

RASA SHASTRA AND BHAISHAJYA KALPANA
(06-Day CME Module for Teachers)

Unit	CourseContents	DurationinHours
01	Need and Scientific explanation of fundamental principles of <i>Rasa shastra</i> and <i>Bhaishajya kalpana</i> in ancient times and it's methodical changes in the contemporary period.	1½Hour
02	Application of advanced tools and technology to identify the characteristic features of raw Metals / Minerals and finished products in light of <i>Grahya Lakshana/Siddhi Lakshana</i> .	1½ Hour
03	Applied aspects of Pharmaceutical processes like <i>shodhana, bhavana, jarana, marana</i> etc. and their importance in therapeutics effects.	1½ Hour
04	Research updates on studies of important materials of <i>Rasa Shastra</i> and <i>Bhaishajya Kalpana</i> .	1½ Hour
05	Plan for the establishment of a model <i>Ayurveda Pharmacy</i> as per GMP / WHO GMP norms Vis-à-vis concept of <i>Rasa-Shala</i> as described in <i>Rasa Shastra</i> .	1½ Hour
06	<p>Identification techniques of metallic/herbo-mineral formulations according to Ayurveda. Analysis of metallic/herbo-mineral formulations by modern parameters and applicable instruments.</p> <ul style="list-style-type: none"> • Volumetric and Gravimetric analytical methods • NPST (Namburi Phased Spot Test) • XRD (X-ray Diffraction) • FTIR (Fourier Transform Infrared) Spectroscopy • NMR (Nuclear Magnetic Resonance) • DLS and TGA (Dynamic Light Scattering and Thermogravimetric Analysis) • XRF (X-ray Fluorescence)/XPS (X-ray Photon Spectroscopy) • SEM (Scanning Electron Microscope) • AAS (Atomic Absorption Spectroscopy) • ICPAES (Inductively Coupled Plasma Atomic Emission Spectroscopy) & ICPMS (Inductively Coupled Plasma Mass Spectroscopy) 	1½ Hour
7	Standard Operative Method of preparation and scientific explanation including HACCP (Hazard Analysis and Critical Control Points) of <i>Rasa aushadhies</i> (Plasma)	1½ Hour
8	Standard Operative Method of preparation and scientific explanation of <i>Rasa aushadhies (kupipakwa aushadhies)</i> .	1½ Hour
9	Standard Operative Method of preparation and scientific explanation of <i>Rasa aushadhies (kharaliya aushadhies)</i> .	1½ Hour
10	Standard Operative Method of preparation and scientific explanation of <i>Rasa aushadhies (parpati aushadhies)</i> .	1½ Hour

11	Standard Operative Method of preparation and scientific explanation of <i>rasa aushadhies (potali rasa)</i> .	1½ Hour
12	Identification methods of <i>ratna & uparatna</i> , their processing methods, therapeutic uses and basic knowledge of Gemmology.	1½ Hour
13	Identification methods of <i>sudha, sikata vargiya dravya</i> , their processing methods and therapeutic uses. Information on <i>lavana</i> and <i>kshara</i> .	1½ Hour
14	Concepts of <i>panchavidha kashaya kalpana</i> and recent trends in technology applied in modifying these <i>kalpanas</i> . Discussion on various dosage forms	1½ Hour
15	Updates on developments in <i>churna kalpana</i> i.e. Drying, Milling, Mixing and applicable Pharmaceutical Techniques.	1½ Hour
16	Updates on Developments on Ayurvedic concept of <i>vati kalpana</i> , tablets, pills and applicable pharmaceutical techniques.	1½ Hour
17	Updates on developments in <i>avaleha kalpana</i> including its modifications and applicable pharmaceutical techniques.	1½ Hour
18	Updates on developments in <i>sneha kalpana</i> including its modifications and applicable pharmaceutical techniques.	1½ Hour
19	Updates on developments in <i>sandhana kalpana</i> , it's Pharmaceutical techniques, quality control and market prevalence.	1½ Hour
20	Applied aspects of <i>visha dravyas</i> and their Pharmaco-therapeutical implications. Use availability and rules regulations regarding some important drugs under NDPS Act, like <i>bhanga</i> and <i>ahipheha</i> etc.	1½ Hour
21	Updates on Ayurvedic concepts of topical applications creams, ointments, liniments, sprays etc. and other external applications and pharmaceutical developments.	1½ Hour
22	Updates on different <i>ahara kalpana</i> , their role in disease and health management and relevant regulatory aspects viz. FSSAI along with information on functional food and Nutraceuticals.	1½ Hour
23	Drug delivery system, concepts of the route of drug administration, information about Posology, Concept of <i>anupana-sahapana</i> and <i>pathya-apathya</i> .	1½ Hour

24	Knowledge about Drugs & Cosmetics Act-1940 and Rules1945 related to <i>Ayurvedic</i> drugs. Role and responsibilities of <i>Ayurveda</i> Drug Inspector. Information about Good Manufacturing Practices (GMP, WHO-GMP, EUGMP etc.), applicable to <i>Ayurvedic</i> drugs.	1½ Hour
25	Information on organizations related to researches and regulatory aspects in <i>Ayurveda</i> - CCRAS, ICMR, CSIR, ICAR, CDRL, NISCAIR, CIMAP, DRDO, PCIM&H & IPC, NMPB, INSA, DBT, NMM and National Ayush Institutes. Information about research projects in <i>Ayurveda</i> , TKDL- CSIR, Research Projects under EMR (Extra Mural Research) Scheme of Ministry of AYUSH, Research Schemes under DST (Dept. of Science & Technology), <i>Ayurvedic</i> biology.	1½ Hour
26	Pharmaceutical Databases: Databases of medicinal plants published by CCRAS, ICMR and CDRL etc. other organizations. Pharmacopeias, Formularies and other supporting publications pertaining to <i>Ayurveda</i> . Information on UGC-CARE. Resources on Internet – World Wide Web, Search Engines, Search Directories, Major Pharmacy Websites, Electronic Publications, Research Journals in Pharmacy and Pharmaceutical Science	1½ Hour
27	Bio-assay (Animal & microbial assay) for <i>Ayurvedic</i> drugs. A brief note on OECD (Organisation for economic cooperation development) and its guidelines for toxicity studies. Basic Knowledge about composition and functioning of Ethical committees for studies in animals and human.	1½ Hour
28	Concept of shelf life in <i>Ayurveda</i> and methods of evaluating shelf life in conventional sciences & role of packaging in enhancing shelf life.	1½ Hour
29	<i>Rasa chikitsa</i> and pharmaco-therapeutics in ancient and contemporary period.	1½ Hour
30	An Introduction to Herbal Medicines in Global Scenario and emergence of Phyto-pharmaceuticals and its regulations.	1½ Hour
31	Pharmacovigilance in ancient texts and contemporary thoughts in context to <i>Ayurvedic</i> medicines.	1½ Hour
32	Fundamentals of Technology in Teaching and Learning process.	1½ Hour
33	Applied aspects of Technology in Teaching and Learning process.	1½ Hour
34	Research in AYUSH sector and its perspective towards global need.	1½ Hour
35.	Microteaching session of “Study Design for various research in AYUSH sector”.	1½ Hour
36	Research Publications and Research protection with special focus on the subject related publication.	1½ Hour
37	Practical execution of a research programme.	1½ Hour

