 4. Provide the basic care social aspects of health promotion and specific prevention activities in the community.	Internal [50]+ university [100] Total marks=100
Sociology for Health Sciences	1. Describe the development of medical sociology 2. Discuss the sociological approaches of health. 3. Discuss the health issues in socio-cultural perspective. 4. Apply the sociology knowledge in health care decision making	**W** Internal [50]+ university [100] Total marks=100
Anatomy & Physiology Related to Cardiac Technology	**Learning outcomes (Anatomy)** 1. Describe the anatomy of cardiovascular system related to cardiac care. 2. Identify the cardio vascular structures related to cardiac care 3. Discuss the functions cardio vascular system related to cardiac care 4. Apply the above knowledge in cardiac care **Learning outcomes {PHYSIOLOGY}** 1. Describe the properties of cardiac muscle 2. Comprehend in detail about the cardiac cycle and cardiac output 3. Analyse the heart sounds , hemodynamic , blood pressure 4. Demonstrate the cardiovascular response in pathological condition 5. Applied physiology of electrocardiogram of the heart	**W** Internal [50]+ university [100] Total marks=100
Pharmacology Related to Cardiac Technology	1. Describe the classification and dosage of drugs used in cardiac care 2. Describe the pharmacokinetics and pharmacodynamics of commonly used cardiac drugs 3. Discuss the effects of various drugs on cardiac systems including side effects 4. Apply the basic Pharmacology knowledge in cardiac care	**W** Internal [50]+ university [100] Total marks=100
Research Methodology and Biostatistics for Health Sciences	1. Discuss the process of health sciences research 2. Differentiate various study designs 3. Discuss validity 4. Discuss descriptive and inferential statistics	**W** Internal [50]+ university [100] Total marks=100
Concepts of disease and outlines of clinical evaluation in Cardiac Technology	**1.** Describe the aetio pathology of heart diseases **2.** Discuss the signs and symptoms of heart diseases 3. Describe the invasive and non invasive cardiac investigations 4. Describe the Medical and surgical management of cardiac diseases 5. Discuss the prognosis of heart diseases	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Chemistry for Health Sciences	1. Identify the nature of the organic compounds by chemical tests 2. Describe the common chemical reactions 3. Describe the structures of the therapeutic agents	**W** Internal [50]+ university [100] Total marks=100
Invasive procedures of Cardiac	1. Describe the various cardiac catheterization procedures and is familiar with his/her role during each of those procedures. 2. Discuss the various equipments used for a cardiac	**W** Internal [50]+ university [100]+

Technologies	catheterization lab 3. Enumerates on the technologist's responsibility before, during and post cardiac catheterization procedures. 4. Identification of the various instruments used in a cath study / BMV / PTCA 5. Indications and contraindications for cardiac catheterization, CABG and valve replacements and repair	Total marks=100
Instrumentations related to cardiac Technology	**1.** Discuss about the physics and instrumentations of ECG 2. Discuss about the physics and instrumentation of ECHO 3. Ability to handle the TMT machine and knowing its trouble shooting **4.** Explain the instrumentation functions on multiple cardiac ultrasound systems **5.** Demonstrate how to operate the holter and ambulatory BP monitoring machines 6. Discuss about the principles , calibration and maintainance of each and every equipment used in cardiac care	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Physics and Electronics for Health Sciences	1. Describe the basics principles of physics related to allied health care 2. Apply the principles of physics 3. Describe concepts of active and passive devices used in the electronic instrumentation 4. Demonstrate voltage, current and resistance measurements 5. Apply the concepts of safety procedures in bio-medical instrumentation and patient	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Infection Control	1. Explain the process of infection control in health care 2. Apply the infection control knowledge while providing care 3. Demonstrate the procedures of infection control	**W** Internal [100] Total marks=100
Procedures related to Cardiac Technology -I (electrocardiogram , TMT , holter , ABP)	1. Define the different ECG leads , ECG waves , intervals and segments 2. Demonstrate the procedure of recording an ECG 3. Interpret ECG 4. Differentiate normal variants and major wave form abnormalities , rhythm disorders and their clinical implications 5. Correlate ECG finding with clinical scenarios 6. Assess the common rhythm abnormalities encountered with holter monitoring and properly identifying them 7. Analyse the result of holter monitoring and prepare a report 8. Discuss about the protocols and procedures of treadmill test and analyse the various cardiac conditions and ECG abnormalities during exercise stress test	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Evidence Based Practice	1. Discuss the importance of EBP 2. Describe the process of EBP 3. Ask a relevant clinical question 4. Acquire evidence 5. Appraise evidence	**W** Internal [50]+ university [100] Total marks=100
Quality Assurance in Health Care	1. Discuss the importance of quality assurance in health care delivery 2. Discuss the strategies of planning, implementing and measuring hospital performance 3. Implement quality approaches and tools in healthcare settings	**W** Internal [50]+ university [100]+ Total marks=100
Health Care Safety	1. Discuss quality improvement and patient safety 2. Integrate performance improvement methodologies into health	**W** Internal [50]+

	care safety 3. Implement consistent, evidence-based quality and safety practices	university [100] Total marks=100
Procedures related to Cardiac Technology -II (echo)	1. Identify cardiac structures seen in each 2D ultrasound view 2. Describe the hemodynamics of blood flow seen in each cardiac view 3. Describe the changes in cardiac structure associated with cardiac pathology 4. Describe about the types of cardiomyopathies , and pericardial diseases 5. Discuss about the echo assessment of systolic and diastolic dysfunction 6. Describe briefly about the Coronary artery disease 7. Describe about the protocols and procedure for dobutamine stress echo.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Advanced procedural skills	1. Describe the newer procedures in 2D, M-MODE and Doppler measurements 2. Demonstrate how to obtain strain and strain rate imaging 3. Describe the principles of 3D ECHO 4. Discuss the protocols and procedures for TEE , DSE , contrast echocardiography 5. Demonstrate the procedure of the 3-D echo in specific cardiac disease 6. Basics of 4D echocardiography	**W** Internal [50]+ university [100] Total marks=100
Health professionalism	1. Provide compassionate care to patients while respecting their privacy and dignity. 2. Display honesty, integrity and responsibility in all educational setting and in interactions with patients, their families & colleagues. 3. Explain the basic principles of bioethics and how to balance these principles in practice	**W** Internal [50]+ university [100] Total marks=100
First aid and emergency care	1. Explain the common first aid procedures 2. Demonstrate basic life support skills	**W** Internal [100] Total marks=100
Project	1. Develop a research question 2. Write a research proposal 3. Collect and analyse data 4. Prepare a concise report	**W** Internal [100] Total marks=100

SRI RAMACHANDRA
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(DEEMED TO BE UNIVERSITY)
Porur, Chennai – 600116

FACULTY OF ALLIED HEALTH SCIENCES

REGULATIONS AND SYLLABUS
FOR
B.Sc. APPLIED PSYCHOLOGY DEGREE PROGRAMME
(Choice Based Credit System)

B.Sc. APPLIED PSYCHOLOGY DEGREE PROGRAMME
(Choice Based Credit System)

PROGRAMME OUTCOMES

1. Explain the principles and theories of psychology in personality, emotion, intelligent, motivation, and learning.
2. Describe the basic concepts and theories of Applied Psychology, counseling and psychological assessment
3. Demonstrate the interpersonal skills and effective communication
4. Apply the important skills require in counseling approaches and practices.

