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CREATIVE TRANSFER OF SKILLS AND COMPETENCE IN 3D FOOTWEAR CAD

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With the support of the Lifelong Learning Programme of the European Union

International Technical Footwear Congress

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BSc programmes

4 years (8 semesters), 240 ECTS

www.tpmi.tuiasi.ro

February 03-05, 2016, Chennai, INDIA





'Gheorghe Asachi' Technical University of Iasi, Romania

Faculty of Textile, Leather and **Industrial Management**

dustrial Engineering

Textile Technology and Design Knitting and Clothing Technology Footwear and Leather Goods Technology and Design Industrial Design (also in English)

al Engineering

Textile Chemical Technology Chemical Technology of Leather and Leather Substitutes

Engineering & Management

Industrial Business Engineering

BACHELOR STUDY

to industry or other work places

from industry or another university

MASTER STUDY

to industry or other work places

from industry or another university

DOCTORAL STUDY

3 yrs study, get Ph.D.

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Council of Leather Exports

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Projects aimed to develop innovative e-learning tools



companies cannot create internal training departments

Lack of teaching materials



Ageing teachers/tutors

Attractiveness for young generation

Virtual Training Centre for Shoe Design (2007-2009)

 Training in Innovation. **Entrepreneurship** and Design for the **Footwear Industry** (2011 - 2013)

 International **Integrated Training** Plan for the **Footwear Sector** (2011 - 2013)

 Creative Transfer of **Competence in 3D Footwear CAD to VET** Professionals (2013-2015)

•STEP TO **SUSTAINABILITY - How** to Implement **Sustainable** Manufacturing in **Footwear** (2013-2016)

Knowledge Platform for **Transferring Research** and Innovation in **Footwear Manufacturing** (2015 - 2018)

•Fit to Comfort – Skills Alliance for comfort & healthy footwear manufacturing (2015-2017)



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INGA 3D

EU funded project within the framework of the **Lifelong Learning Programme/ Leonardo da Vinci** in footwear sector

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AIM: to transfer and to extend the Icad3d+ innovative software solutions and the 3D technologies for footwear CAD

• Partners:

ROMANIA - 'Gheorghe Asachi'Technical University - Coordinator SPAIN - INESCOP-Instituto Technologico del Calzado PORTUGAL - Virtual Campus, Lda SPAIN - IED Istituto Europeo di Design UK - University of Salford SPAIN - RED 21 SL



Programme



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INGA 3D

EU funded project within the framework of the Lifelong Learning Programme in footwear sector

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OBJECTIVES:

- to transfer the INNOVATION from Spain to other countries, namely Romania, Portugal, and UK
- to develop **skills and competencies in 3D Footwear CAD**. Target group -VET professionals: teachers, trainers and tutors
- to develop new training content and supportive e-learning tools based on units of learning outcomes
- to set up an Online Learning Platform

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In International Technical Footwear Congress February 03-05, 2016, Chennai, INDIA

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Why Icad 3D+ software solution as basis for INGA 3D project ?

•Icad 3D+ was developed by INESCOP and RED 21 (Spain) within the framework of several **EU funded** research projects.

detailed and accurate visualization
 of footwear prototypes in a virtual
 space.

•immediate **feedback** both to teacher and to student/trainee.

•learning by doing - Knowledge and skills are transmitted in a dynamic and effective way







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- **AIM:** To **analyse needs** for skills and competencies in footwear CAD **Methodology:**
- Peer learning and peer teaching Literature review
- **Desk research** on the Skills and Competence available training courses and study programs
- Field research Questionnaires and Interviews

Findings:

- Directions for further **developments** of the INGA 3D curriculum and training content
- **Competence mapping** and designing the **matrices of skills** for 4 training modules