Note: Organizers have to conduct the event by considering any of the 24 units that must include at least 01 unit from the category Technology in teaching Process and 02 unit from the category Research methodology , out of total 37 units.

Unit -01

Topic: Need and Scientific explanation of fundamental principles, credit of *Rasa shastra* and *Bhaishajya kalpana* in ancient past and it's methodical changes in contemporary period.

Categories: Microteaching Session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Fundamental Principles of *Rasa Shastra* and *Bhaishajya Kalpana*.
- Need of the knowledge of fundamental principles.
- Importance of history and historical literatures for growth, development and research of an educational system.
- Historical approach of *Rasa Shastra* and *Bhaishajya Kalpana*.
- Continuous transformation of concept, knowledge and applied aspects from history to present w.r.t *Rasa Shastra* and *Bhaishajya Kalpana*.
- Impact of history on present status of *Rasa Shastra* and *Bhaishajya Kalpana*.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objectives of fundamental principles and history of *Rasa Shastra* and *Bhaishajya Kalpana*.

Material for activity: A sheet with important mile stones of *Rasa Shastra* and *Bhaishajya kalpana* in different period of History. Each participant will search for available literatures using different online and off line platform on their own.

Unit 02

Topic: Application of advanced tools and technology to identify the characteristic features of Metals / Minerals, raw materials and finished products in the light of *Grahya Lakshana/Siddhi Lakshana*.

Categories: Microteaching Session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Significance of *grahya lakshana* in Identification of genuine raw materials (minerals and metals) and consequences of *agrahya* methods used in identification of mineral/metals.
- Significance of *siddhi lakshana* in Metal/mineral, finished products w.r.t. therapeutic purposes.
- Possible correlation between contemporary identification tools and techniques with classical *grahya lakshana* and *oushadha siddhi lakshyan*.
- Use of different physical, chemical, qualitative and quantitative analytical techniques for identification and storing the data as repositories.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.

- Each group will present learning objectives of topics, which will be redefined by the resource person.

Material for activity: A sheet with listed possible analytical tools and techniques with working principles. The participants will prepare a grid of metals/minerals to be analyzed by different techniques for their identification and authentication. Each participant will search for available literatures using different online and off line platform on their own.

Unit 03

Topic: Applied aspects of Pharmaceutical processes like *shodhana*, *bhavana*, *jarana*, *marana* etc. and their importance in therapeutics effects.

Categories: Microteaching session of *Rasa shastra* and *Bhaishajya kalpana*

Course contents:

i. Interactive session

- Designing/Choosing/Compatibility of pharmaceutical processings on the basis of nature of raw materials.
- Understanding/Explanation of classical pharmaceutical processings in the light of contemporary sciences.
- Use of contemporary tools and devices with their working principles for *Ayurvedic* Pharmaceutical processings.
- Possibilities of adaptations/inductions of other pharmaceutical techniques to accelerate the productivity.
- Significances of pharmaceutical processings towards the therapeutic effects.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objectives of topics, which will be redefined by the resource person.
- Each group will be assigned some pharmaceutical processings to present graphically/diagrammatically with sequential flow charts.

Material for activity: A sheet with listed pharmaceutical techniques with working principles. The participants will prepare a list of tools and devices for certain pharmaceutical processing. Each participant will search for available literatures using different online and off line platform on their own.

Unit 04

Topic: Research updates on studies of important materials of *Rasa Shastra* and *Bhaishajya Kalpana*.

Categories: Microteaching session of *Rasa shastra* and *Bhaishajya kalpana*

Course contents:

i. Interactive session

- Background information on the subject *Rasa Shastra* and *Bhaishajya kalpana* along with materials of different sources.
- Research and it's application on conceptual values of *Rasa shastra* and *Bhaishajya kalpana*.
- Research designing and model to evaluate safety and efficacy of different materials.
- Publication and research writing.
- Concerns on use of metallic/herbo-mineral formulations in therapeutics.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present different research model.
- Each group will present different aspects of research publication writing.

Material for activity: A sheet with listed research designing and research model to evaluate the *Rasa dravyas*. Each participant will prepare a network/data of research findings of a particular *Rasa dravya*. Each participant will search for available literatures using different online and off line platform on their own.

Unit 05

Topic: Plan for the establishment of an ideal Ayurveda Pharmacy as per GMP / WHO GMP norms Vis-à-vis concept of Rasa-Shala as described in Rasa Shastra.

Categories: Microteaching session of *Rasa shastra* and *Bhaishajya kalpana*

Course contents:

i. Interactive session

- Concept of *rasashala* and it's architect described in Ancient literatures.
- GMP (Good Manufacturing Practices), various schedules and rules applicable to *AYUSH* drug manufacturing.
- Infrastructural and legal requirements for an ideal *Ayurvedic* pharmacy, ancient and contemporary view.
- Experiences of GMP certified pharmacies w.r.t. progress, production, quality legality and post marketing surveillance.
- Role of ideal GMP pharmacies for promoting skill development and addressing youth employment issue.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present model of ideal GMP pharmacy.
- Each group will present about skill development and self-employment through *Ayurvedic* pharmacy.

Material for activity: A sheet with miniature of GMP model pharmacy and data of *ayurvedic* pharmacies. Each participant will prepare a comparison between the *rasashala* in ancient period and *Ayurvedic* pharmacies now a days. Each participant will search for available literatures using different online and off line platform on their own.

Unit 06

Topic: Identification techniques of metallic/herbo-mineral formulations according to Ayurveda. Analysis of metallic/herbo-mineral formulations by modern parameters and applicable instruments.

