



## **INGA 3D - Creative transfer of competence in 3D footwear CAD to VET professionals**

**LLP-LdV-ToI/2013-RO-024**

# **Module III : 3D CAD-APPLICATIONS TO ORTHOPAEDIC FOOTWEAR**

Training Program

**Prepared by University of Salford**

**Module III : 3D CAD-APPLICATIONS TO ORTHOPAEDIC FOOTWEAR**

**Total Teaching Hours – Lectures and Activities in class: 25 hours**

**Individual Study: 25 hours**

**ECVET : 2**

**Objectives**

- 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, and therapeutic features which are compatible with the specific foot pathology and users expectations
- To practice the 3D modelling process to a range of 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 and orthopaedic footwear designs.

**UNIT 1 : The Orthopaedic Last (4 hrs : 2 hrs Theory+ 2 hrs activities in class/exercises)**

<b>Knowledge</b>	<b>Skills</b>	<b>Competences</b>
<ul style="list-style-type: none"> <li>• Understand the modifications required to last designs in order to accommodate specific foot pathologies</li> </ul>	<ul style="list-style-type: none"> <li>• To be able to apply knowledge of foot pathologies to bespoke last design</li> </ul>	<ul style="list-style-type: none"> <li>• To be able to choose the correct last for the requirements of specific foot pathologies.</li> </ul>

**Lesson 1.1. The last features in relation to different foot pathologies**

**Theory -1 hour**

- A series of case studies of a complex foot conditions related to systemic pathologies resulting in foot dimensions, structure and mechanical function that requires a specific last and bespoke design of ‘orthopaedic’ footwear.

**Lesson 1.2. Last designs in relation to specific pathologies**

**Theory -1 hour**

- Features of the last in relation to the requirements for specific pathologies and the implications for footwear design.

**Activities in class/Software exercises -2 hours**

Exercises will be carried out to choose lasts for specific pathologies applying knowledge of these pathologies (for women and men).

**UNIT 2: Orthopaedic Footwear Design (13 hrs) 3 hrs Theory+ 10 hrs activities in class/exercises)**

<b>Knowledge</b>	<b>Skills</b>	<b>Competences</b>
<ul style="list-style-type: none"> <li>• Understand the 3D footwear designing process applied to the construction of orthopaedic footwear for different foot pathologies (women's men's)</li> <li>• Understand the rationale for specific footwear design features and components in relation to foot pathology</li> </ul>	<ul style="list-style-type: none"> <li>• To translate the design requirements into technical 3D computer-aided designs of orthopaedic footwear for specific foot pathology and for women and men</li> <li>• To apply knowledge of footwear components and their function to the design of orthopaedic footwear.</li> </ul>	<ul style="list-style-type: none"> <li>• To demonstrate an ability to design orthopaedic footwear with features that fulfil the requirements for a specific foot pathology.</li> <li>• To produce footwear designs that meet the requirements for a specific foot pathology and that reflect mainstream footwear designs</li> </ul>

**Lesson 2.1. Design features and components in relation to the overall construction of the footwear**

**Theory -2 hours**

- Basic styles for orthopaedic footwear
- Design requirements for specific foot pathologies
- Footwear features and components in relation to foot pathology: materials for uppers, linings and soles, uppers' opening and fastening, sole units and heels.

**Lesson 2.2. Orthopaedic footwear design for specific foot pathologies**

**Theory -1 hour**

- Case studies: Specific foot pathologies

- **Activities in class/Software exercises: 5 hours in class and 5 hours self-directed practice.** Application of the knowledge of design requirements for specific foot pathologies, for men and women - 3 cases will be provided for the student to work to in class followed by an additional 3 cases as self-directed practice.

**Note for Student:**

- Design footwear for the cases presented in slides 7-12 (Lesson 2.2)
- Justify your choices of design features

- Compare and contrast your designs with those of the other students in class

**UNIT 3:Orthopaedic Footwear - Modified Features (8 hrs):2 hrs Theory+ 6 hrs activities in class/exercises)**

**Knowledge**

- Understand the relationship between the function of specific design features and the appearance of the footwear
- Understand the function and impact of modifications and additions to the footwear

**Skills**

- To translate knowledge of specific modifications into the design of the footwear

**Competences**

- To produce footwear modifications that meet the requirements of the specific foot pathology and the overall design of the footwear.

**Lesson 3.1. Orthopaedic modifications of sole for specific foot pathologies**

**Theory -1 hour**

Modifications to outer sole. Rocker soles – positioning and design, wedged soles, thickness and flare. The design requirements for specific pathologies.

**Activities in class/Software exercises -3 hours**

Modify a footwear collection, applying the orthopaedic modifications and combinations of modifications to sole for the specific cases presented in Unit 2/ Lesson 2.2

**Lesson 3.2. Orthopaedic modifications of heel for specific foot pathologies**

**Theory -1 hour**

Modifications to heel. Style and relationship to sole. Elevation and elongation, wedges, flare and floats. The requirements for specific pathologies.

**Activities in class/Software exercises - 3 hours**

Modify a footwear collection, applying the orthopaedic modifications and combinations of modifications to **heels** for the specific cases in Unit 2/ Lesson 2.2