SYLLABUS

First Year – Semester - I							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours / Marks**
1	UPS19CT101	APPLIED PERSPECTIVES OF PSYCHOLOGICAL PROCESSES-I	2	1	**1**	**4**	90/100

Outcome
At the end of this course students will be able to know

- The basic psychological processes, emerging specialties and their applications.
- Describe perception, types of learning and techniques to improve memory

First Year – Semester – I							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
2	UPS19CT103	HEALTH PSYCHOLOGY	2	2		4	90/100

Outcome:
At the end of this course students will be able to know

- Principles of health psychology in everyday life
- Students will explain how principles of health psychology operate in everyday life worldviews.
- Describe about mind- body relation

- Explore the health enhancing behaviour and well-being

First Year – Semester – I							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
3	UPS19CT105	BIOLOGICAL BASIS OF BEHAVIOUR	2	4		4	90/100

Outcome:

At the end of this course students will be able to know

- Describe nervous system
- Understand sensation and effect of hormones on behaviour

First Year – Semester – I							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
4	UPS19DE107	POSITIVE PSYCHOLOGY	2	1		3	60/100

Outcome

After completion of this unit students will be able to,

- Know about how positive thinking will help to strengthen their behavior
- Happiness and well-being
- Describe about Work-life balance

First Year – Semester – II							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
7	UPS19CT102	APPLIED PERSPECTIVES OF PSYCHOLOGICAL PROCESSES-II	2	2		4	90/100

Outcome:

At the end of this course students will be able to know

- Describe on problem solving, creative thinking
- Understand theories of intelligence and assessment

First Year – Semester – II							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
8	UPS19CT104	LIFE SPAN DEVELOPMENT	2	2	1	5	120/100

Outcome:

At the end of this course students will be able to know

- Understand the lifespan development
- Describe on physical, Cognitive, Socio-emotional development

First Year – Semester - II							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
9	UPS19DE106	ENVIRONMENTAL PSYCHOLOGY	2	2		4	90/100

Outcome

After completion of this unit students will be able to,

- Know about how environment plays an important role in one's behavior.
- Describe about environmental problems

First Year – Semester - II							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
10	UPS19DE108	FORENSIC PSYCHOLOGY	2	2		4	90/100

Outcome

After completion of this unit students will be able to,

- To know about psychological impacts of crime and how to prevent the crime in psychosocial aspect.
- Describe post-traumatic stress disorder

First Year – Semester - II							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
12	UPS19AE112	PERSONALITY DEVELOPMENT	2			2	30/100

OUTCOME:

After completion of this unit students will be able to,

- Develop self-knowledge and awareness of their beliefs, values and cultural backgrounds.
- Demonstrate an ability to manage their behaviour and emotional health.
- Take responsibility for individual choices and actions.

Second Year – Semester - III							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
13	UPS19CT201	APPLIED SOCIAL PSYCHOLOGY	2	2		4	90/100

18	UPS19Cl251	APPLIED SOCIAL PSYCHOLOGY(PRACTICAL)			2	2	60/100

Outcome:

At the end of this course students will be able to know

- Explain how basic social psychological findings can be used to bring about desired changes
- Compare different explanations for a social psychological phenomenon
- Understand the differences between testing theories and testing interventions

Second Year – Semester - III							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
14	UPS19CT203	CLINICAL PSYCHOLOGY AND MENTAL HEALTH PROBLEMS	2	2		4	90/100

Outcome:

At the end of this course students will be able to know

- Differentiate normal and abnormal behaviour
- Classification of abnormal behaviour
- Demonstrate conceptual in clinical psychology

Second Year – Semester - III							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
15	UPS19DE205	SPORTS PSYCHOLOGY	2	2		4	90/100

Outcome:

At the end of this course students will be able to know

- Describe the role of sports psychology for athletes and in their performance.
- Apply psychological theories in the field of physical education and sports for enhanced participation and optimal performance among children.
- Describe the general characteristics of various stages of growth and development, personality and its characteristics
- Understand the psycho-sociological aspects of human behaviour in relation to physical education and sports.

Second Year – Semester - IV							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
19	UPS19CT202	BASICS OF RESEARCH METHODOLOGY &BIOSTATISTICS (MCT008)	4			4	60/100

Outcome:

At the end of this course students will be able to know

- Process of Conducting Research
- Describe the Inferential Statistics , Descriptive Statistics
- Understand Qualitative, Quantitative and Mixed methods

Second Year – Semester - IV							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
20	UPS19CT204	APPLIED CLINICAL PSYCHOLOGY	2	2		4	90/100
24	UPS19CL252	APPLIED CLINICAL PSYCHOLOGY (PRACTICAL)			3	3	90/100

Outcome:

After completion of this unit students will be able to,

- Demonstrate conceptual and proficiency in clinical psychology
- Understand the skills for diagnosis and classification of mental disorders.

Second Year – Semester - IV							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
22	UPS19AE208	STRESS MANAGEMENT	2			2	30/100

Outcome

After completion of this unit students will be able to,

- Understand stress including the physiology of stress and how stress affects human conditions, Psychological aspects of stress
- Coping strategies Values, goals and life direction Time Management
- Mindfulness Relaxation Techniques: Power Nap, Relaxing breathing, Meditation, Yoga,

Second Year – Semester - IV							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
23	UPS19AE210	INTERPERSONAL COMPETENCIES	2			2	30/100

Outcome

After completion of this unit students will be able to,

- The various meanings and definitions of interpersonal communication and social interaction
- Overarching structures such as culture, mass media and gender, and their role in shaping interpersonal interaction

Third Year – Semester - V

Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
26	UPS19CT301	ORGANIZATIONAL PSYCHOLOGY	2	2	1	5	120/100

Outcome

After completion of this unit students will be able to,

- Know the major areas of organizational psychology, including leadership development; employee training, motivation, and satisfaction; group dynamics, organizational climate; and team-building

Third Year – Semester - V							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
27	UPS19CT303	COMMUNITY PSYCHOLOGY	2	1		3	60/100

Outcome

After completion of this unit students will be able to,

- Demonstrate knowledge of the theory, historical foundations, and methods of community psychology. Differentiate Community Psychology from other sub-disciplines of psychology.
- Demonstrate familiarity with the empirical basis for prevention science, health promotion, and community psychology in preventing and responding to community issues.

Third Year – Semester - V							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
28	UPS19DE305	PSYCHODIAGNOSTICS	2	2		4	90/100

Outcome

After completion of this unit students will be able to,

- Understand psychological assessment
- Demonstrate ability to asses' personality and intelligence.

Third Year – Semester - V							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
29	UPS19DE307	PSYCHOPATHOLOGY	2	2		4	90/100

Outcomes

After completion of this unit students will be able to,

- Know in psychopathology assessment and therapeutic intervention.

- Understand in psycho-diagnostics, psychotherapy, Rehabilitative services
- Demonstrate an ability to manage towards promoting the wellbeing and quality-of-life of individuals.

Third Year – Semester - VI							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
32	UPS19CT302	COUNSELING PSYCHOLOGY	2	2		4	90/100
35	UPS19CL352	COUNSELING PSYCHOLOGY (PRACTICAL)			3	3	90/100

Outcome

After completion of this unit students will be able to,

- Know the counseling goal and outcome
- Explore the process of counseling
- Understand the skills of counselor

Third Year – Semester - VI							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
33	UPS19CT304	HUMAN RESOURCE MANAGEMENT	2	2		4	90/100

Outcome

After completion of this unit students will be able to,

- Contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes.
- Present and evaluate communication messages and processes related to the human resources function of the organization.
- Manage own professional development and provide leadership to others in the achievement of ongoing competence in human resources professional practice.