- Volumetric and Gravimetric analytical methods
- NPST (Namburi Phased Spot Test)
- XRD (X-ray Diffraction)
- FTIR (Fourier Transform Infrared) Spectroscopy
- NMR (Nuclear Magnetic Resonance)

- DLS and TGA (Dynamic Light Scattering and Thermo gravimetric Analysis)
- XRF (X-ray Fluorescence)/XPS (X-ray Photon Spectroscopy)
- SEM (Scanning Electron Microscope)
- AAS (Atomic Absorption Spectroscopy)
- ICPAES (Inductively Coupled Plasma Atomic Emission Spectroscopy) & ICPMS (Inductively Coupled Plasma Mass Spectroscopy)
- Other useful techniques.

Categories: Microteaching session of *Rasa shastra* and *Bhaishajya kalpana*

Course contents:

i. Interactive session

- Identification and quality control criteria of *bhasma* in ancient method and it's possible explanation in current scientific language.
- Identification and standard quality control criteria of *bhasma* by using different advanced, sophisticated tools and techniques with working principles.
- Applications and limitations of these instruments in characterization of metals/minerals (raw/processed)

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning object of explanation of *bhasma* and it's pharmaceutical processing.
- Each group will present about different analytical tools for identification of *bhasma*.

Material for activity: A sheet with different analytical tools/devices for identification and quality assessment of *bhasma*. Each participant will prepare a chart of contemporary analytical instruments with working principles. Each participant will search for available literatures using different online and off line platform on their own.

Unit 07

Topic: - Standard Operative Method of preparation and scientific explanation of *Rasa Aushadhies (Bhasma)*

Categories: Microteaching session of *Rasa shastra* and *Bhaishajya kalpana*

Course contents:

i. Interactive session

- Definition and qualities of *aushadhi* w.r.t *rasa aushadhies*.
- Current trend of *rasa aushadhies* and it's general SOP for pharmaceutical manufacturing.
- *bhasma*, a specially designed *rasa aushadhi* and it's historical approach.
- Maran (incineration), it's scientific explanation along with significances of *puta* and it's effect on metals/minerals.
- SOP for *Bhasma*, described in ancient text and it's systematic scientific explanations.
- Ancient assessment criteria of *bhasma* and it's scientific explanation
- Standardization and quality control parameters of *bhasma*.
- Therapeutic prevalence of *bhasma* and updated research on it.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objective of *bhasma*.
- Each group will present about different updated research on *bhasma*.

Material for activity: A sheet with SOP of *bhasma* and its pharmaceutical explanations. Each participant will prepare a summary of all the *rasa aushadhies* w.r.t their therapeutic prevalence. Each participant will search for available literatures using different online and off line platform on their own.

Unit 08

Topic: -Standard Operative Method of preparation and scientific explanation of *rasa aushadhies* (*kupipakwa aushadhies*).

Categories: Microteaching session of *rasa shastra* and *bhaishajya kalpana*

Course contents:

i. Interactive session

- Definition and qualities of *aushadhi* w.r.t *rasa aushadhies*.
- Current trend of *Rasa Aushadhies* and its general SOP for pharmaceutical manufacturing.
- *kupipakwa*, a specially designed *rasa aushadhi* and its historical approach.
- SOP for *kupipakwa* medicines described in ancient text and its systematic scientific explanations.
- Siddhi lakshan for *kupipakwa* medicines and its explanation
- Classification of *kupipakwa* medicines.
- Standardization and quality control parameters of *kupipakwa* medicines.
- Therapeutic prevalence of *kupipakwa* medicines and updated research on it.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objective of *kupipakwa* medicines.
- Each group will present about different updated research on *kupipakwa*.

Material for activity: A sheet with SOP of *kupipakwa* medicines and its pharmaceutical explanations. Each participants will prepare a summary of all the *rasa aushadhies* w.r.t their therapeutic prevalence. Each participant will search for available literatures using different online and off line platform on their own.

Unit 09

Topic: - Standard Operative Method of preparation and scientific explanation of *rasa aushadhies* (*kharaliya aushadhies*).

Categories: Microteaching session of *rasa shastra* and *bhaishajya kalpana*

Course contents:

i. Interactive session

- Definition and qualities of *aushadhi* w.r.t *rasa aushadhies*.
- Current trend of *rasa aushadhies* and its general SOP for pharmaceutical manufacturing.
- *Kharaliya*, a specially designed *rasa aushadhi*.
- SOP for *kharaliya* medicines described in ancient text and its systematic scientific explanations.
- Siddhi lakshan of *kharaliya* medicines and its scientific explanations
- Standardization and quality control parameters of *kharaliya* medicines.
- Therapeutic prevalence of *kharaliya* medicines and updated research on it.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objective of *kharaliya* medicines.

Material for activity: A sheet with SOP of *kharaliya* medicines and its pharmaceutical explanations. Each participants will prepare a summary of all the *rasa aushadhies* w.r.t their therapeutic prevalence. Each participant will search for available literatures using different online and off line platform on their own.

Unit 10

Topic: - Standard Operative Method of preparation and scientific explanation of *rasa aushadhies* (*parpati aushadhies*).

Categories: Microteaching session of *Rasa shastra* and *Bhaishajya kalpana*

Course contents:

i. Interactive session

- Definition and qualities of *aushadhi* w.r.t *rasa aushadhies*.
- Current trend of *rasa aushadhies* and its general SOP for pharmaceutical manufacturing.
- *Parpati*, a specially designed *rasa aushadhi* and its historical approach.
- SOP for *parpati* medicines described in ancient text and its systematic scientific explanations.
- *Siddhi lakshan* of *parpati* and its scientific explanations
- Classification of *parpati* on the basis of *siddhi lakshan* and pharmaceutical processing.
- Standardization and quality control parameters of *parpati* medicines.
- Therapeutic prevalence of *parpati* medicines and updated research on it.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objective of *parpati* medicines.
- Each group will present about different updated research on *parpati*.

Material for activity: A sheet with SOP of *parpati* medicines and its pharmaceutical explanations. Each participants will prepare a summary of all the *rasa aushadhies* w.r.t their therapeutic prevalence. Each participant will search for available literatures using different online and off line platform on their own.

Unit 11

Topic: Standard Operative Method of preparation and scientific explanation of *rasa aushadhies* (*pottali rasa*).

Categories: Microteaching session of *Rasa shastra* and *Bhaishajya kalpana*

Course contents:

i. Interactive session

- Definition and qualities of *aushadhi* w.r.t *rasa aushadhies*.
- Current trend of *rasa aushadhies* and its general SOP for pharmaceutical manufacturing.
- *pottali*, a specially designed *rasa aushadhi* and its historical approach.
- SOP for *potali* medicines described in ancient text and its systematic scientific explanations.
- *siddhi lakshan* of *potali* and its scientific explanations
- Standardization and quality control parameters of *potali* medicines.
- Therapeutic prevalence of *potali* medicines and updated research on it.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.

