

**Competency-Based Dynamic Curriculum for MD/MS SIDDHA  
(PRESCRIBED BY NCISM)**

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**Semester II  
Applied Basics of Nanju Maruthuvam  
(Clinical Toxicology)  
(SUBJECT CODE : SIDPG-AB-NM)**

(Applicable from 2024-25 batch, from the academic year 2024-25 onwards until further notification by NCISM)



**BOARD OF UNANI, SIDDHA AND SOWA-RIGPA  
NATIONAL COMMISSION FOR INDIAN SYSTEM OF MEDICINE  
NEW DELHI-110026**

## **PREFACE**

The competency-based curriculum for postgraduate students of Nanju Maruthuvam (Clinical Toxicology) is a thoughtfully designed academic framework aimed at developing expertise in Siddha toxicology. Spanning three years and six semesters, this program seamlessly integrates theoretical knowledge, practical training, and research, equipping students to address toxicological challenges in both clinical and research domains effectively.

The curriculum begins with a strong foundation in the first semester through two core subjects: Research Methodology and Medical Statistics, essential for scientific research, data analysis, and evidence-based practice. In the second semester, the focus shifts to Applied Basics of Nanju Maruthuvam, which provides a holistic introduction to Siddha toxicology. This paper emphasizes key concepts such as physician ethics, contemporary regulations, purification techniques, safety assessments, and the preparation of antidotes, while also covering key domains like anatomy, physiology, biochemistry, and microbiology, thereby laying the groundwork for advanced learning.

From the third to the sixth semester, students engage in advanced topics through four specialized papers. The Nanju Maruthuvam (Siddha Toxicology) paper explores toxicological conditions such as metal, mineral, and plant poisoning, along with the management of envenomation, addiction, and toxin-induced diseases, including Siddha emergency medicines. It highlights Siddha management for contact poisons, approaches for treating treatment-incurred side effects, and the application of pharmacovigilance to ensure holistic detoxification and healing. The Clinical Toxicology paper covers the epidemiology of poisoning, poison management, and medico-legal aspects, emphasizing diagnostic methods, critical care strategies, and advancements in managing toxic exposures.

The Pharmacology and Experimental Toxicology paper explores principles such as pharmacodynamics, pharmacokinetics, pharmacogenomics, experimental toxicology, and efficacy evaluation methodologies, involving both lower animals and rodents. It also covers ethical research practices, advancements such as in-vitro studies, computational toxicology, toxicokinetics, and the role of biomarkers in toxicity testing, providing a comprehensive understanding of modern pharmacological and toxicological approaches.

The Forensic Medicine and Analytical Toxicology paper emphasizes medico-legal investigations, forensic practices, analytical techniques in forensic science, clinical toxicology, and Siddha drug development strategies, incorporating emerging technologies like nanotechnology to ensure the safety and efficacy of Siddha formulations. It also includes Forensic Psychiatry postings for hands-on training, offering a holistic perspective that integrates traditional Siddha principles with modern scientific advancements.

The program integrates practical and experiential learning through hands-on training, workshops, demonstrations, virtual and simulation labs, field visits, case-based, problem-based, and team-based learning, along with tutorials, symposiums, teaching assignments, etc. These components are strategically designed to enhance skills, apply knowledge in real-world contexts, and empower students with the confidence and expertise for academia, clinical practice, and innovative research.

This curriculum embodies the harmony of traditional wisdom and modern science, preparing students to excel in Siddha toxicology and contribute meaningfully to its advancement. By fostering analytical thinking, ethical practice, and a commitment to learning, the program aspires to shape professionals who will uphold and extend the legacy of Siddha medicine.

We extend our best wishes to all students embarking on this transformative academic journey, confident in their potential to make significant contributions to the field of Siddha toxicology.

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We want that education by  
which **character** is formed,  
**strength of mind** is increased,  
the **intellect** is expanded, and by  
which one can **stand on one's**  
**own feet.**

*-Swami Vivekananda*

# NCISM

(NATIONAL COMMISSION FOR INDIAN SYSTEM OF MEDICINE)

## Competency-Based Dynamic Curriculum MD/ MS SIDDHA

Applied Basics of Nanju Maruthuvam (SIDPG-AB-NM)

### Summary & Credit Framework

#### Semester II

| Module Number & Name                                                                                          | Credits   | Notional Learning Hours | Maximum Marks of assessment of modules (Formative Assessment) |
|---------------------------------------------------------------------------------------------------------------|-----------|-------------------------|---------------------------------------------------------------|
| M1. Basic concepts of Nanju Maruthuvam (Siddha Toxicology) and Maruthuvar Ilakanam (Doctrine of Physician)    | 1         | 30                      | 25                                                            |
| M2. Marunthin Ilakkanam (Distinctive of Drug features)                                                        | 2         | 60                      | 50                                                            |
| M3. Fundamentals of Unavu Matrum Unavu Nanju (Food and Food Poison)                                           | 1         | 30                      | 25                                                            |
| M4. Mooligai Suddhi Muraigal (Purification of Medicinal Plants)                                               | 2         | 60                      | 50                                                            |
| M5. Thathu Matrum Sangama Suddhi Muraigal (Purification of Metals, Minerals and, Substances of Animal Origin) | 2         | 60                      | 50                                                            |
| M6. Applied Bio Chemistry                                                                                     | 2         | 60                      | 50                                                            |
| M7. Applied Microbiology                                                                                      | 2         | 60                      | 50                                                            |
| M8. Applied Physiology                                                                                        | 1         | 30                      | 25                                                            |
| M9. Applied Anatomy                                                                                           | 1         | 30                      | 25                                                            |
| M10. Siddha Nanju Murivu Marunthu Seimuraigal (Siddha Antidote Preparation methods)                           | 2         | 60                      | 50                                                            |
|                                                                                                               | <b>16</b> | <b>480</b>              | <b>400</b>                                                    |

#### Credit frame work

SIDPG-AB-NM consists of 10 modules totaling 16 credits, which correspond to 480 Notional Learning Hours. Each credit comprises 30 hours of learner engagement, distributed across teaching, practical, and experiential learning in the ratio of 1:2:3. Accordingly, one credit includes 5 hours of teaching, 10 hours of practical training, 13 hours of experiential learning, and 2 hours allocated for modular assessment, which carries 25 marks.

**Important Note:** The User Manual MD/MS Siddha is a valuable resource that provides comprehensive details about the

curriculum file. It will help you understand and implement the curriculum. Please read the User Manual before reading this curriculum file. The curriculum file has been thoroughly reviewed and verified for accuracy. However, if you find any discrepancies, please note that the contents related to the MSE should be considered authentic. In case of difficulty and questions regarding the curriculum, write to [syllabus24sid@ncismindia.org](mailto:syllabus24sid@ncismindia.org).

**Course Code and Name of Course**

| Course code | Name of Course                                              |
|-------------|-------------------------------------------------------------|
| SIDPG-AB-NM | Applied Basics of Nanju Maruthuvam<br>(Clinical Toxicology) |

**Table 1 : Course learning outcomes and mapped Program learning outcomes**

| CO No | A1<br>Course learning Outcomes (CO) SIDPG-AB-NM<br>At the end of the course SIDPG-AB-NM, the students should be able to-                                                                                                                                                               | B1<br>Course learning Outcomes mapped with program learning outcomes. |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| CO1   | Apply clinical knowledge in the diagnosis and treatment modalities of poisoning, <i>Idu Marunthu</i> , poisonous bites, and, its complications, including emergency care and drug therapy-related adverse effects.                                                                     | PO1,PO2,PO6                                                           |
| CO2   | Perform <i>Suddhi</i> (purification) techniques for Siddha raw materials and formulations, preparation of antidotes, and standardize formulations, including Siddha nano medicines using modern analytical methods in accordance with traditional practices and regulatory guidelines. | PO2,PO3,PO4,PO5                                                       |
| CO3   | Conduct safety studies through experimental research utilizing in-vitro, in-vivo, and computational methodologies.                                                                                                                                                                     | PO2,PO3,PO4,PO5,P<br>O6                                               |
| CO4   | Analyze the risks and reporting procedures to pharmacovigilance centers to ensure safety monitoring in clinical practice.                                                                                                                                                              | PO1,PO2,PO3,PO4,P<br>O5                                               |
| CO5   | Design and execute clinical trials for cases associated with core subjects, adhering to ethical principles and regulatory guidelines.                                                                                                                                                  | PO1,PO2,PO3,PO4,P<br>O6                                               |
| CO6   | Apply the clinical skills in de-addiction and rehabilitation through Siddha treatment procedures.                                                                                                                                                                                      | PO1,PO2,PO3,PO4                                                       |
| CO7   | Analyze and apply legal and ethical principles of medical jurisprudence to handle cases effectively related to toxicology and forensic medicine.                                                                                                                                       | PO1,PO2,PO3,PO8                                                       |
| CO8   | Demonstrate teaching skills and implement innovative practices that integrate traditional toxicological knowledge with modern entrepreneurship in Siddha medicine.                                                                                                                     | PO5,PO6,PO7,PO8                                                       |

**Table 2 : Course contents (Modules- Credits and Notional Learning Hours)**

| 2A<br>Module Number | 2B<br>Module & units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2C<br>Number of Credits | Notional Learning Hours |                          |                                                          |             |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------|--------------------------|----------------------------------------------------------|-------------|
|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                         | 2D<br>Lectures          | 2E<br>Practical Training | 2F<br>Experiential Learning including Modular Assessment | 2G<br>Total |
| 1                   | <p><b>M-1 Basic concepts of Nanju Maruthuvam (Siddha Toxicology) and Maruthuvar Ilakanam (Doctrine of Physician)</b></p> <p>This module explains the foundational principles of Siddha toxicology, the role and ethics of the physician, and provides an overview of contemporary regulations and ethical guidelines in the practice and research of Siddha medicine.</p> <p>• <b>M1U1 Basic Principles of Siddha Medicine</b></p> <p>1.1.1 96 <i>Thathuvangal</i> (96 Philosophies)</p> <p>1.1.2 <i>Suvai</i> (Taste)</p> <p>1.1.3 <i>Envagai Thervu</i> (Eightfold clinical methods of examination)</p> <p>1.1.4 <i>Alavai</i> (Logic/Epistemology)</p> <p>• <b>M1U2 Maruthuvar Ilakanam (Doctrine of physician)</b></p> <p>1.2.1 <i>Maruthuvanin Veru Peyarkalum Vilakkamum</i> (Names and Definition of Maruthuvan) and <i>Maruthuvan Ariya Vendiya Noolkal</i> (The Medical Works for Study)</p> <p>1.2.2 <i>Maruthuvan Iyal</i> (Special Characteristics of Medical Practitioners) and <i>Maruthuvan Ozhukkam</i> (The Good Traits of the Doctors) and <i>Maruthuvan Udai</i> (Suitable Dress for the Physician)</p> <p>1.2.3 <i>Noyaliyin Vinai Neenga Maruthuvan Seyya Vendiya Vinaiyozhi</i></p> | 1                       | 5                       | 10                       | 15                                                       | 30          |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |    |    |    |    |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|----|----|
|   | <p><i>Muraikal</i> (Methods for removing the karma of the Patient)</p> <p>1.2.4 <i>Maraiyor Maruthuvar</i> Comparison and <i>Maruthuvan Ariya Venduvana</i> (The Things to be Known to a Physician)</p> <p>1.2.5 <i>Vaithiyar Aaga thagaathavargal</i> (Person unfit to be a Physician), <i>Payanatra Maruthuvan Panbu</i> (The Nature of Useless Medical Men and the Quacks), and <i>Theeya Maruthuvar Iyalbu</i> (The Medical Science should not be taught to Deceit Persons)</p> <p>1.2.6 <i>Vathiyarkatku Thevai</i> (Alchemy and Medical Practice)</p> <p>• <b>M1U3 National Commission for Indian System of Medicine (Ethics and Registration) Regulations 2023.</b></p> <p>1.3.1 Ethical standards in Siddha medical practice as per the National Commission guidelines</p> <p>1.3.2 Roles and Responsibilities of Siddha Practitioners under Ethical Guidelines</p> <p>1.3.3 Ethical practices in Siddha medicine</p> <p>• <b>M1U4 Ethical Guidelines for Biomedical Research on Human Subjects</b></p> <p>1.4.1 Participant's rights and well-being during biomedical research</p> <p>1.4.2 Ethical research practices in Siddha medicine</p> <p>1.4.3 Scientific validity and accountability in research practices</p> |   |    |    |    |    |
| 2 | <p><b>M-2 Marunthin Ilakkanam (Distinctive of Drug features)</b></p> <p>This module focuses on the distinctive characteristics of Siddha drugs, methods of drug examination, toxicology, and the consequences of improper purification and</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2 | 10 | 20 | 30 | 60 |

therapeutic practices.

- **M2U1 Marunthu Ilakkanam Matrum Marunthu Sothanaigal (Integral aspects of drugs and Testing of drugs based on Siddha Medicine)**

- 2.1.1 *Vilakkam* (Definition) and *Marunthu Vagaigal* (Types)
- 2.1.2 *Marunthukalin Ayul Kaalam* (Shelf life)
- 2.1.3 *Marunthu Sothanaigal* (*Chenduram*, *Parpam*, & *Kattu*)
- 2.1.4 *Pothuvana Marunthalavu* (Standard measurement)
- 2.1.5 *Marunthin Pakkuva Apakkuva Gunam*
- 2.1.6 Adulteration in Siddha Drug

- **M2U2 Marunthunnum Vithigal (Rules of Medication)**

- 2.2.1 *Marunthugalin alavu* (Dosage)
- 2.2.2 *Anupanam* (Adjuvant)
- 2.2.3 *Thunai Marunthugal* (Supportive Medicine)
- 2.2.4 *Marunthuvaikkum Paathiram* (Vessels for Preserving Siddha drugs)
- 2.2.5 *Marunthoottum Paathiram* (Vessels for feeding Siddha drugs)
- 2.2.6 *Marunthoottum Kaalam* (Dosing Period)
- 2.2.7 *Pinikku Marunthalavu* (Dosage for illness)

- **M2U3 Basic concepts of Nanju**

- 2.3.1 *Siddhargal marunthaakkum adippadai vithigal* (Basic principles for Preparation of Siddha medicine)
- 2.3.2 *Aga Nanju* and *Pura Nanju* (Inner part poison and Outer part poison)
- 2.3.3 *Nanjukku Matru Nanju* (Alternative poison to poison)
- 2.3.4 *Nanju Ilakkanam*, *Nanju Vagaigal*, *Nanju Sothanai* (Characteristics of Poison, Types and, test for poisons)

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |   |    |    |    |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|----|----|
|   | <p>2.3.5 <i>Nachari Seigai Udaiya Mooligaigal</i> (Herbal Antidotes)</p> <p>• <b>M2U4 Complications of Mei Suddhi (Cleansing therapy)</b></p> <p>2.4.1 <i>Bedhi Maruthuvam</i> (Consequences of Purgation therapy)<br/> 2.4.2 <i>Vaanthi Maruthuvam</i> (Consequences of Vomiting therapy)<br/> 2.4.3 <i>Nasiyam</i> therapy (Consequences of Nasal Application therapy)<br/> 2.4.4 <i>Ennai Kuliya</i> (Consequences of Oil Bath therapy)</p> <p>• <b>M2U5 Suddhi Seiyaamai Matrum Sarivara Mudiyaatha Marunthugalin Kaedugal (Consequences of Unpurified and Unfinished Siddha Medicine)</b></p> <p>2.5.1 <i>Suddhi Seiyyaatha Marunthugalin Kaedugal</i> (Dangers of non-purification in drug preparation)<br/> 2.5.2 <i>Sarivara Mudiyaatha Marunthugalin Kaedugal</i> (Dangers of improperly prepared drugs)</p> |   |   |    |    |    |
| 3 | <p><b>M-3 Fundamentals of Unavu Matrum Unavu Nanju (Food and Food Poison)</b></p> <p>This module covers the fundamentals of food, food poison, safety practices, and dietary principles in Siddha medicine, emphasizing the impact of food on health and disease prevention.</p> <p>• <b>M3U1 Unavu Ilakkanam (Food)</b></p> <p>3.1.1 <i>Unavu Ilakkanam</i> (Suitable food for Eating) and <i>Unavin Alavu</i> (Quantum of food)</p>                                                                                                                                                                                                                                                                                                                                                                                 | 1 | 5 | 10 | 15 | 30 |

- 3.1.2 *Kollaththakka Unavu* (Unsuitable diet and its adverse effects)
- 3.1.3 *Serimaana Kaala Alavu* (Duration for the Digestion of Different Food Stuff)
- 3.1.4 *Migu matrum Kurai Unvain Paathippu* (Effect of under feeding and over feeding)

• **M3U2 Unavu Nanju (Food Poison)**

- 3.2.1 *Paathira Baetham* (Toxicity of food substances due to vessels)
- 3.2.2 *Unavu – Marunthu Thodarbu* (Food - Drug interaction according to Siddha)
- 3.2.3 *Unavu – Unavu Thodarbu* (Food – Food interaction according to Siddha)
- 3.2.4 *Unavin Maarupatta saerkaaiyaal erpadum nanju* (Different combinations of food)
- 3.2.5 Drug - Drug interaction according to Siddha
- 3.2.6 *Karappan Patharthangal* (Eczema-causing foods)

• **M3U3 Unavu Kalappadam Matrum Serivootigal (Food Adulteration and Additives)**

- 3.3.1 *Unavu kalappadathin varaiyaraigal matrum vagaigal* (Definitions and Types of Food Adulteration)
- 3.3.2 *Unavuk kalappadap pagupaaivu* (Analysis of Food Adulteration)
- 3.3.3 *Unavu Serivootigalin varaiyaraigal matrum vagaigal* (Definitions and Types of Food Additives)
- 3.3.4 *Unavu Serivootigalin pagupaaivul* (Analysis of Food Additives)

• **M3U4 Pathiyam Matrum Apathiyam Ilakkanam (Basics of Pathiyam and**

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |    |    |    |    |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|----|----|
|   | <b>Apathiyam)</b><br><br>3.4.1 <i>Pathiyam, Pathiya Pathaarthagal (Pathiyam and Food substances for Pathiyam)</i><br>3.4.2 <i>Apathiyam, Apathiya Pathaarthangal (Apathyam and Food substances for Apathiyam)</i><br>3.4.3 <i>Ichapathiyam, Suitable food Substances during Ichapathyam</i><br>3.4.4 <i>Pathiyam - For some Siddha preparations - Rasam Serntha Marunthugal, Parangippattai, and Serankottai Serntha marunthugal, Aya chenduram, Gantha chenduram, and Thamira parpam</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |    |    |    |    |
| 4 | <b>M-4 Mooligai Suddhi Muraigal (Purification of Medicinal Plants)</b><br>This module explores the purification methods of medicinal plants in Siddha medicine, focusing on both general and specialized techniques, as well as purification of liquid and semiliquid substances.<br><br><b>• M4U1 Mooligai Sarakkugal (Plant materials)</b><br><br><i>Pothu Suddhi (Common purification process)</i><br>4.1.1 <i>Ilai (Leaf) - Poo (Flower) - Pattai (Bark) - Ver (Root) - Kizhangu (Tuber) - Chooranam (Powder)</i><br><i>Sirappu Suddhi (Specific purification process)</i><br>4.1.2 <i>Akkiragaram (Anacyclus pyrethrum Linn.) - Amukkara (Withania somnifera Linn.) - Abini (Papaver somniferum Linn.) - Oomathan vithai (Datura stramo Linn.) - Etti kottai (Strychnos nux-vomica Linn.) - Omam (Trachyspermum ammi Linn.)</i><br>4.1.3 <i>Kanja (Cannabis sativa Linn.) - Kadukkai (Terminalia chebula Retz.) - Kariapolam (Aloe barbadensis Mill.) - Vellaipolam (Commiphora myrrha Nees.) - Kalarchi kottai (Caesalpinia bonduc Linn.) - Kukkil (Commiphora</i> | 2 | 10 | 20 | 30 | 60 |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |    |    |    |    |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|----|----|
|   | <p><i>mukul Hook.)</i></p> <p>4.1.4 <i>Kurosani omam (Hyoscyamus niger Linn.) - Sivathai ver (Operculina turpethum Linn.) - Seenthil thandu (Tinospora cordifolia Thumb.) - Seeragam (Cuminum cyminum Linn.) - Sukku (Zingiber officinale Roscoe.)</i></p> <p>4.1.5 <i>Senkottai (Semecarpus anacardium L.f.) - Thaandri [Terminalia bellirica (Gaertn.)Roxb.] - Thippili (Piper longum Linn.) - Thetraan (Strychnos potatorum L.f.) - Naabi (Aconitum ferox Wall.ex Ser. or Aconitum napellus Linn.) - Nilavarai (Senna alexandrina Mill)</i></p> <p>4.1.6 <i>Nellikai (Emblica officinalis Gaertn.) - Nervaalam (Croton tiglium Linn.) - Parangi sakkai (Smilax china Linn.) - Pugai ialai (Nicotiana tabacum Linn.) - Perungaayam (Ferula asafoetida Linn.) - Manjal (Curcuma longa Linn.)</i></p> <p>4.1.7 <i>Maasikkai (Quercus incana Bardr. ) - Milagu (Piper nigrum Linn.) - Vasambu (Acorus calamus Linn.) - Eerandam (Ricinus communis Linn.) - Kerudapachai [Selaginella Plana (Desv.ex poir) Hieron]</i></p> <p>• <b>M4U2 Neerma Vagaigal (Liquid and Semiliquid materials)</b></p> <p>4.2.1 <i>Thengai Ennai (Coconut oil) - Aamankkennai (Castor oil) - Iluppai Nei (Mahua oil) - Nalla Ennai (Sesame oil) - Punnai Ennai (Tamanu oil)</i></p> <p>4.2.2 <i>Thayir (Curd) - Mor (Butter Milk) - Vennai (Butter) - Nei (Ghee) - Pasumpaal (Cow milk) - Vellattu Paal (Goat Milk) - Vilangukalin Neer (Animal Urine)</i></p> <p>4.2.3 <i>Venneer (Warm water) - Poosanikai neer (Ash gourd juice) - Kaluneer (Rice water) - Kaadi (Rice vinegar) - Thanneer (Water) - Panineer (Snow water)</i></p> |   |    |    |    |    |
| 5 | <b>M-5 Thathu Matrum Sangama Suddhi Muraigal (Purification of Metals,</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2 | 10 | 20 | 30 | 60 |

## Minerals and, Substances of Animal Origin)

This module focuses on the purification processes for metals, minerals, and substances of animal origin in Siddha medicine, ensuring their safe and effective therapeutic use.

### • M5U1 Thathu Porutgal (Minerals and Metals)

- 5.1.1 *Ulogangal* (Metals) – *Ayam* (Iron) – *Ekku* (Steel) – *Karuvangam* (Lead) – *Kaantham* (Magnetic oxide of Iron) – *Semmbu* (Copper) - *Thandavaalam* (Cast iron) – *Naagam* (Zinc) – *Thangam* (Gold) - *Mandooram* (Ferric oxide) – *Venkaalam* (Bronze) – *Velvangam* (Tin) - *Velli* (Silver)
- 5.1.2 *Panchasootham* (Mercury and its compounds) – *Rasam* (Mercury) - *Rasa Chenduram* (Red sulphide of Mercury) - *Lingam* (Cinnabar) - *Pooram* (Calomel) - *Veeram* (Hydrargyrum perchloride)
- 5.1.3 *Paadanangal* (Arsenic like compounds) - *Paadanangal* (Arsenic like compounds) – *Panja paadaanam* (Five elements Paadanam) - *Nava paadanam* (Nine poisonous substance) - *Anjanakkal* (Lead sulphide) – *Eli paadanam* – *Ganthagam* ( Sulphur) – *Gowri paadanam* – *Thaalagam* (Yellow Orpiment) – *Thotti paadanam* – *Manosilai* (Red Orpiment) – *Miruthar singi* (Galena) - *Vellai paadanam* (White Arsenic)
- 5.1.4 *Kaaraasaarangal* (Salts) - *Induppu* (Rock Salt) – *Lavanam* (Salt) – *Evatchaaram* (Potassium carbonate) - *Kalluppu* (Sodium chloride) – *Karpooram* (Camphor) – *Sathisaaram* - *Seenaakaram* (Alum) – *Navacharam* (Ammonium chloride) – *Pooniru* (Fullers Earth) – *Valaiyaluppu* – *Vediuppu* (Potassium nitrate) – *Venkaaram* (Sodium biborate)
- 5.1.5 *Manigal* (Gems) - *Komethagam* (Garnet) – *Neelamani* (Sapphire) – *Pavazham* (coral) - *Putparaagam* (yellow sapphire) – *Manikkam* (Ruby) – *Muthu* (pearl) - *Vaidooriyam* (Chrysoberyl Cats Eye) – *Vairam* (Diamond) - *Maragatham* (Emerald)
- 5.1.6 *Ubarasangal* (Secondary Minerals) - *Abragam* (Mica) – *Annabethi* (Green Vitriol) – *Kalnaar* (Asbestos) - *Karsunnapu* (Lime Stone) – *Kaavikkal* (Red ochre) – *Silasathu* - *Thutham* (Cupric sulphate) – *Paal thutham* (Zinc sulphate) – *Mayil thutham* – *Thurisu* – *Nandukkal* (Fossil stone)

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   |    |    |    |    |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|----|----|
|   | <p>crab) – <i>Nimilai</i></p> <p>• <b>M5U2 Sangama Porutkal (Substances of Animal Origin)</b></p> <p>5.2.1 <i>Elumbugal</i> (Bones) - <i>Kulambugal</i> (Hoofs) - <i>Kombukal</i> (Horns) - <i>Aamai Odu</i> (Tortoise shell)</p> <p>5.2.2 <i>Thaen</i> (Honey) - <i>Palagarai</i> (Cowrie) - <i>Muthuchippi</i> (Pearl Oyster) - <i>Muttai Odu</i> (Egg shell) - <i>Sangu</i> (Conch) - <i>Nathai Odu</i> (Snail shell)</p> <p>5.2.3 <i>Kilinjai</i> (Mussel) - <i>Iragugal</i> (Feathers) - <i>Punugu</i> (Civet Musk) - <i>Kasthuri</i> (Kasthuri Musk/Moshk) - <i>Korosani</i> (Goat bile) - <i>Poonaagam</i> (Earth worm) - <i>Kombarakku</i> (Laac Gum) - <i>Mezhugu</i> (Bee wax)</p> |   |    |    |    |    |
| 6 | <p><b>M-6 Applied Bio Chemistry</b></p> <p>This module provides an in-depth understanding of biochemical analysis and interpretation, focusing on gastric, cerebrospinal fluid, kidney and liver function, tumor markers, and metabolism in clinical practice.</p> <p>• <b>M6U1 Gastric Function Test and Examination of Cerebrospinal fluid</b></p> <p>6.1.1 Gastric Juice</p> <p>6.1.2 Gastric Function Test</p> <p>6.1.3 Composition of Normal CSF</p> <p>6.1.4 Examine Cerebrospinal Fluid (CSF)</p> <p>• <b>M6U2 Interpretation of Kidney function tests</b></p> <p>6.2.1 Electrolytes</p>                                                                                              | 2 | 10 | 20 | 30 | 60 |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |    |    |    |    |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|----|----|
|   | <p>6.2.2 Urea and Creatinine – Uric acid - GFR</p> <p>6.2.3 RFT</p> <p>6.2.4 Interpretations of RFT</p> <p>• <b>M6U3 Interpretation of Liver function tests and Enzymes</b></p> <p>6.3.1 Functions of the Liver</p> <p>6.3.2 Liver Function Tests (LFT)</p> <p>6.3.3 Interpret results of LFT</p> <p>6.3.4 Liver Enzymes</p> <p>6.3.5 Significance of various factors on Liver Enzymes</p> <p>• <b>M6U4 Tumor Markers</b></p> <p>6.4.1 Tumor markers</p> <p>6.4.2 Test for tumor markers</p> <p>6.4.3 Interpretations of Tumour Markers</p> <p>• <b>M6U5 Metabolism</b></p> <p>6.5.1 Enzyme kinetics</p> <p>6.5.2 Biotransformation</p> <p>6.5.3 Xenobiotic metabolism</p> |   |    |    |    |    |
| 7 | <p><b>M-7 Applied Microbiology</b></p> <p>This module explores the role of microorganisms in vaccination, drug resistance, toxin</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2 | 10 | 20 | 30 | 60 |

production, microbial metabolism of toxins, and their analysis in toxicological studies.

- **M7U1 Vaccination Risk and Allergy to anti-infective drugs**

- 7.1.1 Allergy to anti-infective drugs

- 7.1.2 Anti-infective drugs

- 7.1.3 Vaccination Risk

- **M7U2 Toxin-producing Microorganisms**

- 7.2.1 Bacteria: *Clostridium botulinum* - *Staphylococcus aureus*

- 7.2.2 Fungi: *Aspergillus flavus* - *Fusarium graminearum*

- 7.2.3 Algae: *Cyanobacteria*

- **M7U3 Mechanisms of Microbial Resistance and Toxin Production**

- 7.3.1 Endotoxins and Exotoxins

- 7.3.2 Mycotoxins

- 7.3.3 Antibiotic Resistance

- 7.3.4 Heavy Metal and Xenobiotic Resistance

- **M7U4 Microbial Metabolism in Toxin Degradation and Detoxification**

- 7.4.1 Microbial Biodegradation of Pesticides

- 7.4.2 Biotransformation of Toxins: Mechanisms of Activation and Inactivation

- **M7U5 Microbiological Analysis in Toxicology**

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |   |    |    |    |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|----|----|
|   | <p>7.5.1 Microbial Identification: Techniques and Applications [Polymerase Chain Reaction(PCR), Sequencing]</p> <p>7.5.2 Toxin Detection: Methods and Approaches [e.g., Enzyme-Linked Immunosorbent Assay (ELISA)]</p> <p>7.5.3 Microbial Enumeration: Quantification Methods [e.g., Colony-Forming Unit(CFU) Counting]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |   |    |    |    |
| 8 | <p><b>M-8 Applied Physiology</b><br/>This module covers key physiological processes including absorption, distribution, blood composition, excretion, and the body's physiological responses to toxins.</p> <ul style="list-style-type: none"> <li>• <b>M8U1 Absorption</b> <ul style="list-style-type: none"> <li>8.1.1 Skin absorption</li> <li>8.1.2 Gastrointestinal absorption</li> <li>8.1.3 Respiratory absorption</li> </ul> </li> <li>• <b>M8U2 Distribution</b> <ul style="list-style-type: none"> <li>8.2.1 Blood Circulation</li> <li>8.2.2 Plasma protein binding</li> <li>8.2.3 Tissue distribution</li> </ul> </li> <li>• <b>M8U3 The Blood Cells and Liquid Component</b> <ul style="list-style-type: none"> <li>8.3.1 RBC Indices</li> <li>8.3.2 WBC Indices</li> </ul> </li> </ul> | 1 | 5 | 10 | 15 | 30 |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |   |    |    |    |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|----|----|
|   | <p>8.3.3 Platelets</p> <p>8.3.4 Clotting Indices</p> <p>8.3.5 Blood Coagulation</p> <p>8.3.6 Anti-Coagulant Therapy</p> <p>• <b>M8U4 Excretion</b></p> <p>8.4.1 Renal excretion</p> <p>8.4.2 Hepatic excretion</p> <p>8.4.3 Respiratory excretion</p> <p>• <b>M8U5 Physiological responses to Toxins</b></p> <p>8.5.1 Inflammation</p> <p>8.5.2 Oxidative stress</p> <p>8.5.3 Apoptosis</p> <p>8.5.4 Immune responses</p> <p>8.5.5 Immunotoxicity</p> |   |   |    |    |    |
| 9 | <p><b>M-9 Applied Anatomy</b></p> <p>This module focuses on the application of anatomical knowledge in Forensic radiology, the identification of target organs affected by toxins, and histological interpretation of tissue-specific damage.</p> <p>• <b>M9U1 Forensic Radiology</b></p> <p>9.1.1 Radiology of Bones</p>                                                                                                                             | 1 | 5 | 10 | 15 | 30 |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |    |    |    |    |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|----|----|
|    | 9.1.2 Radiology of Dentine<br>9.1.3 Detection of Injuries<br>9.1.4 Analysis of Gunshot Wounds<br><br><b>• M9U2 Anatomy of Specific Target Organs in Poisoning</b><br><br>9.2.1 Liver<br>9.2.2 Kidney<br>9.2.3 Lungs<br>9.2.4 Heart<br>9.2.5 Nervous system<br>9.2.6 Skin<br>9.2.7 GI Tract<br>9.2.8 Blood Brain Barrier<br><br><b>• M9U3 Histology of Specific Target Organs in Poisoning</b><br><br>9.3.1 Liver<br>9.3.2 Oesophagus - Stomach<br>9.3.3 Kidney<br>9.3.4 Brain<br>9.3.5 Lung<br>9.3.6 Skin<br>9.3.7 Pancreas - Spleen<br>9.3.8 Heart |   |    |    |    |    |
| 10 | <b>M-10 Siddha Nanju Murivu Marunthu Seimuraigal (Siddha Antidote)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2 | 10 | 20 | 30 | 60 |

## **Preparation methods)**

This module covers the methods of preparing specific and general antidotes in Siddha medicine to counteract various poisons.