Third Year – Semester - VI							
Course Number	Course Code	Course Title	L	T	P	**C**	**Total Hours/ Marks**
34	UPS19DE306 (UAH19DE306)	HEALTH PROFESSIONALISM	2	1		3	60/100

Learning outcomes

After completing this course the students will be able to

6. Provide compassionate care to patients while respecting their privacy and dignity.
7. Display honesty, integrity and responsibility in all educational setting and in interactions with patients, their families & colleagues.
8. Explain the basic principles of bioethics and how to balance these principles in practice

B.Sc. MEDICAL LABORATORY TECHNOLOGY
(Choice Based Credit System)

PROGRAME OBJECTIVES

The objectives of the entry level graduate programme on **B.Sc. Medical Laboratory Technology** in Sri Ramachandra Institute of Higher Education and Research [Deemed to be University] are to produce competent Allied Health Professional who,

1. As a **healthcare provider** applies the acquired knowledge and skills in prevention, investigations and managing patients under the direction of a medical professional.
2. As a **communicator, leader and team member** advocates effective communication, inter professional and leadership skills in delivering contemporary health care needs of the community
3. As an independent **professional and a lifelong learner** Demonstrates high standards of professional ethics, integrity & continuous learning

PROGRAMME OUTCOMES

Roles:

- ✓ Allied Health Care Provider
- ✓ Critical thinker
- ✓ Professional
  - o Ethical practitioner
  - o Communicator
  - o Team player
- ✓ Reflective practitioner
- ✓ Lifelong learner

Programme outcomes / Competencies:

1. Heath care

1. Demonstrate knowledge of basic medical science subjects required to practice as a Health care technologist
2. Demonstrate the knowledge in related clinical subjects
3. Identifies the appropriate investigations/ Procedures required
4. Demonstrates skills in handling the equipments
5. Performs the procedures skilfully
6. Documents the results in prescribed format
7. Provide appropriate patient care considering socio economic and cultural aspects informed by research evidence
8. Adheres to the safety procedures

2. Critical thinking

1. Demonstrates sound professional judgment and reasoning in decision-making
2. Synthesizes and analyzes the information in decision making
3. Integrates relevant information with previous learning, experience, professional knowledge, and current practice models

3. Ethics and accountability

1. Adheres to the Code of Ethics prescribed by the professional body/Faculty/Department
2. Maintains appropriate relationships and boundaries with patients and care givers

4. Communication

1. Communicates effectively with the patient, inter professional team members, and other stakeholders using patient-centered principles that address physical, social, cultural or other barriers to communication
2. Delivers information in a respectful, thoughtful manner
3. Uses a systematic approach to record keeping of service provided
4. Maintains confidentiality and security in the sharing, transmission, storage, and management of information**.**
5. Demonstrates an appropriate use of information technology relevant to their field

5. Professional Responsibility

1. Practices as an autonomous professional, exercising their own professional judgment
2. Demonstrates a commitment to their patients, public, and profession
3. Practices within scope of professional and personal limitations and abilities
4. Demonstrates professional integrity
5. Practices in a non-discriminatory way
6. Demonstrates a commitment to the growth of the profession

5. Inter professional relationship

1. Collaborates with inter professional team, and other stakeholders
2. Demonstrates flexibility within team
3. Works effectively with inter professional team, and other stakeholders to manage positive professional relationships
4. Manages differences, misunderstandings, and limitations that may contribute to inter professional tensions in an effective and diplomatic manner

6. Reflective practice

1. Demonstrates the importance of self-awareness and self-reflection
2. Be able to reflect critically on personal practice in order to be able to improve it.
3. Takes responsibility for personal and professional development

7. Lifelong learning committed to continuous improvement of skills and knowledge

1. Demonstrates commitment to continuing competence
2. Apply newly gained knowledge or skills to the care of the patient
3. Familiar with basic health sciences research methods
4. Demonstrates the process of evidence based practice (Ask, acquire, appraise, apply and assess)

INTENDED LEARNING OUTCOMES

COURSE TITLE	**OUTCOMES**	**ASSESSMENT METHODS** V-Verbal W-Written P-Practical
Anatomy for Health Sciences	1. Define basic technical terminology and language associated with anatomy 2. Identify the structures of human body 3. Describe the anatomy of human body 4. Describe the structure and features of the organ systems of the human body	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+

	5. Identify the anatomical structure in the dissected specimen	orals[25] Total marks=100 (Internal)
Physiology for Health Sciences	1. Describe the functional anatomy and histology of various organ systems 2. Describe the basic physiological principles involved in the normal functioning of the human body 3. Apply the physiological principles in comprehending the pathophysiology of disease and its management	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Psychology for Health Sciences	1. Describe the theories and basic principles in psychology 2. Explain the behavior and mental processes 3. Apply the principles of psychology while providing health care and enrich their knowledge and to meet the challenges they encounter in health care profession.	**W** Internal [50]+ university [100] Total marks=100
Biochemistry for Health Sciences	1. Describe chemistry & metabolism of macromolecules, vitamins and minerals 2. Correlate biochemical mechanisms to diseases 3. Discuss the importance of biochemical parameters in clinical decision making	**W** Internal [50]+ university [100] Practical [75]+ orals[25] Total marks=100 (Internal)
Medical Terminologies	1. Describe the basic principles of term usage when referring to concepts in the health field. 2. Describe the Greek-and Latin derived basic structures of medical terms 3. Identify the roles of the four types of word parts used in forming medical terms. 4. Describe the steps in locating a term in a medical dictionary. Understand the importance of spelling medical terms correctly	**W** Internal [100] Total marks=100
Micro-Biology for Health Sciences	1. Classify microorganisms, discuss the morphological and growth characteristics and its association with causation of disease 2. Demonstrate and interpret basic laboratory techniques used in the detection of micro organisms 3. Explain principles of antimicrobial therapy and Immunization 4. Demonstrate basic infection control practices	**W,P,V** Internal [50]+ university [100] Total marks=100 Practical [75]+ orals[25] Total marks=100 (Internal)
Patho - Physiology and Treatment of Disease	1. Identify and Describe the causative agent in various disease 2. Comprehend the major signs and symptoms of the various diseases 3. Describe the pathophysiology of various disease related to anesthetic care Apply pathophysiology 4. knowledge in anesthetic care 5. To Analyze the patient pre-operative fit for undergoing procedure	**W** Internal [50]+ university [100] Practical [75]+ orals[25] Total marks=100 (Internal)
Pharmacology for Health Sciences	1. Identify the fundamental principles of pharmacokinetics and pharmacodynamics. 2. Apply the pharmacodynamics and pharmacokinetic principles that describe drug actions in humans. 3. Compare and contrast the specific pharmacology of the major classes of drugs, important distinctions among members of each	**W** Internal [50]+ university [100] Total marks=100