- Each group will present learning objective of *potali* medicines.
- Each group will present about different updated research on *potali*.

Material for activity: A sheet with SOP of *potali* medicines and its pharmaceutical explanations. Each participants will prepare a summary of all the *rasa aushadhies* w.r.t their therapeutic prevalence. Each participant will search for available literatures using different online and off line platform on their own.

Unit 12

Topic: Identification methods of *ratna & uparatna*, their processing methods and therapeutic uses & basic knowledge of Gemmology.

Categories: Microteaching session of *Rasa shastra* and *Bhaishajya kalpana*

Course contents:

i. Interactive session

- Descriptions of *ratna and uparatna* in ancient literatures and basic knowledge of gemmology.
- Identification of Ratna and Uparatna on the basis of *grahya lakshan* and contemporary techniques and their correlations.
- SOP for pharmaceutical processings of *ratna and uparatna* and their scientific explanation w.r.t. the associated materials used and process followed.
- Astrological and therapeutic effects of *ratna and uparatna*.
- Relevance and prevalence of *ratna and uparatna* as therapeutic agent in contemporary period.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present the learning objectives of *ratna and uparatna*.

Material for activity: A sheet with SOP for pharmaceutical processings and therapeutic indications of Ratna and Uparatna. Each participants will prepare a Chart of *ratna and uparatna*. Each participant will search for available literatures using different online and off line platform on their own.

Unit 13

Topic: Identification methods of *sudha, sikta vargiya dravya*, their processing methods and therapeutic uses. Information on *lavana and kshara*.

Categories: Microteaching session of *Rasa shastra* and *Bhaishajya kalpana*

Course contents:

i. Interactive session

- Introduction to *sudha varg, lavan varg and kshara varg* materials.
- Identification of *sudha, sikata vargiya Dravya* on the basis of *grahya lakshan* and contemporary techniques and their correlations.
- SOP for pharmaceutical processings of *sudha, sikata vargiya dravya*, and their scientific explanation w.r.t. the associated materials used and process followed.
- SOP for pharmaceutical processings of *lavan and kshara* and their scientific explanation w.r.t. the associated materials used and process followed.
- Therapeutic effects of *sudha, sikata vargiya dravya, lavan and kshara* medicines.
- ADR of *lavan and kshara* medicines.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objectives of *sudha varg* medicines.
- Each group will present about different updated research on *lavan and kshara* medicines.

Material for activity: A sheet with SOP for *sudha varg* medicine manufacturing and their therapeutic use. Each participant will prepare a chart for *lavan and kshara* medicines w.r.t their processings, therapeutic use and ADR. Each participant will search for available literatures using different online and off line platform on their own.

Unit 14

Topic: Concepts of *panchavidha kashaya kalpana* and recent trends in technology applied in modifying these *kalpanas*. Discussion on various dosage forms

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- *panchavidha kashaya kalpana* as fundamental principles of *Bhaishajya Kalpana*.
- Introduction to Primary *kalpanas* w.r.t. *samhita* and other literatures.
- Consensus and justification for *panchavidha kashaya kalpana* as primary *kalpana*.
- SOP for pharmaceutical processings of all dosage forms of *panchavidha kashaya kalpana*.
- Applied aspects of *panchavidha kashaya kalpana* and their modifications w.r.t. current trend of drug manufacturing.
- Use of technology and contemporary knowledge for improving the potency and shelf life of *panchavidha kashaya kalpana* rational modified pharmaceutical processings for each 05 dosage form.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objectives of *panchavidha kashaya kalpana*.
- Each group will present about different modified pharmaceutical processings of *panchavidha kashaya kalpana* in current trend of drug manufacturing.

Material for activity: A sheet with SOP for preparing *panchavidha kashaya kalpana*, their therapeutic dose and shelf life. Each participant will prepare the worksheet for *panchavidha kashaya kalpana* with their possible modified pharmaceutical processing by using modern technology. Each participant will search for available literatures using different online and off line platform on their own.

Unit 15

Topic: Updates on developments in *Churna kalpana* i.e. Drying, Milling, Mixing and applicable Pharmaceutical Techniques.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Concept of *churna kalpana* in *samhita* and other medieval literatures.
- SOP for pharmaceutical processings of *churna kalpana* and powder dosage form.
- Applied aspects of different pharmaceutical techniques like drying, milling, blending, filtering etc. used to prepare powder dosage forms.

- Concept of sieving and Classification of powder dosage forms.
- Brief knowledge about different tools and equipments used for size reduction, preparing powder dosage forms with working principles along with factors that adversely affects powders.
- Merits, demerits and precautions for *churna kalpana*.
- Standardization and quality control parameters of *churna kalpana*.
- ii. Activity session** (Group discussion)
- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objectives of *churna kalpana*.
- Each group will present about different pharmaceutical techniques for *churna kalpana* to increase the quality and productivity.

Material for activity: A sheet with SOP for preparing *churna kalpana*, it's therapeutic dose and shelf life. Each participant will prepare the chart for different types of powder and different tools and equipments used for size reduction with working principles. Each participant will search for available literatures using different online and off line platform on their own.

Unit 16

Topic: Updates on Developments in ayurvedic tablets, pills and applicable pharmaceutical techniques.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Concept of *vati kalpana* in *samhita* and other medieval literatures.
- SOP for pharmaceutical processings of *vati kalpana* and tablet dosage form.
- Applied aspects of different pharmaceutical techniques like milling, blending, granulating, adding of excipients, drying, punching etc. used to prepare tablets.
- Tableting by granulation and direct compression.
- Brief knowledge about different tools and equipments used for *vati*/tablet/pill dosage forms in ancient and modern period with working principles along with factors that adversely affect tablets.
- Merits, demerits and precautions for *vati kalpana*.
- Standardization and quality control parameters of *vati kalpana*.

ii. Activity session

 (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objectives of *vati kalpana*.
- Each group will present about different pharmaceutical techniques for *vati kalpana* to increase the quality and productivity.

Material for activity: A sheet with SOP for preparing *vati kalpana*, it's therapeutic dose and shelf life. Each participant will prepare a working flow chart for different stages of tableting. Each participant will search for available literatures using different online and off line platform on their own.