### **• M10U1 Specific Siddha Antidotes Preparations**

10.1.1 *Karuvel Kopuli Kudineer – Arugankattai Kudineer – Vasambu Kari*

10.1.2 *Kadukkai Kudineer - Poritha Vengara Karaisal - Avuriverpattai Karkam*

10.1.3 *Kuppai Meni Karkam - Thulasi Verpattai Kudineer – Thayir Vellam*

10.1.4 *Nilapanai Kizhangu Kudineer – Linga Nanju Kudineer - Thaalaga Nanju Kudineer*

10.1.5 *Serankottai Nanju Murivu – Nervalam Nanju Murivu – Abini and Kanja Nanju Murivu*

### **• M10U2 General Siddha Antidote Preparations - I**

10.2.1 *Vida kuzhambu*

10.2.2 *Vida mai*

10.2.3 *Neelagandakuligai*

10.2.4 *Sundarithylam*

10.2.5 *Sanjeevi Chooranam - Nilavaagaikarpam - Aaduthinnapalai karpam*

10.2.6 *Kudorikuzhambu – Rasa mai - Rasaathimarunthu – Naabi kuzhambu*

10.2.7 *Sarva Vidari Kuligai*

10.2.8 *Gandhaga Urundai – Thippiliyathi Marunthu – Nellikai Gandhaga Nei – Sombu Kudineer – Paranjothi Maathirai*

10.2.9 *Eganthathailam*

10.2.10 *Sarva Vida thodari Kuligai*

|  |                                                                                                                                                                                                                                                                                                              |           |           |            |            |            |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|------------|------------|------------|
|  | <b>• M10U3 General Siddha Antidote Preparations - II</b><br><br>10.3.1 <i>Palagarai parpam</i><br>10.3.2 <i>Abraga parpam</i><br>10.3.3 <i>Kowsigar Kuzhambu</i><br>10.3.4 <i>Sivanar Amirtham</i><br>10.3.5 <i>Agasthiyar Kuzhambu</i><br>10.3.6 <i>Maragatha Parpam</i><br>10.3.7 <i>Seena Vidamirtham</i> |           |           |            |            |            |
|  |                                                                                                                                                                                                                                                                                                              | <b>16</b> | <b>80</b> | <b>160</b> | <b>240</b> | <b>480</b> |

**Table 3 : Modules - Unit - Module Learning Objectives and Session Learning Objective- Notional Learning Hours- Domain-Level- TL Methods**

| 3A<br>Course<br>Outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3B<br>Learning Objective (At the end of the (lecture/practical training /experiential learning) session, the students should be able to) | 3C<br>Notional<br>Learning<br>Hours | 3D<br>Lecture/<br>Practical<br>Training/<br>Experiential<br>Learning | 3E<br>Domain/<br>Sub<br>Domain | 3F<br>Level (D<br>oes/Show<br>s how/K<br>nows ho<br>w/Know) | 3G<br>Teaching<br>Learning<br>Methods |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------|---------------------------------------|
| <b>Module 1 : Basic concepts of Nanju Maruthuvam (Siddha Toxicology) and Maruthuvar Ilakanam (Doctrine of Physician)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                          |                                     |                                                                      |                                |                                                             |                                       |
| <b>Module Learning Objectives</b><br><b>(At the end of the module, the students should be able to)</b> <p>Describe the 96 Thathuvangal, Suvai (taste types), Envagai Thervu (eight diagnostic tools), and Alavai (measurement methods) used in Siddha medicine.</p> <p>Apply the principles of 96 Thathuvangal and Envagai Thervu in clinical diagnostic and therapeutic decision-making.</p> <p>Integrate the ethics regulations in Siddha medical practice by valuing patient rights, confidentiality, and informed care.</p> <p>Illustrate the difference between ethical and unethical practices in biomedical research, citing examples from both modern and traditional perspectives.</p> <p>Assess the relevance and contribution of Siddha principles in shaping modern ethical healthcare practices and decision-making frameworks.</p> |                                                                                                                                          |                                     |                                                                      |                                |                                                             |                                       |
| <b>Unit 1 Basic Principles of Siddha Medicine</b> <p>1.1.1 96 <i>Thathuvangal</i> (96 Philosophies)</p> <p>1.1.2 <i>Suvai</i> (Taste)</p> <p>1.1.3 <i>Envagai Thervu</i> (Eightfold clinical methods of examination)</p> <p>1.1.4 <i>Alavai</i> (Logic/Epistemology)</p> <p><b>References:</b> 1,2,3,4,5,6,7</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                          |                                     |                                                                      |                                |                                                             |                                       |
| 3A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3B                                                                                                                                       | 3C                                  | 3D                                                                   | 3E                             | 3F                                                          | 3G                                    |

|                 |                                                                                                                                                                                  |   |                           |         |           |            |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|------------|
| CO1,CO5,CO7,CO8 | Discuss the concept of <i>Alavai</i> in Siddha medicine and its application in logical reasoning and diagnostic processes                                                        | 2 | Lecture                   | CC      | Knows-how | TUT,L&GD   |
| CO1,CO5,CO7,CO8 | Demonstrate the application of <i>Envagai Thervu</i> (Eightfold clinical methods of examination) in diagnosing and understanding health conditions through practical scenarios.  | 3 | Practical Training 1.1    | PSY-GUD | Shows-how | D,PT,D-BED |
| CO1,CO5,CO7,CO8 | Identify the six types of <i>Suvai</i> (tastes) and analyze their physiological roles and evaluate their therapeutic applications within the framework of Siddha medicine.       | 3 | Experiential-Learning 1.1 | PSY-GUD | Shows-how | CBL,DIS    |
| CO1,CO5,CO7,CO8 | Demonstrate an understanding of the 96 <i>Thathuvangal</i> through practical application in diagnosing and interpreting Siddha philosophical principles in case-based scenarios. | 6 | Practical Training 1.2    | PSY-GUD | Shows-how | D-BED,PT   |

## Unit 2 Maruthuvar Ilakanam (Doctrine of physician)

- 1.2.1 *Maruthuvanin Veru Peyarkalum Vilakkamum* (Names and Definition of Maruthuvan) and *Maruthuvan Ariya Vendiya Noolkal* (The Medical Works for Study)
- 1.2.2 *Maruthuvan Iyal* (Special Characteristics of Medical Practitioners) and *Maruthuvan Ozhukkam* (The Good Traits of the Doctors) and *Maruthuvan Udai* (Suitable Dress for the Physician)
- 1.2.3 *Noyaliyin Vinai Neenga Maruthuvan Seyya Vendiya Vinaiyozhi Muraikal* (Methods for removing the karma of the Patient)
- 1.2.4 *Maraiyor Maruthuvar Comparison* and *Maruthuvan Ariya Venduvana* (The Things to be Known to a Physician)
- 1.2.5 *Vaithiyan Aaga thagaathavargal* (Person unfit to be a Physician), *Payanatra Maruthuvan Panbu* (The Nature of Useless Medical Men and the Quacks), and *Theeya Maruthuvar Iyalbu* (The Medical Science should not be taught to Deceit Persons)
- 1.2.6 *Vathiyarkatku Thevai* (Alchemy and Medical Practice)

## References: 2,3

| 3A              | 3B                                                                                                                                                                                                                                                                                                                                                                              | 3C | 3D                        | 3E  | 3F        | 3G     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|-----|-----------|--------|
| CO1,CO5,CO7,CO8 | Conduct brainstorming and experiential activities to explore the foundational attributes and roles of a Siddha physician ( <i>Maruthuvan</i> ), including their names, definitions, and essential texts ( <i>Maruthuvan Ariya Vendiya Noolkal</i> ). Demonstrate core competencies, perform diagnostic and therapeutic methods, and practice ethical, holistic healthcare based | 1  | Experiential-Learning 1.2 | CAP | Shows-how | RLE,FC |

|                 |                                                                                                                                                                                                                                                                                                               |   |                           |         |           |          |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|----------|
|                 | on Siddha principles.                                                                                                                                                                                                                                                                                         |   |                           |         |           |          |
| CO1,CO5,CO7,CO8 | Outline the essential characteristics, ethical traits, and attire of a Siddha physician, as described in <i>Maruthuvan Iyal</i> , <i>Maruthuvan Ozhukkam</i> , and <i>Maruthuvan Udai</i> , through brainstorming, field visits, and real-life experiential learning.                                         | 1 | Experiential-Learning 1.3 | CS      | Shows-how | FV,RLE   |
| CO1,CO5,CO7,CO8 | Describe the methods outlined in Siddha principles for removing the <i>karma</i> of the patient ( <i>Noyaliyin Vinai Nenga Maruthuvan Seyya Vendiya Vinaiyozhi Muraikal</i> ) and their relevance in holistic healing.                                                                                        | 1 | Lecture                   | CC      | Knows-how | L&GD,TUT |
| CO1,CO5,CO7,CO8 | Demonstrate the roles and responsibilities of <i>Maraiyor (Pandit)</i> and <i>Maruthuvar</i> (Physician) in Siddha medicine and Identify the essential knowledge and skills required for a physician in Siddha practices.                                                                                     | 1 | Experiential-Learning 1.4 | CAP     | Shows-how | DIS,RLE  |
| CO1,CO5,CO7,CO8 | Identify the characteristics of individuals deemed unfit to be physicians in Siddha medicine, Analyze the traits of ineffective medical practitioners and quacks and Discuss ethical considerations related to teaching medical science and the consequences of imparting knowledge to deceitful individuals. | 1 | Experiential-Learning 1.5 | PSY-GUD | Shows-how | RP,RLE   |
| CO1,CO5,CO7,CO8 | Demonstrate the significance of alchemy ( <i>Rasavatham</i> ) in Siddha medicine and evaluate its integration with therapeutic practices; demonstrate the role of a physician in applying alchemical techniques for effective clinical use.                                                                   | 1 | Experiential-Learning 1.6 | CAP     | Shows-how | TUT,RLE  |

### Unit 3 National Commission for Indian System of Medicine (Ethics and Registration) Regulations 2023.

- 1.3.1 Ethical standards in Siddha medical practice as per the National Commission guidelines
- 1.3.2 Roles and Responsibilities of Siddha Practitioners under Ethical Guidelines
- 1.3.3 Ethical practices in Siddha medicine

**References: 8**

|           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>3A</b> | <b>3B</b> | <b>3C</b> | <b>3D</b> | <b>3E</b> | <b>3F</b> | <b>3G</b> |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|

|                 |                                                                                                                                                                                                                                                   |   |                           |     |           |               |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|-----|-----------|---------------|
| CO1,CO5,CO7,CO8 | Describe the ethical standards in Siddha medical practice as per the National Commission guidelines.                                                                                                                                              | 1 | Lecture                   | CC  | Knows-how | L&GD,L, L&PPT |
| CO1,CO5,CO7,CO8 | Outline the ethical responsibilities of Siddha practitioners as per the National Commission for Indian System of Medicine (Ethics and Registration) Regulations 2023, and apply these principles to enhance professional conduct.                 | 1 | Experiential-Learning 1.7 | CS  | Shows-how | RP,DIS        |
| CO1,CO5,CO7,CO8 | Apply ethical principles outlined in the National Commission for Indian System of Medicine (Ethics and Registration) Regulations 2023 to real-life scenarios in Siddha medical practice, ensuring patient safety and professional accountability. | 1 | Experiential-Learning 1.8 | CAP | Shows-how | PER,CBL       |

#### Unit 4 Ethical Guidelines for Biomedical Research on Human Subjects

- 1.4.1 Participant's rights and well-being during biomedical research
- 1.4.2 Ethical research practices in Siddha medicine
- 1.4.3 Scientific validity and accountability in research practices

#### References: 9

| 3A              | 3B                                                                                                                                                                                                             | 3C | 3D                        | 3E      | 3F        | 3G             |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|----------------|
| CO1,CO5,CO7,CO8 | Describe ethical principles and apply regulatory frameworks to evaluate best practices that ensure the protection of participants' rights and well-being in biomedical research.                               | 1  | Lecture                   | CC      | Knows-how | L&GD,L &PPT ,L |
| CO1,CO5,CO7,CO8 | Explore ethical guidelines for biomedical research on human subjects to develop and evaluate research protocols in Siddha medicine, ensuring adherence to participant rights, safety, and scientific validity. | 3  | Experiential-Learning 1.9 | CAP     | Shows-how | RLE,PER, CBL   |
| CO1,CO5,CO7,CO8 | Demonstrate ethical guidelines to ensure scientific validity and accountability in designing biomedical research involving human subjects.                                                                     | 1  | Practical Training 1.3    | PSY-GUD | Shows-how | D,PT           |

#### Practical Training Activity

### **Practical Training 1.1 : *Envagai Thervu* (Eightfold Diagnostic Techniques)**

Total Activity Hours: 3 Hours

#### **ACTIVITY 1: Demonstration (1 Hour)**

The teacher will demonstrate each of the eight diagnostic methods: *Naa* (Tongue), *Niram* (Complexion), *Mozhi* (Speech), *Vizhi* (Eyes), *Sparisam* (Touch/Temperature), *Malam* (Stool), *Moothiram* (Urine), *Naadi* (Pulse). Students will observe the demonstration carefully, noting the technique, interpretation, and correlation with *Vatham*, *Pitham*, and *Kabam*. Each student must individually record the methods observed and their diagnostic significance in their practical logbook as per the teacher's instructions.

#### **ACTIVITY 2: Demonstration Bedside (1 Hour)**

The teacher will provide mock patient case scenarios featuring various signs and symptoms.

In small groups, students will analyze the cases, apply *Envagai Thervu* principles, and determine the dominant three humors (*Mukkutram*) involved.

Each group will present their diagnostic reasoning to the class, and the teacher will guide and validate interpretations.

Individual students must record the diagnostic process and group findings in the logbook or practical record, as per the format instructed by the teacher.

#### **ACTIVITY 3: Practical (1 Hour)**

The teacher will first demonstrate the traditional method of urine examination, focusing on parameters such as color, odor, froth, consistency, and sedimentation pattern.

Students will then perform the urine analysis either individually or in small groups, strictly following the procedure demonstrated by the teacher.

Each student must document their individual observations and interpretations in the practical logbook, clearly linking the findings to *Vatham*, *Pitham*, and *Kabam* assessment.

### **Practical Training 1.2 : 96 *Thathuvangal* in Diagnosis & Therapy**

Total activity hours: 6 hours

#### **ACTIVITY 1: Demonstration Bedside (3 Hours)**

Students are given case studies describing different health conditions. In small groups, students analyze cases to identify how 96 *Thathuvangal* relate to the symptoms. Each group presents their findings, explaining how disturbances in *Thathuvangal* contribute to the disease process.

#### **ACTIVITY 2 : Practical (3 Hours)**

Students participate in role-play exercises where they act as physicians and patients. Each group simulates a patient consultation, identifying *Thathuvangal* imbalances and suggesting appropriate Siddha interventions. The instructor provides feedback on their diagnostic approach and therapeutic recommendations.

### **Practical Training 1.3 : Ethically Sound Siddha Biomedical Research Protocol**

Total activity hours: 1 hour

#### **ACTIVITY 1: Practical (30 Minutes)**

Students analyze real-world case studies on ethical dilemmas in research. Group discussion on best practices and common ethical issues, such as informed consent, data

privacy, and scientific integrity.

#### ACTIVITY 2: Demonstration (30 Minutes)

The teacher presents examples of well-structured Siddha research protocols. Students review and analyze how these protocols adhere to ethical standards and regulatory guidelines.

### Experiential learning Activity

#### Experiential-Learning 1.1 : Six Tastes in Siddha Medicine.

Total activity hours: 3 Hours

##### ACTIVITY 1: Discussion (one and half Hours)

Activity: Group discussion on the impact of each taste on the body's physiological and pathological states. Teacher facilitates an interactive session on: How specific tastes pacify or aggravate Vatham, Pitham, and Kabam. Examples of foods and herbs used for humor balancing in daily diet. Students correlate their personal taste experience (from Hour 1) with its theoretical significance in Siddha medicine.

##### ACTIVITY 2: Case-Based Learning (one and half Hour )

Activity: Teacher presents case scenarios (e.g., a patient with excessive Pitham symptoms like acidity and heat). Students analyze and suggest diet modifications based on Suvai principles.

Small-group discussions on: Dietary recommendations for specific conditions. Selection of medicinal herbs based on taste and humor-balancing properties. Each group presents their findings, and the teacher provides feedback.

#### Experiential-Learning 1.2 : Role of a *Maruthuvan*: Names, Definitions, and Essential Texts

Total Activity Hours: 1 Hour

##### ACTIVITY 1: Flipped classroom (30 Minutes)

Type: Student-led | Mode: Individual | Setting: Home-based preparation

Instructions:

Under the guidance of the teacher, each student shall independently explore designated classical Siddha texts at home. The focus is to:

Identify the definitions and roles of Maruthuvan (Siddha physician).

List and document the essential texts every Maruthuvan should be familiar with.

Reflect on how these texts frame the foundational knowledge of Siddha medical practice.

Each student must document the key points, reflections, and any questions that arise during this exploration in their practical logbook or digital journal, as instructed by the teacher.

##### ACTIVITY 2: Real-life experience(30 Minutes)

Type: Teacher-facilitated experiential activity | Mode: Individual reflection from group interaction

Instructions:

In the classroom, the teacher will facilitate a structured discussion where students share key insights from their self-study. The discussion will be guided to draw relevance between Siddha doctrines and their application in current healthcare practices.

Following the discussion, students will participate in a guest lecture or virtual Q&A session with an experienced Siddha practitioner, arranged by the faculty.

Each student is required to:

Individually reflect on the interaction.

Record observations, practical insights, and key takeaways in their logbook, focusing on the application of Siddha doctrines in real-life clinical settings.

Complete the entry as per the format/instructions provided by the teacher.

**Experiential-Learning 1.3** : The Ideal Siddha Physician: Traits, Ethics, and Attire

Total activity hour: 1 hour

ACTIVITY 1: Field visit (30 Minutes)

Students visit a Siddha OPD. They observe the physician's interaction with patients, dress code, and ethical conduct. They record their observations in a logbook or worksheet.

ACTIVITY 2: Real-Life Experience(30 Minutes)

Objective: Learn from experienced Siddha practitioners.

Activity: Students interact with a senior physician (either in-person or through a short Q&A session). The doctor shares insights on professionalism, ethics, and attire in practice. Students reflect and discuss how they can embody these traits in their future practice.

**Experiential-Learning 1.4** : Siddha Physician: Comparing *Maraiyor* & *Maruthuvar*

Total activity hour: 1 Hour

ACTIVITY 1: Real-Life Observation (30 Minutes)

Objective: Observe the knowledge and skills essential for a Siddha physician.

Activity: Students shadow a Siddha physician (in-person or through video demonstration). They focus on how the physician applies traditional knowledge, interacts with patients, and uses diagnostic skills. Each student notes their observations and reflections.

ACTIVITY 2: Discussion (30 Minutes)

Objective: Consolidate understanding of essential Siddha medical knowledge and skills.

Activity: Teacher leads a guided discussion, helping students connect their observations with traditional expectations of a Siddha physician. Students discuss "What should a Siddha physician know?", covering herbal medicine, diagnostic methods, ethics, and patient care. They summarize their key learnings in a reflection journal.

**Experiential-Learning 1.5** : Ethical vs. Unethical Practices in Siddha Medicine

Total activity hour: 1 Hour

ACTIVITY 1: Role Plays (30 Minutes)

Activity: Students perform short role-plays showcasing good and bad medical practices (e.g., ethical patient care vs. deception). Classmates analyze and discuss the impact of these behaviors.

ACTIVITY 2: Real-Life Experience (30 Minutes)

Activity: Students interact with an experienced Siddha physician (in-person or virtually). They ask about real-life ethical challenges and standards in the profession. Students reflect and record key takeaways in a logbook.

### **Experiential-Learning 1.6 : Alchemy in Siddha Medicine: Importance and Practice**

Total activity hour: 1 Hour

ACTIVITY 1: Tutorial(30 Minutes)

Activity: Teacher presents key Siddha texts mentioning alchemical processes. Students explore specific preparation techniques (e.g., purification, incineration). Group discussion on safety, efficacy, and ethical aspects of these methods.

ACTIVITY 2: Real-Life Experience (30 Minutes)

Activity: Students observe or participate in a demonstration of Siddha preparation using alchemical methods. Teacher or practitioner explains the process, significance, and precautions taken. Students record observations and reflections in a logbook.

### **Experiential-Learning 1.7 : Ethical Responsibilities in Siddha Practice**

Total activity hour: 1 Hour

ACTIVITY 1: Discussion (30 Minutes)

Activity: Teacher presents a hypothetical or real-world ethical dilemma in Siddha practice. Students discuss and propose ethical solutions. Group discussion on consequences of unethical behavior in practice.

ACTIVITY 2: Roleplay (30 Minutes)

Activity: Students act as practitioners, patients, and regulators in roleplay scenarios. Each group enacts ethical challenges and responses in a medical setting. Teacher provides feedback and key takeaways.

### **Experiential-Learning 1.8 : Ethics in Action: Real-Life Applications for Siddha Practitioners**

Total activity hour: 1 Hour

ACTIVITY 1: Case-Based Learning (30 Minutes)

Activity: Teacher presents case studies with ethical dilemmas. Students work in small groups to analyze the cases and discuss possible solutions based on regulatory guidelines. Each group summarizes their findings.

**ACTIVITY 2: Presentations (30 Minutes)**

Activity: Groups present their ethical resolutions to the class. Peers and facilitator provide constructive feedback on solutions. Teacher concludes with key takeaways on ethical decision-making.

**Experiential-Learning 1.9 : Ethical Excellence in Siddha Research Practices**

Total activity hours: 3 hours

**ACTIVITY 1: Case-Based Learning (1 Hour)**

Activity: Teacher presents real or hypothetical case studies involving ethical dilemmas (e.g., informed consent, risk-benefit analysis, data privacy). Students work in groups to analyze cases and discuss the consequences of ethical lapses. Groups propose solutions based on established ethical guidelines. Class discussion follows, consolidating key learning points.

**ACTIVITY 2: Presentations (1 Hour)**

Activity: Each group designs a mock Siddha research protocol, emphasizing ethical compliance (e.g., participant safety, regulatory approval, data protection). Groups present their protocols to peers, explaining key components. Feedback session: Teacher and classmates provide suggestions to improve the ethical aspects of the research designs.

**ACTIVITY 3: Real-Life Experience (1 Hour)**

Activity: Facilitated discussion on the role of ethics committees, regulatory bodies, and traditional knowledge in modern research. If possible, visit a Siddha research center or ethics committee to observe ethical compliance in action. Interaction with professionals to understand challenges and best practices in research ethics. Students document key learnings in their logbooks.

**Modular Assessment**

**Assessment method**

**Hour**

**Modular Assessment Instructions:** Conduct a structured modular assessment. Assessment will be for 25 marks. Maintain a structured marking pattern and use different assessment methods for each module throughout the semester. Keep a record of the structured pattern used for assessment and calculate the modular grade point as per Table 6C.

**CHOOSE ANY OF THE BELOW ASSESSMENT FOR 25 MARKS**

**Structured modular assessment:**

**Section A:** Long Answer Questions (LAQ) – 10 Marks

Number of Questions: 1

Marks Allocation per Question: 10 Marks

**Section B:** Short Answer Questions (SAQ) – 10 Marks

Number of Questions: 5 (Answer all)

Marks Allocation per Question: 2 Marks

2

**Section C: Viva (5 Marks)**

Mode: Oral viva voce conducted individually.

Marks Allocation:

Understanding of concepts – 3 Marks

Application and critical thinking – 2 Marks

Marking and Evaluation

Total: 25 Marks

LAQ: 10 Marks

SAQ: 10 Marks

Viva: 5 Marks

Or

Any practical in converted form can be taken for assessment. (15 Marks)

and

Any experiential learning such as portfolios, reflections, or presentations can be taken as an assessment. (10 Marks)

## Module 2 : Marunthin Ilakkanam (Distinctive of Drug features)

### Module Learning Objectives

(At the end of the module, the students should be able to)

Define and classify the key principles and concepts of Siddha medicine, including the definitions, types, shelf life, and common adulterants in Siddha drugs. Interpret the significance of Anupanam, Thunai Marunthugal, and Dosage in Siddha medicine, and discuss the role of Suthi Seyamai in drug preparation and therapeutic applications.

Conduct and perform practical tests related to Marunthu Sothanaigal (Chenduram, Parpam, and Kattu) and demonstrate the process of assessing Pakkuva Apakkuva Gunam to determine the quality of Siddha medicines.

Describe the characteristics of various Siddha formulations and evaluate their therapeutic efficacy based on traditional principles and modern quality assessment parameters.

Elaborate the ethical importance of maintaining purity in Siddha medicine and prioritize the role of proper drug standardization in ensuring patient safety and efficacy.

### Unit 1 Marunthu Ilakkanam Matrum Marunthu Sothanaigal (Integral aspects of drugs and Testing of drugs based on Siddha Medicine)

2.1.1 *Vilakkam* (Definition) and *Marunthu Vagaigal* (Types)

2.1.2 *Marunthukalin Ayul Kaalam* (Shelf life)

2.1.3 *Marunthu Sothanaigal* (Chenduram, Parpam, & Kattu)

2.1.4 *Pothuvana Marunthalavu* (Standard measurement)

2.1.5 *Marunthin Pakkuva Apakkuva Gunam*

2.1.6 Adulteration in Siddha Drug

**References:** 2,3,7,10,11,12,13,14,15

| 3A | 3B | 3C | 3D | 3E | 3F | 3G |
|----|----|----|----|----|----|----|
|    |    |    |    |    |    |    |

|                         |                                                                                                                                                                                                                                                                          |   |                           |         |           |                  |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|------------------|
| CO1,CO2,CO3<br>,CO5,CO8 | Describe the definitions and classifications of different types of Siddha medicines, including their distinct categories and uses in medical practice.                                                                                                                   | 1 | Lecture                   | CK      | Knows-how | L&GD,DIS,L&PPT,L |
| CO1,CO2,CO3<br>,CO5,CO8 | Discuss the shelf life of various Siddha drugs and differentiate their preservation timelines; evaluate factors influencing stability and recommend suitable storage practices for optimal efficacy.                                                                     | 1 | Lecture                   | CK      | Knows-how | L,L&PPT,L&GD,LS  |
| CO1,CO2,CO3<br>,CO5,CO8 | Demonstrate <i>Chenduram</i> , <i>Parpam</i> , and <i>Kattu</i> testing methods based on Siddha principles, ensuring adherence to traditional guidelines.                                                                                                                | 3 | Practical Training 2.1    | PSY-GUD | Shows-how | PT,D             |
| CO1,CO2,CO3<br>,CO5,CO8 | Demonstrate the application of standard measurements ( <i>Pothuvana Marunthalavu</i> ) in Siddha medicine, ensuring accurate quantification during drug preparation and testing processes.                                                                               | 3 | Experiential-Learning 2.1 | PSY-GUD | Shows-how | PER,DIS          |
| CO1,CO2,CO3<br>,CO5,CO8 | Identify the characteristics of <i>Marunthin Pakkuva matrum Apakkuva Gunam</i> (mature and immature properties of drugs), analyze their influence on therapeutic efficacy, and demonstrate their application in the preparation and clinical use of Siddha formulations. | 3 | Experiential-Learning 2.2 | PSY-GUD | Shows-how | DIS,FC           |
| CO1,CO2,CO3<br>,CO5,CO8 | Identify the adulteration in Siddha drugs by performing practical testing, discussing case studies, and analyzing visual content on drug adulteration.                                                                                                                   | 3 | Practical Training 2.2    | PSY-GUD | Shows-how | PT,D             |

## Unit 2 Marunthunnum Vithigal (Rules of Medication)

2.2.1 *Marunthugalin alavu* (Dosage)

2.2.2 *Anupanam* (Adjuvant)

2.2.3 *Thunai Marunthugal* (Supportive Medicine)

2.2.4 *Marunthuvaikkum Paathiram* (Vessels for Preserving Siddha drugs)

2.2.5 *Marunthoottum Paathiram* (Vessels for feeding Siddha drugs)

2.2.6 *Marunthoottum Kaalam* (Dosing Period)

2.2.7 *Pinikku Marunthalavu* (Dosage for illness)

**References:** 2,3,16

| 3A                  | 3B                                                                                                                                                         | 3C | 3D                        | 3E      | 3F        | 3G          |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|-------------|
| CO1,CO2,CO3,CO5,CO8 | Investigate the principles for determining appropriate dosage in Siddha medicine.                                                                          | 3  | Experiential-Learning 2.3 | CAP     | Shows-how | FC,DIS,LS   |
| CO1,CO2,CO3,CO5,CO8 | Demonstrate the process of selecting and administering appropriate adjuvants ( <i>Anupanam</i> ) in Siddha medicine.                                       | 2  | Practical Training 2.3    | PSY-MEC | Shows-how | D,PT        |
| CO1,CO2,CO3,CO5,CO8 | Demonstrate the application of supportive medicines ( <i>Thunai Marunthugal</i> ) in Siddha practices.                                                     | 2  | Practical Training 2.4    | PSY-MEC | Shows-how | PT,D        |
| CO1,CO2,CO3,CO5,CO8 | Apply the principles of selecting appropriate vessels for preserving Siddha drugs to ensure drug efficacy and longevity.                                   | 2  | Experiential-Learning 2.4 | CAP     | Knows-how | RLE,DIS     |
| CO1,CO2,CO3,CO5,CO8 | Demonstrate the correct selection and use of vessels for administering Siddha medicines, understanding their role in preserving the efficacy of the drugs. | 2  | Experiential-Learning 2.5 | CAP     | Shows-how | PER,DIS     |
| CO1,CO2,CO3,CO5,CO8 | Describe the importance of <i>Marunthoottum Kaalam</i> (Dosing Period)                                                                                     | 1  | Lecture                   | CK      | Knows-how | L&PPT, L&GD |
| CO1,CO2,CO3,CO5,CO8 | Describe the appropriate dosage for specific diseases ( <i>Pinikku Marunthalavu</i> ).                                                                     | 1  | Lecture                   | CK      | Knows-how | L,RLE,FC    |

### Unit 3 Basic concepts of Nanju

- 2.3.1 *Siddhargal marunthaakkum adippadai vithigal* (Basic principles for Preparation of Siddha medicine)
- 2.3.2 *Aga Nanju* and *Pura Nanju* (Inner part poison and Outer part poison)
- 2.3.3 *Nanjukku Matru Nanju* (Alternative poison to poison)
- 2.3.4 *Nanju Ilakkanam, Nanju Vagaigal, Nanju Sothanai* (Characteristics of Poison, Types and, test for poisons)
- 2.3.5 *Nachari Seigai Udaiya Mooligaigal* (Herbal Antidotes)

**References:** 10,17,18,19

| 3A                  | 3B                                                                                                                                                                                                                                          | 3C | 3D                        | 3E      | 3F        | 3G          |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|-------------|
| CO1,CO2,CO3,CO5,CO8 | Demonstrate the foundational principles of Siddha medicine preparation by applying traditional methodologies, understanding detoxification techniques, and analyzing case studies.                                                          | 6  | Practical Training 2.5    | PSY-GUD | Shows-how | DL,D-M,PT   |
| CO1,CO2,CO3,CO5,CO8 | Demonstrate the identification, classification, and purification of <i>Aga Nanju</i> (Inner part poison) and <i>Pura Nanju</i> (Outer part poison) in Siddha medicine through practical applications.                                       | 5  | Experiential-Learning 2.6 | PSY-GUD | Shows-how | CBL,JC,DIS  |
| CO1,CO2,CO3,CO5,CO8 | Describe the concept and significance of <i>Nanjukku Matru Nanju</i> (alternative to poison) in Siddha medicine                                                                                                                             | 1  | Lecture                   | CC      | Knows-how | L&GD,L      |
| CO1,CO2,CO3,CO5,CO8 | Define the core concepts of <i>Nanju Ilakkanam</i> (characteristics of poison), classify the <i>Nanju Vagaigal</i> (types of poisons), and demonstrate appropriate <i>Nanju Sothanai</i> (tests for poisons) relevant to Siddha toxicology. | 2  | Lecture                   | CC      | Knows-how | L&PPT, L&GD |
| CO1,CO2,CO3,CO5,CO8 | Identify <i>Nachari Seigai Udaiya Mooligaigal</i> (herbal antidotes), showing practical skills in effectively recognizing and utilizing these herbs.                                                                                        | 2  | Practical Training 2.6    | PSY-GUD | Shows-how | PT,D        |

#### Unit 4 Complications of Mei Suddhi (Cleansing therapy)

- 2.4.1 *Bedhi Maruthuvam* (Consequences of Purgation therapy)
- 2.4.2 *Vaanthi Maruthuvam* (Consequences of Vomiting therapy)
- 2.4.3 *Nasiyam* therapy (Consequences of Nasal Application therapy)
- 2.4.4 *Ennai Kuliya* (Consequences of Oil Bath therapy)

**References:** 2,3

| 3A                  | 3B                                                                                                                                                                          | 3C | 3D                        | 3E      | 3F        | 3G           |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|--------------|
| CO1,CO2,CO3,CO5,CO8 | Identify the complications arising from <i>Bedhi Maruthuvam</i> (Purgation therapy), demonstrating an understanding of the emotional and ethical considerations involved in | 3  | Experiential-Learning 2.7 | PSY-GUD | Shows-how | CBL,DIS, RLE |

|                         |                                                                                                                                                                                                        |   |                           |         |           |             |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|-------------|
|                         | patient care                                                                                                                                                                                           |   |                           |         |           |             |
| CO1,CO2,CO3<br>,CO5,CO8 | Identify the complications of <i>Vaanthi Maruthuvam</i> (Vomiting therapy) by analyzing case studies, discussing preventive and corrective measures, and reflecting on real-life clinical experiences. | 3 | Experiential-Learning 2.8 | PSY-GUD | Shows-how | RLE,CBL,DIS |
| CO1,CO2,CO3<br>,CO5,CO8 | Identify and manage the complications of <i>Nasiyam</i> (Nasal Application) therapy by analyzing case studies, discussing preventive measures, and reflecting on real-life clinical experiences.       | 2 | Experiential-Learning 2.9 | PSY-GUD | Shows-how | CBL,DIS     |
| CO1,CO2,CO3<br>,CO5,CO8 | Elaborate on the step-by-step process of <i>Ennai Kuliya</i> (oil bath therapy), analyze its therapeutic benefits, and identify potential complications associated with improper practice.             | 1 | Lecture                   | CC      | Knows-how | L&PPT, L&GD |

#### Unit 5 Siddhi Seiyaamai Matrum Sarivara Mudiyaatha Marunthugalin Kaedugal (Consequences of Unpurified and Unfinished Siddha Medicine)

2.5.1 *Siddhi Seiyaatha Marunthugalin Kaedugal* (Dangers of non-purification in drug preparation)

2.5.2 *Sarivara Mudiyaatha Marunthugalin Kaedugal* (Dangers of improperly prepared drugs)

**References:** 10,16,20

| 3A                      | 3B                                                                                                                                                                                                                                            | 3C | 3D                     | 3E      | 3F        | 3G         |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------------|---------|-----------|------------|
| CO1,CO2,CO3<br>,CO5,CO8 | Discuss the adverse effects of using non-purified drugs in Siddha medicine, analyze classical references to support these observations, and evaluate the importance of adopting proper purification methods for safe therapeutic application. | 2  | Lecture                | CC      | Knows-how | L&GD,L&PPT |
| CO1,CO2,CO3<br>,CO5,CO8 | Demonstrate the dangers associated with improperly prepared drugs, showing practical skills in recognizing and addressing these issues effectively.                                                                                           | 2  | Practical Training 2.7 | PSY-GUD | Shows-how | PT,D       |

#### Practical Training Activity

**Practical Training 2.1** : Siddha Drug Testing: *Chenduram*, *Parpam*, and *Kattu*.

Total activity hours: 3 Hours

ACTIVITY 1: Demonstration (1 Hour)

The teacher demonstrates step-by-step drug testing methods for *Chenduram*, *Parpam*, and *Kattu*. Students observe key parameters such as appearance, texture, solubility, and reaction to standard tests.

ACTIVITY 2: Practical (2 Hours)

Students, in small groups, conduct visual, physical, and chemical tests on the drugs. Record observations on color, texture, solubility, and reaction with specific reagents.

Each group presents its findings, comparing results across different samples. The teacher facilitates a discussion on quality indicators, potency, and standardization techniques.

### **Practical Training 2.2 : Adulteration in Siddha Drugs**

Total activity hours: 3 Hours

ACTIVITY 1: Demonstration (1 Hour)

The teacher demonstrates testing techniques for detecting adulteration. Students observe and compare physical properties (color, texture, solubility) and chemical reactions of pure vs. adulterated samples.

ACTIVITY 2: Practical (2 Hours)

In small groups, students perform adulteration tests on provided drug samples. Record observations on differences in purity indicators and discuss potential contaminants.