	class, the risks and benefits, in relation to the organ systems they affect, and the diseases for which they are used therapeutically.	
Preventive Medicine	1. Describe the functions of health care in India 2. Comprehend and explain the concept of health care and their goals 3. Demonstrate the utility of care in prevention and control of common disorder among rural folks of RHTC. 4. Provide the basic care social aspects of health promotion and specific prevention activities in the community.	**W** Internal [50]+ university [100] Total marks=100
Sociology for Health Sciences	1. Describe the development of medical sociology 2. Discuss the sociological approaches of health. 3. Discuss the health issues in socio-cultural perspective. 4. Apply the sociology knowledge in health care decision making	**W** Internal [50]+ university [100] Total marks=100
Blood banking and transfusion medicine & Clinical pathology (Haematology & Urine Analysis)	1. Explain Normal Hematopoiesis, Composition of blood, Antigen & Antibodies, Immune response, Factors affecting antigen antibody reactions ,Blood collection and donor reactions. 2. Component preparation, storage & uses , Transfusion transmissible infections, Hazards of transfusion, safety precautions in the laboratory. Quality assurance in blood banking, eequipments in blood banking & maintenance of records. Licensing policies in blood banking, Blood donation camps. **3.** Perform cross matching and coombs, 1. Perform and explain CBC, Peripheral smear 2. Bleeding investigations 3. Urine analysis, body fluid analysis, stool analysis	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Histopathology & Cytology	1. Demonstrate the procedure of tissue processing and microtomy 2. Demonstrate H & E staining and special stains procedure 1. Demonstrate preparation of cytology smear and staining for body fluid, FNAC specimens and cervical smears. 2. Explain the quality control.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Research Methodology and Biostatistics for Health Sciences	1. Discuss the process of health sciences research 2. Differentiate various study designs 3. Discuss validity 4. Discuss descriptive and inferential statistics	**W** Internal [50]+ university [100] Total marks=100
Microbiology & Serology Paper-I	1. Understand the basic principles and concepts of General bacteriology and Immunology 2. Learn and perform the techniques involved in the sterilization, preparation of media, culture methods, antibiotic sensitivity testing, basic biochemical reactions for identifying common bacteria, common serological procedures and staining methods. 3. Know the medically important bacteria and the diseases produced by them.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Microbiology & Serology Paper-II	1. Understand the General properties of viruses, viral cultivation methods and their laboratory diagnosis. 2. To know common medically important viral disease and its laboratory diagnosis and treatment. 3. Know the medically important parasitic & fungal disease and its	**W,P,V** Internal [50]+ university [100] Total marks=100

	laboratory diagnosis and treatment.	Internal [50]+ Practical [25]+ orals[25] Total marks=100
Infection Control	1. Explain the process of infection control in health care 2. Apply the infection control knowledge while providing care 3. Demonstrate the procedures of infection control	**W** Internal [100] Total marks=100
Quality Assurance in Health Care	1. Discuss the importance of quality assurance in health care delivery 2. Discuss the strategies of planning, implementing and measuring hospital performance 3. Implement quality approaches and tools in healthcare settings	**W** Internal [50]+ university [100]+ Total marks=100
Health Care Safety	1. Discuss quality improvement and patient safety 2. Integrate performance improvement methodologies into health care safety 3. Implement consistent, evidence-based quality and safety practices	**W** Internal [50]+ university [100] Total marks=100
Clinical Chemistry Paper-I	1. Acquire knowledge of the various instrumentation techniques and must develop the skill to apply it in the biochemistry lab. 2. Implement the concepts of specimen collection , handling and processing to minimize the biological variations . 3. Understand the lab tests and techniques to enable him to work efficiently in any clinical laboratory independently.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Clinical Chemistry Paper-II	1. Explain the normal biochemical changes and metabolic functions in the human body. 2. Understand the alterations in biochemistry in diseases / abnormalities which will help him in understanding the lab results.	**W,P,V** Internal [50]+ university [100] Total marks=100 Internal [50]+ Practical [25]+ orals[25] Total marks=100
Health professionalism	1. Provide compassionate care to patients while respecting their privacy and dignity. 2. Display honesty, integrity and responsibility in all educational setting and in interactions with patients, their families & colleagues. 3. Explain the basic principles of bioethics and how to balance these principles in practice	**W** Internal [50]+ university [100] Total marks=100
First aid and emergency care	1. Explain the common first aid procedures 2. Demonstrate basic life support skills	**W** Internal [100] Total marks=100
Project	1. Develop a research question 2. Write a research proposal 3. Collect and analyse data 4. Prepare a concise report	**W** Internal [100] Total marks=100

M.Sc. MIND BODY AND LIFESTYLE SCIENCE[A39]PROGRAM
(Under Choice Based Credit System)

(Effective from the Academic Year 2020-21)

Program Outcome & Course Outcome

Program Learning Outcomes

The M.Sc.graduate in Mind Body and Lifestyle Science will

PO.1. Demonstrate understanding of the interplay between the mind and body and its impact on wellness and disease
PO.2 Demonstrate ability to provide mind body interventions that promote wellness and integrates with the management of Lifestyle diseases
PO.3. Design and implement an individualized patient-centered health and wellness care plan.
PO.4. Demonstrate skill to induce a sense of responsibility and accountability of their clients to be compliant with their wellness goals
PO.5. Effectively communicate to clients by incorporating cultural awareness, empathy, active listening, appropriate use of language and that motivates the clients.
PO.6. Empower clients to set and accomplish health related behavioral change (goals, assess their progress)
PO.7. Apply the science of behavior change in motivating individuals towards a health generating behavior that is integrative and evidence based.
PO.8. Demonstrate professional conduct and adhere to professional ethics and principles

FIRST YEAR- SEMESTER I
PRINCIPLES OF MIND-BODY MEDICINE
Upon completion of the coursethe student should be able to:
CO.1.Comprehend the history of mind body medicine
CO.2. Recognize the role of regulatory mechanisms of the body and homeostasis
CO.3. Understand the systemic physiology
CO.4. Appreciate the role of nervous system in the control of various systems
CO.5. Record the basic physiological parameters like pulse, BP, ECG, PEFR

FUNDAMENTALS OF LIFESTYLE MEDICINE(Theory)
FUNDAMENTALS OF LIFESTYLE MEDICINE (PRACTICAL)
Upon completion of the course the student should be able to:
CO.1. Understand Lifestyle medicine and its core elements
CO.2. Comprehend the health, history, components, salutogenesis and models of health
CO.3. Recognize the Core elements of lifestyle medicine
CO.4. Describe the factors related to healthy living
CO.5. Understand roles and responsibilities of health care teams
CO.6. Appraise the impact of alcohol and tobacco abuse on health and society
CO.7. Demonstrate 24 hrfood recall and explain its importance

PRINCIPLES OF NUTRITION
Upon completion of the course the student should be able to:
CO.1. Outline the basics of food, nutrition and diet
CO.2. Comprehend and distinguish various sources of nutrition in health and diseases
CO.3. Recognize the importance of Micro and macronutrients
CO.4. Understand energy balance
CO.5. Interpret food labels

COACHING: STRUCTURE AND PROCESS
Upon completion of the course the student should be able to:
CO.1. Recognize role of coach on Health and wellness

CO.2. Comprehend coaching psychology
CO.3. Outline coaching process and coaching presence
CO.4. Recognize client coach relationship
CO.5. Critically analyze the impact of compassion, criticism, positive psychology on client behaviour

FOUNDATIONS OF HEALTHY LIVING- I (PRACTICAL)

Upon completion of the course the student should be able to:

CO.1. Perform a defined set of Yoga asanas
CO.2. Perform a chosen type of relaxation response exercise
CO.3. Consistently perform a chosen aerobic exercise activity
CO.4. Maintain a sleep log
CO.5. Provide evidence of participation in prosocial activities

CLINICAL ROTATION - I

Upon completion of the course the student should be able to:

CO.1. To elicit a biopsychosocial history
CO.2. To communicate the health goals of patients
CO.3. To communicate in a language that is comprehensible
CO.4. Encourage participation in prosocial activities

FIRST YEAR – SEMESTER II

STRESS AND RELAXATION RESPONSE

Upon completion of the course the student should be able to:

CO.1. Comprehend the pathophysiology of stress and discuss its impact on health
CO.2. Recognize and categorize stress at various age groups
CO.3. Appraise the relaxation responses
CO.4. Apply various stress mitigating approaches and resilience building techniques
CO.5 Comprehend the social relationships impact on health and stress
CO.6. Illustrate the role of attitude on health

LIFESTYLE MEDICINE: HEALTH BEHAVIOR

Upon completion of the course the student should be able to:

CO.1. Recognize and identify the various factors affecting life at workplace
CO.2. Critically appreciate the interrelation of work, health and community
CO.3. Comprehend stress at work place and non-work place
CO.4. Illustrate the impact of worker health on the enterprise
CO.5. Access, analyze and interpret stress and burnout

EXERCISE AS MEDICINE

Upon completion of the course the student should be able to:

CO.1. Appreciate the history and evolution of exercise as medicine
CO.2. Classify various types of exercise and recognize the physiological changes during exercise
CO.3. Recognize the Importance of physical activity in health and disease
CO.4. Evaluate the various models to Promote Physical Activity
CO.5. Assess, interpret and monitor anthropometry and physical activity measurements

SMART PROGRAMME

Upon completion of the course the student should be able to:

CO.1. Identify stress symptoms
CO.2. Learn breath-focused meditation
CO.3. Demonstrate the ability to substitute stress perspectives with adaptive perspectives
CO.4. Apply lifestyle modifications to improve resilience

COACHING: COMMUNICATION AND BEHAVIOR CHANGE

Upon completion of the course the student should be able to:

CO.1. Appreciate and analyze health behavior
CO.2. Describe and critique various types of communication
CO.3. Understand and apply SMART goal setting
CO.4. Comprehend models of change management through coaching and feedbacks
CO.5. Recognize the importance of motivational interview

NUTRITION: DIETARY INTERVENTION

Upon completion of the course the student should be able to:

CO.1. Relate therapeutic nutrient intervention and role of a dietician in clinical practice
CO.2. Describe, observe and reflect different types of diets and their usage in health and diseases
CO.3. Appreciate importance of Whole Food Plant in Preventative health and restoring health and wellbeing
CO.4. Comprehend the physiology behind calorie restriction and fasting
CO.5. Associate the role of human psychology and culture with eating patterns

YOGA AS LIFESTYLE INTERVENTION (PRACTICAL)

Upon completion of the course the student should be able to:

CO.1. Appreciate the significance of yoga as lifestyle intervention
CO.2. Discuss the Physiological effects of various asanas on different systems of the body
CO.3. Comprehend the guidelines in yoga practice
CO.4. Perform yogasasna
CO.5. Identify and guide the appropriate yogasana for health and disease conditions

CLINICAL ROTATION –II

Upon completion of the course the student should be able to:

CO.1. Enable the adolescent to set their health targets and achieve
CO.2. Application of certain psychological tools for assessment
CO.3. Elimination of interventions in certain disease conditions

SECOND YEAR – SEMESTER III

ART IN WELLNESS

Upon completion of the course the student should be able to:

CO.1. Appreciate the history and evolution of Art as a tool to wellness
CO.2. Recognize and appreciate neuroesthetics and the triad
CO.3. Comprehend different forms of art used as therapy
CO.4. Recognize and examine psychodynamics of art therapy
CO.5. Relate the significance of art therapy in clinical practice
CO.6. Apply Art as a wellness and therapeutic intervention

ADOLESCENT STRESS

Upon completion of the course the student should be able to:

CO.1. Describe the phases of adolescent development
CO.2. Outline the physiological changes in adolescence
CO.3. Explain the etiopathogenesis, clinical presentations, evaluation and impact of adolescent stress on health
CO.4. Should be able to obtain biopsychosocial history from adolescents
CO.5. Apply and interpret the stress assessment tools in adolescent

NUTRITION IN THE KITCHEN

Upon completion of the course the student should be able to:

CO.1. Apply the principles of balanced diet in menu planning
CO.2. Demonstrate the various cooking methods
CO.3. Explain the food procurement and processing
CO.4. Identify the common food adulterants and demonstrate methods to remove them
CO.5. Describe, observe and reflect the processes involved in establishing kitchen garden
CO.6. Adopt safety measures in kitchen

EXERCISE: AS A CLINICAL INTERVENTION

Upon completion of the course the student should be able to:

CO.1. Demonstrate knowledge on the importance of physical activity in health and diseases
CO.2. Assess physical activity as per defined protocols
CO.3. Prescribe Exercise and Physical activity and ensure adherence

GENERAL ELECTIVE - To be chosen by students

- Register for online courses through NPTEL, EdX, or Coursera
- Identify courses that will add value to the Masters program they are doing
- Attend the online courses either during the college hours or outside hours
- Take up evaluation through the registered online portal and submit the successful completion certificate to the course coordinator

CLINICAL ROTATION–III (ENDOCRINOLOGY, OBG, CARDIOLOGY, ONCOLOGY)

Upon completion of the course the student should be able to:

CO.1. Take history of patients from a biopsychosocial perspective
CO.2. Obtain SOAP Nutritional history from patients
CO.3. Coach patients including goal setting, motivational interview
CO.4. Assess outcomes and help the patient overcome barriers

RESEARCH SEMINAR OR ADVANCED SEMINAR SERIES

Upon completion of the course the student should be able to:

CO.1. Appropriately and Efficiently Search Scientific Literature
CO.2. Critically review published scientific publication
CO.3. Present critical appraisal of the scientific article at department journal club
CO.4. Critical review of scientific publications in the chosen area for dissertation *[Make an attempt for writing and submitting systematic review or meta analysis on the dissertation topic]*
CO.5. Understand and reflect on advanced lecture series by experts

SECOND YEAR – SEMESTER IV

ADOLESCENT COACHING

Upon completion of the course the student should be able to:

CO.1. Recognize the Psycho-physiological changes and problems during adolescence
CO.2. Plan and Design the complete process of coaching adolescents
CO.3. Organize and show the structure of coaching adolescents
CO.4. Recognize the role of Mind body medicine strategies in mitigating adolescent stress
CO.5. Demonstrate the assessment and show the process of adolescent coaching

NUTRITION IN WELLNESS

Upon completion of the course the student should be able to:

CO.1. Comprehend wellness lifecycle
CO.2. Analyze the impact of under and over nutrition
CO.3. Illustrate the influence of lifestyle modifications on NCD
CO.4. Explain mindful eating
CO.5. Construct diet and food preparation for current day

DISSERTATION & VIVA VOCE

Upon completion of the course the student should be able to:

CO.1. Formulate a research question and prepare a research protocol
CO.2. Conduct the proposed research study after obtaining clearance from Ethics committee
CO.3. Analyze the data obtained with appropriate statistical test and tool
CO.4. Interpret the findings of the study in the light of the recent scientific literature
CO.5. Write the Dissertation for submission
CO.6. Make efforts to present the data at scientific forum
CO.7. Submit manuscript for publication in indexed journal

INTERNSHIP

Upon completion of the course the student should be able to:

CO.1. Evaluate and customize lifestyle modifications in clinical settings for various NCDs under supervision

CO.2. Perform wellness coaching in controlled setting

Department of Speech Language & Hearing Sciences, SRIHER (DU)
B. ASLP

Program Outcome

The outcomes of the B.ASLP program are to equip the students with knowledge and skills to

- function as audiologists and speech-language pathologists in different work settings
- understand concepts in speech, language, communication, hearing and disability
- screen, evaluate, diagnose and assess the severity of different disorders related to speech, language, swallowing and hearing,
- manage speech, language, swallowing and hearing disorders across life span
- counsel persons with disorders of communication and their family members
- rehabilitate persons with speech, language, swallowing and hearing disorders
- prevent speech, language, swallowing and hearing disorders
- liaise with professionals in allied fields and other stake holders
- implement public awareness and education program,
- undertake advocacy measures on behalf of and for persons with speech language and hearing disorders

Course Outcome
Semester - I
B 1.1 Introduction to Speech Language Pathology

Outcomes: After completing this course, the student will be able to

Demonstrate knowledge of fundamental concepts related to speech, language and communication

Demonstrate knowledge of normal aspects of speech and language development and identify disorders of communication in children and adults.