INGA 3D RESULTS Peer Learning Scenarios in Footwear CAD

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Offical Event of INGA 3D RESULTS NTERNATIONAL UNION DE HOE INDUSTRY TECHNICIANS **Peer Learning Scenarios in Footwear CAD** Organizer 1e http://www.inga3d.eu/reports/ **Council of Leather Exports** Supported by: INGA 3D FUPHTMU जन्मामेन जन्म Govt. of India 2013-80-024 tion Period anpcdefp 🚷 INGA3D FLIPHTMLS CREATIVE TRANSFER OF COMPETENCIES IN 3D FOOTWEAR CAD TO I - Q 0 # 5 0 5 opramul a construction of the second s invâțare pe tot VET PROFESSIONALS rearrant viettii This primer has been furched with To up-shill teaching staff from secondary betlary LLP-LdV-Tol/2013-RO-024 education for applying new Protwaar CAD including in This publication reflects the views only of **Implementation** Period the author, and the Correntsion carried 2013-2015 Be teld responsible for any use which many be made of the information Summary PP'S. **Final Event** 6.3 To produce training/teaching content for creating ***** knowledge, akills and competences, that are nece Background to cope with the European/global trends of the footness industry on creativity, innovation and new CAD Results technologies 550N A) partner countries reported that there is lack of teaching resources Deciles, gos and tasks for teachers, ratorials erect available to the area of features of Catt. When Download: Peer Learning Scenarios on Footwear Computer Contact Aided Design these researces tay availably for internet, published tendootikit, they are mainly in-English. Linguistic Surriers on websical terms stop many teachers/tealusco/tea from increalesing these result in the fasts increases or training content. Furthers on increasing the result of the results in their sectors or there are contained by contain. A set arrangement, availing the results into a like result from space are encounted by the data place are indexed by evalues to taken an existence by the contained or training contained for functions are indexed by a data that there is a balance by the contained to the set of the sectors are indexed by a data that there is a balance by the contained to the sector and the set of the target bies restances of that expact CAD results the training regression. Also, there is a large and their Partners Newsletters nee high good by polagogic approach and methodology 66 Flyer Figure- E-book format of the Report on peer learning Scenarios on Demo Lesson Download: Peer Learning Scenarios on Footwear Computer Footwear CAD the shield

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http://www.inga3d.eu/site/assets/files/1012/r3 training program module i.pdf

MODULE II: 3D CAD – APPLICATIONS TO BASIC FOOTWEAR CONSTRUCTIONS

MODULE I: FOOTWEAR CAD BY ICAD3D+ SOFTWARE

http://www.inga3d.eu/site/assets/files/1012/r3 training program module ii.pdf

MODULE III: 3D CAD-APPLICATIONS TO ORTHOPAEDIC FOOTWEAR

http://www.inga3d.eu/site/assets/files/1012/r3 training program module iii.pdf

MODULE IV: 3D CAD- APPLICATIONS TO FASHIONABLE FOOTWEAR

http://www.inga3d.eu/site/assets/files/1012/r3 training program module iv.pdf

INGA 3D RESULTS Training program in Footwear CAD

MODULE 1 - FOOTWEAR CAD BY ICAD3D+ SOFTWARE

Fotal Teaching Hours - Lectures and Activities in class: 50 hours

Skills

workspace

· To be able to obtain the

mean forme and shell

Individual Study: 50 hours

- · To initiate learners in the operation of Icad3D+ (footwear-specific software).
- · To develop skills and competences for creating virtual prototypes on virtual lasts using lcad3D+.
- · To develop skills and competences for creating virtual models with accessories and components
- · To obtain accurate virtual models using the rendering software and to prepare technical sheets.

UNIT 1: Basics for Footwear CAD (7 Hrs)

Knowledge

Objectives

- · Understand the basic elements of 3D CAD workspace and
- operations with files Know the basic operations
- with the last Understand how the flattening
- tools work

Competences

- · To be aware about the To import digital files · To control the last in the main concepts powered by Icad3D+ software
 - To understand and to operate in the workspace
 - To flatten and to start the modelling process
 - Figure- Matrix of skills







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Module I

FOOTWEAR CAD BY ICAD3D+ Software

INGA 3D RESULTS Training program in Footwear CAD

PROGRAM UNITS

- Basics of Footwear CAD
- Virtual Model
- Presenting Virtual Models-Rendering and Producing Technical Sheets

Objectives

□ to operate with various features of Icad3D+ specific software;

- □ to create footwear prototypes on virtual lasts, including accessories and components;
- □to obtain accurate virtual models using the rendering software and to prepare technical sheets.

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Module II

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3D CAD - APPLICATIONS TO BASIC FOOTWEAR CONSTRUCTIONS

INGA 3D RESULTS Training program in Footwear CAD

PROGRAM UNITS

•Basic Constructions for Women's Footwear

•Basic Constructions for Men's Footwear

•Basic Constructions for Children's Footwear

Objectives

□ to apply the 3D CAD technology powered by Icad3D+ software for designing basic footwear constructions types;

□ to practice the 3D modelling process to a range of different footwear styles, characteristics and features which are compatible with design requirements and expectations;

□ to develop skills and competences in producing detailed virtual models of women's, men's and children's footwear.

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Module III

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3D CAD - APPLICATIONS TO ORTHOPAEDIC FOOTWEAR

Objectives

INGA 3D RESULTS Training program in Footwear CAD

PROGRAM UNITS

- Orthopaedic Last Selection
- Orthopaedic Footwear Design
- Orthopaedic Footwear Modified Features

□to apply knowledge of 3D CAD technology powered by Icad3D+ software in order to select orthopaedic lasts appropriate for the specific foot pathology;

to practice the 3D modelling process to a range of different footwear styles, therapeutic features and modifications which are compatible with the specific foot pathology and users expectations;
 to develop the skills and competences to produce virtual models of women's and men's orthopaedic footwear designs.