Group discussion on the effects of adulteration on drug efficacy and safety. Instructor-led lecture on common adulteration methods and preventive measures. Video clips showcase real-world testing and quality control processes.

### **Practical Training 2.3 : Adjuvants in Siddha Medicine**

Total activity hours: 2 Hours

ACTIVITY 1: Demonstration (1 Hour)

The teacher demonstrates the preparation and use of adjuvants like honey, milk, ghee, and herbal juices. Students observe and participate in the preparation process under supervision.

ACTIVITY 2: Practical (1 Hour)

Case-Based Learning: Analyze patient case studies and identify the most suitable adjuvant based on disease, drug, and patient-specific factors.

Discussion Session: Explore the rationale behind choosing adjuvants, focusing on their role in enhancing efficacy, bioavailability, and compatibility with Siddha medicines.

### **Practical Training 2.4 : Role of supportive medicines (*Thunai Marunthugal*) in Siddha practice**

Total activity hours: 2 Hours

ACTIVITY 1: Demonstration (1 Hour)

The Teacher demonstrates the preparation of selected *Thunai Marunthugal*. Students participate in hands-on preparation and observe their incorporation into treatment protocols.

**ACTIVITY 2: Practical (1 Hour)**

Case Study Analysis: Review real or hypothetical cases where supportive medicines are used, discussing their efficacy and mode of action.

Group Discussion: Explore the therapeutic role of *Thunai Marunthugal*, referencing classical Siddha texts and modern perspectives.

**Practical Training 2.5 : Principles and Practices in Siddha Medicine Preparation**

Total activity hours: 6 Hours

**ACTIVITY 1: Demonstration on Model (2 Hours)**

The instructor will demonstrate the step-by-step preparation of Siddha higher-order medicines.

Focus on purification (Suddhi) techniques for raw materials such as minerals and metals, and demonstrate the higher-order medicine preparation using herbs only. Students will observe and document key steps, including ingredient selection and processing methods.

**ACTIVITY 2: Practical (2 Hours)**

Students will actively participate in preparing a basic Siddha formulation under supervision. Application of *Thiravaga Pirayogam* (use of acids) and *Seyaneer Pirayogam* (use of special liquid mediums).

Emphasis on correct sequencing and standardization in the preparation process. Students will record their observations and findings.

**ACTIVITY 3: Demonstration Lab (2 Hour)**

Students will analyze real-life case studies of successful and unsuccessful medicine preparations. Discussion on the role of *Maarana Pirayogam* (use of transformative/killing substances) and *Muppu Chunnam Pirayogam* (use of universal salt-based processes).

Group discussion on common mistakes, corrective measures, and the significance of each preparation step.

**Practical Training 2.6 : Nachari Seigai Udaiya Mooligaigal (Herbal Antidotes)**

Total activity hours: 2 Hours

**ACTIVITY 1: Practical (1 Hour)**

The Teacher will demonstrate the identification of key herbal antidotes, explaining their distinctive features and antidotal effects. Students will observe and take notes on the characteristics, preparation, and uses of each herb.

Spotter Identification Activity: Herbal antidotes will be placed at different stations, and students will rotate through them, identifying the herbs and recording their antidotal properties.

**ACTIVITY 2: Demonstration (1 Hour)**

Students will share their experiences, discuss challenges faced in identification, and clarify doubts.

Application in real-life scenarios: Discussion on how these antidotal herbs can be used in practical toxicology and emergency treatment.

### **Practical Training 2.7 : Dangers Associated with Improperly Prepared Drugs**

Total activity hours: 2 Hours

ACTIVITY 1: Practical (1 Hour)

The Teacher will present real-life cases involving complications from improperly prepared drugs.

Students will work in groups to analyze the cases, identify the risks, and discuss appropriate preventive measures.

ACTIVITY 2: Demonstration (1 Hour)

Each group will present their findings and solutions to the class. The Teacher will provide feedback, emphasizing key points in safe drug preparation.

A guest healthcare professional will share real-life experiences and challenges related to improper drug preparation. Students will engage in a Q&A session to gain deeper insights from the expert.

### **Experiential learning Activity**

#### **Experiential-Learning 2.1 : Standard Measurement Techniques in Medicinal Components**

Total activity hours: 3 Hours

ACTIVITY 1: Presentation(one and half Hour)

Students will measure ingredients for a specific formulation using traditional methods.

Focus on ensuring consistency with standard Siddha guidelines.

ACTIVITY 2: Discussion (One and half Hour)

Students will discuss the importance of accurate measurements in maintaining drug efficacy and safety.

The Teacher will facilitate a session linking theoretical principles to practical application in Siddha medicine.

#### **Experiential-Learning 2.2 : Drug Maturity (*Pakkuva matrum Abakkuva Gunam*) in Siddha Medicine**

Total activity hours: 3 Hours

ACTIVITY 1: Flipped Classroom (1 Hour)

Students will review pre-assigned classical Siddha texts and modern references on drug maturity (*Pakkuva*) and immaturity (*Apakkuva*).

Focus on key attributes affecting drug properties, such as potency, stability, and efficacy.

ACTIVITY 2: Discussion (2 Hour)

Compare traditional Siddha views on drug maturity with modern scientific insights.

Discuss how both perspectives contribute to ensuring drug effectiveness and safety.

#### **Experiential-Learning 2.3 : Mastering Siddha Dosage Principles**

Total activity hours: 3 Hours

ACTIVITY 1: Flipped Classroom (1 Hour)

Students will review pre-assigned classical Siddha texts on dosage principles.

Focus on dosage variations based on: Patient factors (age, constitution, condition), Seasonal variations, Forms of medicine

Provide guiding questions to help students analyze dosage adjustments.

ACTIVITY 2: Discussion (1 Hour)

Facilitate a group discussion on key factors influencing dosage. Analyze case scenarios to determine appropriate dosages for different conditions.

Students will explore classical texts in the library, documenting unique dosage recommendations.

ACTIVITY 3: Library Session (1 Hour)

Conduct peer review to ensure accuracy and understanding of dosage calculations.

#### **Experiential-Learning 2.4 : Choosing the right Vessel for Siddha Medicine Preservation**

Total activity hours: 2 Hours

ACTIVITY 1: Discussion (1 Hour)

Demonstration Session: Observe and participate in the use of traditional and modern vessels for medicine preservation. Understand the advantages and limitations of different vessel types (e.g., clay, glass, metal).

Group Discussion: Analyze vessel selection based on classical Siddha texts and modern storage guidelines.

ACTIVITY 2: Real-Life Experience (1 Hour)

Visit a Siddha pharmacy or manufacturing unit to observe real-world drug preservation practices. Compare traditional vs. modern preservation techniques.

Reflect on key takeaways and discuss improvements for ensuring medicine stability and efficacy.

#### **Experiential-Learning 2.5 : Vessels for Administering Siddha Medicines**

Total activity hours: 2 Hours

ACTIVITY 1: Discussion (1 Hour)

Demonstration: The Teacher showcases different vessels (e.g., clay, brass, stone, glass) used in administering Siddha medicines. Explanation of material composition, compatibility, and traditional significance of each vessel.

Group Discussion: Students discuss why certain vessels are chosen based on medicine type, temperature sensitivity, and therapeutic effects.

ACTIVITY 2: Presentation (1 Hour)

Group Activity: Each group selects the appropriate vessel for a given Siddha medicine.

Presentation: Groups justify their selection, linking it to drug properties, administration methods, and traditional principles.

Instructor Feedback: Guidance on best practices for selecting vessels to ensure medicine efficacy and safety

**Experiential-Learning 2.6** : *Aga Nanju* (Inner part poison) and *Pura Nanju* (Outer part poison).

Total activity hours: 5 Hours

ACTIVITY 1: Case-Based Learning (2 Hour)

Students analyze poisoning case studies, identifying symptoms, diagnosis methods, and treatments.

Group discussion on managing cases using traditional antidotes and detoxification techniques.

ACTIVITY 2: Discussion (2 Hours)

Discussion of various toxic substances and their properties, sources, and effects. Classification of substances into *Aga Nanju* and *Pura Nanju* categories.

Suggesting purification methods based on Siddha detoxification techniques.

ACTIVITY 3: Journal club (1 Hour)

Students document their learnings, including key characteristics, symptoms, and management of *Aga Nanju* & *Pura Nanju*.

Compiled information serves as a future reference for Siddha toxicology practice.

**Experiential-Learning 2.7** : Complications of Purgation Therapies in Siddha Medicine

Total activity hours: 3 Hours

ACTIVITY 1: Case-Based Learning (1 Hour)

The teacher presents real-life cases of complications from *Bedhi Maruthuvam*.

Students work in groups to analyze cases, identify complications, and discuss appropriate treatments.

ACTIVITY 2: Discussion (1 Hour)

Each group presents their findings and proposed solutions to the class.

The Teacher provides feedback and highlights key points, including ethical considerations in managing complications.

ACTIVITY 3: Real-Life Experience (1 Hour)

A Siddha healthcare professional shares practical experiences and challenges in cleansing and purgation therapies.

Students engage in a Q&A session to gain insights into real-world practice.

**Experiential-Learning 2.8** : Complications of Vomiting Therapy in Siddha Medicine

Total activity hours: 3 Hours

ACTIVITY 1: Case-Based learning (1 Hour)

The Teacher will present real-life case studies of complications arising from *Vaanthi* therapy.

Students will work in groups to analyze each case, identify potential causes of complications, and discuss suitable management strategies based on Siddha principles.

ACTIVITY 2: Discussion (1 Hour)

| <p>Each group will present their findings, including identified complications, possible causes, and corrective measures.<br/>The Teacher will provide expert feedback, emphasizing best practices, preventive measures, and ethical considerations in vomiting therapy.</p> <p><b>ACTIVITY 3: Real life experience (1 Hour)</b><br/>A Siddha healthcare practitioner will share real-world experiences, discussing challenges encountered during <i>Vaanthi</i> therapy.<br/>Students will have the opportunity to ask questions, clarify doubts, and gain deeper insights into handling complications effectively.</p>                                                                                                                                                                                                                                                                                                 |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <p><b>Experiential-Learning 2.9 : Complications of <i>Nasiyam</i> Therapy</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |
| <p>Total activity hours: 2 Hours</p> <p><b>ACTIVITY 1: Case-Based learning (1 Hour)</b><br/>The Teacher will present real-life case studies highlighting complications from <i>Nasiyam</i> therapy. Students will work in small groups to analyze the cases, identify potential causes, and discuss appropriate corrective measures.<br/>Each group will present their findings, focusing on preventive strategies and management approaches.</p> <p><b>ACTIVITY 2: Discussion (1 Hour)</b><br/>A Siddha healthcare professional will share practical experiences related to <i>Nasiyam therapy</i> complications.<br/>Students will engage in an interactive Q&amp;A session to clarify doubts and gain deeper insights into real-world challenges and solutions.</p>                                                                                                                                                  |      |
| <p><b>Modular Assessment</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |
| Assessment method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Hour |
| <p><b>Modular Assessment Instructions:</b> Conduct a structured modular assessment. Assessment will be for 50 marks. Maintain a structured marking pattern and use different assessment methods for each module throughout the semester. Keep a record of the structured pattern used for assessment and calculate the modular grade point as per Table 6C.</p> <p><b>CHOOSE ANY OF THE BELOW ASSESSMENT FOR 50 MARKS</b></p> <p><b>Structured modular assessment:</b><br/>Total Marks – 50 (25+10+5+5+5)<br/>Short Essays: 5 questions × 5 marks each = 25 Marks<br/>Practical Spotters: 10 Marks<br/>Identification of Adulteration: 5 Marks<br/>Marunthu Sothanaigal (Parpam, Chenduram, and Chunnam): 5 Marks<br/>Case Study (Cleaning therapy complications and adverse effects of unpurified/incomplete products): 5 Marks<br/>or<br/>Any practical in converted form can be taken for assessment. (25 Marks)</p> | 4    |

and

Any experiential learning such as portfolios, reflections, or presentations can be taken as an assessment. (25 Marks)

## Module 3 : Fundamentals of Unavu Matrum Unavu Nanju (Food and Food Poison)

### Module Learning Objectives

(At the end of the module, the students should be able to)

- Define the principles of diet in Siddha medicine, including suitable and unsuitable foods, food combinations, and the effects of inappropriate dietary practices.
- Interpret the significance of food adulteration, food-drug interactions, and food safety based on Siddha medical principles.
- Perform and demonstrate practical assessments of food adulteration, evaluate food-drug interactions, and analyze food safety in accordance with Siddha dietary practices.
- Differentiate and classify the toxic effects of foods due to vessel interactions (*Paathira Baetham*) and compare the dietary restrictions of *Pathiyam* (prescribed diet) and *Apathiyam* (prohibited diet) in Siddha formulations.
- Illustrate the importance of adhering to Siddha dietary guidelines for maintaining health and justify the role of dietary practices in disease prevention and treatment.

### Unit 1 Unavu Ilakkanam (Food)

- 3.1.1 *Unavu Ilakkanam* (Suitable food for Eating) and *Unavin Alavu* (Quantum of food)
- 3.1.2 *Kollaththakka Unavu* (Unsuitable diet and its adverse effects)
- 3.1.3 *Serimaana Kaala Alavu* (Duration for the Digestion of Different Food Stuff)
- 3.1.4 *Migu matrum Kurai Unvain Paathippu* (Effect of under feeding and over feeding)

References: 2,3,21

| 3A          | 3B                                                                                                                                                                                | 3C | 3D                        | 3E  | 3F        | 3G          |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|-----|-----------|-------------|
| CO1,CO2,CO8 | Describe the Suitable food for Eating based on Siddha principles and Explain the appropriate Quantum of food for maintaining good health.                                         | 1  | Lecture                   | CK  | Knows-how | L&PPT ,L&GD |
| CO1,CO2,CO8 | Examine the impact of unsuitable dietary ( <i>Kollaththagatha Unavu</i> ) choices on health and demonstrate the identification of adverse effects through case-based discussions. | 1  | Experiential-Learning 3.1 | CAP | Shows-how | CBL         |

|             |                                                                                                                                                          |   |                           |         |           |     |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|-----|
| CO1,CO2,CO8 | Identify the digestion timelines of various food groups and evaluate their implications on metabolic health, dietary planning, and nutrient assimilation | 1 | Experiential-Learning 3.2 | PSY-GUD | Shows-how | DIS |
| CO1,CO2,CO8 | Investigate the adverse effects of underfeeding and overfeeding, and demonstrate how these dietary imbalances impact health and well-being.              | 1 | Experiential-Learning 3.3 | CAP     | Shows-how | PL  |

## Unit 2 Unavu Nanju (Food Poison)

- 3.2.1 *Paathira Baetham* (Toxicity of food substances due to vessels)
- 3.2.2 *Unavu – Marunthu Thodarbu* (Food - Drug interaction according to Siddha)
- 3.2.3 *Unavu – Unavu Thodarbu* (Food – Food interaction according to Siddha)
- 3.2.4 *Unavin Maarupatta saerkaaiyaal erpadum nanju* (Different combinations of food)
- 3.2.5 Drug - Drug interaction according to Siddha
- 3.2.6 *Karappan Patharthangal* (Eczema-causing foods)

**References:** 2,3,21

| 3A          | 3B                                                                                                                                                                             | 3C | 3D                        | 3E      | 3F        | 3G          |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|-------------|
| CO1,CO2,CO8 | Describe the effects of various cooking and storage vessels on food toxicity as per Siddha principles, and critically appraise their safety and suitability in daily practice. | 1  | Lecture                   | CK      | Knows-how | L&GD,L &PPT |
| CO1,CO2,CO8 | Investigate the interactions between food and Siddha medicines, identifying their synergistic and antagonistic effects.                                                        | 1  | Experiential-Learning 3.4 | CAP     | Shows-how | LS,CBL      |
| CO1,CO2,CO8 | Apply the knowledge of food incompatibilities in Siddha medicine by identifying harmful food combinations and their toxic effects.                                             | 1  | Experiential-Learning 3.5 | CAP     | Shows-how | CBL,PL      |
| CO1,CO2,CO8 | Demonstrate the concept of drug-drug interactions in Siddha medicine to adapt safe prescribing practices.                                                                      | 1  | Practical Training 3.1    | PSY-GUD | Shows-how | PT,D        |
| CO1,CO2,CO8 | Identify and analyze eczema-causing foods in Siddha medicine.                                                                                                                  | 1  | Practical Training 3.2    | PSY-GUD | Shows-how | PT,D-BED    |

|             |                                                                                                                             |   |         |    |           |      |
|-------------|-----------------------------------------------------------------------------------------------------------------------------|---|---------|----|-----------|------|
| CO1,CO2,CO8 | Discuss the interactions between different food substances based on Siddha principles and evaluate their effects on health. | 1 | Lecture | CC | Knows-how | L&GD |
|-------------|-----------------------------------------------------------------------------------------------------------------------------|---|---------|----|-----------|------|

### Unit 3 Unavu Kalappadam Matrum Serivootigal (Food Adulteration and Additives)

3.3.1 *Unavu kalappadathin varaiyaraigal matrum vagaigal* (Definitions and Types of Food Adulteration)

3.3.2 *Unavuk kalappadap pagupaaivu* (Analysis of Food Adulteration)

3.3.3 *Unavu Serivootigalin varaiyaraigal matrum vagaigal* (Definitions and Types of Food Additives)

3.3.4 *Unavu Serivootigalin pagupaaivul* (Analysis of Food Additives)

**References:** 22,23,24,27

| 3A          | 3B                                                                                                                                                                | 3C | 3D                        | 3E      | 3F        | 3G               |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|------------------|
| CO1,CO2,CO8 | Describe the types of food adulteration from Siddha and modern perspectives, and critically evaluate their physiological and pathological impacts on health.      | 1  | Lecture                   | CK      | Knows-how | L&GD,L,<br>L&PPT |
| CO1,CO2,CO8 | Identify the food adulterants using standard tests and practical techniques, and discuss their health implications.                                               | 4  | Practical Training 3.3    | PSY-GUD | Shows-how | D,PT,DL          |
| CO1,CO2,CO8 | Apply the knowledge on the types and functions of food additives, and critically assess their influence on human health and the overall quality of food products. | 3  | Experiential-Learning 3.6 | CAP     | Shows-how | LS,RLE           |
| CO1,CO2,CO8 | Demonstrate the identification and analysis of food additives through practical methods and evaluate their effects on food safety.                                | 4  | Practical Training 3.4    | PSY-GUD | Shows-how | PT,DL,D          |

### Unit 4 Pathiyam Matrum Apathiyam Ilakkanam (Basics of Pathiyam and Apathiyam)

3.4.1 *Pathiyam, Pathiya Pathaarthagal* (Pathiyam and Food substances for Pathiyam)

3.4.2 *Apathiyam, Apathiya Pathaarthangal* (Apathiyam and Food substances for Apathiyam)

3.4.3 *Ichapathiyam*, Suitable food Substances during *Ichapathyam*

3.4.4 *Pathiyam* - For some Siddha preparations - *Rasam Serntha Marunthugal*, *Parangippattai*, and *Serankottai Serntha marunthugal*, *Aya chenduram*, *Gantha chenduram*, and *Thamira parpam*

**References:** 2,3,21

| 3A          | 3B                                                                                                                                                                                                                                                                                                                                                  | 3C | 3D                        | 3E      | 3F        | 3G      |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|---------|
| CO1,CO2,CO8 | Describe the concept of <i>Pathiyam</i> within Siddha medicine, and systematically distinguish the recommended dietary substances for health maintenance and disease management.                                                                                                                                                                    | 1  | Lecture                   | CK      | Knows-how | L&GD    |
| CO1,CO2,CO8 | Demonstrate the concept of <i>Apathiyam</i> (restricted diet) in Siddha medicine and identify food substances that should be avoided for specific health conditions.                                                                                                                                                                                | 1  | Experiential-Learning 3.7 | PSY-GUD | Shows-how | DIS,CBL |
| CO1,CO2,CO8 | Explore the concept of <i>Ichapathiyam</i> in Siddha medicine, and differentiate the appropriate food substances permitted during its observance to support therapeutic goals.                                                                                                                                                                      | 2  | Experiential-Learning 3.8 | CAP     | Shows-how | DIS,CBL |
| CO1,CO2,CO8 | Investigate the dietary restrictions ( <i>Pathiyam</i> ) required for specific Siddha medicinal preparations such as <i>Rasam Serntha Marunthugal</i> , <i>Parangipattai</i> , <i>Serankottai Serntha Marunthugal</i> , <i>Aya Chenduram</i> , <i>Gantha Chenduram</i> , and <i>Thamira Parpam</i> , and apply this knowledge in clinical practice. | 2  | Experiential-Learning 3.9 | CAP     | Shows-how | DIS,CBL |

### Practical Training Activity

#### Practical Training 3.1 : Drug - Drug interactions according to Siddha

Total activity hours: 1 Hour

ACTIVITY 1: Demonstration (30 Minutes)

The Teacher will demonstrate potential drug interactions in Siddha medicine. Explain how certain combinations may alter efficacy or cause adverse effects.

Students will observe, take notes, and discuss key findings.

ACTIVITY 2: Practical (30 Minutes)

Students will replicate the demonstration in small groups or individually.

Identify and record observations in their practical logbook.

#### Practical Training 3.2 : Understanding Food Triggers for Eczema in Siddha Medicine

Total activity hours: 1 Hours

ACTIVITY 1: Demonstration Bedside (30 Minutes)

The Teacher will present real-life patient case studies of eczema.

Students will analyze dietary habits and identify potential food triggers.

ACTIVITY 2: Practical (30 Minutes)

Students will list common eczema-triggering foods based on Siddha principles.

Suggest suitable dietary modifications and document their recommendations in their logbook.

### **Practical Training 3.3 : Detection of the Food Adulterants**

Total activity hours: 4 Hours

ACTIVITY 1: Demonstration Lab (1 Hour)

The teacher will demonstrate simple techniques to detect food adulteration (e.g., iodine test for starch, water test for milk adulteration, etc.).

Students will observe and take notes on different adulteration detection methods.

ACTIVITY 2: Practical (2 Hours)

Students will test various food samples (milk, spices, oils, grains, etc.) to detect adulterants.

Record observations and results in their logbook.

ACTIVITY 3: Demonstration (1 Hour)

Group discussion on the impact of adulterants on health, referencing Siddha dietary principles.

Student presentations summarizing their findings and insights from the practical session.

### **Practical Training 3.4 : Investigating the Food Additives**

Total activity hours: 4 Hours

ACTIVITY 1: Demonstration Lab (1 Hour)

The Teacher will demonstrate simple tests for detecting preservatives, artificial colors, and flavor enhancers in food samples.

Students will observe and take notes on test methods and expected results.

ACTIVITY 2 : Practical (2 Hours)

Students will perform qualitative tests on different food samples to identify additives.

Record observations and compare results with food safety standards.

ACTIVITY 3: Demonstration (1 Hour)

Group discussion on the health effects of food additives and their role in food quality.

Student presentations linking findings to Siddha dietary guidelines.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Experiential learning Activity</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Experiential-Learning 3.1</b> : Case-Based Learning on Adverse Effects of Unsuitable Diet ( <i>Kollaththagatha Unavu</i> )                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>Total activity hour: 1 Hour</p> <p>ACTIVITY 1: Case-Based Learning : (1 Hour)</p> <p>Students will work in small groups to analyze the cases, identify dietary issues, and discuss their health consequences. Each group will present their findings and dietary recommendations to the class.</p> <p>The teacher will provide feedback, emphasizing the importance of balanced nutrition and the risks of poor dietary choices.</p>                                                                                                                                                   |
| <b>Experiential-Learning 3.2</b> : Digestion times of Various Foods                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>Total activity hour: 1 Hour</p> <p>ACTIVITY 1: Discussion (1 Hour)</p> <p>Students will discuss how digestion times impact health, energy levels, and well-being. Each group will analyze case studies related to dietary habits and their effects on digestion.</p> <p>Groups will share their insights, and the instructor will summarize key takeaways.</p>                                                                                                                                                                                                                         |
| <b>Experiential-Learning 3.3</b> : Effects of Underfeeding and Overfeeding                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p>Total activity hour: 1 Hour</p> <p>ACTIVITY 1: Peer learning (1 Hour)</p> <p>Each student will analyze a case study related to underfeeding or overfeeding. They will identify dietary issues, health consequences, and suggest possible solutions.</p> <p>Students will document their observations in their logbooks as per the Teacher's guidance</p>                                                                                                                                                                                                                               |
| <b>Experiential-Learning 3.4</b> : Food-Drug Interactions in Siddha Medicine                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p>Total activity hour: 1 Hour</p> <p>ACTIVITY 1: Case-Based learning (30 min)</p> <p>Each student will review a real-life or hypothetical case where food-drug interactions affected treatment outcomes. They will identify incompatible food-medicine combinations and document their effects in their logbooks.</p> <p>ACTIVITY 2:Library session (30 min)</p> <p>Students will analyze food compatibility with Siddha medicines based on classical texts and modern insights.</p> <p>They will record key learnings and examples in their logbooks as per the Teacher's guidance.</p> |

**Experiential-Learning 3.5 : Toxic Food Combinations in Siddha Medicine**

Total activity hour: 1 Hour

ACTIVITY 1: Case Based learning (30 min)

Each student will review a real or hypothetical case of food poisoning caused by incompatible food combinations.

They will identify the toxic food pairings and document their effects in their logbooks.

ACTIVITY 2: Peer Learning (30 min)

Students will present different toxic food combinations and explain their impact on health and metabolism.

They will record key learnings and examples in their logbooks as per the Teacher's guidance.

**Experiential-Learning 3.6 : Understanding the Food Additives**

Total activity hours: 3 Hours

ACTIVITY 1: Library session(1 Hour)

Students will review assigned readings and videos on food additives, including their classification and effects.

They will take brief notes and reflect on key points, recording insights in their logbooks.

ACTIVITY 2: Real life experience(2 Hour)

Students will analyze real-life case studies where food additives have impacted health.

Each group will identify key concerns, discuss findings, and document their learning in their logbooks.

**Experiential-Learning 3.7 : *Apathiyam* and *Apathiya Pathaarthangal* (unsuitable dietary substances during illness).**

Total activity hour: 1 Hour

ACTIVITY 1: Case-Based Learning (30 min)

Students will analyze real-life patient scenarios where unsuitable dietary choices worsened health conditions. Discuss how *Apathiyam* (dietary restrictions) can help prevent or manage such conditions.

Students will document key takeaways in their logbooks.

ACTIVITY 2: Discussion (30 min)

The Teacher will explain the importance of *Apathiyam* in Siddha medicine. Group discussion on specific foods that aggravate diseases and why they should be avoided.

Students will summarize their learnings for future reference.

**Experiential-Learning 3.8 : *Ichapathiyam* and Choosing the Suitable Food Substances during *Ichapathyam*.**

| <p>Total activity hours: 2 Hours</p> <p>ACTIVITY 1: Case-Based Learning (1 Hour)</p> <p>Students will analyze clinical cases where <i>Ichapathiyam</i> (permissible diet) is recommended. Discussion on why specific foods are allowed in certain health conditions. Students will document key observations in their logbooks.</p> <p>ACTIVITY 2: Discussion (1 Hour)</p> <p>The Teacher will explain the principles of Ichapathiyam and its role in maintaining health. Group discussion on how <i>Ichapathiyam</i> varies based on different diseases and patient needs.</p> <p>Students will summarize their insights and discuss practical applications.</p>                                                  |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <p><b>Experiential-Learning 3.9</b> : <i>Pathiyam</i> (Dietary restrictions) for specific Siddha Formulations</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |
| <p>Total activity hours: 2 Hours</p> <p>ACTIVITY 1: Case-Based Learning (1 Hour)</p> <p>Analyze case studies where specific Siddha formulations are prescribed. Discuss why dietary restrictions (<i>Pathiyam</i>) are essential for these medicines. Students will record key insights in their logbooks.</p> <p>ACTIVITY 2: Discussion (1 Hour)</p> <p>The teacher will explain how <i>Pathiyam</i> influences drug efficacy. Group discussion on the effects of improper diet on Siddha treatments.</p> <p>Students will share examples and clarify doubts.</p>                                                                                                                                                 |      |
| <p><b>Modular Assessment</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |
| Assessment method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Hour |
| <p><b>Modular Assessment Instructions:</b> Conduct a structured modular assessment. Assessment will be for 25 marks. Maintain a structured marking pattern and use different assessment methods for each module throughout the semester. Keep a record of the structured pattern used for assessment and calculate the modular grade point as per Table 6C.</p> <p><b>CHOOSE ANY OF THE BELOW ASSESSMENT FOR 25 MARKS</b></p> <p><b>Structured modular assessment:</b></p> <p>Total Marks – 25 (10+10+5)</p> <p>Short Essays: 2 questions × 5 marks each = 10 Marks</p> <p>Practical Spotters: 5 spotters × 2 marks each = 10 Marks</p> <p>Create Awareness among people related to food adulteration: 5 Marks</p> | 2    |

or  
Any practical in converted form can be taken for assessment. (15 Marks)

and  
Any experiential learning such as portfolios, reflections, or presentations can be taken as an assessment. (10 Marks)

## Module 4 : Mooligai Suddhi Muraigal (Purification of Medicinal Plants)

### Module Learning Objectives

(At the end of the module, the students should be able to)

Describe the processes and techniques involved in *Pothu Suddhi* and *Sirappu Suddhi* for different plant materials such as *Ilai*, *Poo*, *Kai*, *Vithai*, *Pattai*, and *Thandu*.

Differentiate the unique purification and preparation methods of plant-based medicinal substances used in Siddha formulations.

Demonstrate and perform the purification and processing techniques for herbal substances such as *Thengai Ennai*, *Aamankennai*, and *Iluppai Nei* in compliance with Siddha medicinal standards.

Analyze the different *Suddhi* methods for substances like *Senkottai*, *Thippili*, *Nellikai*, *Nervaalam*, and *Parangi Sakkai*, evaluating their importance in medical preparations.

Assess and justify the role of *Suddhi* processes in enhancing the medicinal efficacy and safety of herbal and mineral substances in Siddha practice.

### Unit 1 Mooligai Sarakkugal (Plant materials)

*Pothu Suddhi* (Common purification process)

4.1.1 *Ilai* (Leaf) - *Poo* (Flower) - *Pattai* (Bark) - *Ver* (Root) - *Kizhangu* (Tuber) - *Chooranam* (Powder)

*Sirappu Suddhi* (Specific purification process)

4.1.2 *Akkiragaram* (*Anacyclus pyrethrum* Linn.) - *Amukkara* (*Withania somnifera* Linn.) - *Abini* (*Papaver somniferum* Linn.) - *Oomathan vithai* (*Datura stramo* Linn.) - *Etti kottai* (*Strychnos nux-vomica* Linn.) - *Omam* (*Trachyspermum ammi* Linn.)

4.1.3 *Kanja* (*Cannabis sativa* Linn.) - *Kadukkai* (*Terminalia chebula* Retz.) - *Kariapolam* (*Aloe barbadensis* Mill.) - *Vellaipolam* (*Commiphora myrrha* Nees.) - *Kalarchi kottai* (*Caesalpinia bonduc* Linn.) - *Kukkil* (*Commiphora mukul* Hook.)

4.1.4 *Kurosani omam* (*Hyoscyamus niger* Linn.) - *Sivathai ver* (*Operculina turpethum* Linn.) - *Seenthil thandu* (*Tinospora cordifolia* Thumb.) - *Seeragam* (*Cuminum cyminum* Linn.) - *Sukku* (*Zingiber officinale* Roscoe.)

4.1.5 *Senkottai* (*Semecarpus anacardium* L.f.) - *Thaandri* [*Terminalia bellirica* (Gaertn.)Roxb.] - *Thippili* (*Piper longum* Linn.) - *Thetraan* (*Strychnos potatorum* L.f.) - *Naabi* (*Aconitum ferox* Wall.ex Ser. or *Aconitum napellus* Linn.) - *Nilavarai* (*Senna alexandrina* Mill)

4.1.6 *Nellikai* (*Emblica officinalis* Gaertn.) - *Nervaalam* (*Croton tiglium* Linn.) - *Parangi sakkai* (*Smilax china* Linn.) - *Pugai ialai* (*Nicotiana tabacum* Linn.) - *Perungaayam* (*Ferula asafoetida* Linn.) - *Manjal* (*Curcuma longa* Linn.)