B 1.2 Introduction to Audiology

Outcomes: After completion of this course, the student will be able to

Demonstrate knowledge about the origin of audiology

Give examples of physical properties of sound and its psychophysical correlates

Demonstrate knowledge about the different types of hearing loss and give examples of pathological conditions that would cause hearing loss

B 1.3 Anatomy and Physiology related to Speech and Hearing Organs

Outcomes: After completing this course, the student will be able to

To use and explain the concepts in anatomy and physiology of speech and hearing organs for communication

B 1.4 Clinical Psychology related to Communication Sciences
Outcomes: After completing this course, the student will be able to

Demonstrate understanding of application of clinical psychology for communication sciences

B 1.5 Linguistics and Phonetics
Outcomes: After completing this course, the student will be able to apply basic principles in linguistics and phonetics for analysis of speech and language.

B 1.6 Electronics and Acoustics
Outcomes: After completing this course, the student will be able to apply basic principles of electronics and acoustics to signals and instrumentation in speech and hearing

B 1.7 Epidemiology, Research Methods and Statistics

Outcomes: After completing this course, the student will be able to give examples of conduct of research and use of statistics in research related to speech and hearing

Semester - II

B 2.1 Neurology

Outcomes: After completing this course, the student will be able

To demonstrate knowledge about neuroanatomy and physiology related to speech and hearing

To give examples of various neurological conditions affecting communication

B 2.2 Otorhinolaryngology

Outcomes:

After completing this course, the student will be able to demonstrate knowledge about the diseases of ear, nose and throat.

B 2.3 Speech Language Diagnostics and Therapeutics

Outcome: After completing this course, the student will be able to demonstrate knowledge about fundamental principles of speech-language diagnostics and therapeutics for assessment and management of communication disorders

B 2.4 Audiological Evaluation

Outcomes: After completion of this course, the student should be able to

Take case history, perform otoscopy and tunning fork tests.

Carryout pure tone audiometry including masking

Carryout different tests involved in speech audiometry

Carryout subjective calibration and daily listening checks of the audiometer

B 2.5. Speech-language Pathology – Lab

Outcomes: After completing this course, the student will be able to

Transcribe speech using IPA

Perform analysis of speech and language

Administer tests to assess speech and language abilities

To prepare diagnostic report, write therapy goals, plan activities for therapy and develop an appropriate therapy kit

B 2.6 Audiology- Lab

Outcomes: After completing this course, the student will be able to

Perform calculations applying concept of dB

Perform basic psychophysical experiments to calculate RETSPL, MCL, UCL, equal loudness contours

Carry out basic hearing tests including puretone audiometry, speech aduiometry with masking

Semester - III

B 3.1 Language Disorders in Children

Outcomes: After completing this course, the student will be able to

Explain the process of acquisition of language and factors that influence its development in children.

Identify and assess language delay and disorders in children.

Select appropriate strategies for intervention.

Counsel and provide guidance to parents/caregivers of children with language disorders.

B 3.2 Speech Sound Disorders

Outcomes: After completing this course, the student will be able to

Describe normal speech sound development and characterization of individuals with speech sound disorders.

Perform phonological analysis and assessment of speech sound disorders.

Plan intervention for individuals with speech sound disorders.

B 3.3 Diagnostic Audiology - Behavioural Tests

Outcomes: After completing this course, the student will be able to

Select individualized test battery for assessing cochlear pathology, retro cochlear pathology, functional hearing loss, CAPD, vestibular dysfunctions, tinnitus and hyperacusis

Demonstate knowledge of the procedures to carry out the above tests

Make appropriate diagnosis based on the test results and suggest referrals.

Select test parameters to improve sensitivity and specificity of tests.

B 3.4 Paediatric Audiology

Outcomes: After completing this course, the student will be able to

Describe auditory development

List etiologies and relate them to different types of auditory disorders that may arise

Explain different hearing screening/identification procedures and their application

Elaborate on different aspects of paediatric behavioural, physiological/ electrophysiological evaluation

Semester - IV

B 4.1 Motor Speech Disorders in Children

Outcomes: After completing this course, the student will be able to

Describe the characteristics of motor speech disorders in children such as cerebral palsy, childhood apraxia of speech and other childhood dysarthrias

Assess the speech and non-speech aspects associated with the above conditions

Plan and execute therapy strategies for children with motor speech disorders

B 4.2 Voice and its Disorders

Outcomes: After completing this course, the student will be able to

Describe characteristics of normal voice

Explain etiology related to voice problems, and its pathophysiology

Identify and assess voice disorders

Provide counseling and therapy to individuals with voice disorders

B.4.3 Amplification Devices

Outcomes: After completing this course, students will be able to

Assess the candidacy for hearing aids and counsel the client accordingly

Evaluate the listening needs and select appropriate hearing aid

Program digital hearing aids as per the listening needs of client and assess the benefit from hearing aid using subjective and objective methods

Make different types of ear molds

Counsel the parents/caregivers

B 4.4 Diagnostic Audiology - Physiological Tests

Outcomes: After completing this course, the students will be able to

Justify the need for using the different physiological tests in the audiological assessment

Interpret the results to detect the middle ear, cochlear and retro cochlear pathologies and also differentially diagnose among these pathologies

Design tailor-made test protocols in immittance, AEPs and OAEs as per the clinical need

Make appropriate diagnosis based on the test results and suggest referrals

Semester V

B 5.1 Structural Anomalies and Speech Disorders

Outcomes: After completing the course, the student will be able to

Demonstrate knowledge about speech characteristics of persons with cleft lip and palate, anomalies of tongue and mandible and laryngectomy

Evaluate and diagnose the speech characteristics seen in individuals with oro-facial anomalies and laryngectomy

Learn about the techniques for the management of speech disorders in these conditions

B 5.2 Fluency and its Disorders

Outcomes: After completing the course, the student will be able to

Demonstrate knowledge about speech characteristics of persons with developmental stuttering and other fluency disorders

Evaluate and diagnose the speech characteristics seen in individuals with stuttering and other fluency disorders

Learn about the techniques for the management of speech disorders in these conditions

B 5.3 Aural Rehabilitation in Children

Outcomes: After completing this course the student will be able to

Describe the different communication options available for young children with hearing impairment

Explain the impact of hearing impairment on auditory development and spoken language communication

Describe factors that affect acoustic accessibility and strategies to manage them at home and in classroom

Design activities for auditory learning at different levels

Enumerate how the needs of individuals with hearing impairment using sign language and spoken language as form of communication in India are being met

B 5.4 Implantable Hearing Devices

Outcomes: After completing this course, the students will be able to

Assess candidacy for bone anchored hearing devices, middle ear implants, cochlear implants, and ABI

Select the appropriate device depending on the audiological and non-audiological findings

Handle post-implantation audiological management

Assess the benefit derived from implantation

Counsel the parents/care givers during different stages of implantation

Semester VI

B 6.1 Motor Speech Disorders in Adults

Outcomes: After completing this course, the student will be able to

Describe the characteristics of motor speech disorders in adults such as dysarthria and apraxia of speech

Assess the speech and non-speech aspects associated with the above conditions

Plan and execute therapy strategies for adults with motor speech disorders and dysphagia

B 6.2 Language Disorders in Adults

Outcomes: After completing this course, the student will be able to

Describe the characteristics of language disorders in adults

Assess the speech, language and non-speech aspects associated with the above conditions

Plan and execute therapy strategies for adults with language disorders

B 6.3 Aural Rehabilitation in Adults

Outcomes: After completing this course, the student will be able to

Describe the impact on the quality of life of adults with hearing impairment

Explain the principles, benefits and limitations of auditory training and speech reading

Recognize factors that impair communication and suggest facilitative and repair strategies

Identify components of aural rehabilitation program for adults and older adults

Identify strategies used with older adult to implement a successful rehabilitation program

Administer different tools for assessment of hearing handicap, attitudes and beliefs that can impact aural rehabilitation

B 6.4 Audiology in Practice

Outcomes: After completing the course, the student will able to

List and describe the highlights of legislations relating to hearing impairment and other disabilities

Incorporate ethical practices in professional service delivery.

