

Course description

Course abbreviation:	UCHTML/CA190	Page:	1 / 2
Course name:	Advanced Technology in Application and C		
Academic Year:	2023/2024	Printed:	13.07.2025 11:35

Department/Unit /	UCHTML / CA190			Academic Year	2023/2024
Title	Advanced Technology in Application and C			Type of completion	Examination
Long Title	Advanced Technology in Application and Coloring			Type of completion	Combined
Accredited/Credits	Yes, 0 Cred.			Course credit prior to	No
Number of hours				Counted into average	NO
Occ/max	Status A	Status B	Status C	Min. (B+C) students	not determined
Summer semester	0 / -	0 / -	0 / -	Repeated registration	NO
Winter semester	0 / -	0 / -	0 / -	Semester taught	Winter, Summer
Timetable	Yes			Internship duration	0
Language of instruction	English				
Optional course	Yes				
Evaluation scale	S N				
No. of hours of on-premise	0				
Auto acc. of credit	No				
Periodicity	every year				
Specification periodicity					
Substituted course	UCHTML/CD190				
Preclusive courses	N/A				
Prerequisite courses	N/A				
Informally recommended courses	N/A				
Courses depending on this Course	N/A				

Course objectives:

The object of the course is to introduce listeners to the development, issues and trends into the future when applying individual classes of colorants.

Requirements on student

Oral debate on the issue, the connection with other subjects of the field.

Content

Types of textile fibres and products, technological classes of colorants. Coloring requirements, ecological aspects. The economics of dyeing. Historical development of textile dyeing. A view of cotton growing from an economic, ecological and moral direction.

Auxiliary agents for dyeing - distribution according to desired effect. Water softeners, dye wetting agents, hydrotropic and solubilising agents, equalising agents - basic concepts, dispersants and dyeing agents. Economic and environmental aspects, direction of development. The concept of colouring saturation. Equalising behaviour of textile dyes - migration. The issue of constancy, basic concepts. Pulling and blocking procedures, principles. Economic and environmental aspects.

Colourisation of cellulose materials, pre-treatment requirements for coloured materials, dye classes for cellulose materials. The importance of the addition of a strong electrolyte in the dyeing of cellulose materials - the basic idea of colloidal chemistry.

Possibility of reducing the amount of strong electrolyte in dye baths. Wastewater treatment issues. Dead and immature cotton, a streak of viscose silk. Application of reactive dyes to cellulose materials - technological principles. Sample boxes of dyes - their meaning. Classification of dyes by CI. Application of direct, vat dyes and indigosol dyes. Sulphur dyes of different classes and insoluble azo dyes - basic principles of application.

Coloristic properties of polyethylene terephthalate fibres, disperse dyes. Technological principles of application - pressure dyeing, dyeing with carrier, thermosol. Issues of level dyeing, rapid colouring procedures. The issue of oligomers. Reducing energy consumption during dyeing. Dyeing of mixtures polyester - cellulose fibres. Principles, applications. Dyeing of protein fibres, wool and other types. Coloristic properties and technological classes of dyes - different classes of acidic dyes, metal complex dyes, mordant dyes and reactive dyes - principles of application, stability. The issue of metal ions on dyed materials as well as in wastewater. Possibilities of cleavage of azo dyes. Carcinogenicity of amines. Egalization problems in wool dyeing, pointiness.

Levelling agents. Dyeing of mixtures polyester - wool.

Dyeing of aliphatic polyamides - technology classes of dyes, requirements for stability and equal dyeing.. Streakiness of PA silk. Dyeing of mixtures. Ecological views on dyeing of aliphatic polyamides. Dyeing of polyacrylonitrile, characteristics of manufactured PAN fibres, technological classes of dyes - cationic dyes, colouring, equality and levelling agents. Dyeing of mixtures PAN - wool.

Textile printing - direct printing method, reserve printing, discharge method, transmission printing, digital printing method - requirements for printing paste, event. inks for digital printing. Thickening agents for textile printing - meaning, concepts, rheological properties, basic types, possibilities of modification of natural polysaccharides. Water-soluble synthetic polymers, emulsion backings. Changes in textile printing technology and trends into the future. Technological principles of printing cellulose materials with reactive dyes, vat dyes and pigments. Composition of the printing paste - the importance of the individual components. Printing of wool.. Printing polyester and polyamide - principles.

Prerequisites - other information about course preconditions

Wider general knowledge in the fields of physical chemistry, organic chemistry and technology, polymer chemistry and chemical engineering.

Competences acquired

The examination is oral. The basic form of the test is the debate over selected thematic headings. The degree of knowledge acquired and the ability to combine knowledge acquired in the subject into the broader context of the field studied is examined.

Fields of study

Guarantors and lecturers

- **Guarantors:** doc. Ing. Ladislav Burgert, CSc.

Literature

- **Basic:** A.K.Roy Choudhury. *Textile Preparation and Dyeing*. USA, 2006. ISBN 1-57808-402-4.

Teaching methods

Stimulating activities (simulation, games, drama)

Assessment methods

Oral examination

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Organic Technology	Doctoral	Part-time	Organic Technology	1	2019	2023	Compulsory Option	B		
Organic Technology	Doctoral	Full-time	Organic Technology	1	2019	2023	Compulsory Option	B		