4.1.7 *Maasikkai* (*Quercus incana* Bardr. ) - *Milagu* (*Piper nigrum* Linn.) - *Vasambu* (*Acorus calamus* Linn.) - *Eerandam* (*Ricinus communis*

Linn.) - Kerudapachai [*Selaginella Plana* (Desv.ex poir) Hieron]

References: 7,25,26

| 3A      | 3B                                                                                                                                                                                                                                             | 3C | 3D                        | 3E      | 3F        | 3G             |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|----------------|
| CO2,CO8 | Describe the <i>Pothu Suthi</i> (general purification) for different plant materials such as <i>Ilai</i> , <i>Poo</i> , <i>Kai</i> , <i>Vithai</i> , etc.                                                                                      | 3  | Lecture                   | CC      | Knows-how | L&PPT ,L&GD    |
| CO2,CO8 | Apply purification techniques for <i>Akkiragaram</i> , <i>Amukkara</i> , <i>Abini</i> , <i>Oomathan Vithai</i> , <i>Etti Kottai</i> , and <i>Omam</i> , demonstrating their significance in enhancing safety, and efficacy in Siddha medicine. | 9  | Experiential-Learning 4.1 | CAP     | Shows-how | FC,PrBL, JC    |
| CO2,CO8 | Demonstrate the purification methods for <i>Kanja</i> , <i>Kadukkai</i> , <i>Kariapolam</i> , <i>Vellaipolam</i> , <i>Kalarchi Kottai</i> , and <i>Kukkil</i> , evaluating their impact on medicinal safety.                                   | 9  | Experiential-Learning 4.2 | CAP     | Shows-how | PT,FC,JC       |
| CO2,CO8 | Describe the purification process of <i>Kurosani Omam</i> , <i>Kombarakku</i> , <i>Sivathai Ver</i> , <i>Seenthil Thandu</i> , <i>Seeragam</i> , and <i>Chukku</i> .                                                                           | 2  | Lecture                   | CC      | Knows-how | L&GD,L &PPT ,L |
| CO2,CO8 | Demonstrate purification processes for substances like <i>Senkottai</i> , <i>Thippili</i> , <i>Thetraan</i> , <i>Naabi</i> , and <i>Nilavvarai</i> .                                                                                           | 6  | Practical Training 4.1    | PSY-GUD | Shows-how | D,PT           |
| CO2,CO8 | Describe the purification process of substances like <i>Maasikkai</i> , <i>Milagu</i> , <i>Vasambu</i> , <i>Eerandam</i> , and <i>Kerudapachai</i> .                                                                                           | 2  | Lecture                   | CC      | Knows-how | L&GD,L &PPT ,L |
| CO2,CO8 | Demonstrate the purification process of <i>Nellikai</i> , <i>Nervaalam</i> , <i>Parangi Sakkai</i> , <i>Pugai Ilai</i> , <i>Perungaayam</i> , and <i>Manjal</i> as per Siddha literature.                                                      | 4  | Practical Training 4.2    | PSY-GUD | Shows-how | D,PT           |

## Unit 2 Neerma Vagaigal (Liquid and Semiliquid materials)

4.2.1 *Thengai Ennai* (Coconut oil) - *Aamankkennai* (Castor oil) - *Iluppai Nei* (Mahua oil) - *Nalla Ennai* (Sesame oil) - *Punnai Ennai* (Tamanu oil)

4.2.2 *Thayir* (Curd) - *Mor* (Butter Milk) - *Vennai* (Butter) - *Nei* (Ghee) - *Pasumpa* (Cow milk) - *Vellattu Paal* (Goat Milk) - *Vilangukalin Neer* (Animal Urine)

4.2.3 *Venneer* (Warm water) - *Poosanikai neer* (Ash gourd juice) - *Kaluneer* (Rice water) - *Kaadi* (Rice vinegar) - *Thanneer* (Water) - *Panineer* (Snow water)

**References:** 7,25,26

| 3A      | 3B                                                                                                                                                                                                                                                                                                        | 3C | 3D                        | 3E      | 3F        | 3G            |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|---------------|
| CO2,CO8 | Describe the purification process of <i>Thengai Ennai</i> , <i>Aamankennai</i> , <i>Iluppai Nei</i> , <i>Nalla Ennai</i> , and <i>Punnai Ennai</i> .                                                                                                                                                      | 3  | Lecture                   | CC      | Knows-how | L,L&PPT ,L&GD |
| CO2,CO8 | Demonstrate the purification process of <i>Thayir</i> , <i>Mor</i> , <i>Vennai</i> , <i>Nei</i> , <i>Pasumpa</i> , <i>Vellattu Paal</i> , and <i>Vilangukalin Neer</i> .                                                                                                                                  | 10 | Practical Training 4.3    | PSY-GUD | Shows-how | DIS,D,PT      |
| CO2,CO8 | Apply traditional purification techniques to <i>Vaathumai ennai</i> , <i>Pungan nei</i> , <i>Veppam ennai</i> , <i>Venneer</i> , <i>Poosanikai neer</i> , <i>Kaluneer</i> , <i>Kaadi</i> , <i>Thanneer</i> , and <i>Panineer</i> , and assess their quality and therapeutic relevance in Siddha medicine. | 8  | Experiential-Learning 4.3 | CAP     | Shows-how | PrBL,DIS ,PAL |

### Practical Training Activity

**Practical Training 4.1** : Purification of *Senkottai*, *Thippili*, *Thaandri*, *Thetraan*, *Naabi*, and *Nilavvarai*

Total Activity Hours: 6 Hours

ACTIVITY 1: Demonstration (2 Hours)

The teacher will first demonstrate the traditional Siddha purification procedures for *Senkottai* (*Semicarpus anacardium L.*), *Thaandri*

(*Terminalia bellerica Roxb.*), and *Naabi* (*Aconitum ferox Wll.ex.ser*), explaining each step, its purpose, and the expected outcomes as per classical Siddha texts.

Following the demonstration, students will observe and document the key procedural steps, tools used, and changes in the materials during the purification process. These observations must be recorded in the practical record or logbook as per the teacher's instructions.

ACTIVITY 2: Practical (4 Hours)

Based on the teacher's instruction, students will then repeat or perform the purification techniques for *Thippili* (*Piper longum L.*), *Thetraan* (*Croton tiglium L.*), and *Nilavvarai* (*Cassia auriculata L.*) either individually or in small groups, under guided supervision.

The focus will be on the removal of impurities and enhancement of medicinal quality and efficacy in line with Siddha purification principles (*Suddhi Muraigal*). Students are required to carefully follow each procedural step demonstrated and record their own practice and outcomes in the practical record or logbook as per the format given by the teacher.

After the practical session, a collaborative session will be conducted where students will engage in analyzing the outcomes of the purification process using modern analytical perspectives such as changes in color, texture, solubility, or safety indicators.

**Practical Training 4.2** : Purification of Herbal Formulations Using *Nellikai, Nervaalam, Parangi Sakkai, Pugai Ilai, Perungaayam, and Manjal*

Total Activity Hours: 4 Hours

**ACTIVITY 1: Demonstration (1 Hour)**

The teacher will first demonstrate the correct method of collecting and preparing raw herbal samples from reliable sources, emphasizing identification, cleanliness, and suitability for purification based on traditional Siddha textual references

Following this, students will, either individually or in small groups, collect the specified herbs under supervision and prepare them for the purification process as per the instructions.

Students will record the sample details, collection source, and preparation steps in their practical record or logbook as directed by the teacher.

**ACTIVITY 2: Practical (3 Hours)**

The teacher will demonstrate the classical Siddha purification methods applicable to the selected herbs, highlighting each step and its purpose.

After the demonstration, students will individually or in small groups repeat the purification process under supervision, ensuring adherence to traditional methods as demonstrated.

Students will observe and record any physical or chemical changes noted during the process (e.g., color, texture, smell, sedimentation, etc.) in a structured format provided by the teacher and enter all findings in their practical logbook.

Each student will document the purification steps followed, observations made, and outcomes achieved in detail in their logbook as per teacher instructions.

A teacher-led group discussion will then be conducted, where students will share insights on how purification enhances the therapeutic efficacy and safety of the herbs.

Key discussion points and personal reflections will be noted by each student in their logbook.

**Practical Training 4.3** : Purification of *Thayir, Mor, Vennai, Nei, Pasumpa, Vellattu PaaL, and Vilangukalin Neer*.

Total Activity Hours: 10 Hours

**ACTIVITY 1: Demonstration(3 Hours)**

The teacher will demonstrate traditional purification (*Suddhi*) methods for each selected substance, explaining each step clearly as per traditional Siddha textual references.

Students will observe carefully and document the key purification steps in their practical record or logbook.

**ACTIVITY 2: Practical(4 Hours)**

Following the teacher's demonstration, students will individually or in small groups repeat the purification techniques under the teacher's guidance.

They will record physical and chemical changes observed during the process in their practical record or logbook.

**ACTIVITY 3: Discussion (3 Hours)**

Students will compare their purification outcomes with expected results and analyze the impact of purification on the medicinal quality of the substances.

A group discussion will be conducted to reflect on the role and importance of purified substances in Siddha treatments.

Students will summarize the insights gained and record key points in their logbook.

### **Experiential learning Activity**

#### **Experiential-Learning 4.1** : Purification of *Akkiragaram, Amukkara, Abini, Oomathan Vithai, Etti Kottai, and Omam*

Total Activity Hours: 9 Hours

##### **ACTIVITY 1: Project based learning (3 Hours)**

Based on the instruction of the teacher, the student normally will perform the activity individually for the specified duration.

The student will individually perform the purification techniques for each raw material using procedures described in traditional Siddha textual references. The student will observe and document the physical and chemical changes before and after the purification process.

Documentation should be maintained in the logbook or recorded in such a format as instructed by the teacher.

##### **ACTIVITY 2: Flipped Classroom (3 Hours)**

As per the instruction of the teacher, the student normally will do the activity individually for the specified hour and record it accordingly.

The student will review assigned scientific journals or review articles related to the significance of purification in Siddha medicine. Focus should be on the principles of purification (*Suddhi Muraigal*) and how these influence the efficacy, safety, and pharmacological profile of Siddha medicines.

The student is expected to prepare individual notes or concept summaries, and record their learning in the logbook or in a manner as instructed by the teacher.

##### **ACTIVITY 3: Journal Club (3 Hours)**

Based on the instruction of the teacher, the student normally will analyze and reflect on the task individually for the allotted duration.

Each student will individually analyze selected research articles pertaining to purification techniques, both traditional and modern, in the context of Siddha pharmacology.

Following this, the student will participate in a discussion session (either peer-led or teacher-guided), sharing key findings, interpretations, and implications.

All learnings, reflections, and critical points derived from the discussion must be documented in the logbook or in such a way as per the instruction of the teacher.

#### **Experiential-Learning 4.2** : The purification processes of *Kanja, Kadukkai, Kariapolam, Vellaipolam, Kalarchi Kottai, and Kukkil*.

Total Activity Hours: 9 Hours

##### **ACTIVITY 1: Discussion(3 Hours)**

Under teacher facilitation, students will participate in a group discussion to reflect on their individual purification activities.

Each student will be encouraged to share observations on how the purification process impacted the quality, efficacy, and safety of the substances.

The medicinal significance and clinical implications of using purified substances in Siddha practice will be emphasized.

After the discussion, each student will write a summary of their key learnings, reflections, and insights in their logbook, in a format or structure prescribed by the teacher.

##### **ACTIVITY 2: Flipped classroom (3 Hours)**

Students will first attend a lecture session supported by a PowerPoint presentation that elaborates on the principles, procedures, and pharmacological importance of purification in Siddha medicine.

This is followed by a flipped classroom activity, where each student will individually review assigned scientific articles or classical texts on various purification methods and their role in enhancing drug safety and efficacy.

Students are required to take individual notes, reflect on key points, and prepare for upcoming discussions. All observations and insights must be recorded in the logbook or documented according to the teacher's guidelines.

#### ACTIVITY 3: Journal Club (3 Hours)

Each student will analyze research papers related to purification practices in Siddha or integrative medicine, focusing on how purification influences medicinal properties such as bioavailability, potency, and safety.

Students will then participate in a journal club discussion, collaborating in small groups to share and synthesize their learnings. The discussion will focus on critical insights gained from the literature, such as improvements in pharmacodynamics, reduction of toxicity, or standardization of procedures.

Each student must present key findings in a structured format and individually document the learnings, discussions, and reflections in their logbook or in the format prescribed by the teacher.

### **Experiential-Learning 4.3** : Purification of *Vaathumai ennai*, *Pungan nei*, *Veppam ennai*, *Venneer*, *Poosanikai neer*, *Kaluneer*, *Kaadi*, *Thanneer*, and *Panineer*

Total Activity Hours: 8 Hours

#### ACTIVITY 1: Project based learning (3 Hours)

Under the guidance and instructions provided by the teacher, each student will individually carry out the traditional Siddha purification (*Suddhi*) methods for selected substances based on traditional Siddha textual references

Students must strictly follow the purification steps as outlined in classical Siddha texts and as instructed by the teacher.

Each student will carefully observe and execute the procedure, documenting the step-by-step process, materials used, and time duration in their practical logbook in the format specified by the instructor.

Focus will be given to hygiene, precision, and proper handling as per traditional and safety standards.

#### ACTIVITY 2: Peer Assisted Learning (3 Hours)

Students will independently observe and document the physical and chemical characteristics of the substance both before and after purification.

Based on teacher instructions, each student will compare the purified substance with its unpurified counterpart and record visible, olfactory, and textural differences (e.g., color change, odor reduction, sedimentation, etc.).

All findings must be recorded in a structured data sheet or template provided by the teacher, and filed in the logbook for evaluation.

Students will also note any deviations or difficulties encountered during the purification process.

#### ACTIVITY 3: Discussion(2 Hours)

Under teacher facilitation, students will participate in a group discussion to reflect on their individual purification activities.

Each student will be encouraged to share observations on how the purification process impacted the quality, efficacy, and safety of the substances.

The medicinal significance and clinical implications of using purified substances in Siddha practice will be emphasized.

After the discussion, each student will write a summary of their key learnings, reflections, and insights in their logbook, in a format or structure prescribed by the teacher.

| Modular Assessment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Assessment method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Hour |
| <p><b>Modular Assessment Instructions:</b> Conduct a structured modular assessment. Assessment will be for 50 marks. Maintain a structured marking pattern and use different assessment methods for each module throughout the semester. Keep a record of the structured pattern used for assessment and calculate the modular grade point as per Table 6C.</p> <p><b>CHOOSE ANY OF THE BELOW ASSESSMENT FOR 50 MARKS</b></p> <p><b>Structured modular assessment:</b><br/> Total Marks – 50 (20+20+10)<br/> Practical Purification Process: 1 × 20 Marks = 20 Marks<br/> Demonstration of Purification Process (through physical demonstration, PPT, or video): 1 × 20 Marks = 20 Marks<br/> Identification of Raw Drug and Writing Purification Process: 1 × 10 Marks = 10 Marks<br/> or<br/> Any practical in converted form can be taken for assessment. (25 Marks)<br/> and<br/> Any experiential learning such as portfolios, reflections, or presentations can be taken as an assessment. (25 Marks)</p> | 4    |

## Module 5 : Thathu Matrum Sangama Suddhi Muraigal (Purification of Metals, Minerals and, Substances of Animal Origin)

### Module Learning Objectives

(At the end of the module, the students should be able to)

Define and describe the purification and preparation processes of *Thathu Porutgal* (minerals and metals) like *Arappodi*, *Thangam*, *Velli*, *Induppu*, and *Rasam*, along with *Sangama Porutkal* (animal-based materials) such as *Elumbugal*, *Thaen*, and *Sangu*.

Differentiate the purification methods and their significance in medicinal preparation for various *Paadanangal*, including 64 *Paadanangal*, *Panja Paadaanam*, and *Nava Paadaanam*.

Demonstrate and perform the purification and formulation of *Thathu Porutgal* and *Sangama Porutkal*, ensuring their safety and efficacy in Siddha medicinal preparations.

Compare and analyze the unique properties and therapeutic applications of materials such as *Lingam*, *Veeram*, *Kilinjai*, and *Muthusippi* in different Siddha formulations.

Assess and justify the importance of proper purification techniques in enhancing the medicinal value, potency, and safety of mineral and animal-based Siddha drugs.

### Unit 1 Thathu Porutgal (Minerals and Metals)

5.1.1 *Ulogangal* (Metals) – *Ayam* (Iron) – *Ekku* (Steel) – *Karuvangam* (Lead) – *Kaantham* (Magnetic oxide of Iron) – *Semmbu* (Copper) - *Thandavaalam* (Cast iron) – *Naagam* (Zinc) – *Thangam* (Gold) - *Mandooram* (Ferric oxide) – *Venkalam* (Bronze) – *Velvangam* (Tin) - *Velli* (Silver)

5.1.2 *Panchasootham* (Mercury and its compounds) – *Rasam* (Mercury) - *Rasa Chenduram* (Red sulphide of Mercury) - *Lingam* (Cinnabar) - *Pooram* (Calomel) - *Veeram* (Hydrargyrum perchloride)

5.1.3 *Paadanangal* (Arsenic like compounds) - *Paadanangal* (Arsenic like compounds) – *Panja paadaanam* (Five elements Paadanam) - *Nava paadanam* (Nine poisonous substance) - *Anjanakkal* (Lead sulphide) – *Eli paadanam* – *Ganthagam* ( Sulphur) – *Gowri paadanam* – *Thaalagam* (Yellow Orpiment) – *Thotti paadanam* – *Manosilai* (Red Orpiment) – *Miruthar singi* (Galena) - *Vellai paadanam* (White Arsenic)

5.1.4 *Kaaraasaarangal* (Salts) - *Induppu* (Rock Salt) – *Lavanam* (Salt) – *Evatchaaram* (Potassium carbonate) - *Kalluppu* (Sodium chloride) – *Karpooram* (Camphor) – *Sathisaaram* - *Seenaakaram* (Alum) – *Navacharam* (Ammonium chloride) – *Pooniru* (Fullers Earth) – *Valaiyaluppu* – *Vediuppu* (Potassium nitrate) – *Venkaaram* (Sodium biborate)

5.1.5 *Manigal* (Gems) - *Komethagam* (Garnet) – *Neelamani* (Sapphire) – *Pavazham* (coral) - *Putparaagam* (yellow sapphire) – *Manikkam*

(Ruby) – *Muthu* (pearl) - *Vaidooriyam* (Chrysoberyl Cats Eye) – *Vairam* (Diamond)  
 - *Maragatham* (Emerald)  
 5.1.6 *Ubarasangal* (Secondary Minerals) - *Abragam* (Mica) – *Annabethi* (Green Vitriol) – *Kalnaar* (Asbestos) - *Karsunnapu* (Lime Stone)  
 – *Kaavikkal* (Red ochre) – *Silasathu* - *Thutham* (Cupric sulphate) – *Paal thutham* (Zinc sulphate) – *Mayil thutham* – *Thurisu* – *Nandukkal* (Fossil stone crab) – *Nimilai*

**References:** 7,10,25,26

| 3A      | 3B                                                                                                                                                                                                                                                                                                                                    | 3C | 3D                        | 3E      | 3F        | 3G             |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|----------------|
| CO2,CO8 | Apply the knowledge on the purification techniques of <i>Ayam, Ekku, Karuvangam, Kaantham, Sembu, Thandavaalam, Naagam, Thangam, Mandooram, Venkalam, Velvangam, and Velli</i> , evaluating their significance in enhancing therapeutic efficacy and safety in Siddha medicine.                                                       | 9  | Experiential-Learning 5.1 | CAP     | Shows-how | JC,DA,D, PrBL  |
| CO2,CO8 | Describe the purification of <i>Rasam, Rasa Cendooram, Lingam, Pooram, and Veeram</i> .                                                                                                                                                                                                                                               | 4  | Lecture                   | CC      | Knows-how | PT,L&GD ,L     |
| CO2,CO8 | Demonstrate the purification techniques for <i>Paadanangal, Panja Paadaanam, Nava paadanam, Anjanakkal, Eli paadanam, Ganthagam, Gowri paadanam, Thaalagam, Thotti paadanam, Manosilai, Miruthar singi, and Vellai paadanam</i> , integrating traditional Siddha methods to ensure their safety, stability, and therapeutic efficacy. | 7  | Practical Training 5.1    | PSY-GUD | Shows-how | D,PT,DL        |
| CO2,CO8 | Demonstrate the purification of <i>Induppu, Lavanam, Evatchaaram, Kalluppu, Karpooram, Sathisaaram, Seenaakaram, Navacharam, Pooniru, Valaiyaluppu, Vediuppu, and Venkaaram</i> , showcasing their practical applications in enhancing safety, stability, and therapeutic effectiveness in Siddha medicine.                           | 7  | Practical Training 5.2    | PSY-GUD | Shows-how | D,DL           |
| CO2,CO8 | Describe the purification processes of <i>Komethagam, Neelamani, Pavazham, Putparaagam, Manikkam, Muthu, Vaidooriyam, Vairam, and Maragatham</i> , applying their significance to enhance the safety, potency, and therapeutic applications in Siddha medicine.                                                                       | 3  | Lecture                   | CC      | Knows-how | FC,L&G D,L,IBL |

|         |                                                                                                                                                                                                                                                                                                                                                                                  |   |                           |         |           |                 |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|-----------------|
| CO2,CO8 | Apply purification techniques for <i>Abragam</i> , <i>Annabethi</i> , <i>Kalnaar</i> , <i>Karsunnapu</i> , <i>Kaavikkal</i> , <i>Silasathu</i> , <i>Thutham</i> , <i>Paal Thutham</i> , <i>Mayil Thutham</i> , <i>Thurisu</i> , <i>Nandukkal</i> , and <i>Nimilai</i> , emphasizing their importance in ensuring safety, stability, and therapeutic efficacy in Siddha medicine. | 9 | Experiential-Learning 5.2 | PSY-ADT | Shows-how | PT,DIS,PrBL,CBL |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|-----------------|

## Unit 2 Sangama Porutkal (Substances of Animal Origin)

5.2.1 *Elumbugal* (Bones) - *Kulambugal* (Hoofs) - *Kombukal* (Horns) - *Aamai Odu* (Tortoise shell)

5.2.2 *Thaen* (Honey) - *Palagarai* (Cowrie) - *Muthuchippi* (Pearl Oyster) - *Muttai Odu* (Egg shell) - *Sangu* (Conch) - *Nathai Odu* (Snail shell)

5.2.3 *Kilinjai* (Mussel) - *Iragugal* (Feathers) - *Punugu* (Civet Musk) - *Kasthuri* (Kasthuri Musk/Moshk) - *Korosanai* (Goat bile) - *Poonaagam* (Earth worm) - *Kombarakku* (Laac Gum) - *Mezhugu* (Bee wax)

**References:** 7,10,25,26

| 3A      | 3B                                                                                                                                                                                                                                                                                                | 3C | 3D                        | 3E      | 3F        | 3G                |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|-------------------|
| CO2,CO8 | Describe the purification of <i>Elumbugal</i> , <i>Kulambugal</i> , <i>Kombukal</i> , <i>Aamai Odu</i> in Siddha medicine.                                                                                                                                                                        | 3  | Lecture                   | CC      | Knows-how | L&PPT, L&GD       |
| CO2,CO8 | Demonstrate the purification methods for <i>Thaen</i> , <i>Palagarai</i> , <i>Muthuchippi</i> , <i>Muttai Odu</i> , <i>Sangu</i> , and <i>Nathai Odu</i> , emphasizing their role in enhancing therapeutic applications and ensuring safety in Siddha formulations.                               | 6  | Practical Training 5.3    | PSY-GUD | Shows-how | D,PT              |
| CO2,CO8 | Perform purification techniques for <i>Kilinjai</i> , <i>Iragugal</i> , <i>Punugu</i> , <i>Kasthuri</i> , <i>Korosanai</i> , <i>Poonaagam</i> , <i>Kombarakku</i> , and <i>Mezhugu</i> and demonstrate the importance of purification in improving the efficacy and safety of Siddha formulations | 8  | Experiential-Learning 5.3 | CAP     | Shows-how | DIS,D,JC, PrBL,FC |

## Practical Training Activity

**Practical Training 5.1** : Purification of *Paadanangal*, *Panja paadaanam*, *Nava paadanam*, *Anjanakkal*, *Eli paadanam*, *Ganthagam*, *Gowri paadanam*, *Thaalagam*, *Thotti paadanam*, *Manosilai*, *Miruthar singi*, and *Vellai paadanam*

Total Activity Hours: 7 Hours

**ACTIVITY 1:**Demonstration lab (1 Hour)

Students will review classical Siddha textual references and relevant scientific literature related to purification techniques (*Suddhi*) prior to class.

In class, the teacher will facilitate a focused discussion to clarify concepts, materials involved, variations in purification methods, and their significance.

Students actively participate in the group discussion based on the pre-class reading.

Note key variations in methods and their therapeutic implications.

Record discussion highlights and key points in the practical record/logbook.

**ACTIVITY 2:** Practical (4 Hours)

The teacher will first demonstrate the classical purification techniques for the following substances: *Ganthagam, Gowri Paadanam, Thaalagam, Manosilai, Vellai Paadanam*

The demonstration will cover step-by-step procedures, safety precautions, and expected changes (physical and chemical).

After the demonstration, students will repeat the purification process in small groups or individually, following the teacher's instructions carefully.

Student observe the demonstration attentively, noting each step and associated changes.

Carry out the purification process with proper handling and adherence to traditional methods.

Record the materials used, procedural steps, and observations (before and after purification) in the logbook in the structured format provided.

Ensure clarity and completeness of documentation for later reflection.

**ACTIVITY 3:** Demonstration (2 Hours)

In small groups, students will discuss their practical experiences, variations noticed, and the quality outcomes of their purification processes.

The teacher will facilitate a peer-led journal club in which students will review and compare selected scientific articles with traditional methods to assess possibilities for standardization and quality control.

Students Prepare a brief summary of purification results and share observations with peers.

Analyze how purification affects safety and efficacy.

Note relevant points and insights in the practical logbook.

Each student will individually reflect on the purification process and outcomes.

They will analyze potential refinements to improve traditional techniques based on observations, discussions, and journal review.

Compile all findings, including step-wise processes, comparative analysis, challenges, and recommendations.

Enter the complete record into the practical logbook as per the teacher's instructions.

Submit the logbook for teacher review, if required.

**Practical Training 5.2** : Purification of *Induppu, Lavanam, Evatchaaram, Kalluppu, Karpooram, Sathisaaram, Seenaakaram, Navacharam, Pooniru, Valaiyaluppu, Vediuppu, and Venkaaram*

Total Activity Hours: 7 Hours

#### ACTIVITY 1: Demonstration (3 Hours)

Purpose: To provide conceptual clarity and background on purification (*Suddhi*) techniques for various inorganic substances.

Instructions to Students:

Before class, read traditional Siddha textual references on the purification of the following substances:

*Induppu, Lavanam, Evatchaaram, Kalluppu, Karpooram, Sathisaaram, Seenaakaram, Navacharam, Pooniru, Valaiyaluppu, Vediuppu, and Venkaaram.*

In class, the teacher will facilitate a group discussion comparing traditional purification methods with scientific understandings.

Each student will individually record the key points, similarities, and variations in their logbook, following the format prescribed by the teacher.

#### ACTIVITY 2: Demonstration Lab (4 Hours)

Substances Covered Practically:

*Induppu, Kalluppu, Seenaakaram, Navacharam, Pooniru, Vediuppu, and Venkaaram*

The teacher demonstrates classical Siddha purification methods for each of the listed substances, highlighting the step-by-step process, tools used, safety precautions, and expected physical/chemical changes.

After the demonstration, students will individually or in small groups repeat the same purification methods under the teacher's supervision.

During practice, students will carefully observe and document:

Stepwise procedure followed

Materials and conditions used

Physical and chemical changes (color, consistency, reactions, etc.) before and after purification

Documentation:

Students must record all details and observations in the practical record/logbook as per the template or instructions given by the teacher.

Each student will summarize key points and group insights in their logbook.

Individually compile all purification data, observations, and findings into a concise report format.

Highlight key learnings, difficulties faced, and best practices identified.

Present findings and refinements to peers during a structured group discussion led by the teacher.

Finalize logbook entries as per the teacher's instructions for record-keeping and assessment.

#### **Practical Training 5.3** : Purification of *Thaen, Palagarai, Muthuchippi, Muttai Odu, Sangu, and Nathai Odu*

Total Activity Hours: 6 Hours

#### ACTIVITY 1: Demonstration (2 Hours)

Teachers provide students with selected readings from Siddha classical texts and scientific literature on purification (*Suddhi*) methods for the following substances: *Thaen, Palagarai, Muthuchippi, Muttai Odu, Sangu, and Nathai Odu.*

Students individually review the assigned materials before class.

Participate in a teacher-guided group discussion to:

Analyze the traditional significance of purifying these marine/animal-origin substances.  
 Discuss variations in purification techniques and their clinical implications.  
 Record key discussion points and theoretical understanding in the practical logbook under the 'Literature Review & Discussion' section.

**ACTIVITY 2: Practical (4 Hours)**  
 Substances for Practice: *Palagarai, Muthuchippi, Muttai Odu, Sangu, and Nathai Odu*  
 The teacher demonstrates the step-by-step Siddha purification methods for each substance.  
 Emphasize traditional references, safety measures, and expected physical and chemical changes.  
 Under the teacher's guidance, Students individually or in small groups, repeat the demonstrated purification techniques for the given substances.  
 Carefully observe and document:  
 The purification process (sequence, heating, use of solvents, etc.)  
 Changes in texture, color, solubility, or integrity before and after purification  
 Record the full process and findings in the practical logbook using the prescribed format (date, name of substance, method, observations, remarks).  
 Students individually compile all observations and results from the hands-on session into a summary.  
 Prepare a short oral or written presentation highlighting:  
 Key learnings about the purification methods used  
 Any deviations from expected outcomes  
 Clinical relevance and potential improvements  
 Participate in a teacher-moderated discussion to share and compare findings.  
 Finalize the logbook entries, incorporating feedback from peers and the teacher.

### Experiential learning Activity

**Experiential-Learning 5.1** : Purification of *Ayam, Ekku, Karuvangam, Kaantham, Semmbu, Thandavaalam, Naagam, Thangam, Mandooram, Venkalam, Velvangam, and Velli*

Total Activity Hours: 9 Hours

**ACTIVITY 1:** Project based learning (4 Hours)

Under the guidance of the teacher, each student will individually observe the purification demonstrations of the following metals based on traditional Siddha textual references: *Ayam, Velvangam, Karuvangam, Kaantham, and Naagam*.

The teacher will demonstrate each step of the traditional Siddha purification process, highlighting the specific techniques, precautionary measures, and observable physical and chemical changes (e.g., change in color, texture, sedimentation, or reaction with liquids).

Instructions to Students:

Observe the procedure attentively, taking note of key steps and material transformations.  
 Individually record the purification method, materials used, time and temperature (if applicable), and the observable changes in a structured logbook format provided by the teacher.  
 Ensure each purification method is documented with clarity and completeness as per the teacher's instructions.

**ACTIVITY 2: Drug analysis (3 Hours)**  
 Students will analyze and compare the purification methods for the following additional metals: *Ekku, Sembu, Thandavaalam, Thangam, Mandooram, Venkalam, and Velli*.  
 Instructions to Students:  
 Based on the teacher's briefings and references provided, individually compare and analyze the techniques used for different metals.  
 Focus on how these purification methods help in toxicity removal, improve safety, and enhance therapeutic efficacy.  
 Reflect on challenges or variations in methods, if any, and note possible improvements or questions that arise during the analysis.  
 Each student will compile a comparative table or reflection note (as instructed) in the logbook, highlighting key similarities, differences, and their significance in clinical practice.

**ACTIVITY 3: Journal Club (2 Hours)**  
 Students will be assigned scientific papers and classical Siddha references related to metal purification. Under teacher guidance, each student will independently analyze the contents.  
 Instructions to Students:  
 Read and critically analyze the assigned materials, focusing on the scientific basis, safety aspects, and therapeutic improvements attributed to the purification process.  
 Write a structured review or summary highlighting important findings, correlation with traditional practices, and any suggested refinements to current methods.  
 Document the analysis and key takeaways in the logbook using the format provided by the teacher.  
 Prepare 2–3 individual points for classroom discussion, if instructed.

**Experiential-Learning 5.2** : Purification of *Abragam, Annabethi, Kalnaar, Karsunnapu, Kaavikkal, Silasathu, Thutham, Paal Thutham, Mayil Thutham, Thurisu, Nandukkal, and Nimilai*

Total Activity Hours: 9 Hours  
**ACTIVITY 1: Project based learning (5 Hours)**  
 Teacher demonstrate the classical Siddha purification process for each of the following substances:  
*Abragam, Annabethi, Karsunnapu, Silasathu, Mayil Thutham, and Nandukkal*  
 Explain the traditional procedures, tools, expected changes, and precautions.  
 Student individually perform the purification process for the assigned substances under supervision.  
 Carefully observe and record:  
 Step-by-step procedure followed for each substance  
 Changes observed during purification (color, texture, reaction, solubility, etc.)

Tools and ingredients used

Follow traditional Siddha textual references provided by the teacher.

Maintain all records in the practical logbook in the given structured format. Include date, name of the substance, method adopted, and observed outcomes.

#### ACTIVITY 2: Discussion (2 Hours)

Teacher show video-assisted presentations of advanced or alternative purification techniques for the following substances:

*Abragam, Annabethi, Kalnaar, Karsunnapu, Kaavikkal, Silasathu, Thutham, Paal Thutham, Mayil Thutham, Thurisu, Nandukkal, and Nimilai*

Highlight differences between methods and the reasoning behind technique variations.

Student individually observe the demonstrations or presentations, focusing on procedural uniqueness and comparative outcomes.

In teacher-guided small groups, engage in peer discussions to:

Compare traditional Siddha purification methods with modern or regionally modified versions

Identify which methods enhance safety and therapeutic potency

Record summarized notes and discussion highlights in the practical logbook, mentioning any key differences and observations.

#### ACTIVITY 3: Case based learning (2 Hours)

Teacher provide students with selected scientific articles and classical textual references relating to purification, safety, and efficacy of the above-mentioned substances.

Share case studies showing therapeutic impact of proper purification, including adverse effects of unpurified substances.

Student read and review the assigned literature individually.

Analyze and extract insights on how purification influences the pharmacological actions and toxicity of the substances.

Document the following in the logbook:

Summary of each case study or article

Correlation between purification and improved medicinal effect

Suggestions or refinements for traditional methods, if any

Participate in a concluding group discussion where each student shares 1–2 key insights gained from their analysis.

### **Experiential-Learning 5.3** : Purification of *Kilinal, Iragugal, Punugu, Kasthuri, Korosanai, Poonaagam, Kombarakku, and Mezhu*.

Total Activity Hours: 8 Hours

#### ACTIVITY 1: Project based learning(3 Hours)

Under the guidance and instructions provided by the teacher, each student will individually carry out the traditional Siddha purification (*Suddhi*) methods for selected substances based on traditional Siddha textual references

Students must strictly follow the purification steps as outlined in classical Siddha texts and as instructed by the teacher.

Each student will carefully observe and execute the procedure, documenting the step-by-step process, materials used, and time duration in their practical logbook in the format specified by the instructor.

Focus will be given to hygiene, precision, and proper handling as per traditional and safety standards.

#### ACTIVITY 2: Demonstration (3 Hours)

Substances Covered in Demo: *Punugu, Kasthuri, Korosani*

The teacher will demonstrate the classical Siddha purification steps for each of the above substances.

Highlight special considerations, handling methods, and expected transformations.

Student Individually observes the expert demonstration.

Carefully note each step of the purification technique.

Document observations regarding:

Significance of each step in altering or enhancing medicinal qualities

Comparative notes between demo and individual practice sessions

Record learnings and insights in the logbook, as per instructions given by the teacher.

#### ACTIVITY 3: Discussion(1 Hour)

Substances for Review: *Kilinal, Iragugal, Poonaagam, Kombarakku, Mezugu, Punugu, Kasthuri, Korosani*

The teacher provides a reading list from classical Siddha texts and recent scientific research articles.

Guide students on how to analyze and extract key information relevant to purification practices and outcomes.

Student Individually review the assigned literature from Siddha texts and modern references in the library or digital platforms.

Take structured notes on:

Purpose of purification for each material

Traditional methods vs. contemporary relevance

Enter findings and relevant quotes/references in the logbook under “Literature Review.”

#### ACTIVITY 4: Flipped class room(1 Hour)

Teacher Instructions:

Facilitate a journal club where students can present and reflect on their literature review and hands-on experience.

Student Instructions:

Based on earlier activities, prepare a brief individual presentation on:

Key purification methods for one or more substances

Therapeutic and safety relevance of purification

Insights from literature and practical sessions

Actively participate in group discussion, compare notes with peers, and refine your learning.

Update your logbook with discussion summaries and teacher feedback.

#### Modular Assessment

| Assessment method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Hour |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <p><b>Modular Assessment Instructions:</b> Conduct a structured modular assessment. Assessment will be for 50 marks. Maintain a structured marking pattern and use different assessment methods for each module throughout the semester. Keep a record of the structured pattern used for assessment and calculate the modular grade point as per Table 6C.</p> <p><b>CHOOSE ANY OF THE BELOW ASSESSMENT FOR 50 MARKS</b></p> <p><b>Structured modular assessment:</b><br/> Total Marks – 50 (20+20+10)<br/> Practical Purification Process: 1 × 20 Marks = 20 Marks<br/> Demonstration of Purification Process (through physical demonstration, PPT, or video): 1 × 20 Marks = 20 Marks<br/> Identification of Raw Drug and Writing Purification Process: 1 × 10 Marks = 10 Marks<br/> or<br/> Any practical in converted form can be taken for assessment. (25 Marks)<br/> and<br/> Any experiential learning such as portfolios, reflections, or presentations can be taken as an assessment. (25 Marks)</p> | 4    |

## Module 6 : Applied Bio Chemistry

### Module Learning Objectives

(At the end of the module, the students should be able to)

Define and describe the key biochemical tests, including Gastric Function Tests, Kidney Function Tests (Urea, Creatinine, GFR, Uric Acid), Liver Function Tests, and Tumour Markers, along with an explanation of biotransformation pathways and Xenobiotic metabolism.