Provide information on welfare measures, policies of government schemes

Describe different strategies to create awareness of hearing impairment and programs to address them

Explain the different clinical practice settings in audiology with reference to their requirement, protocols and role and responsibility of audiologist

Describe methods to measure the impact of noise on humans and strategies to address excessive noise exposure in industries and the community

Describe terminology, technology and methods used in tele practice, and their application in audiological service delivery

Department of Speech Language & Hearing Sciences
M.Sc. (Audiology)

Program outcomes

The outcome of the M.Sc. (Audiology) program are to equip the students with knowledge and skills to;

- function as teachers and researchers in institutions of higher learning,
- diagnose and manage hearing, vestibular and auditory processing disorders across life span,
- counsel and guide persons with hearing and balance issues
- implement rehabilitation programs for persons with hearing impairment, auditory processing issues vestibular disorders
- function as the disability certification authority in the field,
- liaise with professionals in allied fields and other stake holders
- implement prevention and public education programs,
- undertake advocacy measures on behalf of and for persons with hearing impairment
- advise government and other institutions on legal and policy issues related to persons with hearing impairment, and
- establish and administer institutions of higher learning.

Learning Outcomes
Semester I

Course Title: Auditory Physiology
After completing this course, the student will be able to:

a) Illustrate the development of the ear
b) Describe the micro and macro anatomy & physiology of the cochlea.
c) Explain the physiological basis for generation of OAE,
d) Use appropriate protocol for recording OAEs for clinical purpose and for research,
e) Use appropriate protocol for recording ECochG for clinical purpose and for research, and

Course title: Neurophysiology of hearing
After completing this course, the student will be able to

a) strengthen the basics in anatomy and neurophysiology of the afferent and efferent system,
b) discuss the neurophysiologic basis of the disorders affecting the auditory nervous system
c) apply the neurological basis of electrophysiological assessment

Course title: Hearing sciences
At the end of the course the student will be able to

a) demonstrate knowledge of psychophysical components of sound, their measurement, and their relationship with each other
b) critically evaluate the different methods of estimation of thresholds
c) discuss the various psychophysical procedures to estimate thresholds and measure pitch
d) design experiments using principles learnt in absolute sensitivity, differential sensitivity, masking

Course title: Technology and instrumentation in Audiology
After completing this course, the student will be able to

a) discuss advanced aspects of signal acquisition and processing
b) Demonstrate application of software based tools for analysis of sounds
c) Demonstrate application of tele-technology
d) demonstrate the technology used in amplification devices

Course title: Research Methods, Statistics & Epidemiology

At the end of the course, the student will be able to:

a) evaluate research material/publications in terms of types of research designs and statistical methods used.
b) discuss epidemiological concepts in relation to speech-language, hearing disorders
c) appraise evidence-based practice in different fields of speech-language and hearing disorders
d) develop a research proposal for research project

Course title: Research Seminar - 1

At the end of the course the student will be able

a) to identify a research question within a broad research theme
b) submit a summary of literature related to broad area of research

Semester II

Course title: Auditory Perception

After completing this course, the student will be able to:

a) Illustrate the interaction of physical and biological aspects of sound
b) Apply the concepts of localization in managing persons with hearing impairment
c) Apply the phenomenon of interaction of two ears in managing the persons with hearing impairment
d) Discuss the factors involved in music perception

Course title: Auditory Disorders

After completing this course, the student will be able to

a) develop insight in to histopathological changes in auditory disorders
b) perform differential diagnosis of auditory disorders
c) Apply knowledge to coordinate with medical professionals in treating auditory disorders

Course title: Electrophysiological Assessment

After completing this course, the student will be able to

a) discuss and classify auditory evoked potentials,
b) use appropriate protocols for recording exogenous and endogenous potentials for clinical and research purposes
c) apply the technology for recording auditory evoked potentials,
d) interpret exogenous and endogenous potentials

Course title: Advances in Management of Hearing Loss

At the end of course the student will be able to

a) discuss the need and candidacy for amplification/assistive devices
b) explain the strategies of device selection and optimization
c) select appropriate amplification and habilitation procedures for persons with different types of hearing impairment
d) counsel and guide on strategies to enhance communication

Course title: Genetics of Hearing & Pediatric Audiology

After completing this course, the student will be able to

a) discuss the implication of identifying gene mutation for hearing loss
c) counsel parents or caregivers of children on probability of occurrence of congenital hearing loss
d) carry out screening programs to do primary and secondary prevention of hearing loss
e) Introduce pediatric modification of protocols for diagnosis and managemen

Course Title: Research Seminar - 2

At the end of the course the student will be able

a) write a research proposal in the prescribed format
b) submit research proposal to the IEC for approval

Semester III

Course title: Implant Audiology

At the end of the course, the student should be able to

a) identify and discuss the types of implantable hearing devices,
b) discuss the purpose of different components of implantable hearing devices,
c) determine candidacy for implantable hearing devices,
d) assess benefits from implantable hearing devices and guide the clinical population, and
e) contribute to formulation of Government policies and schemes relating to implantable hearing devices

Course Title: Speech Perception

At the end of the course, the student should be able to

a) discuss coding of speech in the auditory pathway in normal hearing and hearing impaired individuals,
b) critically evaluate theories of speech perception and methods to synthesis speech,
c) apply the differences in the vowel and consonant perception in individual with normal hearing and hearing impairment,
d) discuss various factors affecting speech perception.

Course title: Auditory Processing Disorders

At the end of the course the student will be able to

a) diagnose and differentially diagnose auditory processing disorders (APDs) and explain their physiological bases,
b) administer different tests for diagnosis and interpret the findings including correlation with findings from imaging and cognitive studies,
c) advise clinical clientele on management of APDS including guidance on aids and appliances, and
e) advise and liaise with members of the management team like neurologists, neurosurgeons on the diagnosis as well as management of APDs.

Course title: Vestibular Systems and its Disorders

After completing this course, the student should be able to

a) discuss the functioning of the balance and vestibular system
b) explain the disorders of the vestibular system
c) assess vestibular system using appropriate tests/protocols
d) recommend appropriate management option for persons with vestibular dysfunction
e) counsel and guide the clinical clientele with vestibular disorders

Course Title: Research Practicum

At the end of the course the student will be able:

a) demonstrate progress in relevant sections of the research study depending on the individual requirements of the study

Semester IV

Course title: Audiology in Practice

At the end of the course, the students should be able to

a) define the role of an audiologist in different set-ups.
b) Liaise with other professionals in setting-up an audiology clinic.
c) audit audiology practices in existing set-ups.
d) discuss Governments and other agencies on the formulation of policies and legislative acts relating to hearing disability
e) discuss the legal implications of practice in audiology.