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Module IV

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3D CAD - APPLICATIONS TO FASHIONABLE FOOTWEAR

PROGRAM UNITS

Training program in Footwear CAD

Structure of Footwear Collections

INGA 3D RESULTS

- Heels and Outsoles
- Materials, Trimmings and Ornamentation

Objectives

□to apply 3D CAD technology powered by Icad 3D+ software for fashionable footwear through collection development;

□to practice the 3D modelling process to a range of different styles, characteristics and features which are compatible with design specifications of the fashionable footwear;

□to design footwear collections mainly focused on operating with various materials, footwear components, trimmings and ornamentations.

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Sample content available at: http://www.inga3d.eu/results/

INGA 3D RESULTS Footwear CAD Handbook

-4 volumes, more than 900 pages
-effective educational approach to modules and units of learning outcomes: Knowledge, Skills and Competences
-4 languages: EN, ES, PT, RO

KO CAD - APPLICATIO

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INGA 3D RESULTS Multimedia supportive guide for teachers and trainers

- 58 tools developed by INGA 3D projects for teachers and trainers:
 - Training Program: Description, Methodology,
 Objectives, Learning Outcomes- Skills, Competences and Knowledge, Number of hours, ECVET etc)
 - Guide for Navigating on INGA Online Learning Platform
 - Presentations of each lesson
 - Multimedia resources Videos
 - Assessment Tests
 - Examples of projects/ study cases







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INGA 3D RESULTS Online Learning Platform



12 complete units that include 40 lessons have been transformed into e-learning format, being enriched with more than 50 videos

Visualize the patterns

When all the patterns were created, with Ctrl pressed, select by left clicking all the patterns You can select it form "Model pieces list", where you see the shape of each pattern or "Pieces" by left clicking on their names.



http://www.inga3d.eu/demo-lesson/

Select the lines to apply stitches and apply stitches to patterns

Select the new defined stitch type, left click on the line you want the stitch to be positioned and then right click and the stitch will be marked.



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Identification of groups (VET professionals)
Definition of implementation plan/strategy
Alfa testing on group of trainers (9). Beta testing on group of trainees (5)

•Piloting Sessions- 45 teachers/tutors/trainers

- ✓ RO: 4 sessions
- ✓ ES: 2 sessions
- ✓ UK: 1 session
- ✓ PT: online course at international level

• On line feedback questionnaire at each stage for improvements of training contents (lessons), OLP and tools

INGA 3D RESULTS Piloting training sessions



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INGA 3D RESULTS Piloting training sessions - Feedback

- 'The course has been pleasant to be part of a really great experience as my knowledge of this software is non existent. I feel I have learnt a great deal of information in regards to the use of the software '(participant in UK)
- About 80% of the participants think the course got enough aids and materials delivered, they think too that the teacher aids was good. Nearly all participants feel they have gained skills to use the program and the necessary knowledge of the program which they used for their work. (Spain)
- 'For me this course presented an interesting experience. Even my field of interest is completely different, it was quite easy to follow this course. The contents support the learning objectives and the media used are understandable and well displayed' (participant Romania)

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INGA 3D project- an example of successful partnership in Romania, Spain, UK and Portugal

- To up-skill teaching staff for:
 - adding new 3D CAD technology to the traditional education in footwear in order to create a link between education and industry
 - introducing new teaching/training e- tools in schools

•adopting training methodologies and contents that meet the expectations of new generation of students/learners

- To train staff from footwear companies for performing training/tutoring activities in Footwear CAD technologies toward their own employees
- To produce training/teaching content for creating
 Knowledge, Skills and Competences =Learning Outcomes









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INGA 3D project- an example of successful partnership in Romania, Spain, UK and Portugal



- To experiment various learning scenarios in order to maximize the number of potential users
- To contribute at increasing the attractiveness of the VET study/training programs in the field of footwear design and technology
- To encourage and to motivate VET teachers, trainers and tutors in stimulating innovative thinking and creativity among their students/trainees
- To motivate university graduates for choosing a career as teacher in VET schools



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What next ?

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e-Learning Access (Vearly

Multimedia Guide (DVD

INGA 3D Online Learning Platform

http://inga3d-store.virtual-campus.eu/

Training Handbook

Icad 3D+ software

INGA 3D Handbooks

http://www.red21.es/en/3d-2/

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Products (dam)				HOME COMP	PRODUCTS - VIDEOS	& RENDER SUPPORT CONT	ACT ONLINE PAYMENT
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TRAINING FOR VET TEACHERS, TRAINERS AND TUTORS IN THE FOOTWEAR SECTOR

Acknowledgment



The INGA 3D project, titled "Creative Transfer of Competence in 3D Footwear CAD to VET Professionals" (contract LLP-LdV-ToI/2013-RO-024) has been funded by ANPCDEFP Romania within the framework of the European LLP/LdV programme.



Find out more at http://www.inga3d.eu/