Interpret the principles behind the biochemical assays for gastric fluid, CerebroSpinal Fluid (CSF), kidney and liver function tests, and tumour marker analysis in relation to disease pathology.

Perform and demonstrate the practical procedures for analyzing gastric fluid, cerebrospinal fluid (CSF), Kidney and Liver function parameters, and Tumour markers, ensuring accurate result interpretation.

Analyze abnormal biochemical markers related to gastric activity, kidney dysfunction, liver enzyme imbalances, and tumour markers, correlating them with disease states.

Assess and justify the clinical significance of biochemical test results in diagnosing and managing gastrointestinal, renal, hepatic, and oncological disorders, emphasizing their role in patient care.

### Unit 1 Gastric Function Test and Examination of Cerebrospinal fluid

6.1.1 Gastric Juice

6.1.2 Gastric Function Test

6.1.3 Composition of Normal CSF

6.1.4 Examine Cerebrospinal Fluid (CSF)

References: 28

| 3A          | 3B                                                                                                                                                                    | 3C | 3D      | 3E | 3F        | 3G            |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------|----|-----------|---------------|
| CO1,CO5,CO8 | Describe the composition, mechanisms of secretion, and physiological roles of gastric juice, with emphasis on its function in digestion and its clinical relevance to | 1  | Lecture | CC | Knows-how | FC,L&G<br>D,L |

|             |                                                                                                                                                                                                            |   |                           |         |           |               |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|---------------|
|             | gastrointestinal health.                                                                                                                                                                                   |   |                           |         |           |               |
| CO1,CO5,CO8 | Demonstrate the importance of Gastric Function Tests (GFT) in diagnosing gastrointestinal disorders, integrating the knowledge of procedures, interpretation, and patient-centered ethical considerations. | 5 | Experiential-Learning 6.1 | PSY-GUD | Knows-how | FC,RP,DIS,SIM |
| CO1,CO5,CO8 | Describe the physical, chemical, and cellular characteristics of normal cerebrospinal fluid (CSF), and correlate these parameters with their physiological functions and diagnostic significance.          | 1 | Lecture                   | CC      | Knows-how | FC,L&GD,DIS   |
| CO1,CO5,CO8 | Demonstrate guided techniques for examining CerebroSpinal Fluid (CSF), interpreting results to assess neurological and systemic conditions.                                                                | 5 | Practical Training 6.1    | PSY-GUD | Shows-how | D,DL,D-M,PT   |

## Unit 2 Interpretation of Kidney function tests

6.2.1 Electrolytes

6.2.2 Urea and Creatinine – Uric acid - GFR

6.2.3 RFT

6.2.4 Interpretations of RFT

**References:** 28,29

| 3A          | 3B                                                                                                                                                                                                         | 3C | 3D                        | 3E      | 3F        | 3G           |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|--------------|
| CO1,CO5,CO8 | Discuss the roles and normal reference ranges of key electrolytes, and interpret their significance in maintaining physiological homeostasis and in the diagnosis of clinical conditions.                  | 1  | Lecture                   | CC      | Knows-how | L,FC,L&GD    |
| CO1,CO5,CO8 | Identify the levels of urea, creatinine, glomerular filtration rate (GFR), and uric acid in the assessment of renal function, and appraise their clinical relevance in health and pathological conditions. | 5  | Experiential-Learning 6.2 | PSY-GUD | Shows-how | BL,FC,RE,DIS |
| CO1,CO5,CO8 | Describe the components, significance, and clinical implications of Renal Function Tests                                                                                                                   | 1  | Lecture                   | CC      | Knows-    | FC,L,L&      |

|             |                                                                                                                                              |   |                        |         |           |                |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------|---|------------------------|---------|-----------|----------------|
|             | (RFT), demonstrating comprehension of their role in diagnosing and managing renal disorders.                                                 |   |                        |         | how       | GD             |
| CO1,CO5,CO8 | Demonstrate the interpretation of Renal Function Test (RFT) results, linking clinical observations to kidney function and related disorders. | 5 | Practical Training 6.2 | PSY-GUD | Shows-how | D,PT,DL, D-BED |

### Unit 3 Interpretation of Liver function tests and Enzymes

- 6.3.1 Functions of the Liver
- 6.3.2 Liver Function Tests (LFT)
- 6.3.3 Interpret results of LFT
- 6.3.4 Liver Enzymes
- 6.3.5 Significance of various factors on Liver Enzymes

**References:** 28,29

| 3A          | 3B                                                                                                                                                                                         | 3C | 3D                        | 3E      | 3F        | 3G             |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|----------------|
| CO1,CO5,CO8 | Describe the Functions of the Liver and its role in metabolism and detoxification.                                                                                                         | 1  | Lecture                   | CC      | Knows-how | L,L&GD, BL     |
| CO1,CO5,CO8 | Describe knowledge of Liver Function Test (LFT) components and their normal reference ranges to interpret biochemical patterns and assess clinical conditions related to hepatic function. | 3  | Experiential-Learning 6.3 | PSY-GUD | Does      | FC,CBL, DIS    |
| CO1,CO5,CO8 | Demonstrate the ability to interpret Liver Function Test (LFT) results accurately and correlate findings with clinical conditions.                                                         | 5  | Practical Training 6.3    | PSY-GUD | Shows-how | D,D-BED ,DL,PT |
| CO1,CO5,CO8 | Describe the functional roles of key liver enzymes and correlate their variations with the diagnosis and progression of liver-related disorders.                                           | 1  | Lecture                   | CC      | Knows-how | L,FC,L& GD     |
| CO1,CO5,CO8 | Demonstrate and interpret liver function tests (LFTs) and enzyme levels to assess liver health and diagnose potential conditions.                                                          | 3  | Experiential-Learning 6.4 | PSY-GUD | Shows-how | DIS,JC,C BL    |

#### Unit 4 Tumor Markers

- 6.4.1 Tumor markers
- 6.4.2 Test for tumor markers
- 6.4.3 Interpretations of Tumour Markers

**References:** 28,29

| 3A          | 3B                                                                                                                                                                 | 3C | 3D                        | 3E      | 3F        | 3G             |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|----------------|
| CO1,CO5,CO8 | Describe the role of Tumour Markers in cancer diagnosis and management.                                                                                            | 2  | Lecture                   | CC      | Knows-how | L&PPT          |
| CO1,CO5,CO8 | Identify tests for tumor markers, demonstrating proficiency in laboratory techniques and their clinical significance for cancer diagnosis and management           | 5  | Practical Training 6.4    | PSY-MEC | Shows-how | PT,DL,D        |
| CO1,CO5,CO8 | Perform the clinical indications and interpretations of tumor markers to enhance diagnostic accuracy, prognostic assessment, and treatment monitoring in oncology. | 5  | Experiential-Learning 6.5 | CAP     | Shows-how | CBL,JC,RLE,DIS |

#### Unit 5 Metabolism

- 6.5.1 Enzyme kinetics
- 6.5.2 Biotransformation
- 6.5.3 Xenobiotic metabolism

**References:** 28,29

| 3A          | 3B                                                                                                                                  | 3C | 3D      | 3E | 3F        | 3G   |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------|----|---------|----|-----------|------|
| CO1,CO5,CO8 | Demonstrate the principles of enzyme kinetics and relate kinetic parameters to the regulation and efficiency of metabolic pathways. | 2  | Lecture | CC | Knows-how | L&GD |

|             |                                                                                                                                                                                                                  |   |                           |     |           |           |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|-----|-----------|-----------|
| CO1,CO5,CO8 | Apply knowledge of biotransformation pathways to analyze drug metabolism and evaluate their significance in enhancing therapeutic efficacy and minimizing toxicity.                                              | 2 | Experiential-Learning 6.6 | CAP | Shows-how | JC,DIS    |
| CO1,CO5,CO8 | Apply the knowledge on the mechanisms of xenobiotic metabolism and evaluate their implications for human health, focusing on detoxification pathways and their relevance in clinical and environmental contexts. | 3 | Experiential-Learning 6.7 | CAP | Shows-how | SY,BS,DIS |

### Practical Training Activity

#### Practical Training 6.1 : Examination of Cerebrospinal Fluid (CSF)

Total activity hours: 5 Hours

##### ACTIVITY 1 :Demonstration (1 Hour)

Watch video demonstrations on CSF collection, handling, and safety precautions.

Group discussion on proper sample storage and transportation.

##### ACTIVITY 2: Demonstration Lab (1 Hour)

Observe CSF samples for color, clarity, and consistency.

Analyze known results of biochemical parameters (glucose, protein levels, etc.).

##### ACTIVITY 3: Demonstration on Model (1 Hour)

Identify cellular components (WBCs, RBCs, microorganisms) under the microscope.

Compare normal vs. abnormal CSF samples using prepared slides or images.

##### ACTIVITY 4: Practical (2 Hours)

Work in groups to analyze given CSF test results.

Correlate findings with hypothetical patient scenarios and discuss possible conditions.

Use virtual tools or models to simulate CSF analysis.

Summarize key learnings and present findings to the class.

#### Practical Training 6.2 : Interpretation of Renal Function Test (RFT) results

Total activity hours: 5 Hours

##### ACTIVITY 1: Demonstration (1 Hour)

Tutorial session on key RFT parameters: serum creatinine, blood urea nitrogen (BUN), and electrolyte balance.

Discussion on normal vs. abnormal values and their clinical significance.

##### ACTIVITY 2: Practical (1 Hour)

Hands-on session analyzing the provided RFT reports.  
 Identify abnormalities and their implications in kidney function.  
**ACTIVITY 3: Demonstration Bedside (1 Hour)**  
 Work in small groups to correlate RFT findings with hypothetical patient scenarios.  
 Discuss differential diagnoses based on variations in RFT parameters.  
**ACTIVITY 4: Demonstration Lab (2 Hours)**  
 Engage in simulated case studies to replicate real-world diagnostic situations.  
 Apply a stepwise approach to diagnosing renal conditions using RFT results.  
 Review scientific articles and Siddha perspectives on kidney health.  
 Discuss case reports related to RFT findings in Siddha medicine.

**Practical Training 6.3** : Interpretation of Liver Function Test (LFT) results

Total activity hours: 5 Hours  
**ACTIVITY 1: Demonstration (1 Hour)**  
 Guided tutorial on key LFT markers: bilirubin, ALT, AST, ALP, total protein, and albumin.  
 Discussion on normal vs. abnormal values and their clinical significance.  
**ACTIVITY 2: Practical (1 Hour)**  
 Hands-on session analyzing the provided LFT reports.  
 Identify abnormalities and their implications in liver function.  
**ACTIVITY 3: Demonstration Bedside(1 Hour)**  
 Work in small groups to correlate LFT findings with hypothetical patient scenarios.  
 Discuss differential diagnoses based on variations in LFT parameters.  
**ACTIVITY 4: Demonstration Lab (2 Hours)**  
 Engage in clinical simulation exercises to interpret real-world LFT cases.  
 Apply a structured approach to diagnosing liver conditions.  
 Review and critique scientific articles on Siddha perspectives related to liver health.  
 Discuss case studies linking LFT findings with Siddha treatment approaches.

**Practical Training 6.4** : Test for tumour markers

Total activity hours: 5 Hours  
**ACTIVITY 1: Demonstration (1 Hour)**

Overview of tumor markers (e.g., AFP, CEA, CA-125, PSA) and their clinical significance.

Teacher-led demonstration of standardized tumor marker testing procedures.

#### ACTIVITY 2: Practical (1 Hour)

Perform sample tumor marker tests under supervision.

Follow standard protocols for accuracy and reliability.

#### ACTIVITY 3: Demonstration Lab (3 Hour)

Analyze sample test results and correlate findings with specific cancers.

Brainstorming session on clinical implications of tumor markers.

Discuss common errors in tumor marker testing and their solutions.

Explore quality control measures to ensure precise results.

Review practical demonstrations and refine learned techniques in simulated testing.

Engage in a group discussion on applying tumor marker tests in clinical diagnostics.

### Experiential learning Activity

#### Experiential-Learning 6.1 : Gastric Function Tests (GFT)

Total activity hours: 5 Hours

##### ACTIVITY 1: Discussion (1 Hour)

Overview of GFT – principles, indications, and clinical applications.

Group discussion on different types of GFT (e.g., gastric acid secretion tests, urea breath test).

##### ACTIVITY 2: Simulation (1 Hour)

Instructor-led demonstration of GFT procedures, covering patient preparation and protocols.

Students simulate key steps in a controlled environment.

##### ACTIVITY 3: Flipped classroom(1 Hour)

Flipped classroom session – review case studies and discuss test results.

Collaborative interpretation of findings related to gastric disorders.

##### ACTIVITY 4:Role-play (2 Hour)

Discuss patient concerns related to GFT procedures.

Role-play patient counseling on test preparation and results.

#### Experiential-Learning 6.2 : Urea, Creatinine, Glomerular Filtration Rate (GFR), and Uric Acid

Total activity hours: 5 Hours

ACTIVITY 1: Flipped Classroom (1 Hour)

Self-study session using curated resources on renal biomarkers.

Q&A discussion to clarify key concepts.

ACTIVITY 2: Real life experience (2 Hour)

Group discussions to analyze real-world case studies of renal function abnormalities.

Interpret test results and link findings to potential kidney disorders.

ACTIVITY 3: Discussion (1 Hour)

Discussion on the clinical significance of Urea, Creatinine, GFR, and Uric Acid.

Interactive Q&A session to deepen understanding.

ACTIVITY 4: Blended Learning (1 Hour)

Use blended learning tools to simulate clinical scenarios for renal assessment.

Make diagnostic decisions based on simulated patient data.

### **Experiential-Learning 6.3 : Liver Function Tests (LFT)**

Total activity hours: 3 Hours

ACTIVITY 1: Discussion (1 Hour)

Overview of LFT components (e.g., Bilirubin, ALT, AST, ALP, Albumin, etc.).

Discussion on normal ranges and liver conditions associated with abnormal values.

ACTIVITY 2: Case based learning (1 Hour)

Analyze patient case studies with real or simulated LFT reports.

Group discussions to interpret results and link findings to liver diseases.

ACTIVITY 3: Flipped Classroom (1 Hour)

Students present key insights from pre-assigned learning materials.

Q&A session to consolidate understanding of LFT interpretation.

### **Experiential-Learning 6.4 : Interpretation of Liver function tests and Enzymes**

ACTIVITY 1: Case-Based Learning (1 Hour)

Analyze real or simulated patient LFT reports to identify abnormalities.

Discuss clinical relevance of altered liver enzyme levels.

ACTIVITY 2: Discussion (1 Hour)

Collaborate in small groups to identify trends in enzyme variations.

Link findings to liver conditions such as hepatitis, cirrhosis, or drug-induced liver injury.

ACTIVITY 3: Journal Club (1 Hour)

Review Siddha literature and modern research on liver biomarkers.

Discuss advanced concepts in liver function assessment and their clinical applications.

**Experiential-Learning 6.5** : Indication and interpretation of tumour markers

Total activity hours: 5 Hours

ACTIVITY 1: Discussion (1 Hour)

Understand the biochemical basis of tumor markers and their clinical relevance.

Discuss common tumor markers (e.g., AFP, CEA, CA-125, PSA) and their significance in cancer diagnosis.

ACTIVITY 2: Real life experience (1 Hour)

Analyze real-life or simulated patient cases to assess tumor marker results.

Interpret marker levels in different cancer types and clinical scenarios.

ACTIVITY 3: Case-Based Learning (1 Hour)

Work in small groups to correlate tumor marker findings with patient history and symptoms.

Discuss challenges in interpretation and false positives/negatives.

ACTIVITY 4: Journal Club (2 Hour)

Review recent research articles on advancements and limitations in tumor marker usage.

Discuss emerging trends and their implications in cancer detection.

**Experiential-Learning 6.6** : Biotransformation pathways

Total activity hours: 2 Hours

ACTIVITY 1: Discussion (1 Hour)

Understand the key enzymatic processes: Oxidation, reduction, hydrolysis, conjugation, and detoxification. Discuss real-world examples of drug metabolism and biotransformation.

Analyze case studies to identify metabolic pathways and their effects on drug efficacy and toxicity.

ACTIVITY 2: Journal Club (1 Hour)

Work with simulated drug metabolism data to predict metabolic products and their clinical impact.

Review recent research articles in a journal club session to discuss advancements in biotransformation and its relevance in Siddha medicine.

### **Experiential-Learning 6.7 : Mechanisms of Xenobiotic Metabolism**

Total activity hours: 3 Hours

ACTIVITY 1: Discussion (2 Hour)

Explore Phase I (oxidation, reduction, hydrolysis) and Phase II (conjugation) reactions in xenobiotic metabolism.

Discuss enzymatic vs. non-enzymatic pathways and their role in detoxification.

ACTIVITY 2: Symposium (1 Hour)

Students present key insights from discussions in a mini-symposium format.

Engage in peer learning and collaborative problem-solving to enhance understanding.

### **Modular Assessment**

| Assessment method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Hour |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <p><b>Modular Assessment Instructions:</b> Conduct a structured modular assessment. Assessment will be for 50 marks. Maintain a structured marking pattern and use different assessment methods for each module throughout the semester. Keep a record of the structured pattern used for assessment and calculate the modular grade point as per Table 6C.</p> <p><b>CHOOSE ANY OF THE BELOW ASSESSMENT FOR 50 MARKS</b></p> <p><b>Structured modular assessment:</b></p> <p>Total Marks – 50 (25+25)</p> <p>Practical Interpretation of Lab Report with Case History: 5 × 5 Marks = 25 Marks</p> <p>Theory - Short Answers: 5 questions × 5 marks each = 25 Marks</p> <p>or</p> <p>Any practical in converted form can be taken for assessment. (25 Marks)</p> <p>and</p> <p>Any experiential learning such as portfolios, reflections, or presentations can be taken as an assessment. (25 Marks)</p> | 4    |

## Module 7 : Applied Microbiology

### Module Learning Objectives

(At the end of the module, the students should be able to)

Define and describe the role of vaccination, anti-infective drugs, drug allergies, and antimicrobial resistance, as well as the characteristics of toxin-producing microorganisms such as *Clostridium botulinum*, *Staphylococcus aureus*, *Aspergillus flavus*, and *Fusarium graminearum*.

Analyze the mechanisms of microbial toxin production, including the differentiation between endotoxins and exotoxins, and evaluate the pathways of antibiotic resistance, with emphasis on microbial adaptation to heavy metals and xenobiotics.

Perform and demonstrate microbiological techniques such as toxin detection, microbial enumeration (CFU counting), and resistance analysis through laboratory-based methods.

Analyze and differentiate between various microbial resistance mechanisms, including genetic mutations, efflux pumps, and enzymatic degradation of antibiotics, correlating them with clinical outcomes.

Assess and justify the impact of antimicrobial resistance, vaccination strategies, and microbial toxin metabolism in the context of public health and preventive medicine.

### Unit 1 Vaccination Risk and Allergy to anti-infective drugs

7.1.1 Allergy to anti-infective drugs

7.1.2 Anti-infective drugs

7.1.3 Vaccination Risk

References: 30

| 3A          | 3B                                                                                                                                                                                                             | 3C | 3D      | 3E | 3F        | 3G            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------|----|-----------|---------------|
| CO1,CO5,CO8 | Describe the mechanisms and clinical presentations of hypersensitivity reactions to anti-infective drugs, and formulate appropriate management strategies to optimize patient safety and therapeutic outcomes. | 2  | Lecture | CC | Knows-how | FC,L&G<br>D,L |

|                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                |           |                           |           |           |                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------|-----------|-----------|------------------|
| CO1,CO5,CO8                                                                                                                                                                                                                                                               | Demonstrate the application of Siddha and modern anti-infective drugs, integrating traditional knowledge with modern safety practices to address infections effectively.                                       | 5         | Practical Training 7.1    | PSY-GUD   | Shows-how | PT,D             |
| CO1,CO5,CO8                                                                                                                                                                                                                                                               | Identify the potential risks and adverse effects associated with vaccination, and apply this knowledge to clinical decision-making and public health risk communication.                                       | 2         | Experiential-Learning 7.1 | PSY-MEC   | Shows-how | FC,DIS           |
| <b>Unit 2 Toxin-producing Microorganisms</b><br><br>7.2.1 Bacteria: <i>Clostridium botulinum</i> - <i>Staphylococcus aureus</i><br>7.2.2 Fungi: <i>Aspergillus flavus</i> - <i>Fusarium graminearum</i><br>7.2.3 Algae: <i>Cyanobacteria</i><br><br><b>References: 31</b> |                                                                                                                                                                                                                |           |                           |           |           |                  |
| <b>3A</b>                                                                                                                                                                                                                                                                 | <b>3B</b>                                                                                                                                                                                                      | <b>3C</b> | <b>3D</b>                 | <b>3E</b> | <b>3F</b> | <b>3G</b>        |
| CO1,CO5,CO8                                                                                                                                                                                                                                                               | Describe the toxin production mechanisms of <i>Clostridium botulinum</i> and <i>Staphylococcus aureus</i> , and evaluate their clinical significance and preventive measures                                   | 3         | Experiential-Learning 7.2 | CC        | Knows-how | FC,DIS           |
| CO1,CO5,CO8                                                                                                                                                                                                                                                               | Apply the knowledge of toxin production mechanisms of <i>Aspergillus flavus</i> , assess the health risks associated with its toxins, and explore preventive and management strategies.                        | 3         | Experiential-Learning 7.3 | CAP       | Shows-how | DIS,SIM,FC       |
| CO1,CO5,CO8                                                                                                                                                                                                                                                               | Differentiate the toxin production mechanisms of cyanobacteria, evaluate the environmental and health impacts of their toxins, and identify strategies for monitoring and mitigating cyanotoxin contamination. | 2         | Lecture                   | CC        | Knows-how | L&GD,FC,L&PPT,LS |
| <b>Unit 3 Mechanisms of Microbial Resistance and Toxin Production</b><br><br>7.3.1 Endotoxins and Exotoxins<br>7.3.2 Mycotoxins<br>7.3.3 Antibiotic Resistance<br>7.3.4 Heavy Metal and Xenobiotic Resistance                                                             |                                                                                                                                                                                                                |           |                           |           |           |                  |

**References:** 30,31

| 3A          | 3B                                                                                                                                                                                                 | 3C | 3D                        | 3E      | 3F        | 3G              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|-----------------|
| CO1,CO5,CO8 | Distinguish between endotoxins and exotoxins, describe their mechanisms of action, and explain their significance in microbial pathogenesis and clinical implications.                             | 2  | Lecture                   | CC      | Knows-how | L&GD,FC,SIM     |
| CO1,CO5,CO8 | Apply the knowledge on the properties, sources, and health impacts of mycotoxins, and evaluate strategies for detection, prevention, and control in clinical and environmental contexts.           | 5  | Experiential-Learning 7.4 | PSY-ADT | Shows-how | SIM,DIS,FC      |
| CO1,CO5,CO8 | Demonstrate techniques for identifying and analyzing antibiotic resistance patterns in microorganisms, and evaluate the impact of resistance on treatment strategies.                              | 5  | Practical Training 7.2    | PSY-MEC | Shows-how | PT,D            |
| CO1,CO5,CO8 | Demonstrate the mechanisms by which microorganisms develop resistance to heavy metals and xenobiotics, and assess the implications of these adaptations for human health and environmental safety. | 5  | Experiential-Learning 7.5 | PSY-GUD | Shows-how | FC,SY,JCSIM,DIS |

#### Unit 4 Microbial Metabolism in Toxin Degradation and Detoxification

7.4.1 Microbial Biodegradation of Pesticides

7.4.2 Biotransformation of Toxins: Mechanisms of Activation and Inactivation

**References:** 32

| 3A          | 3B                                                                                                                                                                            | 3C | 3D                        | 3E  | 3F        | 3G           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|-----|-----------|--------------|
| CO1,CO5,CO8 | Elaborate the processes involved in microbial biodegradation of pesticides, emphasizing the mechanisms, environmental impact, and potential applications in bioremediation.   | 2  | Lecture                   | CC  | Knows-how | TUT,L&GD,SIM |
| CO1,CO5,CO8 | Examine the mechanisms of toxin biotransformation, including activation and inactivation pathways, and evaluate their implications for human health and environmental safety. | 5  | Experiential-Learning 7.6 | CAP | Knows-how | SIM,DIS,FC   |

#### Unit 5 Microbiological Analysis in Toxicology

- 7.5.1 Microbial Identification: Techniques and Applications [Polymerase Chain Reaction(PCR), Sequencing]  
 7.5.2 Toxin Detection: Methods and Approaches [e.g., Enzyme-Linked Immunosorbent Assay (ELISA)]  
 7.5.3 Microbial Enumeration: Quantification Methods [e.g., Colony-Forming Unit(CFU) Counting]

**References:** 30

| 3A          | 3B                                                                                                                                                                                                                         | 3C | 3D                        | 3E      | 3F        | 3G           |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|--------------|
| CO1,CO5,CO8 | Describe the techniques and applications of microbial identification, including PCR and sequencing, and explain their relevance in microbial taxonomy, diagnostics, and toxicology.                                        | 2  | Lecture                   | CC      | Knows-how | L&PPT, L_VC  |
| CO1,CO5,CO8 | Demonstrate the principles and procedures of toxin detection methods, such as ELISA, and explain their applications in toxicological and clinical analysis.                                                                | 10 | Practical Training 7.3    | PSY-MEC | Shows-how | FV,DL,P T,D  |
| CO1,CO5,CO8 | Identify microbial enumeration methods, such as CFU (Colony-Forming Unit) counting, and analyze their applicability and significance in evaluating microbial load across clinical, environmental, and industrial contexts. | 3  | Experiential-Learning 7.7 | PSY-GUD | Shows-how | RLE,DIS, SIM |

### Practical Training Activity

#### Practical Training 7.1 : Anti-infective Drugs

Total activity hours: 5 Hours

ACTIVITY 1: Practical(2 Hours)

Teacher-Led demonstration on the application and monitoring of anti-infective drugs in clinical scenarios.

Students repeat the process individually or in small groups under supervision and document observations in the practical record or logbook.

ACTIVITY 2: Demonstration (3 Hours)

Conduct tests to assess the quality and efficacy of selected Siddha anti-infective formulations.

Compare findings with standard references and document results.

Review Siddha-related journal articles on anti-infective drugs.

Present key insights and discuss traditional versus modern approaches.

Analyze case studies focusing on the use of anti-infective drugs in Siddha medicine.

Discuss therapeutic approaches and treatment outcomes in small groups.

### **Practical Training 7.2 : Identifying and Analyzing Antibiotic Resistance**

Total activity hours: 5 Hours

#### **ACTIVITY 1: Practical (2 Hours)**

Teacher demonstrates laboratory techniques for identifying antibiotic resistance, such as disc diffusion and MIC (Minimum Inhibitory Concentration) testing.

Students repeat the procedures in small groups or individually, record observations, and document findings in the practical record or logbook.

#### **ACTIVITY 2: Demonstration (3 Hours)**

Review real-world cases of antibiotic resistance in different microorganisms.

Discuss resistance mechanisms and their clinical implications.

Students participate in simulated clinical scenarios to analyze lab results and determine appropriate treatment strategies for resistant infections.

Compare and justify their chosen approach in a guided discussion.

Explore the global impact of antibiotic resistance on healthcare and policy-making.

Share insights and debate preventive strategies in a structured group discussion.

### **Practical Training 7.3 : Toxin Detection by Method ELISA**

Total activity hours: 10 Hours

#### **ACTIVITY 1: Demonstration (2 Hours)**

Teacher explains the principles, applications, and types of ELISA used in toxin detection.

Video demonstration of ELISA techniques for detecting toxins in clinical and environmental samples.

#### **ACTIVITY 2: Demonstration Lab (3 Hours)**

Visit a well-equipped ELISA lab to observe real-time toxin detection processes.

Interaction with experts to understand laboratory workflow, equipment, and data interpretation.

#### **ACTIVITY 3: Practical (5 Hours)**

Under teacher supervision, students practice ELISA techniques in a controlled setup.

Each student or group performs step-by-step toxin detection, records observations, and documents results in the practical logbook.

Students analyze sample ELISA data and interpret toxin levels.

Group discussion on real-world case studies highlighting ELISA applications in clinical and environmental toxin analysis.

### **Experiential learning Activity**

#### **Experiential-Learning 7.1 : Risks associated with vaccination**

Total activity hours: 2 Hours

ACTIVITY 1: Discussion (1 Hour)

Analyze real-world case studies on potential vaccination risks.

Discuss common adverse effects vs. rare complications in different vaccines.

ACTIVITY 2: Flipped Classroom (1 Hour)

Review and interpret scientific articles on vaccine safety.

Compare individual risks vs. population benefits, emphasizing herd immunity and risk mitigation strategies.

### **Experiential-Learning 7.2** : Toxin-producing Microorganisms - Bacteria - *Clostridium botulinum* and *Staphylococcus aureus*

Total activity hours: 3 Hours

ACTIVITY 1: Discussion (1 Hour)

Study toxin production mechanisms and pathogenicity using scientific articles.

Discuss the differences in toxin action and disease manifestations.

ACTIVITY 2: Flipped Classroom (2 Hour)

Prepare and present case studies on foodborne outbreaks linked to these bacteria.

Highlight sources of contamination, symptoms, and public health impact.

### **Experiential-Learning 7.3** : Toxin-producing Microorganisms - Fungus: *Aspergillus flavus*

Total activity hours: 3 Hours

ACTIVITY 1: Simulation (1 Hour)

Explore the biosynthesis of aflatoxins using simulation tools or visual models.

Understand key enzymes and pathways involved in aflatoxin production.

ACTIVITY 2: Flipped Classroom (1 Hour)

Analyze real-life cases of aflatoxin contamination in food products.

Discuss health effects, regulatory limits, and risk assessment.

ACTIVITY 3: Discussion – Environmental Factors & Detection (1 Hour)

Identify environmental conditions that promote aflatoxin production.

Review detection methods (e.g., chromatography, ELISA) and discuss their applications.

### **Experiential-Learning 7.4** : Detection, Impact, and Control of Mycotoxins

Total activity hours: 5 Hours

ACTIVITY 1: Simulation – Mycotoxin Detection (1 Hour)

Conduct a mock analysis of food samples for mycotoxin contamination using simulated data or lab-based exercises.

Interpret results and identify contamination patterns.

ACTIVITY 2: Discussion – Mitigation Strategies (2 Hour)

Explore prevention, control, and regulatory measures for mycotoxins in food and the environment.

Compare case studies on successful mitigation efforts.

ACTIVITY 3: Flipped Classroom (2 Hour)

Review pre-assigned journal articles or videos on mycotoxins.

Share key insights on emerging detection techniques and risk assessment.

#### **Experiential-Learning 7.5 : Heavy metal and Xenobiotic resistance in microorganisms**

Total activity hours: 5 Hours

ACTIVITY 1: Discussion (1 Hour)

Introduction to mechanisms of microbial resistance to heavy metals and Xenobiotics.

Group discussion on real-world implications in medicine, agriculture, and environmental science.

ACTIVITY 2: Simulation (2 Hours)

Work through case studies using simulation tools or role-playing scenarios.

Analyze resistance gene transfer and its impact on ecosystems and clinical treatments.

ACTIVITY 3: Flipped Classroom (1 Hour)

Students review assigned readings or videos before class.

Present findings and engage in peer discussions on resistance mechanisms.

ACTIVITY 4: Journal Club (1 Hour)

Review and discuss recent research articles or case studies.

Present key findings and explore their implications for public health and environmental safety.

#### **Experiential-Learning 7.6 : Biotransformation of toxins**

Total activity hours: 5 Hours

ACTIVITY 1: Flipped Classroom (2 Hour)

Review scientific literature on toxin biotransformation pathways before the session.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <p>Share key insights through peer discussions.</p> <p><b>ACTIVITY 2: Discussion (1 Hour)</b></p> <p>Discuss real-world examples of toxin activation and inactivation (Xenobiotics, natural toxins).</p> <p>Compare different biotransformation mechanisms.</p> <p><b>ACTIVITY 3: Simulation (2 Hours)</b></p> <p>Use simulations to model Phase I (oxidation, reduction, hydrolysis) and Phase II (conjugation) reactions.</p> <p>Interpret enzymatic processes involved in detoxification.</p>                                                                                                                                                                                        |                    |
| <p><b>Experiential-Learning 7.7 : Microbial enumeration techniques</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |
| <p>Total activity hours: 3 Hours</p> <p><b>ACTIVITY 1: Discussion (1 Hour)</b></p> <p>Watch demonstrations on CFU counting, serial dilutions, and plating methods.</p> <p>Discuss key principles of microbial enumeration.</p> <p><b>ACTIVITY 2: Simulation (1 Hour)</b></p> <p>Practice microbial load calculations using simulated colony count data.</p> <p>Perform step-by-step dilution exercises in a guided session.</p> <p><b>ACTIVITY 3: Real life Experience (1 Hour)</b></p> <p>Analyze real-world applications in food safety and environmental monitoring.</p> <p>Engage in group discussions on the significance of microbial enumeration in different industries.</p>    |                    |
| <p><b>Modular Assessment</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |
| <p><b>Assessment method</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p><b>Hour</b></p> |
| <p><b>Modular Assessment Instructions:</b> Conduct a structured modular assessment. Assessment will be for 50 marks. Maintain a structured marking pattern and use different assessment methods for each module throughout the semester. Keep a record of the structured pattern used for assessment and calculate the modular grade point as per Table 6C.</p> <p><b>CHOOSE ANY OF THE BELOW ASSESSMENT FOR 50 MARKS</b></p> <p><b>Structured modular assessment:</b></p> <p>Total Marks – 50 (25+5+20)</p> <p>Theory - Short Answers: 5 questions × 5 marks each = 25 Marks</p> <p>Practical - Identification of Microbial Infection through Case Scenario: 1 × 5 Marks = 5 Marks</p> | <p>4</p>           |

Viva: 20 Marks

or

Any practical in converted form can be taken for assessment. (25 Marks)

and

Any experiential learning such as portfolios, reflections, or presentations can be taken as an assessment. (25 Marks)

## Module 8 : Applied Physiology

### Module Learning Objectives

(At the end of the module, the students should be able to)

Define and describe the processes of gastrointestinal and respiratory absorption, plasma protein binding, tissue distribution, and physiological responses to toxins, including oxidative stress, apoptosis, and immune reaction.

Analyze the mechanisms of toxin metabolism and differentiate the major elimination pathways (renal, hepatic, and respiratory), and evaluate the role of plasma protein binding in the distribution of toxins within the body.

Perform and demonstrate laboratory tests such as Full Blood Count (FBC), coagulation studies, and respiratory excretion assessments, interpreting their significance in toxicological conditions.