Course title: Seminars in practices related to medical audiology

After completing this course, the student will be able to:

a) Familiarize with procedures related to inpatient protocols
b) Document the findings, opinion and record the outcome measures.

c) Follow precautions and prevent infection to patient and self

Course title: Dissertation

At the end of the course the student will be able

a) Select and apply statistical analyses as required for the research study
b) Write a dissertation in the prescribed format

Department of Speech Language & Hearing Sciences
MSc (Speech Language Pathology)

Program Outcomes

The outcome of the M.Sc.(Speech-Language Pathology) program are to equip the students with knowledge and skills to

- function as teachers and researchers in institutions of higher learning,
- diagnose and manage disorders of speech, language, and swallowing across life span,
- counsel and guide persons with disorders of speech, language and swallowing as well as their family members,
- implement rehabilitation programs for persons with speech, language and swallowing disorders,
- function as the disability certification authority in the field,
- liaise with professionals in allied fields and other stake holders,
- implement prevention and public education programs,
- undertake advocacy measures on behalf of and for persons with speech, language and swallowing disorders,
- advise government and other institutions on legal and policy issues related to persons with communication disorders, and
- establish and administer institutions of higher learning.

Course Outcome
Course Title: Speech Science and Instrumentation
At the end of the course, the student will be able to:
a) discuss about speech science as a distinct field focusing on physiology aspects of speech production and different levels of observation of speech
b) analyze acoustic and aerodynamic aspects of speech production
c) discuss different techniques for physiological measurements of speech
c) discuss clinical and non-clinical application of speech science

Course Title: Neurobiology of Speech-Language and Cognition
At the end of the course, the student will be able to:
a) discuss the anatomy and physiology of nervous system and role of neurotransmitters in relation to speech-language and its disorders,
b) analyze and interpret different neuro-diagnostic findings,
c) discuss the neural basis of speech-language and cognition
d) apply information on neurophysiological and functional changes with aging in relation to speech, language and cognition

Course Title: Augmentative and Alternative Communication
At the end of the course, the student will be able to:
a) identify and discuss various components of AAC
b) discuss the assessment procedures determining candidacy for AAC among individuals with complex communication needs and select appropriate AAC strategies
c) discuss the treatment plan for implementation of AAC for individuals with complex communication needs
d) discuss the current status in practice of AAC in India and identify issues for research

Course Title: Clinical Linguistics and Multilingual Issues
At the end of the course, the student will be able to:
a) discuss the relationship of clinical linguistics to the field of speech-language pathology
b) discuss the acquisition process and related disorders pertaining to various components of language,
b) discuss general concepts, and issues related to socio-linguistics affecting speech-language and communication,
c) discuss the multilingual and multicultural issues in rehabilitation with reference to India

Course title: Research Methods, Statistics & Epidemiology

At the end of the course, the student will be able to:

e) evaluate research material/publications in terms of types of research designs and statistical methods used.
f) discuss epidemiological concepts in relation to speech-language, hearing disorders
g) appraise evidence-based practice in different fields of speech-language and hearing disorders
h) develop a research proposal for research project

Course Title: Research Seminar -1

At the end of the course the student will be able

a) to identify a research question within a broad research theme
b) submit a summary of literature related to broad area of research

Semester II

Course Title: Advances in Speech Sound Disorders

At the end of the course, the student will be able to:

a) Analyze recent theories and concepts related to phonological development and its disorders,
b) discuss comprehensive evidence-based assessment for children with speech sound disorders
c) develop an evidence-based intervention plan for children with speech sound disorders,
c) provide comprehensive care including speech therapy for persons with CLP as a member of the cleft palate team.

Course Title: Voice: Science and Disorders

At the end of the course, the student will be able to:

a) discuss the bio-mechanics of voice production in normal individuals and in those with voice disorders,
b) explain and assess the roles of breathing mechanism, vocal fold vibration, vocal tract resonance and enunciation in voice production,
c) delineate the roles and responsibilities of an SLP in a trans-disciplinary (medical) team to assess and treat voice disorders in children, adults, geriatrics and specific population including professional voice users, and

appraise different service delivery models and procedures to run a voice clinic

Course Title: Disorders of Fluency

At the end of the course, the student will be able to:

a) analyze the current theoretical concepts on nature of stuttering and other fluency disorders
b) discuss the assessment and differential diagnosis of children and adults with fluency disorders,
c) develop an evidenced -base management plan for children and adults with fluency disorders
d) counsel the clinical clientele, their family members and community members for effective management

Course Title: Language Disorders in Children

At the end of the course, the student will be able to:

a) discuss recent concepts related to classification, characteristics and etiology of child language disorders in young children.
b) conduct evidence-based assessments (formal and informal) and differentially diagnose various language disorders in children

apply evidence-based strategies and approaches to management of language disorders in children

Course Title: Language and Literacy Disorders

At the end of the course, the student will be able to:

a) discuss relationship between oral language and development of reading and writing
b) identify characteristics of language and literacy disorders in school-age children
c) discuss methods of screening and specific diagnostic assessments for language and literacy skills in preschool and school-age children.
d) plan evidence-based intervention strategies for literacy in preschool and school years and language in school years

Course Title: Research Seminar - 2

At the end of the course the student will be able

c) write a research proposal in the prescribed format
d) submit research proposal to the IEC for approval

Semester III

Course Title: Neurogenic Speech Disorders

At the end of the course, the student will be able to:

a) apply models of speech motor control and explain neurogenic speech disorders in children and adults
b) discuss assessments of different components of speech leading to differential diagnosis of motor speech disorders in children and adults
c) develop an evidence-based intervention plan for children and adults with motor speech disorders

Course Title: Dysphagia

At the end of the course, the student will be able to

a) discuss the neuroanatomical and neurophysiological bases of normal and abnormal swallowing
b) delineate the roles and responsibilities of an SLP in a trans-disciplinary team to assess and treat swallowing disorders in infants, children, adults and geriatrics in multiple work settings.
c) discuss evidence-based assessment for swallowing across the lifespan.
d) develop management plan for swallowing disorders in the context of different service delivery models

Course Title: Aphasia

At the end of the course, the student will be able to:

a) demonstrate knowledge on the neuroanatomical, pathophysiological and linguistic aspects of aphasia
b) discuss assessment protocol for profiling linguistic and non-linguistic skills in aphasia (monolinguals, bilinguals, illiterates, sign language users)
c) critically evaluate theories and factors influencing spontaneous recovery of aphasia
d) appreciate associated reading and writing disorders in individuals with aphasia

select and use various general and specific intervention strategies for aphasia

Course Title: Cognitive-Communication Disorders

At the end of the course, the student will be able to:

a) Discuss various conditions such as primary progressive aphasia, dementia, traumatic brain injury, right hemisphere damage in adults leading to cognitive communication disorders
b) Demonstrate skills on assessment of linguistic and non-linguistic skills of cognitive communication disorders
c) Appreciate cognitive communication changes related to ageing

Plan evidence-based intervention strategies for management of cognitive communication disorders

Course Title: Research Practicum

At the end of the course the student will be able:

a) demonstrate progress in relevant sections of the research study depending on the individual requirements of the study.

Semester IV

Course Title: Speech-language Pathology in Practice

At the end of the course, the student will be able to:

a) liaise with other professionals in setting-up a speech-language clinic.
b) implement acts and legislations relating to persons with speech-language impairment.
c) advise Governments and other agencies on the formulation of policies and legislative acts relating to speech-language disability
d) audit speech-language practices in existing set-ups.

Course Title: Seminars in Practices related to Medical Speech-language Pathology

At the end of the course, the student will be able to:

a) identify clientele within a medical set-up for services of an SLP
b) demonstrate procedures and requirements for practice including infection control and basic life support
c) discuss the procedures and protocols for documentation of patient care in a medical set-up
d) discuss concepts for collaborative professional practice in a medical model.

Course Title: Dissertation

At the end of the course the student will be able

c) analyze data by applying statistical analyses as required for the research study
d) interpret the findings of the study with reference to previous research
e) write a dissertation in the prescribed format