Unit 17

Topic: Updates on developments in *avaleha kalpana* including its modifications and applicable pharmaceutical techniques.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Concept of *avaleha kalpana* and related pharmaceuticals like *phanita*, *rasakriya* in ancient literatures.
- SOP for pharmaceutical processings of *avaleha kalpana*.
- Applied aspects of different pharmaceutical techniques for manufacturing *avaleha kalpana*.
- Applied aspects of *avaleha siddhi lakshana*.
- Contemporary thought regarding *avaleha kalpana*, its modification and therapeutic as well as nutritional values.
- Brief knowledge about different tools and equipments used for preparing *avaleh kalpana*.
- Merits, demerits and precautions for *avaleha kalpana*.
- Standardization and quality control parameters of *avaleh kalpana*.
- Different researches and their output regarding *sneha kalpana*.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of *avaleha kalpana*.
- Each group will present, modification and nutritional values of *avaleha kalpana*.

Material for activity: A sheet with SOP for preparing *avaleha kalpana*, its therapeutic dose and shelf life. Each group will present, the modification of *avaleh kalpana* and its nutritional values. Each participant will search for available literatures using different online and off line platform on their own.

Unit 18

Topic: Updates on developments in *sneha kalpana* including its modifications and applicable pharmaceutical techniques.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Concept of *sneha* and *sneha kalpana* and related pharmaceuticals in ancient literatures.
- SOP for pharmaceutical processings of *sneha kalpana*.
- Concept of *murchhana* and its applied aspects.
- Applied aspects of different pharmaceutical techniques for manufacturing of *sneha kalpana*.
- Applied aspects of *sneha siddhi lakshana*.
- Contemporary thought regarding *Sneha kalpana*, its modification, liposomal drug delivery system and its therapeutic values.
- Different types of *Sneha kalpana* practiced in pan India, based on therapeutic potency and pharmaceutical techniques.
- Brief knowledge about different tools and equipments used for preparing *Sneha kalpana*.
- Merits, demerits and precautions for *Sneha kalpana*.
- Standardization and quality control parameters of *Sneha kalpana*.
- Different researches and their output regarding *Sneha kalpana*.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of *Sneha kalpana*.
- Each group will present, different classification and therapeutic values of *Sneha kalpana*.

Material for activity: A sheet with SOP for preparing *Sneha kalpana*, its therapeutic dose and shelf life. Each group will present, the modification of *Sneha kalpana* and its therapeutic values. Each participant will search for available literatures using different online and off line platform on their own.

Unit 19

Topic: Updates on developments in *Sandhan kalpana*, its Pharmaceutical techniques, quality control and market prevalence.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Concept of *sandhan kalpana* in ancient literatures.
- SOP for pharmaceutical processings of *sandhan kalpana*.
- Applied aspects of different pharmaceutical techniques for manufacturing of *sandhan kalpana* w.r.t. container, *sandhan dravya* and time factor.
- Applied aspects of *sandhan siddhi lakshana*.
- Contemporary thought regarding *sandhan kalpana* and its therapeutic values.
- Different types of *Sandhan kalpana*, based on processing of *sandhan* and materials for *sandhan*.
- Brief knowledge about different factors responsible for preparing *sandhan kalpana*.
- Merits, demerits and precautions for *Sandhan kalpana*.
- Standardization and quality control parameters of *sandhan kalpana*.
- Different researches and their output regarding *sandhan kalpana*.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of *sandhan kalpana*.
- Each group will present, different classification and therapeutic values of *sandhan kalpana*.

Material for activity: A sheet with SOP for preparing *sandhan kalpana*, its therapeutic dose and shelf life. Each participant will search for available literatures using different online and off line platform on their own.

Unit 20

Topic: Applied aspects of *visha dravyas* and their Pharmaco-therapeutical implications. Use availability and rules regulations regarding some important drugs under NDPS Act, like *bhanga* and *ahiphen* etc.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- *visha dravyas* used in *ayurvedic* therapeutics and their legal aspects including requirements of NDPS act for certain drugs.
- Classification, Collection, Storing and handling of *visha dravyas*.
- 'SOP' for pharmaceutical processings of *Visha dravyas*.
- Applied aspects of different pharmaceutical techniques for different types of *visha dravya*.
- Contemporary thought regarding *visha dravyas* and their therapeutic values.
- Merits, demerits and precautions for *visadravya* containing medicines.

- Standardization and quality control parameters of *visha dravya*.
- Different researches and their output regarding *visha dravya*.
- ii. Activity session** (Group discussion)
- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of *visha dravya*.
- Each group will present, different classification and therapeutic values of *visha dravya*.

Material for activity: A sheet with SOP for Pharmaceutical Processings of *visha dravyas* their therapeutic dose and shelf life.

Unit 21

Topic: Updates on developments in *ayurvedic* creams – ointments, liniments, sprays etc. and other external applications.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Introduction and concept of *lepa kalpana* and other topically applied medicines in *ayurvedic* pharmaceuticals.
- SOP for pharmaceutical processings of *lepa kalpana* and it's different derivatives such as ointment, liniment, cream etc...
- Applied aspects of different excipients and reagents used for preparing various topically used formulations like lotions, cream, gel, ointment, liniment, bio-patch, dusting powders having therapeutic and cosmetic importance etc...
- Possibility of developing new dosage form for topically applied formulations using modern technologies.
- Social and legal status of *ayurvedic* cosmetics and it's market prevalence.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of topically applied formulations.
- Each group will present, different types of topically applied medicines w.r.t. their ingredients and route of application.

Material for activity: A sheet with SOP for preparing topically applied medicines, it's market prevalence and legal aspects. Each participant will search for available literatures using different online and off line platform on their own.

Unit 22

Topic: Updates on different *ahara kalpana*, their role in disease and health management and relevant regulatory aspects viz. FSSAI along with information on functional food and Nutraceuticals.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Introduction and concept of *ahara kalpana* and *pathya kalpana* in ancient literatures.
- SOP for pharmaceutical processings of different *ahara kalpana* and *pathya kalpana*
- Applied aspects of different *ahara kalpana* and *pathya kalpana* w.r.t therapeutic utility.
- Introduction of FSSAI and it's relation to different aspects of *ayurvedic* pharmaceuticals.
- Information on functional food and nutraceuticals along with their therapeutic applications.
- Possibility of developing new dosage form out of *ahara kalpana* and *pathya kalpana* and developing standard marketing policy in accordance to relevant regulatory aspects of FSSAI.
- Importance of *ahara kalpana* and *pathya kalpana* in current scenario of health needed infrastructure.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of *ahara kalpana*.
- Each group will present, different types of *ahara kalpana* and their applied aspects.
- Each group will present about FSSAI and it's relevance in context of *ahara kalpana*.