Analyze and differentiate the effects of oxidative stress, immunotoxicity, and apoptosis on cellular structures, linking them to various toxin-induced diseases.

Assess and justify the role of antioxidants, immune modulators, and therapeutic interventions in mitigating toxin-induced physiological damage.

### Unit 1 Absorption

8.1.1 Skin absorption

8.1.2 Gastrointestinal absorption

8.1.3 Respiratory absorption

References: 33,34

| 3A          | 3B                                                                                                                                                                       | 3C | 3D                        | 3E      | 3F        | 3G        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|-----------|
| CO1,CO5,CO8 | Describe the physiological mechanisms of skin absorption, including factors influencing percutaneous absorption and its applications in drug delivery and toxicology.    | 1  | Lecture                   | CC      | Knows-how | SIM,I&G D |
| CO1,CO5,CO8 | Demonstrate the physiological processes involved in gastrointestinal absorption, highlighting the factors affecting nutrient and drug uptake, and their implications for | 1  | Experiential-Learning 8.1 | PSY-GUD | Shows-how | FC,SIM    |

|                                                                                                                                                                                                          |                                                                                                                                                                               |           |                           |           |           |              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------|-----------|-----------|--------------|
|                                                                                                                                                                                                          | health and disease.                                                                                                                                                           |           |                           |           |           |              |
| CO1,CO5,CO8                                                                                                                                                                                              | Examine the mechanisms and factors influencing respiratory absorption, highlighting its significance in gas exchange, drug delivery, and toxicological exposure.              | 1         | Experiential-Learning 8.2 | CAP       | Shows-how | CBL,SIM      |
| <b>Unit 2 Distribution</b><br><br>8.2.1 Blood Circulation<br>8.2.2 Plasma protein binding<br>8.2.3 Tissue distribution<br><br><b>References:</b> 33,34                                                   |                                                                                                                                                                               |           |                           |           |           |              |
| <b>3A</b>                                                                                                                                                                                                | <b>3B</b>                                                                                                                                                                     | <b>3C</b> | <b>3D</b>                 | <b>3E</b> | <b>3F</b> | <b>3G</b>    |
| CO1,CO5,CO8                                                                                                                                                                                              | Describe the principles of blood circulation and its role in the distribution of nutrients, oxygen, drugs, and toxins within the human body.                                  | 1         | Lecture                   | CC        | Knows-how | L&GD,L_VC,FC |
| CO1,CO5,CO8                                                                                                                                                                                              | Apply the knowledge of mechanisms of plasma protein binding and examine its impact on the distribution, bioavailability, and pharmacokinetics of nutrients, drugs, and toxins | 1         | Experiential-Learning 8.3 | CAP       | Shows-how | SIM,FC       |
| CO1,CO5,CO8                                                                                                                                                                                              | Determine the factors influencing tissue distribution of substances and its implications on pharmacokinetics and therapeutic efficacy.                                        | 1         | Experiential-Learning 8.4 | CAP       | Shows-how | CBL          |
| <b>Unit 3 The Blood Cells and Liquid Component</b><br><br>8.3.1 RBC Indices<br>8.3.2 WBC Indices<br>8.3.3 Platelets<br>8.3.4 Clotting Indices<br>8.3.5 Blood Coagulation<br>8.3.6 Anti-Coagulant Therapy |                                                                                                                                                                               |           |                           |           |           |              |

**References:** 33,34

| 3A          | 3B                                                                                                                                                    | 3C | 3D                        | 3E      | 3F        | 3G           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|---------|-----------|--------------|
| CO1,CO5,CO8 | Distinguish the knowledge of RBC indices to interpret hematological profiles and support the diagnosis and classification of various blood disorders. | 1  | Lecture                   | CC      | Knows-how | L&GD,T<br>UT |
| CO1,CO5,CO8 | Demonstrate WBC indices in clinical cases to assess immune function and diagnose hematological disorders.                                             | 3  | Practical Training 8.1    | PSY-MEC | Shows-how | DL,D,PT      |
| CO1,CO5,CO8 | Demonstrate platelet indices and lab reports to evaluate hemostatic function and diagnose platelet-related disorders.                                 | 3  | Practical Training 8.2    | PSY-MEC | Shows-how | DL,D,PT      |
| CO1,CO5,CO8 | Demonstrate clotting indices and lab reports to assess coagulation status and diagnose clotting disorders.                                            | 2  | Practical Training 8.3    | PSY-GUD | Shows-how | PT,D         |
| CO1,CO5,CO8 | Apply the principles of blood coagulation by interpreting lab reports and analyzing case studies of coagulation disorders.                            | 2  | Practical Training 8.4    | PSY-ADT | Shows-how | PT,D         |
| CO1,CO5,CO8 | Apply the principles of anticoagulant therapy in clinical settings, including the mechanisms of action, indications, and monitoring of therapy.       | 2  | Experiential-Learning 8.5 | CAP     | Shows-how | FC,CBL       |

#### Unit 4 Excretion

- 8.4.1 Renal excretion
- 8.4.2 Hepatic excretion
- 8.4.3 Respiratory excretion

**References:** 34

| 3A          | 3B                                                                                                                                                                                      | 3C | 3D                        | 3E  | 3F        | 3G               |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|-----|-----------|------------------|
| CO1,CO5,CO8 | Apply the physiological principles of renal excretion, including the mechanisms involved in the filtration, reabsorption, and secretion processes, and their role in the elimination of | 1  | Experiential-Learning 8.6 | CAP | Shows-how | CBL,DIS,<br>PrBL |

|             |                                                                                                                                                                                                                                                  |   |                           |     |           |              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|-----|-----------|--------------|
|             | substances from the body.                                                                                                                                                                                                                        |   |                           |     |           |              |
| CO1,CO5,CO8 | Elaborate on respiratory excretion mechanisms and the role of the lungs in eliminating carbon dioxide and volatile substances, and correlate these processes with clinical features of respiratory and metabolic disorders                       | 1 | Lecture                   | CC  | Knows-how | L&GD,T<br>UT |
| CO1,CO5,CO8 | Apply the physiological principles of hepatic excretion, including the liver's role in the metabolism, conjugation, and excretion of substances, and its relevance in clinical practice, particularly in Siddha drug metabolism and elimination. | 1 | Experiential-Learning 8.7 | CAP | Shows-how | CBL,DIS      |

### Unit 5 Physiological responses to Toxins

- 8.5.1 Inflammation
- 8.5.2 Oxidative stress
- 8.5.3 Apoptosis
- 8.5.4 Immune responses
- 8.5.5 Immunotoxicity

**References:** 33

| 3A          | 3B                                                                                                                                                                                               | 3C | 3D                        | 3E  | 3F        | 3G             |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|-----|-----------|----------------|
| CO1,CO5,CO8 | Discuss the physiological responses to toxins—particularly inflammation—to analyze the impact of toxic exposures on immune function and tissue repair mechanisms                                 | 1  | Lecture                   | CC  | Knows-how | TUT,L&GD       |
| CO1,CO5,CO8 | Apply knowledge of the physiological responses to toxins, focusing on oxidative stress, and evaluate its impact on cellular damage and the body's defense mechanisms.                            | 1  | Experiential-Learning 8.8 | CAP | Shows-how | JC,DIS,R<br>LE |
| CO1,CO5,CO8 | Apply knowledge of the immune responses to toxins, exploring how the immune system detects and responds to toxic exposures, and understanding the consequences of dysregulated immune responses. | 1  | Experiential-Learning 8.9 | CAP | Shows-how | DIS            |
| CO1,CO5,CO8 | Apply knowledge of the physiological responses to toxins with a focus on apoptosis,                                                                                                              | 1  | Experiential-             | CAP | Shows-    | CBL,DIS        |

|             |                                                                                                                                                                                                                                            |   |                            |     |           |        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------|-----|-----------|--------|
|             | understanding the mechanisms of programmed cell death and its role in toxin-induced damage.                                                                                                                                                |   | Learning 8.10              |     | how       |        |
| CO1,CO5,CO8 | Apply knowledge of immunotoxicity to evaluate how toxins disrupt immune functions and the implications for health, with a focus on identifying mechanisms of immune modulation and their relevance in clinical and toxicological contexts. | 2 | Experiential-Learning 8.11 | CAP | Shows-how | CBL,JC |

### Practical Training Activity

#### Practical Training 8.1 : White Blood Cell (WBC) indices

Total activity hours: 3 Hours

ACTIVITY 1: Practical (1 Hour)

Teacher demonstrates WBC counting methods, blood smear preparation, and staining techniques.

Students observe and take notes on WBC morphology and differential counts.

ACTIVITY 2: Demonstration Lab (1 Hour)

Students perform WBC analysis under supervision, repeating the steps demonstrated.

Record findings, interpret WBC indices, and correlate with possible clinical conditions.

ACTIVITY 3: Demonstration (1 Hour)

Students analyze case studies with abnormal WBC indices, discussing potential diagnoses.

Findings are recorded in the practical logbook with key observations and interpretations.

#### Practical Training 8.2 : Interpretation of Platelet Indices

Total activity hours: 3 Hours

ACTIVITY 1: Practical(1 Hour)

Teacher demonstrates platelet count measurement techniques using automated analyzers and manual methods.

Students observe and take notes on platelet morphology and function assessment.

ACTIVITY 2: Demonstration Lab(1 Hour)

Students perform platelet count and function tests under supervision, following the demonstrated methods.

Record findings and analyze platelet indices from lab reports.

ACTIVITY 3:Demonstration(1 Hour)

Students review case studies with abnormal platelet indices, discussing conditions like thrombocytosis and thrombocytopenia.

Findings are recorded in the practical logbook with key observations and interpretations.

**Practical Training 8.3 : Interpretation of clotting indices**

Total activity hours: 2 Hours

ACTIVITY 1: Demonstration (1 hour)

Teacher demonstrates clotting tests, including PT, aPTT, INR, and fibrinogen assessment.

Students observe the procedures and understand the clinical significance of clotting indices.

ACTIVITY 2: Practical (1 hour)

Students perform clotting tests under supervision, following the demonstrated protocols.

Interpret clotting indices from given lab reports and correlate with clinical conditions.

Students analyze case studies on coagulation disorders such as hemophilia, DIC, or liver disease-related coagulopathy.

Findings and interpretations are recorded in the practical logbook.

**Practical Training 8.4 : Interpretation of Blood coagulation**

Total activity hours: 2 Hours

ACTIVITY 1: Demonstration (1 hour)

Teacher demonstrates coagulation tests (PT, aPTT, INR, fibrinogen) and explains their clinical relevance.

Discussion on normal vs. abnormal coagulation results and associated disorders.

ACTIVITY 2: Practical (1 hour)

Students interpret given lab reports, identifying coagulation abnormalities.

Correlate lab findings with patient history and clinical symptoms.

Small-group discussion on real-life case studies of hemorrhagic or thrombotic disorders.

Students record their observations and interpretations in the practical logbook.

**Experiential learning Activity****Experiential-Learning 8.1 : Case Analysis of Gastrointestinal Absorption**

Total activity hours: 1 Hours

ACTIVITY 1: Simulation (30 Minutes)

Students individually engage in a guided simulation to observe gastrointestinal absorption under different physiological conditions.

Record observations on factors affecting nutrient and drug uptake in their logbook as per teacher guidance.

ACTIVITY 2: Flipped Classroom (30 Minutes)

Students analyze pre-assigned case studies on malabsorption syndromes and drug bioavailability.

Document key takeaways and reflections in their logbook or as instructed by the teacher

### **Experiential-Learning 8.2 : Case Analysis of Respiratory Absorption**

Total activity hours: 1 Hours

ACTIVITY 1: Simulation (30 minutes)

Individually participate in a simulation demonstrating gas exchange and aerosol absorption in the respiratory system under different conditions.

Observe and analyze how factors like particle size, solubility, and lung physiology affect absorption.

ACTIVITY 2: Case based learning (30 minutes)

Independently analyze case studies on inhalation drug therapy and toxic gas exposure.

Identify key factors influencing respiratory absorption and document observations.

### **Experiential-Learning 8.3 : Plasma Protein Binding: Mechanisms and Significance**

Total activity hours: 1 Hours

ACTIVITY 1: Flipped Classroom (30 minutes)

Individually study the provided materials on plasma protein binding, including its role in drug distribution, bioavailability, and interactions.

Note key points for discussion and application in case scenarios.

ACTIVITY 2: Simulation (30 minutes)

Analyze individual case studies or simulations to assess the impact of plasma protein binding on drug efficacy, nutrient transport, or toxin distribution.

Identify factors affecting binding capacity and their implications for health and disease.

### **Experiential-Learning 8.4 : Tissue Distribution and Pharmacokinetics.**

Total activity hours: 1 Hours

ACTIVITY 1: Case Based learning ( 1 Hour)

Individually analyze case studies or scenarios to explore how different substances distribute in the body based on their chemical properties.

Assess implications on pharmacokinetics, drug efficacy, and toxicity.

### **Experiential-Learning 8.5 : Clinical Application of Anticoagulant Therapy**

Total activity hours: 2 Hours

ACTIVITY 1: Case-Based Learning (1 Hour)

Participate in a structured discussion on different anticoagulants (e.g., warfarin, heparin, DOACs) and their use in conditions like atrial fibrillation, deep vein thrombosis, and pulmonary embolism.

Analyze real-life or simulated clinical cases to determine appropriate anticoagulant choices, dosage adjustments, and monitoring strategies.

ACTIVITY 2: Flipped classroom(1 Hour)

Engage in flipped classroom activities where students apply their knowledge to clinical video scenarios or patient cases.

Discuss anticoagulation management, risks, and patient-specific considerations.

### **Experiential-Learning 8.6 : Physiological Principles of Renal Excretion**

Total activity hours: 1 Hour

ACTIVITY 1: Project based learning (15 minutes)

Independently review assigned readings or video content on renal physiology and excretion mechanisms.

Focus on glomerular filtration, tubular reabsorption, and secretion processes.

ACTIVITY 2:Discussion (20 minutes)

Participate in a structured discussion on factors influencing renal excretion (e.g., age, hydration, disease states).

Explore the impact of renal function on drug elimination and dosing adjustments in renal impairment.

ACTIVITY 2: Case Based learning (25 minutes)

Apply theoretical concepts to clinical cases involving renal function tests (e.g., serum creatinine, GFR).

Interpret test results to assess kidney function and predict the excretion of specific substances.

### **Experiential-Learning 8.7 : Hepatic Excretion and Siddha Drug Metabolism**

Total activity hours: 1 Hour

ACTIVITY 1: Discussion (30 minutes)

Discussion on assigned videos or reading materials on hepatic metabolism, including enzymatic pathways (e.g., cytochrome P450 system) and first-pass metabolism.

Focus on the liver's role in drug conjugation, metabolism, and excretion, particularly in the context of Siddha medicine. Record key insights in the logbook or as per the Teacher's instructions.

ACTIVITY 2: Case based learning (30 minutes)

Apply the reviewed concepts to clinical case studies involving liver function impairment. Discuss in small groups how compromised hepatic excretion affects drug metabolism

and elimination.

Explore necessary adjustments in Siddha treatment for patients with liver dysfunction. Document findings and conclusions as instructed.

### **Experiential-Learning 8.8 : Oxidative Stress and Toxic Exposure**

Total activity hours: 1 Hour

ACTIVITY 1: Discussion (15 minutes)

Discussion on assigned case studies or research articles on oxidative stress and toxin exposure.

Focus on clinical manifestations and adaptive responses of the body.

ACTIVITY 2: Real life experience (20 minutes)

Analyze real-life cases of oxidative stress caused by toxic exposure.

Discuss key findings, symptoms, and potential therapeutic approaches, including perspectives from Siddha medicine.

ACTIVITY 3: Journal Club (25 minutes)

Present insights from a scientific paper related to oxidative stress and toxins.

Discuss recent findings and their relevance to traditional and modern medicine.

### **Experiential-Learning 8.9 : Immune responses to toxins**

Total activity hours: 1 Hour

ACTIVITY 1: Discussion (1 Hour)

Discussion on the fundamental concepts of immune responses to toxins.

Focus on the roles of the innate and adaptive immune systems, inflammation, and cytokine signaling.

Record key takeaways in the logbook or as per the teacher's instructions.

### **Experiential-Learning 8.10 : Physiological Responses to Toxins: Apoptosis and Toxin-Induced Cell Death**

Total activity hours: 1 Hour

ACTIVITY 1: Discussion (30 minutes)

Discussion on assigned reading or video material on apoptosis, focusing on molecular pathways and toxin-induced programmed cell death.

Understand key signaling mechanisms, including intrinsic and extrinsic apoptosis pathways. Record important points in the logbook or as per the Teacher's instructions.

ACTIVITY 2: Case based learning (30 minutes)

Independently analyze real-life or simulated case studies on apoptosis induced by toxins.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Explore the clinical implications of apoptosis in diseases such as cancer and neurodegenerative disorders. Document observations and potential therapeutic approaches to regulate apoptosis as instructed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |
| <b>Experiential-Learning 8.11</b> : Immunotoxicity: Impact of Toxins on Immune Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |
| <p>Total activity hours: 2 Hours</p> <p><b>ACTIVITY 1: Case-Based Learning (1 Hour)</b></p> <p>Individually review the principles of immunotoxicity, focusing on how toxins modulate immune function, leading to hypersensitivity, immunosuppression, or autoimmunity. Analyze real-world case studies to understand the clinical and toxicological relevance of immunotoxicity. Record key findings and interpretations in the logbook or as per the Teacher's instructions.</p> <p><b>ACTIVITY 2: Journal Club (1 Hour)</b></p> <p>Attend a journal club session where postgraduate students present recent research on immunotoxicity to undergraduate students. Engage in discussion to explore new insights, research advancements, and their applications in clinical and toxicological settings. Document learning points and reflections based on the session.</p> |             |
| <b>Modular Assessment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |
| <b>Assessment method</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Hour</b> |
| <p><b>Modular Assessment Instructions:</b> Conduct a structured modular assessment. Assessment will be for 25 marks. Maintain a structured marking pattern and use different assessment methods for each module throughout the semester. Keep a record of the structured pattern used for assessment and calculate the modular grade point as per Table 6C.</p> <p><b>CHOOSE ANY OF THE BELOW ASSESSMENT FOR 25 MARKS</b></p> <p><b>Structured modular assessment:</b></p> <p>Total Marks – 25 (15+10)</p> <p>Practical Interpretation of Lab Report with Case Scenario: 3 × 5 Marks = 15 Marks</p> <p>Viva: 10 Marks</p> <p>or</p> <p>Any practical in converted form can be taken for assessment. (10 Marks)</p> <p>and</p> <p>Any experiential learning such as portfolios, reflections, or presentations can be taken as an assessment. (15 Marks)</p>                 | 2           |

## Module 9 : Applied Anatomy

### Module Learning Objectives

(At the end of the module, the students should be able to)

Define and describe the role of Forensic radiology in identifying injuries, along with the anatomy and excretion pathways of key target organs such as the liver, heart, Gastro Intestinal (GI) tract, and Blood-Brain Barrier (BBB).

Analyze the pathophysiological mechanisms of organ-specific injuries caused by trauma and toxins in the kidney, lung, and skin, and evaluate the application of radiological and histopathological techniques in forensic assessment.

Perform histological analyses of tissue-specific damage in organs such as the kidney, lung, and skin, using microscopic examination and staining techniques to detect pathological changes.

Differentiate and interpret various types of injuries, including blunt force trauma, penetrating injuries, and toxicological effects, by correlating histopathological findings with forensic imaging techniques.

Assess and justify the significance of Forensic radiology and histopathology in medico-legal investigations, emphasizing their role in injury identification and Forensic toxicology.

### Unit 1 Forensic Radiology

9.1.1 Radiology of Bones

9.1.2 Radiology of Dentine

9.1.3 Detection of Injuries

9.1.4 Analysis of Gunshot Wounds

References: 35

| 3A          | 3B                                                                                                                            | 3C | 3D                     | 3E      | 3F        | 3G       |
|-------------|-------------------------------------------------------------------------------------------------------------------------------|----|------------------------|---------|-----------|----------|
| CO1,CO5,CO8 | Demonstrate the ability to identify fractures, bone deformities, and estimate bone age using radiological imaging techniques. | 2  | Practical Training 9.1 | PSY-GUD | Shows-how | PT,D,D-M |

|             |                                                                                                                                                                                                   |   |                           |         |           |             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|-------------|
| CO1,CO5,CO8 | Demonstrate the ability to identify and interpret radiological features of dentine for forensic analysis, including dental age estimation and injury detection.                                   | 2 | Practical Training 9.2    | PSY-GUD | Shows-how | D,D-M,PT    |
| CO1,CO5,CO8 | Apply radiological techniques to detect and interpret various types of injuries, including fractures, soft tissue damage, and trauma-related abnormalities, for forensic purposes.                | 5 | Experiential-Learning 9.1 | CAP     | Does      | W,RLE,Pr BL |
| CO1,CO5,CO8 | Describe the radiological features of gunshot wounds and comprehend the use of X-ray imaging in identifying entry and exit wounds, projectile trajectories, and associated bone or tissue damage. | 2 | Lecture                   | CC      | Knows-how | L&GD,X-Ray  |

## Unit 2 Anatomy of Specific Target Organs in Poisoning

- 9.2.1 Liver
- 9.2.2 Kidney
- 9.2.3 Lungs
- 9.2.4 Heart
- 9.2.5 Nervous system
- 9.2.6 Skin
- 9.2.7 GI Tract
- 9.2.8 Blood Brain Barrier

**References:** 36,37,38,39

| 3A          | 3B                                                                                                                                                            | 3C | 3D                        | 3E  | 3F        | 3G        |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|-----|-----------|-----------|
| CO1,CO5,CO8 | Examine the anatomical and functional features of the liver related to its role in toxin metabolism and the pathological changes observed in poisoning cases. | 2  | Experiential-Learning 9.2 | CAP | Shows-how | PrBL,RL E |
| CO1,CO5,CO8 | Describe the anatomical and physiological characteristics of the kidney and explain its role in toxin filtration and excretion in poisoning cases.            | 1  | Lecture                   | CC  | Knows-how | PER,L&G D |
| CO1,CO5,CO8 | Describe the anatomy of the lungs and their role in the absorption, metabolism, and excretion of toxins during poisoning events.                              | 1  | Lecture                   | CC  | Knows-how | L&GD,PE R |

|             |                                                                                                                                                                                                       |   |                           |         |           |           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|-----------|
| CO1,CO5,CO8 | Conduct discussions on the anatomy and physiological functions of the heart in toxin distribution and cardiovascular implications of poisoning.                                                       | 1 | Experiential-Learning 9.3 | CAP     | Shows-how | CBL       |
| CO1,CO5,CO8 | Describe the anatomy of nervous system and its function and the effects of toxins and its underlying mechanisms on neurotoxicity.                                                                     | 1 | Lecture                   | CC      | Knows-how | L&GD,PE R |
| CO1,CO5,CO8 | Identify and demonstrate the mechanisms of toxin-induced damage to the skin using practical demonstrations, with an understanding of the physiological response to various toxins affecting the skin. | 1 | Practical Training 9.3    | PSY-GUD | Shows-how | D,D-M     |
| CO1,CO5,CO8 | Determine the physiological effects of toxins on the Gastrointestinal (GI) tract, analyzing symptoms and potential interventions based on toxin type and exposure level.                              | 1 | Experiential-Learning 9.4 | CAP     | Shows-how | SIM,CBL   |
| CO1,CO5,CO8 | Investigate the role of the Blood-Brain Barrier (BBB) in poisoning, identifying how toxins cross the barrier and affect the Central Nervous System (CNS).                                             | 1 | Experiential-Learning 9.5 | CAP     | Shows-how | SIM,CBL   |

### Unit 3 Histology of Specific Target Organs in Poisoning

- 9.3.1 Liver
- 9.3.2 Oesophagus - Stomach
- 9.3.3 Kidney
- 9.3.4 Brain
- 9.3.5 Lung
- 9.3.6 Skin
- 9.3.7 Pancreas - Spleen
- 9.3.8 Heart

**References:** 40

| 3A          | 3B                                                                                                                                     | 3C | 3D                     | 3E      | 3F        | 3G    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------|----|------------------------|---------|-----------|-------|
| CO1,CO5,CO8 | Identify histological changes in liver tissue following poisoning, demonstrating an understanding of the cellular responses to toxins. | 1  | Practical Training 9.4 | PSY-GUD | Shows-how | D-M,D |

|             |                                                                                                                                                                                                                                                                          |   |                           |         |           |             |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---------|-----------|-------------|
| CO1,CO5,CO8 | Demonstrate histological alterations in spleen and pancreas tissue resulting from poisoning, identifying key pathological changes at the cellular and tissue levels.                                                                                                     | 1 | Practical Training 9.5    | PSY-GUD | Shows-how | D,D-M       |
| CO1,CO5,CO8 | Identify and analyze histological alterations in the oesophagus and stomach tissues resulting from poisoning, focusing on structural and cellular changes.                                                                                                               | 1 | Practical Training 9.6    | PSY-GUD | Shows-how | D-M,D       |
| CO1,CO5,CO8 | Perform histological changes in the kidney tissues caused by poisoning, with an emphasis on structural alterations such as tubular damage, glomerular changes, and interstitial inflammation, using Siddha concepts in the analysis.                                     | 1 | Experiential-Learning 9.6 | CAP     | Shows-how | JC          |
| CO1,CO5,CO8 | Demonstrate histological changes in brain tissues due to poisoning, with a focus on identifying alterations in neural structures such as neurons, glial cells, and blood-brain barrier integrity, incorporating Modern and Siddha medicine perspectives in the analysis. | 1 | Experiential-Learning 9.7 | PSY-GUD | Shows-how | JC          |
| CO1,CO5,CO8 | Identify histological changes in lung tissues due to poisoning, focusing on the identification of pathological changes like edema, fibrosis, and inflammation, while integrating Modern and Siddha medicine concepts in the interpretation of lung health.               | 1 | Experiential-Learning 9.8 | PSY-GUD | Shows-how | JC          |
| CO1,CO5,CO8 | Identify and analyze histological changes in the skin due to poisoning, with a focus on recognizing inflammatory responses, cellular damage, and repair mechanisms, incorporating relevant concepts from Modern and Siddha medicine.                                     | 1 | Practical Training 9.7    | PSY-GUD | Shows-how | D,D-M       |
| CO1,CO5,CO8 | Identify histological features of heart tissue affected by toxins, identifying structural alterations such as myocardial necrosis, inflammation, and fibrosis, and relate these findings to the physiological responses of the heart to poisoning.                       | 1 | Practical Training 9.8    | PSY-GUD | Shows-how | D,L_VC, D-M |

### Practical Training Activity

#### Practical Training 9.1 : Radiological Examination of Bones: X-ray Interpretation & Bone Age Estimation

Total activity hours: 2 hours

ACTIVITY 1: Demonstration on Model (1 Hour)

Teacher Demonstration (20 Minutes):

The Teacher will explain key radiological features of bones, including normal structures, common fractures, and deformities, using X-ray images.

Demonstrate step-by-step analysis of bone abnormalities in different cases.

Student Practice & Documentation (40 Minutes):

Students will analyze the provided X-ray images under guided supervision in small groups or individually.

Identify and interpret bone structures, fractures, and abnormalities.

Record observations in the practical record or logbook.

ACTIVITY 2: Practical (1 Hour)

Teacher Demonstration (20 Minutes):

Explain and demonstrate the use of radiographic charts (e.g., Greulich and Pyle Atlas) to estimate bone age from X-ray images of hands and wrists.

Demonstration (40 Minutes):

Students will individually or in small groups assess bone age using the provided X-ray images.

Compare findings with chronological age and document observations in the logbook.

### **Practical Training 9.2 : Radiological Examination of Dentine: X-ray Interpretation & Age Estimation**

Total activity hours: 2 Hours

ACTIVITY 1: Demonstration on Model(1 Hour)

Teacher Demonstration (20 Minutes):

The teacher will explain how to interpret dental X-rays, focusing on dentine structure, anomalies, and dental injuries.

Demonstrate step-by-step analysis using real case examples.

Student Practice & Documentation (40 Minutes):

Students will analyze the provided dental X-rays in small groups or individually.

Identify structural features, anomalies, and forensic relevance.

Record observations in the practical record or logbook.

ACTIVITY 2:Practical (1 Hour)

Teacher Demonstration (20 Minutes):

Explain and demonstrate radiographic techniques for forensic dental age estimation based on dentine and enamel development.

Demonstration (40 Minutes):

Students will analyze X-rays to estimate dental age using forensic guidelines.

Compare findings with chronological age and document results in the logbook.

### **Practical Training 9.3 : Toxin-Induced Skin Damage**

Total activity hours: 1 Hour

**ACTIVITY 1: Demonstration (30 Minutes)**

**Teacher Demonstration (15 Minutes):**

The Teacher will showcase live or simulated demonstrations of how different toxins (chemical, biological) affect the skin.

Explain visible reactions such as rashes, burns, and discoloration, linking them to physiological mechanisms.

**Student Observation & Documentation (15 Minutes):**

Students will observe the demonstrations and take notes on the types of skin reactions.

Record observations in the practical logbook.

**ACTIVITY 2: Demonstration on Model (30 Minutes)**

**Video Case Studies (15 Minutes):**

Watch real-life or recorded case studies on toxin-induced skin damage.

Identify patterns of skin reactions and their severity.

**Group Discussion & Logbook Entry (15 Minutes):**

Discuss the observed skin reactions and the physiological mechanisms behind them.

Record key takeaways in the logbook.

**Practical Training 9.4 : Histological Examination of the Liver**

Total activity hours: 1 Hour

**ACTIVITY 1: Demonstration on Model (30 Minutes)**

**Teacher Demonstration (15 Minutes):**

The Teacher will demonstrate the preparation and examination of liver histology slides, highlighting normal vs. poisoned liver tissue.

Key histological features such as cellular alterations, inflammation, and necrosis will be explained.

**Student Observation & Analysis (15 Minutes):**

Students will examine prepared liver histology slides under the microscope.

Identify and document histological changes caused by toxins in the lab notes.

**ACTIVITY 2: Demonstration (30 Minutes)**

**Group Discussion (15 Minutes):**

Students will compare their findings with peers, discussing different stages of liver damage.

**Logbook Entry & Conclusion (15 Minutes):**

Record observations and key takeaways in the lab notes.

Discuss the relevance of histological changes in diagnosing and managing liver poisoning.

**Practical Training 9.5 : Histological Examination of the Spleen and Pancreas**

Total activity hours: 1 Hour

ACTIVITY 1: Demonstration on Model (30 Minutes)

Teacher Demonstration (15 Minutes):

The Teacher will demonstrate the analysis of spleen and pancreas histology slides.

Key histological features such as lymphocytic infiltration, atrophy, necrosis, fibrosis, splenomegaly, and acinar damage will be highlighted.

Student Observation & Documentation (15 Minutes):

Students will examine prepared histology slides and digital images under the microscope.

Identify and document histological changes in the lab notes.

ACTIVITY 2: Demonstration (30 Minutes)

Group Discussion (15 Minutes):

Students will compare their findings, discussing differences in histological changes due to toxins.

Logbook Entry & Conclusion (15 Minutes):

Record key observations in the lab notes.

Discuss the implications of these changes for diagnosing and managing poisoning cases.

#### **Practical Training 9.6 : Histological Examination of the Oesophagus and Stomach**

Total activity hours: 1 Hour

ACTIVITY 1: Demonstration on Model (30 Minutes)

The teacher will show video clips highlighting histological changes in the oesophagus and stomach due to poisoning (e.g., Mucosal erosion, inflammation, hemorrhagic lesions).

Demonstration of how to examine histology slides and digital images under the microscope.

Students will examine prepared histology slides and digital images.

Identify and record key features such as epithelial sloughing, gastric ulcers, inflammatory cell infiltration, and vascular damage.

ACTIVITY 2: Demonstration (30 Minutes)

Students will interpret their findings, linking histological changes with different types of poisons.

Compare observations with known poisoning cases to understand the impact of toxins on the oesophagus and stomach.

Logbook Entry: Record key observations and discussion points in the practical logbook.

#### **Practical Training 9.7 : Histological Examination of Skin Tissues**

Total activity hours: 1 Hour

ACTIVITY 1: Demonstration on Model (30 Minutes)

The Teacher will provide an overview of skin structure, its role as a barrier, and its response to toxins.  
 Video clips will show histological changes in poisoned skin tissues (e.g., epidermal necrosis, dermal inflammation, and healing).  
 Teacher demonstrates how to examine histology slides under the microscope.  
 Students will examine prepared histology slides and digital images of skin affected by toxins (e.g., chemical burns, heavy metals, allergic reactions).  
 Identify and record key histological changes such as inflammation, hyperplasia, and necrosis.  
**ACTIVITY 2: Demonstration (30 Minutes)**  
 Students will discuss their findings, linking structural changes with clinical symptoms.  
 Explore Siddha concepts of skin health, detoxification, and treatment approaches for skin toxicity.  
 Compare traditional Siddha remedies with modern treatments for skin poisoning.  
 Logbook Entry: Record key observations and discussion points in the practical logbook.

### **Practical Training 9.8 : Histological Examination of the Heart**

Total activity hours: 1 Hour  
**ACTIVITY 1: Demonstration on Model (30 Minutes)**  
 The Teacher will explain the myocardial structure and its response to toxic agents (e.g., heavy metals, alcohol, and drugs).  
 Video clips will illustrate histological changes in toxin-affected cardiac tissue.  
 Teacher demonstrates how to examine heart histology slides under the microscope.  
 Students will examine normal and toxin-affected cardiac tissue slides under the microscope.  
 Identify changes such as myocardial necrosis, inflammatory cell infiltration, and fibrosis.  
 Record observations and compare histological differences between toxin exposures.  
**ACTIVITY 2: Demonstration(30 Minutes)**  
 Students will discuss their findings and correlate microscopic changes with clinical symptoms (e.g., arrhythmias, reduced cardiac output, heart failure).  
 Relate histological damage to functional impairment in cardiac toxicity.  
 Logbook Entry: Document key observations and discussion points in the practical logbook.

### **Experiential learning Activity**

#### **Experiential-Learning 9.1 : Forensic Radiology: Interpretation of Injury X-Rays**

Total activity hours: 5 Hours  
**ACTIVITY 1: Project based learning (1 Hour)**  
 Individually review the basics of X-ray interpretation, focusing on identifying fractures, dislocations, and soft tissue abnormalities.  
 Understand forensic applications of radiology in trauma cases. Record key concepts in the logbook or as per the Teacher's instructions.

**ACTIVITY 2: Workshop (2 Hours)**

Participate in a hands-on session to analyze radiological images of different injury types.

Work individually to interpret provided X-rays and document observations. Engage in small-group discussions to compare findings and refine diagnostic accuracy.

**ACTIVITY 3: Real life experience (2 Hours)**

Analyze real-life forensic cases using radiological images.

Simulate forensic reporting by interpreting the images, documenting injury patterns, and concluding the severity of trauma.

Present individual findings and compare with case references. Record conclusions and learning outcomes in the logbook.

