Natural Dyes - Web course

NPTEL

http://nptel.iitm.ac.in

Textile Engineering

Coordinators:

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COURSE OUTLINE

Dyeing fabric is an ancient art. Natural dyeing is back and is in vogue these days. Search for newer sources is of continued interest to dyers. Thus the lectures will offer a substantial amount of information to the students.

Newer Natural dyes-Separation, Structure, Innovative Dyeing and Application using ecofriendly mordants- will deal with description of flora available at different altitudes, their morphology, their habitat, their propagation methods. Extraction of plant part for isolation of colorant, its separation by different chromatographic technique, spectroscopic analysis of the isolated colorant, structure elucidation, innovative dyeing, biomordanting and feasible application for Industrial use has been aimed to be covered in this course along with insight on synthetic dyeing on different fabrics, however much emphasis will be laid on natural dyeing.

The new sources of dye –yielding plants will be listed by their local names and botanical names- giving details of species and genus. Plants will be identified on the basis of their high dye content so that they are economically viable for industrial purpose. With the availability of standardized procedure for utilizing locally available plants/tree products to extract dyes this would help in promoting better and perhaps cheaper use of natural dyes. More than 54 plants will be demonstrated for dye- yielding plants having consistent results and acceptable fastness properties.

COURSE DETAIL

Lecture module	Topics
1	History of Dyestuff
2	Light colour and different dyestuffs
3	Classification of Natural dyes – By structure and by color
4	Relation between Color and constitution
5	Toxicity of dyestuffs
6	Synthetic Dyestuff vs Natural dyestuff
7	Commercial dyes

8	Oxidation of Colors
9	Direct cotton dyes and role of electrolytes
10	Fundamentals of Evaluation of dyestuff by analytical techniques
11	Use of chromatography in dyestuff chemistry
12	Use of Spectroscopy in dyestuff chemistry
13	Non textiles dyestuffs- Synthetic and natural
14	Medicinal properties of Natural dyes
15	Technology of dyeing
16	Basics of Natural Dyeing
17	Methods of Extraction of natural dyes
18	Standardization of Natural dyes
19	Vat dyes and dyeing
20	Pretreatments used in Dyeing
21	Dyeing machinery
22	Continuous dyeing and its adaptation for natural dyeing
23	Dyeing application of each dye on Cotton, Silk and Wool with fastness properties, CIELab values and shade card
24	Assessment of Ecofriendliness of Naturally dyed fabrics
25	Description of the Newer Natural Dye sources- Anthroquinoids dyes
26	Description of the Newer Natural Dye sources- Indigoid dyes
27	Description of the Newer Natural Dye sources-Anthocyanin dyes

28	Description of the Newer Natural Dye sources- Betalains
29	Isolation, and characterization of the colorant molecules from each dye plant
30	Structure- mordant interactions
31	Dyeing applications with Reactive Dyes
32	Dyeing applications with Sulphur dyes
33	Dyeing applications of Polyester and its blends
34	Dyeing applications with polyamides
35	Dyeing applications with Acrylics