Material for activity: A sheet with SOP for preparing *ahara kalpana*, it's market prevalence and FSSAI. Each participant will search for available literatures using different online and off line platform on their own.

Unit 23

Topic: Drug delivery system, concepts of route of drug administration, information about Posology, Concept of *anupana-sahapana* and *pathya-apathya*.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Concept of Posology and drug delivery system in ancient *ayurvedic* literatures.
- Applied aspects of ancient posology and their current correspondences.
- Applied aspects of different parts of drug delivery system like route, time and dose of drug administration.
- Concept of *anupan-sahapan* and *pathya-apathya* in *ayurvedic* therapeutics.
- Applied aspects of *anupan-sahapan* and *pathya-apathya* in *ayurvedic* therapeutics and their scientific explanations

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of Posology and drug delivery system.

Material for activity: A sheet with Posology and drug delivery system. Each participant will search for available literatures using different online and off line platform on their own.

Unit 24

Topic: Knowledge about Drugs & Cosmetics Act-1940 and Rules 1945 related to *Ayurvedic* drugs. Role and responsibilities of *Ayurvedic* Drug Inspector. Information about Good Manufacturing Practices (GMP, WHO-GMP, EUGMP etc.), applicable to *Ayurvedic* drugs.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Introduction to D&C act 1940 and D&C rule 1945.
- Chapter I Sec 3(a), 3(aaa), 3(h), Chapter IV A Section 33 (C) 33 (D), 33 (E) 33 (EE), 33 (EEA), 33 (F), 33 (G) 33 (I) 33(N) 33 (O).....Chapter IV A
- Knowledge about D&C Rule-152, 153, 154, 155, 155(B), 157, 158, 158 (B), 159, 160, 161, 161(B), 162, 165, 166, 167, 169, 170.
- Magic remedies and related acts and rules.
- Brief introduction of Schedule-E drugs, First Schedule containing list of authoritative books and Schedule A containing different forms.
- Qualification and duties of Drug inspector and Govt. Analysts.
- Schedule-T of D&C rule (GMP for ASU) with supplementary guidelines for manufacturing of *rasaushadhies*.
- Brief Knowledge about Schedule-Y of D&C rule.
- Basic knowledge of WHO-GMP, EUGMP

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of D&C act and GMP.

Material for activity: A sheet with briefing of D&C act and rule. Each participant will search for available literatures using different online and off line platform on their own.

Unit 25

Topic: Information on organizations related to researches and regulatory aspects in Ayurveda - CCRAS, ICMR, CSIR, ICAR, CDRL, NISCAIR, CIMAP, DRDO, PCIM&H & IPC, NMPB, INSA, DBT, NMM and National Ayush Institutes. Information about research projects in Ayurveda, TKDL- CSIR, Research Projects under EMR (Extra Mural Research) Scheme of Ministry of AYUSH, Research Schemes under DST (Dept. of Science & Technology), ayurvedic biology.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Introduction of Research and its importance for development and updation of scientific knowledge.
- Introduction about different scientific research organizations like CCRAS, ICMR, CSIR, ICAR, CDRL, NISCAIR, CIMAP, DRDO, PLIM, PCIM&H & IPC and their functioning.
- Information's about research projects w.r.t. planning of research project, designing/framing of research protocol, writing research project, functioning and presenting of research projects.
- Information about different research projects of *Ayurveda* under TKDL, CSIR, EMR scheme of Ministry of AYUSH, DST, DBT etc.
- Publishing of research output and its importance in growth and globalization of *Ayurveda*.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of Research in *Ayurveda*.

Material for activity: A sheet with briefing different research programmes and projects running all over India on different issue of *Ayurveda*. Each participant will identify area of research based on his/her local circumstances and need of the society.

Unit 26

Topic: Pharmaceutical Databases: Databases of medicinal plants published by CCRAS, ICMR and CDRL etc. other organizations. Pharmacopeias, Formularies and other supporting publications pertaining to Ayurveda. Information on UGC-CARE

Resources on Internet – World Wide Web, Search Engines, Search Directories, Major Pharmacy Websites, Electronic Publications, Research Journals in Pharmacy and Pharmaceutical Science

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Introduction about the Database of research and organizational set up.
- Information about published database related to research on *ayurveda* in different official online platform of various research organizations like CCRAS, ICMR and CDRL etc.
- Information and knowledge regarding different Govt. publications and Database on *ayurvedic* single drug and compound formulations like API, AFI and their other supporting publications.
- Knowledge and information regarding use of internet and different online platforms for research programme, for collecting and sharing research data along with related rules and regulations.
- Information about World Wide Web, Search Engines, Search Directories, Major Pharmacy Websites, Electronic Publications, Research Journals in Pharmacy and Pharmaceutical Science

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of Research by using online platform and it's related rules and regulations in context to Ayurveda.

Material for activity: A sheet with briefing, different research database and research programmes in all over India on different issue of *ayurveda* and their online access with rules and regulations thereon. Each participant will find out suitable database for his selected/identified topic during previous session.

Unit 27

Topic: Bio-assay (Animal & microbial assay) for ayurvedic drugs. Brief note on OECD (Organisation for economic cooperation development) and its guide lines for toxicity studies. Basic Knowledge about composition and functioning of Ethical committees for animal and human.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Importance of Bio-assay (Animal and Microbial assay) for *ayurvedic* Pharmaco-therapeutics.
- Brief Knowledge of Pharmacology, forward pharmacology, reverse pharmacology and it's necessity for standardization and globalization of *ayurvedic* medicines.
- Brief knowledge on OECD (Organisation for economic cooperation development) and its guide lines for toxicity studies.
- Importance of generating and storing the Data of safety profile, toxicity study and efficacy study of Ayurvedic herbo-mineral and metallic/mineral medicines and it's publication.
- Brief knowledge on Schedule –Y of Drugs and Cosmetics Act
- Basic knowledge about composition and functioning of Ethics Committee for studies in animals and human being.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of Bio-assay for *ayurvedic* drugs and it's publications.

Material for activity: A sheet with briefing, Bio-assay (animal-microbial assay) for *ayurvedic* drugs and it's publications. Each participant will search for available literatures using different online and off line platform on their own.