**Experiential-Learning 9.2 : Liver Anatomy and Function in Toxin Metabolism**

Total activity hours: 2 Hours

**ACTIVITY 1: Project based learning (30 Minutes)**

Individually review pre-recorded video lectures and reading materials on liver anatomy and its detoxification functions.

Take notes on key concepts related to toxin metabolism and pathological changes in poisoning cases. Record observations in the logbook as per the teacher's instructions.

**ACTIVITY 2: Real life experience (1 Hour 30 Minutes)**

Analyze real-life poisoning cases where the liver is affected.

Discuss anatomical and functional changes observed in different poisoning scenarios. Individually document key findings, insights, and conclusions in the logbook.

**Experiential-Learning 9.3 : Anatomy of the heart and physiological functions of the heart in toxin distribution**

Total activity hours: 1 Hour

**ACTIVITY 1: Case based learning (1 Hour)**

Analyze case studies on cardiovascular toxicology.

Discuss how toxins are distributed, metabolized, and eliminated by the heart. Record key points and insights in the logbook.

**Experiential-Learning 9.4 : Gastrointestinal Toxicity: Anatomy and Effects of Toxins**

Total activity hours: 1 Hour

**ACTIVITY 1: Case based learning (30 Minutes)**

Individually analyze case studies on gastrointestinal poisoning. Evaluate symptoms, toxic effects, and possible interventions.

Discuss findings in a group and record key insights in the logbook as per the teacher's instructions.

**ACTIVITY 2: Simulation (30 Minutes)**

Participate in a simulated case of GI toxicity. Assess symptoms, diagnose the type of poisoning, and determine appropriate treatment.

Predict the physiological progression of toxicity and document conclusions in the logbook.

**Experiential-Learning 9.5 : Blood-Brain Barrier and Toxicology: Defense, Penetration & Interventions**

Total activity hours: 1 Hour

ACTIVITY 1: Case based learning (30 Minutes)

Individually review resources on the structure and function of the Blood-Brain Barrier (BBB) and its role in toxin defense.

Analyze case studies of CNS poisoning, identifying factors influencing toxin penetration across the BBB. Discuss findings in a group and document insights in the logbook as per the Teacher's instructions.

ACTIVITY 2: Simulation (30 Minutes)

Participate in a simulated scenario where different toxins interact with the BBB, affecting brain function.

Assess the physiological impact of toxins and propose treatment strategies to mitigate toxicity. Record observations and conclusions in the logbook.

**Experiential-Learning 9.6 : Histological Examination of the Kidney: Toxicological & Siddha Perspectives**

Total activity hours: 1 Hour

ACTIVITY 1: Journal Club (1 Hour)

Review historical and contemporary studies on kidney damage from toxins in both Western and Siddha medicine.

Compare the perspectives of both systems regarding kidney detoxification and poisoning. Discuss Siddha-based remedies for kidney injury and record key insights in the logbook.

**Experiential-Learning 9.7 : Histological Examination of Brain Tissues: Toxicological & Siddha Perspectives**

Total activity hours: 1 Hour

ACTIVITY 1: Journal Club (1 Hour)

Review and critically analyze journal articles or case studies on brain damage from toxins in both modern and Siddha contexts.

Compare the Siddha perspective on brain health and toxin effects with current scientific findings.

Discuss potential detoxification methods and remedies based on Siddha principles and record key insights in the logbook.

**Experiential-Learning 9.8 : Histological Examination of Lung Tissues: Toxicological & Siddha Perspectives**

Total activity hours: 1 Hour

ACTIVITY 1: Journal Club (1 Hour)

Review case studies or research articles on toxin-induced lung damage from both modern and Siddha perspectives.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Discuss Siddha approaches to lung detoxification and potential remedies for toxin-induced lung injury.<br>Compare traditional and modern understandings of lung toxicity and document key takeaways in the logbook.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |
| <b>Modular Assessment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |
| <b>Assessment method</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Hour</b> |
| <p><b>Modular Assessment Instructions:</b> Conduct a structured modular assessment. Assessment will be for 25 marks. Maintain a structured marking pattern and use different assessment methods for each module throughout the semester. Keep a record of the structured pattern used for assessment and calculate the modular grade point as per Table 6C.</p> <p><b>CHOOSE ANY OF THE BELOW ASSESSMENT FOR 25 MARKS</b></p> <p><b>Structured modular assessment:</b><br/>           Total Marks – 25 (15+10)<br/>           Practical - Identification of Slides: 15 Marks<br/>           Diagnosis by X-ray: 10 Marks<br/>           or<br/>           Any practical in converted form can be taken for assessment. (10 Marks)<br/>           and<br/>           Any experiential learning such as portfolios, reflections, or presentations can be taken as an assessment. (15 Marks)</p> | 2           |

## Module 10 : Siddha Nanju Murivu Marunthu Seimuraigal (Siddha Antidote Preparation methods)

### Module Learning Objectives

(At the end of the module, the students should be able to)

Define and describe the preparation methods of specific and general Siddha antidotes, including *Kadukkai Kudineer*, *Avuriverpattai Karkam*, *Sundarithylam*, *Naabi Kuzhambu*, and *Gandhaga Urundai*.

Describe the pharmacological principles underlying the detoxifying actions of Siddha antidotes by identifying their mode of action, selecting appropriate indications, and assessing their therapeutic benefits in clinical contexts.

Prepare and demonstrate the formulation of Siddha antidotes, such as *Kuppai Meni Karkam*, *Sivanar Amirtham*, *Thippiliyathi Marunthu*, and *Maragatham Parpam*, following traditional purification and processing techniques.

Differentiate the various Siddha antidotes in terms of ingredients, preparation methods, and their specific applications for treating different toxicological conditions.

Assess and justify the selection of appropriate Siddha antidotes for different toxic exposures, emphasizing *Poritha Vengara Karaisal*, *Thulasi Verpattai Kudineer*, and other detoxification formulations in clinical practice.

### Unit 1 Specific Siddha Antidotes Preparations

10.1.1 *Karuvel Kopuli Kudineer – Arugankattai Kudineer – Vasambu Kari*

10.1.2 *Kadukkai Kudineer - Poritha Vengara Karaisal - Avuriverpattai Karkam*

10.1.3 *Kuppai Meni Karkam - Thulasi Verpattai Kudineer – Thayir Vellam*

10.1.4 *Nilapanai Kizhangu Kudineer – Linga Nanju Kudineer - Thaalaga Nanju Kudineer*

10.1.5 *Serankottai Nanju Murivu – Nervalam Nanju Murivu – Abini and Kanja Nanju Murivu*

References: 41,42,43,44

| 3A          | 3B                                                                                                | 3C | 3D      | 3E | 3F     | 3G      |
|-------------|---------------------------------------------------------------------------------------------------|----|---------|----|--------|---------|
| CO1,CO2,CO8 | Describe the preparation methods, therapeutic applications, and safety profiles of <i>Karuvel</i> | 3  | Lecture | CC | Knows- | L&GD,PE |

|             |                                                                                                                                                                                                                                                                                     |   |                            |         |           |          |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------|---------|-----------|----------|
|             | <i>Kopuli Kudineer, Arugankattai Kudineer, and Vasambu Kari</i> as specific Siddha antidotes for various toxicological conditions.                                                                                                                                                  |   |                            |         | how       | R        |
| CO1,CO2,CO8 | Demonstrate a comprehensive understanding and appreciation of the therapeutic significance of <i>Kadukkai Kudineer, Poritha Vengara Karaikal, and Avuriverpattai Karkam</i> , and actively perform their preparation and application in the management of toxicological conditions. | 3 | Experiential-Learning 10.1 | PSY-GUD | Shows-how | DIS,PrBL |
| CO1,CO2,CO8 | Practice the traditional preparation methods and therapeutic applications of <i>Kuppai Meni Karkam, Thulasi Verpattai Kudineer, and Thayir Vellam</i> focusing on their cultural and clinical significance as Siddha antidotes.                                                     | 3 | Experiential-Learning 10.2 | AFT-RES | Shows-how | PrBL,DIS |
| CO1,CO2,CO8 | Conduct the preparation of <i>Nilapanai Kizhangu Kudineer, Linga Nanju Kudineer, and Thaalaga Nanju Kudineer</i> , ensuring precision and adherence to traditional Siddha practices                                                                                                 | 4 | Practical Training 10.1    | CAP     | Shows-how | D,PT     |
| CO1,CO2,CO8 | Demonstrate the preparation of <i>Serankottai Nanju Murivu, Nervalam Nanju Murivu, and Abini and Kanja Nanju Murivu</i> under guided supervision, ensuring accuracy in traditional methodologies and understanding their specific therapeutic applications.                         | 3 | Practical Training 10.2    | PSY-GUD | Shows-how | D,PT     |

## Unit 2 General Siddha Antidote Preparations - I

- 10.2.1 *Vida kuzhambu*
- 10.2.2 *Vida mai*
- 10.2.3 *Neelagandakuligai*
- 10.2.4 *Sundarithylam*
- 10.2.5 *Sanjeevi Chooranam - Nilavaagaikarpam - Aaduthinnapalai karpam*
- 10.2.6 *Kudorikuzhambu – Rasa mai - Rasaathimarunthu – Naabi kuzhambu*
- 10.2.7 *Sarva Vidari Kuligai*
- 10.2.8 *Gandhaga Urundai – Thippiliyathi Marunthu – Nellikai Gandhaga Nei – Sombu Kudineer – Paranjothi Maathirai*
- 10.2.9 *Eganthathailam*
- 10.2.10 *Sarva Vida thodari Kuligai*

**References:** 10,41,42,43,44

| 3A          | 3B                                                                                                                                                                                                                                                                                                            | 3C | 3D                         | 3E      | 3F        | 3G       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------|---------|-----------|----------|
| CO1,CO2,CO8 | Produce <i>Vida Kuzhambu</i> following Siddha protocols while analyzing its composition, mechanisms of action, and clinical applications.                                                                                                                                                                     | 2  | Practical Training 10.3    | PSY-MEC | Shows-how | D,PT     |
| CO1,CO2,CO8 | Describe the importance of <i>Vida Mai</i> in Siddha toxicology by reviewing its ingredients, understanding its preparation, and exploring its therapeutic applications through collaborative discussions and analysis.                                                                                       | 2  | Experiential-Learning 10.3 | AFT-REC | Does      | JC,DIS   |
| CO1,CO2,CO8 | Demonstration foundational procedures in the preparation of Neelagandakuligai, a Siddha antidote, under guided supervision by participating in practical demonstrations, conducting basic drug analysis, and contributing to discussions on its therapeutic and toxicological relevance.                      | 2  | Practical Training 10.4    | PSY-GUD | Shows-how | PT,D     |
| CO1,CO2,CO8 | Perform actively in the preparation and analysis of <i>Sundari Thailam</i> , exploring its formulation process, therapeutic applications, and pharmacological significance through practical sessions and journal club reviews.                                                                               | 4  | Experiential-Learning 10.4 | PSY-GUD | Shows-how | JC,DIS   |
| CO1,CO2,CO8 | Describe the preparation, therapeutic applications, and ingredient composition of <i>Sanjeevi Chooranam</i> , <i>Nilavaagaikarpam</i> , and <i>Aaduthinnapalai Karpam</i> , demonstrating their comprehensive role in Siddha toxicology and antidote formulations through group discussions and presentations | 3  | Lecture                    | CC      | Knows-how | L&GD,PER |
| CO1,CO2,CO8 | Perform the traditional preparation processes, therapeutic uses, and ethical considerations of <i>Kudori Kuzhambu</i> , <i>Rasa Mai</i> , <i>Rasaathi Marunthu</i> , and <i>Naabi Kuzhambu</i> , reflecting on their ingredients and clinical significance through practical sessions and journal discussions | 4  | Experiential-Learning 10.5 | PSY-GUD | Shows-how | JC,DIS   |
| CO1,CO2,CO8 | Demonstrate the foundational steps in the preparation and therapeutic applications of <i>Sarva Vidari Kuligai</i> , with emphasis on ingredient identification and practical applications in toxicology through discussions and journal analysis.                                                             | 1  | Practical Training 10.5    | PSY-GUD | Shows-how | D-M,D    |
| CO1,CO2,CO8 | Demonstrate the preparation methods, ingredient significance, and therapeutic                                                                                                                                                                                                                                 | 2  | Experiential-              | PSY-    | Shows-    | DIS,JC   |

|             |                                                                                                                                                                                                                                         |   |                            |     |           |            |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------|-----|-----------|------------|
|             | applications of <i>Gandhaga Urundai</i> , <i>Thippiliyathi Marunthu</i> , <i>Nellikai Gandhaga Nei</i> , <i>Sombu Kudineer</i> , and <i>Paranjothi Maathirai</i> through critical discussions, ingredient review, and journal analysis. |   | Learning 10.6              | GUD | how       |            |
| CO1,CO2,CO8 | Conduct the preparation and analysis of <i>Eaeganthathailam</i> , demonstrating its formulation and therapeutic roles through practical sessions and journal club reviews                                                               | 3 | Experiential-Learning 10.7 | CAP | Shows-how | PrBL,JC,DA |
| CO1,CO2,CO8 | Discuss the preparation, ingredients, and therapeutic applications of <i>Sarva Vida Thodari Kuligai</i> by referencing classical Siddha texts and contemporary research, focussing on its clinical relevance                            | 4 | Lecture                    | CC  | Knows-how | L&GD,LS    |

### Unit 3 General Siddha Antidote Preparations - II

- 10.3.1 *Palagarai parpam*
- 10.3.2 *Abraga parpam*
- 10.3.3 *Kowsigar Kuzhambu*
- 10.3.4 *Sivanar Amirtham*
- 10.3.5 *Agasthiyar Kuzhambu*
- 10.3.6 *Maragatha Parpam*
- 10.3.7 *Seena Vidamirtham*

**References:** 10,41,42,43,44,45

| 3A          | 3B                                                                                                                                                                                                                                                                         | 3C | 3D                      | 3E      | 3F        | 3G   |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------------------------|---------|-----------|------|
| CO1,CO2,CO8 | Demonstrate foundational skills in the preparation of <i>Palagarai Parpam</i> by observing and performing guided steps of its formulation, while exploring its therapeutic applications and ingredient properties through practical sessions and journal club discussions. | 2  | Practical Training 10.6 | PSY-GUD | Shows-how | PT,D |
| CO1,CO2,CO8 | Demonstrate the preparation of <i>Abraga Parpam</i> , focusing on the sequential process involved in its formulation, while performing an analysis of its therapeutic significance through practical demonstrations and journal club discussions                           | 3  | Practical Training 10.7 | PSY-GUD | Shows-how | D,PT |

|             |                                                                                                                                                                                                                                          |   |                            |         |           |             |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------|---------|-----------|-------------|
| CO1,CO2,CO8 | Apply the preparation techniques of <i>Kowsigar Kuzhambu</i> , exploring its therapeutic applications, ingredients, and traditional significance through discussions, practical demonstrations, and journal club reviews                 | 3 | Experiential-Learning 10.8 | CAP     | Shows-how | PrBL,JC,DIS |
| CO1,CO2,CO8 | Demonstrate guided proficiency in the preparation and therapeutic applications of <i>Sivanar Amirtham</i> , including ingredient identification and procedural methods, through practical demonstrations and journal club discussions    | 1 | Practical Training 10.8    | PSY-GUD | Shows-how | D,PT        |
| CO1,CO2,CO8 | Perform a comprehensive evaluation of <i>Agasthiyar Kuzhambu</i> , focusing on its ingredients, traditional preparation methods, and therapeutic applications through discussions, practical demonstrations, and journal club reviews    | 2 | Experiential-Learning 10.9 | CAP     | Shows-how | DIS,PrBL    |
| CO1,CO2,CO8 | Demonstrate the preparation of <i>Maragatham Parpam</i> by following traditional Siddha methods, while analyzing its composition, properties, and therapeutic applications through practical demonstrations and journal club discussions | 1 | Practical Training 10.9    | PSY-GUD | Shows-how | D,PT        |
| CO1,CO2,CO8 | Demonstrate the preparation of <i>Seena Vidamirtham</i> through traditional Siddha methods, analyze its composition, and explore its therapeutic indications and applications through discussion and hands-on practice                   | 1 | Practical Training 10.10   | PSY-GUD | Shows-how | PT,D        |

### Practical Training Activity

**Practical Training 10.1** : *Nilapanai Kizhangu Kudineer, Linga Nanju Kudineer, and Thaalaga Nanju Kudineer*

Total Activity Hours: 4 Hours

ACTIVITY 1: Demonstration (1 Hour)

The Teacher will demonstrate the step-by-step preparation of each *Kudineer*.

Key focus on ingredient selection, handling, and procedural accuracy.

ACTIVITY 2: Practical (3 Hours)

Students will replicate the preparation process in small groups or individually under supervision.

Emphasis on correct proportions, traditional methods, and precision.

Students will record the process and observations in their practical record or logbook.

Discussion on the therapeutic significance and detoxification properties of the formulations.

**Practical Training 10.2** : Preparation of *Serankottai Nanju Murivu*, *Nervalam Nanju Murivu*, and *Abini and Kanja Nanju Murivu*

Total Activity Hours: 3 Hours

ACTIVITY 1: Demonstration (1 Hour)

The Teacher will demonstrate the step-by-step preparation of each antidote.

Key focus on ingredient selection, traditional techniques, and safety precautions.

ACTIVITY 2: Practical (2 Hours)

Students will replicate the preparation in small groups or individually under supervision.

Emphasis on following traditional preparation methods accurately.

Students will document their preparation process and observations in their practical record.

Discussion on the pharmacological properties of the ingredients and their detoxification mechanisms.

Journal Club: Review Siddha classical texts and case studies on the clinical applications of these antidotes.

**Practical Training 10.3** : Preparation of *Vida Kuzhambu*

Total Activity Hours: 2 Hours

ACTIVITY 1: Demonstration (30 Minutes)

The teacher will demonstrate the step-by-step preparation of *Vida Kuzhambu*, focusing on ingredient selection, measurement, and traditional preparation techniques.

ACTIVITY 2: Practical (1.5 hours)

Students will replicate the preparation process in small groups or individually, following instructions and ensuring accuracy in ingredient handling.

Students will document their observations and preparation process in their practical record.

Discussion on the pharmacological properties of the ingredients and their detoxification effects.

Journal Club: Review classical Siddha texts and case studies highlighting the therapeutic applications of *Vida Kuzhambu* in toxicology.

**Practical Training 10.4** : Preparation of *Neelagandakuligai*

Total Activity Hours: 2 Hours

ACTIVITY 1: Demonstration (30 Minutes)

The Teacher will demonstrate the preparation process of *Neelagandakuligai*, explaining ingredient selection, purification, and stepwise processing.

ACTIVITY 2: Practical (1.5 hours)

Students will replicate the preparation in small groups or individually, ensuring correct procedures and ingredient handling.

Observations will be recorded in their practical logbook.

Students will analyze the properties of *Neelagandakuligai* and its therapeutic effects in detoxification.

Journal Club: Review and discuss classical Siddha texts and modern research articles on their clinical applications in toxicology.

**Practical Training 10.5** : Preparation of *Sarva Vidari Kuligai*

Total Activity Hours: 1 Hour

ACTIVITY 1: Demonstration on Model(30 Minutes)

The Teacher will explain the preparation process, ingredient properties, and detoxifying actions of *Sarva Vidari Kuligai*.

Students will discuss the formulation and its significance in toxicology.

ACTIVITY 2: Demonstration (30 Minutes)

Students will present findings from classical Siddha texts and modern research on *Sarva Vidari Kuligai*.

A journal review session will focus on its pharmacological effects and therapeutic applications in poison management.

**Practical Training 10.6** : Preparation of *Palagarai Parpam*

Total Activity Hours: 2 hours

ACTIVITY 1: Practical (1 Hour)

The Teacher will demonstrate the traditional preparation of *Palagarai Parpam*, including ingredient purification, calcination, and quality control measures.

Students will replicate the process in small groups or individually under supervision, ensuring proper adherence to Siddha methods.

ACTIVITY 2: Demonstration (1 Hour)

Students will review classical Siddha texts and modern research articles on *Palagarai Parpam*.

Discussion will focus on its efficacy, pharmacodynamics, safety profile, and role in toxicology management.

**Practical Training 10.7** : Preparation of *Abraga Parpam*

Total Activity Hours: 3 Hours

ACTIVITY 1: Practical (1.5 Hours)

The Teacher will demonstrate the step-by-step preparation of *Abraga Parpam*, covering purification, fine grinding (*Kalvam*), and calcination (*Putam*).

Students will replicate the process in small groups or individually under supervision, ensuring proper technique and safety measures.

Observation and documentation of physical and chemical changes during each stage of preparation.

ACTIVITY 2: Demonstration (1.5 Hours)

Review classical Siddha texts and modern studies on *Abraga Parpam*.

Discuss its pharmacological effects, therapeutic applications in toxicology and systemic disorders, and safety considerations.

Compare traditional and modern perspectives on its usage and effectiveness.

**Practical Training 10.8** : Preparation of *Sivanar Amirtham*

Total Activity Hours: 1 Hour

ACTIVITY 1: Practical (30 Minutes)

The Teacher will demonstrate the stepwise preparation of *Sivanar Amirtham*, covering ingredient selection, purification, and formulation techniques.

Students will replicate the process in small groups or individually, following instructions and recording observations in their logbooks.

ACTIVITY 2: Demonstration (30 Minutes)

Review classical Siddha texts and modern research articles on *Sivanar Amirtham*.

Discuss its pharmacological actions, safety profile, and applications in toxicology.

Compare traditional and contemporary perspectives on its therapeutic significance.

**Practical Training 10.9** : Preparation of *Maragatham Parpam*

Total Activity Hours: 1 Hour

ACTIVITY 1: Practical (30 Minutes)

The teacher will demonstrate the preparation of *Maragatham Parpam*, focusing on purification techniques and stepwise formulation.

Students will replicate the process in small groups or individually, following instructions and documenting the procedure in their logbooks.

ACTIVITY 2: Demonstration (30 Minutes)

Review classical Siddha texts and modern studies on *Maragatham Parpam*.

Discuss its pharmacological properties, toxicological significance, and therapeutic relevance.

Compare traditional preparation methods with modern scientific interpretations.

**Practical Training 10.10** : Preparation of *Seena Vidamirtham*

Total Activity Hours: 1 Hour

ACTIVITY 1: Practical (30 Minutes)

The teacher will demonstrate the preparation of *Seena Vidamirtham*, highlighting ingredient selection, purification techniques, and formulation steps.

Students will replicate the preparation process individually or in small groups and document their observations in the logbook.

ACTIVITY 2: Demonstration (30 Minutes)

Engage in a discussion on the therapeutic role of *Seena Vidamirtham* in detoxification and disease management.

Review classical Siddha texts and clinical applications of the formulation.

Compare traditional and modern perspectives on its efficacy and safety.

## Experiential learning Activity

### Experiential-Learning 10.1 : Formulation of *Kadukkai Kudineer*, *Poritha Vengara Karaisal*, and *Avuriverpattai Karkam*

Total activity Hours: 3 Hours

ACTIVITY 1: Project based learning (2 Hour)

Student Activity: Each student will prepare one of the formulations under supervision.

Observe changes in color, consistency, and aroma at different preparation stages.

Record the preparation steps and key observations in the logbook.

ACTIVITY 3: Discussion (1 Hour)

Group Activity: Small groups will compare the physical and sensory properties of the prepared antidotes.

Discuss the pharmacological relevance and clinical applications of each formulation.

Present findings on formulation effectiveness and therapeutic significance.

### Experiential-Learning 10.2 : Preparation of *Kuppai Meni Karkam*, *Thulasi Verpattai Kudineer*, and *Thayir Vellam*

Total Activity Hours: 3 Hours

ACTIVITY 1: Project based learning (1 Hour)

Student Activity: Students will individually or in small groups prepare the formulations under supervision.

Observe and document changes in consistency, color, and aroma during preparation.

Record key observations and preparation steps in their logbook.

ACTIVITY 2: Discussion (2 Hour)

Discuss the cultural significance and therapeutic importance of these formulations in Siddha medicine.

Analyze their role in detoxification and healing.

Share insights on preparation challenges and effectiveness in traditional practices.

### Experiential-Learning 10.3 : Preparation of *Vida Mai*

Total Activity Hours: 2 Hours

ACTIVITY 1: Discussion (1 Hour)

Review each ingredient, discussing its detoxifying properties.

Students will prepare *Vida Mai* in small groups under supervision.

Observe and document changes in texture, color, and consistency during preparation.

ACTIVITY 2: Journal Club (1 Hour)

Student Activity: Examine the prepared *Vida Mai*, noting its physical and sensory properties.  
Review classical Siddha texts or modern research on its therapeutic uses.  
Discuss its role in toxin neutralization and possible clinical applications in a guided group discussion.

**Experiential-Learning 10.4** : Preparation of *Sundhari Thailam*

Total Activity Hours: 4 Hours  
ACTIVITY 1: Discussion (2 Hours)  
Students will prepare *Sundhari Thailam* in small groups under supervision. Highlight key processing techniques and precautions.  
Document changes in texture, color, and consistency during preparation.  
ACTIVITY 2: Journal Club (2 Hours)  
Student Activity: Analyze the therapeutic roles of each ingredient in neutralizing toxins.  
Review classical Siddha texts and modern studies on its efficacy.  
Discuss case studies related to its use in poisoning management.  
Compare traditional and modern perspectives on its applications.

**Experiential-Learning 10.5** : Preparation of *Kudori Kuzhambu, Rasa Mai, Rasaathi Marunthu, and Naabi Kuzhambu*

Total Activity Hours: 4 Hours  
ACTIVITY 1: Discussion (2 Hours)  
Students will observe and document key preparation steps. Highlight safety precautions and traditional preparation ethics.  
Discuss the properties and detoxification mechanisms of the ingredients.  
ACTIVITY 2: Journal Club (2 Hours)  
Student Activity: Review and analyze classical Siddha texts and modern research on these antidotes.  
Discuss the therapeutic role and efficacy of each formulation.  
Compare traditional knowledge with contemporary scientific findings.

**Experiential-Learning 10.6** : Preparation of *Gandhaga Urundai, Thippiliyathi Marunthu, Nellikai Gandhaga Nei, Sombu Kudineer, Paranjothi Maathirai*

Total Activity Hours: 2 Hours  
ACTIVITY 1: Discussion (1 Hour)  
Group Exploration: Discuss the classical preparation methods and therapeutic applications of each antidote.  
Present the significance of key ingredients, focusing on their detoxification properties and pharmacological effects.  
ACTIVITY 2: Journal Club (1 Hour)

Review Siddha Literature & Research: Analyze classical Siddha texts and contemporary studies on the efficacy of these formulations in toxicology. Compare ingredient variations and discuss their clinical implications in detoxification and treatment.

#### **Experiential-Learning 10.7 : *Eaeganthathailam***

Total Activity Hours: 3 Hours

ACTIVITY 1: Project based learning (1 Hours)

Participate in the step-by-step preparation of *Eaeganthathailam*.

Focus on ingredient proportions, sequential processing, and purification techniques.

ACTIVITY 2: Drug Analysis(1 Hour)

Examine the pharmacodynamics and pharmacokinetics of its active components.

Discuss its role in detoxification and healing in toxin-related conditions.

ACTIVITY 3: Journal Club (1 Minutes)

Review classical Siddha texts and modern research on *Eaeganthathailam*.

Analyze its relevance in contemporary toxicology and potential integration into modern practices.

#### **Experiential-Learning 10.8 : Preparation of *Kowsigar Kuzhambu***

Total Activity Hours: 3 Hours

ACTIVITY 1: Discussion (1 Hour)

Explore classical Siddha texts and references on *Kowsigar Kuzhambu*.

Discuss its historical significance, ingredient selection, and therapeutic applications in poison management.

ACTIVITY 2: Project based learning (1 Hour)

Observe the step-by-step preparation process, focusing on ingredient sequencing and their roles.

Understand purification techniques and precautions in formulation.

ACTIVITY 3: Journal Club (1 Hour)

Analyze Siddha literature and modern studies on *Kowsigar Kuzhambu*.

Discuss its pharmacological relevance and efficacy in detoxification.

#### **Experiential-Learning 10.9 : Preparation of *Agasthiyar Kuzhambu***

Total Activity Hours: 2 Hours

ACTIVITY 1: Project based learning (1 Hour)

Observe and participate in the preparation of *Agasthiyar Kuzhambu*.

| <p>Focus on ingredient selection, stepwise processing, and Siddha purification techniques.</p> <p>ACTIVITY 2: Discussion (1 Hour)</p> <p>Study classical Siddha texts and modern research on <i>Agasthiyar Kuzhambu</i>.</p> <p>Discuss its formulation, therapeutic applications, and scientific interpretations.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <b>Modular Assessment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |
| Assessment method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Hour |
| <p><b>Modular Assessment Instructions:</b> Conduct a structured modular assessment. Assessment will be for 50 marks. Maintain a structured marking pattern and use different assessment methods for each module throughout the semester. Keep a record of the structured pattern used for assessment and calculate the modular grade point as per Table 6C.</p> <p><b>CHOOSE ANY OF THE BELOW ASSESSMENT FOR 50 MARKS</b></p> <p><b>Structured modular assessment:</b></p> <p>Total Marks – 50 (20+20+10)</p> <p>Practical Antidote Preparation: 1 × 20 Marks = 20 Marks</p> <p>Demonstration of Antidote Preparation (for undergraduates through physical demonstration, PPT, or video): 1 × 20 Marks = 20 Marks</p> <p>Practical - Identification of Raw Drugs and Writing the Antidote Preparation: 1 × 10 Marks = 10 Marks</p> <p>or</p> <p>Any practical in converted form can be taken for assessment. (25 Marks)</p> <p>and</p> <p>Any experiential learning such as portfolios, reflections, or presentations can be taken as an assessment. (25 Marks)</p> | 4    |

**Table 4 : Practical Training Activity**

| (*Refer table 3 of similar activity number) |                                                                      |       |
|---------------------------------------------|----------------------------------------------------------------------|-------|
| Practical No*                               | Practical name                                                       | Hours |
| 1.1                                         | Envagai Thervu (Eightfold Diagnostic Techniques)                     | 3     |
| 1.2                                         | 96 Thathuvangal in Diagnosis & Therapy                               | 6     |
| 1.3                                         | Ethically Sound Siddha Biomedical Research Protocol                  | 1     |
| 2.1                                         | Siddha Drug Testing:Chenduram, Parpam, and Kattu.                    | 3     |
| 2.2                                         | Adulteration in Siddha Drugs                                         | 3     |
| 2.3                                         | Adjuvants in Siddha Medicine                                         | 2     |
| 2.4                                         | Role of supportive medicines (Thunai Marunthugal) in Siddha practice | 2     |
| 2.5                                         | Principles and Practices in Siddha Medicine Preparation              | 6     |
| 2.6                                         | Nachari Seigai Udaiya Mooligaigal (Herbal Antidotes)                 | 2     |
| 2.7                                         | Dangers Associated with Improperly Prepared Drugs                    | 2     |
| 3.1                                         | Drug - Drug interactions according to Siddha                         | 1     |
| 3.2                                         | Understanding Food Triggers for Eczema in Siddha Medicine            | 1     |
| 3.3                                         | Detection of the Food Adulterants                                    | 4     |
| 3.4                                         | Investigating the Food Additives                                     | 4     |

|            |                                                                                                                                                                                              |    |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>4.1</b> | Purification of Senkottai, Thippili, Thaandri, Thetraan, Naabi, and Nilavvarai                                                                                                               | 6  |
| <b>4.2</b> | Purification of Herbal Formulations Using Nellikai, Nervaalam, Parangi Sakkai, Pugai Ilai, Perungaayam, and Manjal                                                                           | 4  |
| <b>4.3</b> | Purification of Thayir, Mor, Vennai, Nei, Pasumpa, Vellattu PaaL, and Vilangukalin Neer.                                                                                                     | 10 |
| <b>5.1</b> | Purification of Paadanangal, Panja paadaanam, Nava paadanam, Anjanakkal, Eli paadanam, Ganthagam, Gowri paadanam, Thaalagam, Thotti paadanam, Manosilai, Miruthar singi, and Vellai paadanam | 7  |
| <b>5.2</b> | Purification of Induppu, Lavanam, Evatchaaram, Kalluppu, Karpooram, Sathisaaram, Seenaakaram, Navacharam, Pooniru, Valaiyaluppu, Vediuppu, and Venkaaram                                     | 7  |
| <b>5.3</b> | Purification of Thaen, Palagarai, Muthuchippi, Muttai Odu, Sangu, and Nathai Odu                                                                                                             | 6  |
| <b>6.1</b> | Examination of Cerebrospinal Fluid (CSF)                                                                                                                                                     | 5  |
| <b>6.2</b> | Interpretation of Renal Function Test (RFT) results                                                                                                                                          | 5  |
| <b>6.3</b> | Interpretation of Liver Function Test (LFT) results                                                                                                                                          | 5  |
| <b>6.4</b> | Test for tumour markers                                                                                                                                                                      | 5  |
| <b>7.1</b> | Anti-infective Drugs                                                                                                                                                                         | 5  |
| <b>7.2</b> | Identifying and Analyzing Antibiotic Resistance                                                                                                                                              | 5  |
| <b>7.3</b> | Toxin Detection by Method ELISA                                                                                                                                                              | 10 |
| <b>8.1</b> | White Blood Cell (WBC) indices                                                                                                                                                               | 3  |
| <b>8.2</b> | Interpretation of Platelet Indices                                                                                                                                                           | 3  |
| <b>8.3</b> | Interpretation of clotting indices                                                                                                                                                           | 2  |
| <b>8.4</b> | Interpretation of Blood coagulation                                                                                                                                                          | 2  |
| <b>9.1</b> | Radiological Examination of Bones: X-ray Interpretation & Bone Age Estimation                                                                                                                | 2  |
| <b>9.2</b> | Radiological Examination of Dentine: X-ray Interpretation & Age Estimation                                                                                                                   | 2  |

|              |                                                                                                  |   |
|--------------|--------------------------------------------------------------------------------------------------|---|
| <b>9.3</b>   | Toxin-Induced Skin Damage                                                                        | 1 |
| <b>9.4</b>   | Histological Examination of the Liver                                                            | 1 |
| <b>9.5</b>   | Histological Examination of the Spleen and Pancreas                                              | 1 |
| <b>9.6</b>   | Histological Examination of the Oesophagus and Stomach                                           | 1 |
| <b>9.7</b>   | Histological Examination of Skin Tissues                                                         | 1 |
| <b>9.8</b>   | Histological Examination of the Heart                                                            | 1 |
| <b>10.1</b>  | Nilapanai Kizhangu Kudineer, Linga Nanju Kudineer, and Thaalaga Nanju Kudineer                   | 4 |
| <b>10.2</b>  | Preparation of Serankottai Nanju Murivu, Nervalam Nanju Murivu, and Abini and Kanja Nanju Murivu | 3 |
| <b>10.3</b>  | Preparation of Vida Kuzhambu                                                                     | 2 |
| <b>10.4</b>  | Preparation of Neelagandakuligai                                                                 | 2 |
| <b>10.5</b>  | Preparation of Sarva Vidari Kuligai                                                              | 1 |
| <b>10.6</b>  | Preparation of Palagarai Parpam                                                                  | 2 |
| <b>10.7</b>  | Preparation of Abraga Parpam                                                                     | 3 |
| <b>10.8</b>  | Preparation of Sivanar Amirtham                                                                  | 1 |
| <b>10.9</b>  | Preparation of Maragatham Parpam                                                                 | 1 |
| <b>10.10</b> | Preparation of Seena Vidamirtham                                                                 | 1 |

