ICT IN TEXTILE AND CLOTHING
HIGHER EDUCATION AND BUSINESS
Novel Trend in Textile Functionalisation

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Syllabus: **Finishing, Printing and Functionalization**
Course draft: **Novel Trend in Textile Functionalisation**
Total: *30 hours*

Short description and lecture plan:

The course ***Novel Trend in Textile Functionalization*** introduce learners with specific functional properties of textiles as self-cleaning, super-hydrophobic, antimicrobial, flame retardant, etc. which are results of functionalization of textiles as an emerging tool for improving textile performance and increase its added value.

Some of established techniques which could be used to impart new functionalities and properties to textile materials including cold plasma processing, electrospinning, sol-gel process, foams, enzymatic treatments, nanotechnology, wet processes, spraying, polymer coating.

In the last few years in terms of eco-friendliness, sustainability, etc., the challenge is to find an easy, cheap, eco-friendly agents (as fire retardant for example) and such approach will be one of main goal of the course. Concerning that direction, different nano-materials could be used, polymerizing gases by irradiation techniques, biomolecules, sustainable colorants, etc.

In addition, novel fabrication methods such as electrospinning, centrifugal spinning, melt spinning, wet spinning and various 3D printing techniques have also been developed to create ideal fibrous materials for medical usage and other end-uses.

Through the course it will be described the processing equipments, the physical-chemical nature of the polymer materials, as well as the most important functionalities provided by these techniques.

A new generation of new high-value textiles developed by surface treatment, chemical grafting, 3D structure, and nanotechnologies to introduce and develop textiles with new functionalities will be described.

The course will be focused on the use of innovative technologies based on ICT technology, eco-friendly processes in order to equip learners with relevant skills and knowledge, as well as with responsibilities for developing a novel material functionalities and environmentally friendly.

Course will be divided in two parts: *theoretical and practical*.

Theoretical:

Learners will learn about new technologies, methods, processes and functional properties of such treated textiles, which could be based on biomimetic approach from nature and how could be transfered onto the textiles surface and structure.

Learners will be informed how complex textile structure influenced on the treatment effectiveness and desired properties.

Through the course the processing equipments will be described, the physical-chemical nature of the polymer materials, as well as the most important functionalities provided by these techniques.

Literature for e-course and all necessarry materials (statistical analysis, market demand, etc.) will be a part of e-course.

Practical:

Course will be prepared as e-course with all persentations, videos, graphical schemes, figures and results.

Also, available technigues and process with procedures will be recorded and uploaded, as well as some of techniques for characterization of achieved functional properties of textiles.

As one of the option will be a practical work of learners:

- Preparing of the presentation using ICT technologies, about specific functional properties of textiles using innovative techniqes of processing.

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