Unit 28

Topic: Concept of shelf life in *ayurveda* and methods of evaluating shelf life in conventional sciences & role of packaging in enhancing shelf life.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Definition and concept of shelf life in different ancient and modern literatures.
- Importance of shelf life and how to improve it, w.r.t *ayurvedic* medicines.
- Methods of evaluation of Shelf life by following conventional sciences.
- Role of different factors improving and decreasing the shelf life of a pharmaceutical product.
- Brief knowledge of Rule 161, 161 (B) and rule 169.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of Shelf-life of a pharmaceutical product.

Material for activity: A sheet with shelf life of different dosage form and pharmaceutical products in relation to Ayurveda. Each participant will select one product and list the methodology of testing its shelf life.

Unit 29

Topic: *Rasa Chikitsa* and pharmaco-therapeutics in ancient and contemporary period.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Introduction of *rasaushadhies* and *rasa chikitsa*.
- *rasaushadhies* and *rasa chikitsa* are inevitable part of *ayurveda* health infrastructure.
- Status of *Rasaushadhies* and *Rasa-chikitsa* in ancient period along with contraindications, *anupana*, *pathya-apathy* etc.
- Prominence of *rasaushadhies* and *rasa-chikitsa* in current era with protocol and guidelines of *Rasachikitsa*.
- Promotion of health care need through *rasa-chikitsa*.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of *rasaushadhies* and *rasa-chikitsa*.

Material for activity: A sheet with frequently/commonly used *rasaushadhies* in treatment of various diseases. Each participant will search for available literatures using different online and off line platform on their own.

Unit 30

Topic: An Introduction to Herbal Medicines in Global Scenario and emergence of Phyto-pharmaceuticals and it's regulations.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Fundamental concept of Phyto-Pharmaceuticals and it's legal aspects.
- Traditional Medicine (TM) strategy, on promotion of the safety, efficacy and quality.
- Introduction to Botanicals, New drug applications and Phyto-pharmaceuticals.
- Relations between Phyto-Pharmaceuticals and Traditional Pharmaceuticals (*ayurvedic* medicines).
- Therapeutic potency and applicability of Phyto-Pharmaceuticals in *ayurvedic* treatment.
- Consequences of Phyto-Pharmaceuticals and market surveillances.

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present learning objectives of topics, which will be redefined by the resource person.
- Each group will be assigned to search the legality, applicable guidelines by screening the authentic databases of various international drug regulating authorities.
- Material for activity: Each participant will interact and understand applicable guidelines, by screening the authentic databases of various international drug regulating authorities.

Unit 31

Topic: Pharmacovigilance in ancient texts and contemporary thoughts in context to *ayurvedic* medicines.

Categories: Microteaching session of *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Introduction of Pharmacovigilance.
- Concept of Pharmacovigilance in *samhita* and medieval period.
- Drug interactions, and impact of improperly prepared medicines. Contraindications causing adverse drug reactions and toxic effects, described in different literatures in context to metal/mineral and herbo-mineral medicines.
- Aim and objective of Pharmacovigilance and procedure of documentation.
- WHO guidelines for Pharmacovigilance.
- ADR reporting and management.
- Use of Pharmacovigilance for Research and development of *ayurvedic* drugs.
- Rational use of Medicines (Focusing on classical concepts)

ii. Activity session (Group discussion)

- Interactive session topics will be distributed to each group by the Resource person.
- Each group will present, learning objectives of Pharmacovigilance.

Material for activity: A sheet with commonly used *rasaushadhies* and their possible ADRs along with remedies. Each participant will search for available literatures using different online and off line platform on their own.

Unit-32

Topic: Fundamentals of Technology in Teaching and Learning process.

Categories: Microteaching Session for **Technology in teaching process** w.r.t. *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Fundamentals and objectives of teaching and learning process in professional course.
- Different techniques of teaching and their impact on learners; like, Black/White board of teaching, PPT mode of teaching and Audio-visual mode of teaching.
- Learning to interpret different data, graphs, charts obtained, through various analytical assessment of raw materials and finished products by the application of technology and various software files such as JCPDS etc.

ii. Activity session (Group discussion)

- Interactive session topics will distributed to each group by the Resource person.
- Each group will present learning objectives of Teaching through Current Technology.

Material for activity: A flow chart sheet, demonstrating, creating and accessing Google form. Each participant will search for available teaching applications in online platform on their own.

Unit-33

Topic: Applied aspects of Technology in Teaching and Learning process.

Categories: Microteaching Session for **Technology in teaching process** w.r.t. *Rasa Shastra* and *Bhaishajya Kalpana*

Course contents:

i. Interactive session

- Possibilities of use of different online teaching applications like Mentimeter, Kahoot etc.
- Use of Online class room and Whatsapp/Broadcast group for academic discussion in 24x7 hours and use of online platform for frequent periodic assessment like Google form etc.
- Introduction to Methods of assessment like structured oral, OSCE/ OSPE, Mini CEX, DOPS, etc.
- Difficulties of using techniques and technological aids for teaching and learning processes.

ii. Activity session (Group discussion)

- Interactive session topics will distributed to each group by the Resource person.
- Each group will present learning objectives of “Teaching through Current Technology”.

Material for activity: A flow chart sheet, demonstrating, creating and accessing Google form. Each participant will search for available teaching applications in online platform on their own.

Unit-34

Topic: Research in AYUSH sector and it’s perspective towards global need.

Categories: Research Methodology

Course contents:

i. Interactive session

- Fundamentals of research & research methodology.
- Foundations of research and areas of research (literary, drug, laboratory, clinical, epidemiological etc.) in different *Samhita* literatures along with their interpretation/interconnections.
- Types of research (e.g. fundamental/applied, experimental/observational, qualitative/quantitative, conceptual/empirical), research lifecycle,
- Need for *AYUSH* research, approaches of research (e.g. Reverse Pharmacology, Forward Pharmacology and *ayurveda* Biology).

ii. Activity session

Advanced

- Reading and classification of research summaries according to types/areas
- Material for activity: Set of published abstracts/project summaries of *AYUSH* research projects and a template for classification of reported research.

Unit 35

Topic: Microteaching session of study Design for various research in *AYUSH* sector.

Categories: Research Methodology

Course contents:

i. Interactive session

- The process of ideation, defining research question/hypothesis/objectives.
- Overview of study methods: literature research, clinical research (case reports, case series, cohort studies, clinical trials), laboratory research (*in-vitro*, *in-vivo*, *in-silico* etc.), epidemiological designs (descriptive, analytical).
- How to design a study (concepts of confounders, bias / हेत्वाभास).

ii. Activity session

- Defining objectives, proposing methods for relevant objectives. The participants will propose their objectives, which will be refined by the resource person. Then the participants will propose methods to achieve respective objectives. The resource person will help in designing study for their objectives.
- Material for activity: A sheet with listed possible keywords specific to various methods. The participants will make a network diagram as 'study design' pertaining to their identified topics.