**Table 5 : Experiential learning Activity**

| (*Refer table 3 of similar activity number) |                                                                   |       |
|---------------------------------------------|-------------------------------------------------------------------|-------|
| Experiential learning No*                   | Experiential name                                                 | Hours |
| 1.1                                         | Six Tastes in Siddha Medicine.                                    | 3     |
| 1.2                                         | Role of a Maruthuvan: Names, Definitions, and Essential Texts     | 1     |
| 1.3                                         | The Ideal Siddha Physician: Traits, Ethics, and Attire            | 1     |
| 1.4                                         | Siddha Physician: Comparing Maraiyor & Maruthuvar                 | 1     |
| 1.5                                         | Ethical vs. Unethical Practices in Siddha Medicine                | 1     |
| 1.6                                         | Alchemy in Siddha Medicine: Importance and Practice               | 1     |
| 1.7                                         | Ethical Responsibilities in Siddha Practice                       | 1     |
| 1.8                                         | Ethics in Action: Real-Life Applications for Siddha Practitioners | 1     |
| 1.9                                         | Ethical Excellence in Siddha Research Practices                   | 3     |
| 2.1                                         | Standard Measurement Techniques in Medicinal Components           | 3     |
| 2.2                                         | Drug Maturity (Pakkuva matrum Abakkuva Gunam) in Siddha Medicine  | 3     |
| 2.3                                         | Mastering Siddha Dosage Principles                                | 3     |
| 2.4                                         | Choosing the right Vessel for Siddha Medicine Preservation        | 2     |
| 2.5                                         | Vessels for Administering Siddha Medicines                        | 2     |
| 2.6                                         | Aga Nanju (Inner part poison) and Pura Nanju (Outer part poison). | 5     |
| 2.7                                         | Complications of Purgation Therapies in Siddha Medicine           | 3     |
| 2.8                                         | Complications of Vomiting Therapy in Siddha Medicine              | 3     |

|            |                                                                                                                                                      |   |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| <b>2.9</b> | Complications of Nasiyam Therapy                                                                                                                     | 2 |
| <b>3.1</b> | Case-Based Learning on Adverse Effects of Unsuitable Diet (Kollaththagatha Unavu)                                                                    | 1 |
| <b>3.2</b> | Digestion times of Various Foods                                                                                                                     | 1 |
| <b>3.3</b> | Effects of Underfeeding and Overfeeding                                                                                                              | 1 |
| <b>3.4</b> | Food-Drug Interactions in Siddha Medicine                                                                                                            | 1 |
| <b>3.5</b> | Toxic Food Combinations in Siddha Medicine                                                                                                           | 1 |
| <b>3.6</b> | Understanding the Food Additives                                                                                                                     | 3 |
| <b>3.7</b> | Apathiyam and Apathiya Pathaarthangal (unsuitable dietary substances during illness).                                                                | 1 |
| <b>3.8</b> | Ichapathiyam and Choosing the Suitable Food Substances during Ichapathyam.                                                                           | 2 |
| <b>3.9</b> | Pathiyam (Dietary restrictions) for specific Siddha Formulations                                                                                     | 2 |
| <b>4.1</b> | Purification of Akkiragaram, Amukkara, Abini, Oomathan Vithai, Etti Kottai, and Omam                                                                 | 9 |
| <b>4.2</b> | The purification processes of Kanja, Kadukkai, Kariapolam, Vellaipolam, Kalarchi Kottai, and Kukkil.                                                 | 9 |
| <b>4.3</b> | Purification of Vaathumai ennai, Pungan nei, Veppam ennai, Venneer, Poosanikai neer, Kaluneer, Kaadi, Thanneer, and Panineer                         | 8 |
| <b>5.1</b> | Purification of Ayam, Ekku, Karuvangam, Kaantham, Semmbu, Thandavaalam, Naagam, Thangam, Mandooram, Venkalam, Velvangam, and Velli                   | 9 |
| <b>5.2</b> | Purification of Abragam, Annabethi, Kalnaar, Karsunnapu, Kaavikkal, Silasathu, Thutham, Paal Thutham, Mayil Thutham, Thurisu, Nandukkal, and Nimilai | 9 |
| <b>5.3</b> | Purification of Kilinjal, Iragugal, Punugu, Kasthuri, Korosanai, Poonaagam, Kombarakku, and Mezhugu.                                                 | 8 |
| <b>6.1</b> | Gastric Function Tests (GFT)                                                                                                                         | 5 |
| <b>6.2</b> | Urea, Creatinine, Glomerular Filtration Rate (GFR), and Uric Acid                                                                                    | 5 |

|            |                                                                                             |   |
|------------|---------------------------------------------------------------------------------------------|---|
| <b>6.3</b> | Liver Function Tests (LFT)                                                                  | 3 |
| <b>6.4</b> | Interpretation of Liver function tests and Enzymes                                          | 3 |
| <b>6.5</b> | Indication and interpretation of tumour markers                                             | 5 |
| <b>6.6</b> | Biotransformation pathways                                                                  | 2 |
| <b>6.7</b> | Mechanisms of Xenobiotic Metabolism                                                         | 3 |
| <b>7.1</b> | Risks associated with vaccination                                                           | 2 |
| <b>7.2</b> | Toxin-producing Microorganisms - Bacteria - Clostridium botulinum and Staphylococcus aureus | 3 |
| <b>7.3</b> | Toxin-producing Microorganisms - Fungus: Aspergillus flavus                                 | 3 |
| <b>7.4</b> | Detection, Impact, and Control of Mycotoxins                                                | 5 |
| <b>7.5</b> | Heavy metal and Xenobiotic resistance in microorganisms                                     | 5 |
| <b>7.6</b> | Biotransformation of toxins                                                                 | 5 |
| <b>7.7</b> | Microbial enumeration techniques                                                            | 3 |
| <b>8.1</b> | Case Analysis of Gastrointestinal Absorption                                                | 1 |
| <b>8.2</b> | Case Analysis of Respiratory Absorption                                                     | 1 |
| <b>8.3</b> | Plasma Protein Binding: Mechanisms and Significance                                         | 1 |
| <b>8.4</b> | Tissue Distribution and Pharmacokinetics.                                                   | 1 |
| <b>8.5</b> | Clinical Application of Anticoagulant Therapy                                               | 2 |
| <b>8.6</b> | Physiological Principles of Renal Excretion                                                 | 1 |
| <b>8.7</b> | Hepatic Excretion and Siddha Drug Metabolism                                                | 1 |
|            |                                                                                             |   |

|             |                                                                                                                      |   |
|-------------|----------------------------------------------------------------------------------------------------------------------|---|
| <b>8.8</b>  | Oxidative Stress and Toxic Exposure                                                                                  | 1 |
| <b>8.9</b>  | Immune responses to toxins                                                                                           | 1 |
| <b>8.10</b> | Physiological Responses to Toxins: Apoptosis and Toxin-Induced Cell Death                                            | 1 |
| <b>8.11</b> | Immunotoxicity: Impact of Toxins on Immune Function                                                                  | 2 |
| <b>9.1</b>  | Forensic Radiology: Interpretation of Injury X-Rays                                                                  | 5 |
| <b>9.2</b>  | Liver Anatomy and Function in Toxin Metabolism                                                                       | 2 |
| <b>9.3</b>  | Anatomy of the heart and physiological functions of the heart in toxin distribution                                  | 1 |
| <b>9.4</b>  | Gastrointestinal Toxicity: Anatomy and Effects of Toxins                                                             | 1 |
| <b>9.5</b>  | Blood-Brain Barrier and Toxicology: Defense, Penetration & Interventions                                             | 1 |
| <b>9.6</b>  | Histological Examination of the Kidney: Toxicological & Siddha Perspectives                                          | 1 |
| <b>9.7</b>  | Histological Examination of Brain Tissues: Toxicological & Siddha Perspectives                                       | 1 |
| <b>9.8</b>  | Histological Examination of Lung Tissues: Toxicological & Siddha Perspectives                                        | 1 |
| <b>10.1</b> | Formulation of Kadukkai Kudineer, Poritha Vengara Karaisal, and Avuriverpattai Karkam                                | 3 |
| <b>10.2</b> | Preparation of Kuppai Meni Karkam, Thulasi Verpattai Kudineer, and Thayir Vellam                                     | 3 |
| <b>10.3</b> | Preparation of Vida Mai                                                                                              | 2 |
| <b>10.4</b> | Preparation of Sundhari Thailam                                                                                      | 4 |
| <b>10.5</b> | Preparation of Kudori Kuzhambu, Rasa Mai, Rasaathi Marunthu, and Naabi Kuzhambu                                      | 4 |
| <b>10.6</b> | Preparation of Gandhaga Urundai, Thippiliyathi Marunthu, Nellikai Gandhaga Nei, Sombu Kudineer, Paranjothi Maathirai | 2 |
| <b>10.7</b> | Eaeganthathailam                                                                                                     | 3 |
| <b>10.8</b> | Preparation of Kowsigar Kuzhambu                                                                                     | 3 |

|             |                                    |   |
|-------------|------------------------------------|---|
| <b>10.9</b> | Preparation of Agasthiyar Kuzhambu | 2 |
|-------------|------------------------------------|---|

**Table 6 : Assessment Summary: Assessment is subdivided in A to H points****6 A : Number of Papers and Marks Distribution**

| Subject Code | Paper | Theory | Practical | Total |
|--------------|-------|--------|-----------|-------|
| SIDPG-AB-NM  | 1     | 100    | 200       | 300   |

**6 B : Scheme of Assessment ( Formative and Summative Assessment)****Credit frame work**

SIDPG-AB-NM consists of 10 modules totaling 16 credits, which correspond to 480 Notional Learning Hours. Each credit comprises 30 Hours of learner engagement, distributed across teaching, practical, and experiential learning in the ratio of 1:2:3. Accordingly, one credit includes 5 hours of teaching, 10 hours of practical training, 13 hours of experiential learning, and 2 hours allocated for modular assessment, which carries 25 marks.

**Formative Assessment :**Module wise Assessment:will be done at the end of each module. Evaluation includes learners active participation to get Credits and Marks. Each Module may contain one or more credits.

**Summative Assessment:**Summative Assessment (University examination) will be carried out at the end of Semester II.

**6 C : Calculation Method for Modular Grade Points (MGP)**

| Module Number & Name<br>(a)                                                                                   | Credits<br>(b) | Actual<br>No. of<br>Notional<br>Learning<br>Hours<br>(c) | Attended<br>Number<br>of<br>notional<br>Learning<br>hours<br>(d) | Maximum<br>Marks of<br>assessment<br>of<br>modules<br>(e) | Obtained<br>Marks<br>per<br>module<br>(f) | MGP =d*<br>f/c*e*100 |
|---------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------|----------------------|
| M1. Basic concepts of Nanju Maruthuvam (Siddha Toxicology) and Maruthuvar Ilakanam (Doctrine of Physician)    | 1              | 30                                                       |                                                                  | 25                                                        |                                           |                      |
| M2. Marunthin Ilakkanam (Distinctive of Drug features)                                                        | 2              | 60                                                       |                                                                  | 50                                                        |                                           |                      |
| M3. Fundamentals of Unavu Matrum Unavu Nanju (Food and Food Poison)                                           | 1              | 30                                                       |                                                                  | 25                                                        |                                           |                      |
| M4. Mooligai Suddhi Muraigal (Purification of Medicinal Plants)                                               | 2              | 60                                                       |                                                                  | 50                                                        |                                           |                      |
| M5. Thathu Matrum Sangama Suddhi Muraigal (Purification of Metals, Minerals and, Substances of Animal Origin) | 2              | 60                                                       |                                                                  | 50                                                        |                                           |                      |
| M6. Applied Bio Chemistry                                                                                     | 2              | 60                                                       |                                                                  | 50                                                        |                                           |                      |
| M7. Applied Microbiology                                                                                      | 2              | 60                                                       |                                                                  | 50                                                        |                                           |                      |

|                                                                                                                                                                                                                   |   |    |  |    |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|--|----|--|--|
| M8. Applied Physiology                                                                                                                                                                                            | 1 | 30 |  | 25 |  |  |
| M9. Applied Anatomy                                                                                                                                                                                               | 1 | 30 |  | 25 |  |  |
| M10. Siddha Nanju Murivu Marunthu<br>Seimuraigal (Siddha Antidote Preparation<br>methods)                                                                                                                         | 2 | 60 |  | 50 |  |  |
| MGP = ((Number of Notional learning hours attended in a module) X (Marks obtained in the modular assessment ) /<br>(Total number of Notional learning hours in the module) X (Maximum marks of the module)) X 100 |   |    |  |    |  |  |

## 6 D : Semester Evaluation Methods for Semester Grade Point Average (SGPA)

SGPA will be calculated at the end of the semester as an average of all Module MGPs. Average of MGPs of the Semester For becoming eligible for Summative assessment of the semester, student should get minimum of 60% of SGPA

**SGPA = Average of MGP of all modules of all papers = add all MGPs in the semester/ no. of modules in the semester**  
**Evaluation Methods for Modular Assessment**

| A<br>S.No | B<br>Module number and Name                                                                                  | C<br>MGP                                                           |
|-----------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 1         | M1.Basic concepts of Nanju Maruthuvam (Siddha Toxicology) and Maruthuvar Ilakanam (Doctrine of Physician)    | C1                                                                 |
| 2         | M2.Marunthin Ilakkanam (Distinctive of Drug features)                                                        | C2                                                                 |
| 3         | M3.Fundamentals of Unavu Matrum Unavu Nanju (Food and Food Poison)                                           | C3                                                                 |
| 4         | M4.Mooligai Suddhi Muraigal (Purification of Medicinal Plants)                                               | C4                                                                 |
| 5         | M5.Thathu Matrum Sangama Suddhi Muraigal (Purification of Metals, Minerals and, Substances of Animal Origin) | C5                                                                 |
| 6         | M6.Applied Bio Chemistry                                                                                     | C6                                                                 |
| 7         | M7.Applied Microbiology                                                                                      | C7                                                                 |
| 8         | M8.Applied Physiology                                                                                        | C8                                                                 |
| 9         | M9.Applied Anatomy                                                                                           | C9                                                                 |
| 10        | M10.Siddha Nanju Murivu Marunthu Seimuraigal (Siddha Antidote Preparation methods)                           | C10                                                                |
|           | <b>Semester Grade point Average (SGPA)</b>                                                                   | (C1+C2+C3+C4+C5+<br>C6+C7+C8+C9+C10)<br>/ Number of<br>modules(10) |

| S. No | Evaluation Methods                                                                           |
|-------|----------------------------------------------------------------------------------------------|
| 1.    | Method explained in the Assessment of the module or similar to the objectives of the module. |

## 6 E : Question Paper Pattern

### MD/MS SIDDHA Examination

### SIDPG-AB-NM

### Sem II

**Time:** 3 Hours ,**Maximum Marks:** 100

**INSTRUCTIONS:** All questions compulsory

|     |                                   | Number of Questions | Marks per Question | Total Marks |
|-----|-----------------------------------|---------------------|--------------------|-------------|
| Q 1 | Application-based Questions (ABQ) | 1                   | 20                 | 20          |

|     |                                                        |   |    |     |
|-----|--------------------------------------------------------|---|----|-----|
| Q 2 | Short answer questions (SAQ)                           | 8 | 5  | 40  |
| Q 3 | Analytical based structured Long answer question (LAQ) | 4 | 10 | 40  |
|     |                                                        |   |    | 100 |

**6 F : Distribution for summative assessment (University examination)**

| S.No                                                                                                                                      | List of Module/Unit                                                                                                                  | ABQ | SAQ | LAQ |
|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|
| <b>(M-1)Basic concepts of Nanju Maruthuvam (Siddha Toxicology) and Maruthuvar Ilakanam (Doctrine of Physician) (Marks: Range 5-20)</b>    |                                                                                                                                      |     |     |     |
| 1                                                                                                                                         | (U-1) Basic Principles of Siddha Medicine                                                                                            | Yes | Yes | Yes |
| 2                                                                                                                                         | (U-2) Maruthuvar Ilakanam (Doctrine of physician)                                                                                    | No  | Yes | Yes |
| 3                                                                                                                                         | (U-3) National Commission for Indian System of Medicine (Ethics and Registration) Regulations 2023.                                  | No  | Yes | Yes |
| 4                                                                                                                                         | (U-4) Ethical Guidelines for Biomedical Research on Human Subjects                                                                   | No  | Yes | Yes |
| <b>(M-2)Marunthin Ilakkanam (Distinctive of Drug features) (Marks: Range 5-20)</b>                                                        |                                                                                                                                      |     |     |     |
| 1                                                                                                                                         | (U-1) Marunthu Ilakkanam Matrum Marunthu Sothanaigal (Integral aspects of drugs and Testing of drugs based on Siddha Medicine)       | No  | Yes | Yes |
| 2                                                                                                                                         | (U-2) Marunthunnum Vithigal (Rules of Medication)                                                                                    | Yes | Yes | Yes |
| 3                                                                                                                                         | (U-3) Basic concepts of Nanju                                                                                                        | Yes | Yes | Yes |
| 4                                                                                                                                         | (U-4) Complications of Mei Suddhi (Cleansing therapy)                                                                                | No  | Yes | Yes |
| 5                                                                                                                                         | (U-5) Suddhi Seiyaamai Matrum Sarivara Mudiyaatha Marunthugalin Kaedugal (Consequences of Unpurified and Unfinished Siddha Medicine) | No  | Yes | Yes |
| <b>(M-3)Fundamentals of Unavu Matrum Unavu Nanju (Food and Food Poison) (Marks: Range 5-20)</b>                                           |                                                                                                                                      |     |     |     |
| 1                                                                                                                                         | (U-1) Unavu Ilakkanam (Food)                                                                                                         | No  | Yes | No  |
| 2                                                                                                                                         | (U-2) Unavu Nanju (Food Poison)                                                                                                      | No  | Yes | Yes |
| 3                                                                                                                                         | (U-3) Unavu Kalappadam Matrum Serivootigal (Food Adulteration and Additives)                                                         | Yes | Yes | Yes |
| 4                                                                                                                                         | (U-4) Pathiyam Matrum Apathiyam Ilakkanam (Basics of Pathiyam and Apathiyam)                                                         | Yes | Yes | Yes |
| <b>(M-4)Mooligai Suddhi Muraigal (Purification of Medicinal Plants) (Marks: Range 5-20)</b>                                               |                                                                                                                                      |     |     |     |
| 1                                                                                                                                         | (U-1) Mooligai Sarakkugal (Plant materials)                                                                                          | Yes | Yes | Yes |
| 2                                                                                                                                         | (U-2) Neerma Vagaigal (Liquid and Semiliquid materials)                                                                              | No  | Yes | Yes |
| <b>(M-5)Thathu Matrum Sangama Suddhi Muraigal (Purification of Metals, Minerals and, Substances of Animal Origin) (Marks: Range 5-20)</b> |                                                                                                                                      |     |     |     |
| 1                                                                                                                                         | (U-1) Thathu Porutgal (Minerals and Metals)                                                                                          | Yes | Yes | Yes |
| 2                                                                                                                                         | (U-2) Sangama Porutkal (Substances of Animal Origin)                                                                                 | No  | Yes | Yes |
| <b>(M-6)Applied Bio Chemistry (Marks: Range 5-15)</b>                                                                                     |                                                                                                                                      |     |     |     |
| 1                                                                                                                                         | (U-1) Gastric Function Test and Examination of Cerebrospinal fluid                                                                   | No  | Yes | Yes |

|                                                                                                                 |                                                                    |     |     |     |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----|-----|-----|
| 2                                                                                                               | (U-2) Interpretation of Kidney function tests                      | No  | Yes | Yes |
| 3                                                                                                               | (U-3) Interpretation of Liver function tests and Enzymes           | No  | Yes | Yes |
| 4                                                                                                               | (U-4) Tumor Markers                                                | No  | Yes | Yes |
| 5                                                                                                               | (U-5) Metabolism                                                   | No  | Yes | Yes |
| <b>(M-7)Applied Microbiology (Marks: Range 5-15)</b>                                                            |                                                                    |     |     |     |
| 1                                                                                                               | (U-1) Vaccination Risk and Allergy to anti-infective drugs         | No  | Yes | Yes |
| 2                                                                                                               | (U-2) Toxin-producing Microorganisms                               | No  | Yes | Yes |
| 3                                                                                                               | (U-3) Mechanisms of Microbial Resistance and Toxin Production      | No  | Yes | Yes |
| 4                                                                                                               | (U-4) Microbial Metabolism in Toxin Degradation and Detoxification | No  | Yes | Yes |
| 5                                                                                                               | (U-5) Microbiological Analysis in Toxicology                       | No  | Yes | Yes |
| <b>(M-8)Applied Physiology (Marks: Range 5-15)</b>                                                              |                                                                    |     |     |     |
| 1                                                                                                               | (U-1) Absorption                                                   | No  | Yes | Yes |
| 2                                                                                                               | (U-2) Distribution                                                 | No  | Yes | Yes |
| 3                                                                                                               | (U-3) The Blood Cells and Liquid Component                         | No  | Yes | Yes |
| 4                                                                                                               | (U-4) Excretion                                                    | No  | Yes | Yes |
| 5                                                                                                               | (U-5) Physiological responses to Toxins                            | No  | Yes | Yes |
| <b>(M-9)Applied Anatomy (Marks: Range 5-20)</b>                                                                 |                                                                    |     |     |     |
| 1                                                                                                               | (U-1) Forensic Radiology                                           | Yes | Yes | Yes |
| 2                                                                                                               | (U-2) Anatomy of Specific Target Organs in Poisoning               | No  | Yes | Yes |
| 3                                                                                                               | (U-3) Histology of Specific Target Organs in Poisoning             | No  | Yes | Yes |
| <b>(M-10)Siddha Nanju Murivu Marunthu Seimuraigal (Siddha Antidote Preparation methods) (Marks: Range 5-20)</b> |                                                                    |     |     |     |
| 1                                                                                                               | (U-1) Specific Siddha Antidotes Preparations                       | Yes | Yes | Yes |
| 2                                                                                                               | (U-2) General Siddha Antidote Preparations - I                     | Yes | Yes | Yes |
| 3                                                                                                               | (U-3) General Siddha Antidote Preparations - II                    | Yes | Yes | Yes |

## 6 G : Instruction for the paper setting & Blue Print for Summative assessment (University Examination)

### Instructions for the paper setting.

1. 100 marks question paper shall contain:-
  - Application Based Question: 1 No (carries 20 marks)
  - Short Answer Questions: 8 Nos (each question carries 05 marks)
  - Long Answer Questions: 4 Nos (each question carries 10 marks)
2. Questions should be drawn based on the table 6F.
3. Marks assigned for the module in 6F should be considered as the maximum marks. No question shall be asked beyond the maximum marks.
4. Refer table 6F before setting the questions. Questions should not be framed on the particular unit if indicated “NO”.
5. There will be a single application-based question (ABQ) worth 20 marks. No other questions should be asked from the same module where the ABQ is framed.
6. Except the module on which ABQ is framed, at least one Short Answer Question should be framed from each module.
7. Long Answer Question should be analytical based structured questions assessing the higher cognitive ability.
8. Use the Blueprint provided in 6G or similar Blueprint created based on instructions 1 to 7

| Blueprint   |                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question No | Type of Question                                                                                                                             | Question Paper Format                                                                                                                                                                                                                                                                                                                                                              |
| Q1          | <b>Application based Questions</b><br><b>1 Question</b><br><b>20 marks</b><br><b>All compulsory</b>                                          | M1.U1 Or<br>M2.U2 Or M2.U3 Or<br>M3.U3 Or M3.U4 Or<br>M4.U1 Or<br>M5.U1 Or<br>M9.U1 Or<br>M10.U1 Or M10.U2 Or M10.U3                                                                                                                                                                                                                                                               |
| Q2          | <b>Short answer Questions</b><br><b>Eight Questions</b><br><b>5 Marks Each</b><br><b>All compulsory</b>                                      | 1. M1.U1 Or . M2.U4 Or . M6.U4 Or . M8.U3<br>2. M3.U3 Or . M5.U2 Or . M9.U2 Or . M10.U1<br>3. M2.U5 Or . M4.U1 Or . M7.U4 Or . M9.U3 Or . M10.U2<br>4. M7.U3 Or . M4.U2 Or . M6.U1 Or . M3.U4<br>5. M1.U4 Or . M6.U5 Or . M8.U4 Or . M10.U3<br>6. M7.U2 Or . M3.U1 Or . M6.U3 Or . M8.U5<br>7. M1.U2 Or . M5.U1 Or . M7.U1 Or . M2.U2<br>8. M1.U3 Or . M6.U2 Or . M3.U2 Or . M7.U5 |
| Q3          | <b>Analytical Based Structured</b><br><b>Long answer Questions</b><br><b>Four Questions</b><br><b>10 marks each</b><br><b>All compulsory</b> | 1. M1.U1 Or . M4.U1 Or . M6.U2 Or . M7.U2<br>2. M2.U3 Or . M5.U2 Or . M3.U2 Or . M10.U2<br>3. M5.U1 Or . M6.U3 Or . M10.U3 Or . M2.U5<br>4. M10.U1 Or . M2.U1 Or . M1.U4 Or . M3.U4                                                                                                                                                                                                |

## 6 H : Distribution of Practical Exam (University Examination)

| S.No | Heads                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Marks |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1    | <p><b>Major Practical: Purification of Raw Drugs (or) Preparation of Antidotes (80 Marks)</b></p> <p>Identifying Drugs (10 Marks) + Procedure Writing (20 Marks) + Preparation (30 Marks) + Presentation (20 Marks) = (80 Marks)</p> <p>Identifying Drugs (10 Marks)</p> <p>Description: Students will identify raw drugs provided in the practical session. They must recognize and name the drug accurately, based on physical characteristics like color, smell, and texture.</p> <p>Evaluation Criteria:</p> <p>Correct identification: 5 Marks</p> <p>Explanation of identification features: 5 Marks</p> <p>Procedure Writing (20 Marks)</p> <p>Description: Students are required to write the step-by-step procedure for purifying a raw drug or preparing an antidote, as per Siddha standards. Emphasis is placed on clarity, logical flow, and accuracy in following traditional purification or preparation techniques.</p> <p>Evaluation Criteria:</p> <p>Logical flow and clarity: 10 Marks</p> <p>Completeness and adherence to standard practices: 10 Marks</p> <p>Preparation (30 Marks)</p> <p>Description: Students must prepare the given antidote or complete the purification process for the raw drug within the allotted time. The final product must match the expected quality.</p> <p>Evaluation Criteria:</p> <p>Proper technique and handling of materials: 10 Marks</p> <p>Quality of the final product: 10 Marks</p> <p>Time management and neatness: 10 Marks</p> <p>Presentation (20 Marks)</p> | 80    |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |    |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|   | <p>Description: Students present their completed work to the examiners, explaining the steps, precautions, and significance of the prepared product.</p> <p>Evaluation Criteria:</p> <p>Confidence and clarity: 10 Marks</p> <p>Accuracy of explanation: 10 Marks</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |
| 2 | <p><b>Short Case (20 Marks)</b></p> <p>Any one task from the following will be given:</p> <p>Write Differential Diagnosis and Diagnosis based on a given scenario.</p> <p>Write Dietary Advice based on a given scenario.</p> <p>Write Prevention and Management for given Cleansing Therapies.</p> <p>Write Differential Diagnosis and Diagnosis based on a given Lab Report related to Poison.</p> <p>Description: PG Scholars will handle a case scenario related to toxicology. Tasks include writing differential diagnosis, diagnosis, dietary advice, or prevention strategies.</p> <p>Evaluation Criteria:</p> <p>Relevance and accuracy of the response: 10 Marks</p> <p>Presentation and logical reasoning: 10 Marks</p> <p>Example Tasks:</p> <p>Differential diagnosis and Diagnosis for a patient with vomiting and abdominal pain (e.g., food poisoning or pesticide poisoning).</p> <p>Dietary advice for a patient taking Rasa parpam.</p> <p>Prevention measures for a cleansing therapy such as Vanthi (Emesis), Bethi (Purgation) Maruthuvam.</p> <p>Diagnosis of Poisoning based on a lab report (e.g Arsenic)</p> | 20 |
| 3 | <p><b>Minor Practical (20 Marks)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20 |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|   | <p>Any one task from the following will be given:</p> <p>Identification of Adulterants in Raw Drugs.</p> <p>Identification of Adulterants in Food Products.</p> <p>Write the Marunthu Sothanaigal (Drug Testing Methods) for a given Finished Drug.</p> <p>Write about Marunthunnum Vithigal: Dosage (Marunthugalin Alavu), Adjuvant (Anupanam), and Supportive Medicines (Thunai Marunthugal) for a given Preparation.</p> <p>Identify the given Raw Drug as Aga Nanju (Inner Poison) or Pura Nanju (Outer Poison).</p> <p>Description: Students perform one of the minor practical tasks, focusing on analysis, differentiation, or application of Siddha toxicological concepts.</p> <p>Evaluation Criteria:</p> <p>Correct identification or differentiation: 10 Marks</p> <p>Explanation or reasoning: 10 Marks</p> <p>Example Tasks:</p> <p>Identification of adulterants (eg. Athividayam)</p> <p>Writing the Marunthu Sothanaigal for a drug like Karuvanga Chenduram.</p> <p>Identify Aga Nanju or Pura Nanju (eg. Kadukkai and Chukku)</p> |    |
| 4 | <p><b>Spotters (20 Marks)</b></p> <p>No of Spotters: 10 (<math>10 \times 2 = 20</math> Marks)</p> <p>Spotters from the following will be given:</p> <p>Identification of Nachari Seigai Udaiya Mooligaigal (Herbal Antidotes).</p> <p>Identification and Interpretation of Histological Slides.</p> <p>Identification of Nanjukku Matru Nanju (Poison-to-Poison Antidotes).</p> <p>Writing Antidotes for Given Poisonous Drugs.</p> <p>Writing about the Given Serivooti (Food Additive).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 20 |

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|                    | <p>Description: Students identify and write brief notes on spotter items, such as herbal antidotes or histological slides.</p> <p>Evaluation Criteria:</p> <p>Correct identification: 1 Mark per spotter</p> <p>Brief description: 1 Mark per spotter</p> <p>Example Spotters:</p> <p>Identify Nachari Seigai Udaiya Mooligaigal like Thumbai (<i>Leucas aspera</i>).</p> <p>Identify and Interpret Histological slide (eg. Liver damage in copper poisoning).</p> <p>Write an antidote for following Poisoning (eg. Datura Poisoning).</p> <p>Identify and describe the toxicity of a food additive like coloring agents/ Ajinomoto (MSG).</p> |            |
| 5                  | <b>Viva (2 examiners: 20 marks/each examiner)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 40         |
| 6                  | <b>Logbook (Activity record)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 10         |
| 7                  | <p><b>Practical and Clinical Record</b></p> <p>No of Practical = 20</p> <p>No of Clinical Case Sheets = 10</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10         |
| <b>Total Marks</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>200</b> |

## Reference Books/ Resources

| S.No | References                                                                                                                                       |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------|
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## Abbreviations

| Domain  |                             | T L Method |                                      | Level |           |
|---------|-----------------------------|------------|--------------------------------------|-------|-----------|
| CK      | Cognitive/Knowledge         | L          | Lecture                              | K     | Know      |
| CC      | Cognitive/Comprehension     | L&PPT      | Lecture with PowerPoint presentation | KH    | Knows how |
| CAP     | Cognitive/Application       | L&GD       | Lecture & Group Discussion           | SH    | Shows how |
| CAN     | Cognitive/Analysis          | L_VC       | Lecture with Video clips             | D     | Does      |
| CS      | Cognitive/Synthesis         | REC        | Recitation                           |       |           |
| CE      | Cognitive/Evaluation        | SY         | Symposium                            |       |           |
| PSY-SET | Psychomotor/Set             | TUT        | Tutorial                             |       |           |
| PSY-GUD | Psychomotor/Guided response | DIS        | Discussions                          |       |           |
| PSY-MEC | Psychomotor/Mechanism       | BS         | Brainstorming                        |       |           |
| PSY-ADT | Psychomotor Adaptation      | IBL        | Inquiry-Based Learning               |       |           |
| PSY-ORG | Psychomotor/Origination     | PBL        | Problem-Based Learning               |       |           |
| AFT-REC | Affective/ Receiving        | CBL        | Case-Based Learning                  |       |           |
| AFT-RES | Affective/Responding        | PrBL       | Project-Based Learning               |       |           |
| AFT-VAL | Affective/Valuing           | TBL        | Team-Based Learning                  |       |           |
| AFT-SET | Affective/Organization      | TPW        | Team Project Work                    |       |           |
| AFT-CHR | Affective/ characterization | FC         | Flipped Classroom                    |       |           |
|         |                             | BL         | Blended Learning                     |       |           |
|         |                             | EDU        | Edutainment                          |       |           |
|         |                             | ML         | Mobile Learning                      |       |           |
|         |                             | ECE        | Early Clinical Exposure              |       |           |
|         |                             | SIM        | Simulation                           |       |           |
|         |                             | RP         | Role Plays                           |       |           |
|         |                             | SDL        | Self-directed learning               |       |           |
|         |                             | PSM        | Problem-Solving Method               |       |           |
|         |                             | KL         | Kinaesthetic Learning                |       |           |
|         |                             | W          | Workshops                            |       |           |
|         |                             | GBL        | Game-Based Learning                  |       |           |
|         |                             | LS         | Library Session                      |       |           |
|         |                             | PL         | Peer Learning                        |       |           |
|         |                             | RLE        | Real-Life Experience                 |       |           |
|         |                             | PER        | Presentations                        |       |           |
|         |                             | D-M        | Demonstration on Model               |       |           |
|         |                             | PT         | Practical                            |       |           |
|         |                             | X-Ray      | X-ray Identification                 |       |           |
|         |                             | CD         | Case Diagnosis                       |       |           |
|         |                             | LRI        | Lab Report Interpretation            |       |           |

|  |  |       |                        |  |  |
|--|--|-------|------------------------|--|--|
|  |  | DA    | Drug Analysis          |  |  |
|  |  | D     | Demonstration          |  |  |
|  |  | D-BED | Demonstration Bedside  |  |  |
|  |  | DL    | Demonstration Lab      |  |  |
|  |  | DG    | Demonstration Garden   |  |  |
|  |  | FV    | Field Visit            |  |  |
|  |  | JC    | Journal Club           |  |  |
|  |  | Mnt   | Mentoring              |  |  |
|  |  | PAL   | Peer Assisted Learning |  |  |
|  |  | C_L   | Co Learning            |  |  |
|  |  | DSN   | Dissection             |  |  |
|  |  | PSN   | Prosection             |  |  |