

Master of Science (Clinical Embryology and Assisted Reproductive Technology)

Program Outcomes

At the end of the program, students will be able to:

PO1 - Comprehensive understanding: Apply the comprehensive understanding of principles, theories and practical applications of reproductive biology in related areas of research and practices.

PO2 - Critical thinking and problem-solving: Identify, formulate, and analyse complex biological problems reaching substantiated conclusions using various principles of life science domain

PO3 - Effective communication: Communicate effectively on complex reproductive health activities with society at large, as a scientist or a teacher, be well versed with the subject to make effective presentations, and be able to defend it efficiently.

PO4 - Leadership and collaboration in Healthcare: Be an independent thinker and researcher effectively as an individual, and as a member or leader of different teams, and in healthcare sector, multidisciplinary research institutions and universities.

PO5 - Design/development of solutions: Design/development of solutions for complex biological problems and design protocols or processes that meet the specified needs with appropriate consideration for public health and safety.

PO6 - Ethical practices and societal responsibility: Apply ethical principles established by different government agencies and commit to research ethics, responsibilities and norms to undertake their current and future research and development in healthcare sector.

PO7 - Environment and sustainability: Apply classic & modern biological theoretical and practical knowledge gained to address societal, health, and public-related studies as a need for sustainable development.

PO8 - Life-long learning: Apply the discipline, ethics, and knowledge obtained to engage in independent and life-long learning in their respective fields of interest wherever they go for further higher studies or jobs.

Program Specific Outcomes

PSO1: Demonstrate proficiency in essential laboratory techniques, including cell culture, molecular biology, and advanced analytical methods used in reproductive health research.

PSO2: Cultivate innovative thinking and entrepreneurship by proposing creative solutions to project challenges, integrating theoretical knowledge with practical applications.

PSO3: Exhibit proficiency in applying theoretical knowledge and practical skills acquired during coursework to address specific challenges encountered during in house projects.

Course Outcomes

Semester:1

Subject	Course Outcome
MOLECULAR CELL BIOLOGY	<p>CO1. Explain basic concepts about the cell structure and its function.</p> <p>CO2. Assess the role played by signalling molecules in cell-cell communications in various cellular process.</p> <p>CO3. Illustrate the cellular and genetic process of prokaryotes and eukaryotes</p> <p>CO4. Analyse the process resulting in production of proteins and their maintenance in the cell</p> <p>CO5. Apply and analyse the knowledge of molecular cell biology to understand the genetic birth defects</p>
BASICS OF BIOCHEMIST RY & PHYSIOLOG Y	<p>CO1. Understand the biochemical functions of the biomolecules.</p> <p>CO2. Important parameters for biochemical estimation and their applications.</p> <p>CO3. Understand the physiology of the reproductive system and endocrinology.</p>
REPRODUCTI VE ANATOMY AND	<p>CO1. Learn and analyze Reproductive Anatomy in humans.</p> <p>CO2. Understand the anomalies pertaining to its embryological development.</p> <p>CO3. Describe the process of gametogenesis and discuss various factors affecting it.</p>

EMBRYOGENESIS	<p>CO4.Outline various menstrual disorders relating to the process of reproductive cycle</p> <p>CO5.Understand the procedures and importance of prenatal diagnostic techniques</p>
STEM CELL BIOLOGY	<p>CO1.Advanced knowledge of the properties and characteristics of stem cells, including their molecular and genetic regulation.</p> <p>CO2.Understanding of the latest advances in stem cell research and technologies</p> <p>CO3.Ability to critically evaluate current and emerging stem cell therapies for a range of diseases and conditions.</p> <p>CO4.Understand and prepare the utilization of Stem cells for various treatments.</p> <p>CO5.Ability to implement therapeutic treatments using stem cells.</p>
LAB COURSE-I	<p>CO1.Understand the internal features of human body</p> <p>CO2.Demonstrate the histology of Kidneys, Testis and Urinary System</p> <p>CO3.Hands-on experience in biochemical estimation of glucose and protein level</p> <p>CO4.Handle and maintain the different types of instruments in the laboratory</p> <p>CO5.Conduct and apply the molecular biology technique in detection of genetic abnormalities</p>

Semester:2

Subject	Course Outcome
<p align="center">MEDICAL MICROBIOLOGY & IMMUNOLOGY</p>	<p>CO1.Understand and gain knowledge of diseases and their pathogenesis.</p> <p>CO2.Examine and analyze the features of micro-organisms in daily life.</p> <p>CO3.Apply and create an aseptic protocol for pathogenic laboratory.</p> <p>CO4.Understand and gain knowledge of human immune system and its functions</p> <p>CO5.Apply and analyze the immunohematology techniques for common infections</p>
<p align="center">CELL & TISSUE BANKING AND CRYOPRESERVATION</p>	<p>CO1.Understand the working of a Cell and Tissue bank</p> <p>CO2.Understand the regulatory requirement of tissue collection.</p> <p>CO3.Understand the principle of production of low temperature.</p> <p>CO4 .Acquire the practical aspects of freezing and thawing.</p> <p>CO5.Describe the different concepts and processes of tissue banking</p>
<p align="center">INFERTILITY ETIOLOGY AND WORKUP</p>	<p>CO1.Understanding the Foundations of Infertility</p> <p>CO2.Proficiency in Patient Screening and Treatment Options</p> <p>CO3.Expertise in Ovarian Stimulation Techniques</p> <p>CO4.In-depth Knowledge of Common Infertility Conditions</p> <p>CO5.Comprehensive IVF Outcome Counseling</p>
<p align="center">RESEARCH METHODOLOGY</p>	<p>CO1.Explain the concept of searching for, select and critically analyse research articles and papers</p> <p>CO2. Describe the process of preparing a literature review</p>
<p align="center">PHARMACOLOGY</p>	<p>CO1: Explain the fundamental concepts of pharmacology, including the nature and source of drugs, essential drug concepts, routes of drug administration, and principles of drug-receptor interactions.</p> <p>CO2: Analyze pharmacokinetic processes such as absorption, distribution, metabolism, and excretion, and understand the principles and mechanisms of drug action, including receptor theories and functions.</p>

	<p>CO3: Evaluate the combined effects of drugs, factors modifying drug action, and hormone-related drug therapies, and assess the screening methods for anti-fertility agents and treatments for male and female infertility.</p>
PRACTICAL – II	<p>CO1. Explain the basics of andrology and embryology.</p> <p>CO2. Perform blood phenotyping, blood analysis and report evaluation.</p> <p>CO3. Describe hygiene practices in lab.</p> <p>CO4. Explain different types of instruments in the lab.</p> <p>CO5. Review the different steps involved in cryopreservation.</p>