22SC803 **CONSERVATION SCIENCE**

Aim

It is a foundation course and aims to familiarize students with various aspects of conservation

Course outcomes

Module	Learning outcomes
1	**Students will get an overview of the challenges faced in preservation, Introduction to various terminologies in conservation science, dyes commonly used in old paintings**
2	**Students will learn about different types of materials used in conservation**
3	**Students will gain thorough knowledge regarding analytical methods used in characterization of artefacts**
4	**Students will gain thorough knowledge regarding preventive conservation methodologies**
5	**Students will learn about different types of palm leaves used for preservation and their preparatory techniques.**

Mode of transaction – Lecture sessions, Assignments, Presentations

Course outline

Module 1: Conservation Science

Introduction to preservation of cultural heritage materials. Highlight on the challenges faced in preservation and restoration of cultural heritage materials both in museum and outdoor environment context - buildings, monuments, and collections. Ethical and contextual aspects with reference to changing values in conservation of cultural materials. Introduction to conservation studies, basic terminologies: Manuscripts, Artifacts, Archelogical objects – stone, ivory, pottery and ceramics, Archivial objects. Concepts of light, colour, theories colour and constitution, colour wheel, complementary colour. Chemical bonding, Secondary interactions and their relations to degradation processes. Various natural and synthetic materials that are used in conservation treatments. Transporting and storing cultural properties. Principles, Practice and Ethics in the Conservation of Cultural Heritage Materials: International organizations like, ICOM, ICOMOS, IIC, AIC, ICCROM, ICON, ECCO, ICCM etc. International Charters and Conventions like Venice charter, ICOM-CC resolutions etc.

Module 2: Materials in Conservation

Chemical properties of surfactants, emulsions, natural and synthetic coatings and adhesives, degradation, mechanical properties, polymer additives. DI water and its significance in conservation. Inorganic materials: Barium Hydroxides, Calcium oxide, Ammonia. Organic Compounds: Acetone, toluene, Xylene etc., Natural product derived materials- essential oils, fibers, cellulose and starch based materials.

Module 3: Analytical methods of identification and characterization.

Scientific principles behind SEM. TEM, ETEM, STEM, SPL, SIMS, PES (UPES &XPES) XRD, SEM –EDX, X – ray Fluorescence spectroscopy, FESEM, PL spectroscopy, AFM, Optical lithography, BET surface analysis.

Module 4: Technical aspects of Conservation

Scientific principles behind preventive conservation. Indigenous materials for preventive conservation: Deterioration, Factors affecting deterioration and their control measures. The theory of surface cleaning, solvent action and varnish removal is covered in lectures and demonstrated in the studio. Recent developments and practical approaches in the cleaning of paintings are discussed including cleaning controversies. Approaches to the visual re-integration of paintings and retouching are presented and reinforced through activities and studio work.

Module 5: Conservation of Palm leaf

Palm-leaf manuscripts: Types of palm leafs- Palmyra palm, Talipot, Corypha taliera Roxb, properties. Preparation techniques for palm leaf Manuscripts, Writing system. Deterioration of Palm Leaf manuscripts, Conservation Treatment, ancient preservation techniques. Preservation Problems of palm leaf- Fumigation, Cleaning, Remedial Treatment, Oiling. Periodic assessments of treated palm leavess .

Reference

1. O.P. Agrawal, "Palm Leaf and Paper: Illustrated Manuscripts of India and Southeast Asia
,"(editor John Guy). Victoria, Australia: National Gallery of Victoria, 1982, 85.

2. Corrado pedeli, stafano Pulgo transilated by Erik Risser,Conservation practices on Archeological excavations, principles and methods.

3. T. Pradeep NANO: The Essentials: Understanding Nanoscience and Nanotechnology, 1st Edition.

4. Agrawal, O.P – Conservation as Manuscripts and Painting of South East AsiaButterworth – Heinemann, London (1984).

5. Chris caple and Vicky Garlick Studies in Archeological Conservation