Unit 36

Topic: Research Publications and Research protection with special focus on the subject related publication.

Categories: Research Methodology

Course contents:

i. Interactive session Introduction for UG

- Introduction of scientific research publications, popular writing and dissemination of scientific literature for laymen.
- Scientometrics: measuring and analysing scientific literature. Different types of papers, peer review and editorial process, research journals (predatory publications and assessing the authenticity of journals), indexing and online databases, impact factor etc.
- Guidelines for publications and reporting standards and publication ethics.

ii. Activity session

Advanced

- Searching research literature specific to objectives (as defined in session 2), using PubMed/Scopus, ResearchGate, CTRI, online ICE, mobile apps related to scientific literature. Each participant will also create PubMed alert related to areas of research / clinical interests.
- Material for activity: Every participant will search for literature using personal laptops or mobile phones. A sheet of important links of web-sources will be provided to the participants.

Unit 37

Topic: Practical execution of a research programme.

Categories: Research Methodology

Course contents:

i. Interactive session

- Transforming idea into a proposal, research infrastructure, and funding agencies.
- Schemes of *AYUSH* Ministry,
- Introduction to *AYUSH* online platforms research infrastructure, *AYUSH* Informatics Grid
- Searching of call for Research proposals in various *AYUSH*, NMPB, DBT, DST and ICMR departments or funding agencies etc.

ii. Activity session

- The participants will visit the *NAMASTE* (National *AYUSH* Morbidity and Standardized Terminologies Electronic) Portal, National Institute of Indian Medical Heritage for online texts, *AYUSH* Research Portal, and online sources related to research funding.
- Material for activity: The participants will search respective portals using personal laptops or mobile phones. A sheet of important links of web-sources related to research funding and online courses will be provided to the participants.

Proposing the method for enrolment, participation and evaluation of the CME programme.

1. Enrolment/ Selection and Evaluation:

A. Statement of Purpose (SOP) for attending CME:

It will be a short brief summary of the participant's background including Education, Institute working, special interest in the subject. Initiatives adopted by the teacher in teaching subjects. Why participants want to attend CME. Considering the CME topic list; which areas he wants to learn or refresh. How he will utilize the knowledge gained during this program.

B. After selection:

Providing schedule, Study material and introducing with participants expectations from the participants, Activities they need to complete and probable submissions.

C. During the session:

Pre-test:

It will be based on Topics of CME, with questions of Qualitative and Quantitative measures, Questions of all types including recall to application.

Formation of Group:

Before starting of the CME, the organizer will divide the participants into suitable groups (minimum 5 participants in each group). Each day the group will decide the group leader/coordinator. Interactive session topics will distributed to each group by resource persons. The average duration of most group discussions is 15 minutes (excluding the preparation time). Group leader/coordinator will share and present the view of the group during activity session of that topic.

New sessions of CME are well divided and are imparting essential knowledge and skills considering the participants. Organizers can plan interactions and ensure at least one individual submission and one group presentation/day.

Organizers should carefully plan activities. The activities should have fixed objectives, resource material, planned discussions, and methods of assessment like presentation or submission as result.

An effective Group discussion may have following elements:

All members of the group have a chance to speak, express their own ideas and feelings freely, and to pursue for finishing out their thoughts.

In case of disagreement on any issue, there should be a mechanism for feeling and sensation of working together, to resolve the dispute and come into the common consensus for the fulfillment of overall aim of the issue.

D. Evaluation can be planned in four stages.

1. Reaction of participants: -

- a. Feedback on contents: Taking daily feedback and one feedback at the end.
- b. A survey on various aspects of CME programme, preferably online can be planned and submitted by participants.
- c. Questions will include reactions related to the CME of the participant.
- d. Qualitative and Quantitative questions can be planned based on sessions.
- e. Feedback on actual implementation of CME, at the student corner of participants institute:
A cumulative feedback can be obtained from the participants, after 06 months (at least) of the programme, regarding, how successfully the technology, applications of knowledge and practical approach of the subject are being implemented at the grassroots level of teaching to the BAMS and PG students at their respective institutes/colleges.

2. Learning: - Post-test: Similar to Pre-test, quiz, or presentation from the participant. This will be an opportunity to know about the conducted program as well as the knowledge and skills gained by participants.

3. Post CME Performance:-

A report of the change in Knowledge, skills, Practice to teaching will be reported by the participants within 06 months after completion of CME.

4. Benefits –

Participants will share a detailed report related to the benefits due to CME related to Knowledge, Skills and behavior/practice. What is implemented in the teaching? What was reaction of Students, Peers and Students? Remark of the participant implementing change, Any support difficulties noted. What else can be added in CME etc.

Total Duration of Hours	36 Hours + 01 Hour
i. Microteaching session	13 ½ -12 Hours
ii. Problem based learning	1 ½ Hours
iii. Practical	16 ½ -13 ½ Hours
iv. Research Methodology & Teaching Technology4.5	- 09 Hours
v. Pre and post training assessment	01 Hour

Note: Each session is 1 ½ Hour (45 min. Interactive session+ 45 Min. Activity session)

Proposal for future development:

It is observed by the respected experts that the circumstances of teaching and availability of infrastructure and other amenities for developing the excellence in academics, all across the country is very much unbalanced and not uniform. Hence it would be more practical and convenient if the CME module will be developed as Basic CME module and Advanced CME module with different criteria of selection of Institute and participants. Advanced CME modules can be prepared on focusing with specific topics like *Kupipakwa Rasayan, Parpati Rasayan*, Topical Applications, use of Modern tools and instruments etc. to develop more competency in specific area of academics, research and pharmaceuticals.

For Basic CME Module: Any institution fulfilling MSR as per the NCISM and continuously permitted from affiliating authority, for minimum of 05 years can apply for basic CME module. To attain basic CME, participants should have minimum qualification of teacher as per MSR of NCISM.

For Advanced CME Module: Premier national institutes and Post graduate institutes, continuously permitted from affiliating authorities for minimum of 05 years, can apply for advanced CME module. To attain advanced CME, participants should be teacher of PG institutions permitted by NCISM or needs to attend at least 02 Basic CME module as minimum qualification. Advanced CME modules can be prepared on concentrating with specific topics like *Kupipakwa Rasayan, Parpati Rasayan*, Topical Applications, use of Modern tools and instruments etc.