Rhino3D for Marine Design

COURSE DESCRIPTION

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Hull Form Development and Fairing

Course Description

This marine specific course is designed to aid the learner in developing an understanding of how Rhino3D may be used for hull form design and fairing. In addition to practical tool skills development, the learner is introduced to strategies for curve and surface creation specifically for hull creation and fairing. Throughout, emphasis is placed on practical application. This course is an intermediate level courses in Rhino3D and the user is expected to have a working knowledge of the application.

What to expect

In this course our instructors walk the user through the various strategies for creating different hull types, from full displacement to planing craft. The focus is on the creation of surfaces that allow quick and simple surface editing and fairing while yielding high-quality, class A surfaces. Learners will practice with control point strategies, number of control points, number of curves, as well as station lines and their relationship to build curves. Curve and surface analysis tools are covered in the context of fairing and surface continuity.

SKILL: ....Intermediate

SCHEDULE: ....Duration: 16 hours

DELIVERY: ....In person: 2 days x 8 hours/day or Online: 4 days x 4 hours/day

Why should you take this course?

(How to convince your Manager)

1. **Gain experience using all Rhino Surface Analysis tools.**

   - Avoid the requirement to purchase expensive CAD tool for doing the hull modification on 1 project. Do all project in Rhino.

   - Start a model from Scratch.

   - Fix an existing model.

2. **Become a Rhino Super User for Marine Design**

   - Using a proven method/process developed from 25 years of experience using the tool (Winston Pynn).

   - Learn how to convert a 2D paper drawing to a perfectly fair 3D Model. (Avoid doing manual work, repetitive trial and error to get to your 3D model).

3. **Learn to manage any type of hulls (Planning & displacement hulls)**

   - Model Class A surface hull, highly editable, perfectly fair & fully developable.

   - Use a semi-parametric method to generate the surface & line plan with less manual effort, ensuring quality & efficiency.

4. **Understand the theory behind surfacing in Rhino**.

   - Give you more control over the Nurbs curve (surface).

   - Allow to respond exactly to your customers hulls specific requirements.

   - Create Bulbus Stern.

COURSE AIMS

I. To use various strategies to create fair and editable hull forms using Rhino3D

II. To show the use of Rhino3D and its surface analysis tools to modify and/or fair a new or existing hull form

COURSE OUTLINE

A) NURBS CURVES AND SURFACES

1. **Overview**
2. **Curves and Surfaces**
    - 2.1. .... Nomenclature 2.1.1.Degree
        - 2.1.2. ... Control Points and Order
        - 2.1.3. ... Knot
        - 2.1.4. ... Weight
    - 2.2. .... Isocurves
    - 2.3. .... UVN
    - 2.4. .... Curvature Graph
3. **Surface Analysis**
    - 3.1. .... Curvature Analysis
    - 3.2. .... Environment Map
    - 3.3. .... Zebra
    - 3.4. .... Edge Continuity
    - 3.5. .... Draft Angle
    - 3.6. .... Hydrostatics
4. **Developable/Non-Developable**
5. **Control Point Strategies**
6. **Application**

B) HULL FORM CREATION STRATEGIES

1. **Overview**
2. **Class A Surfaces**
3. **Lofting**
4. **Sweep Rails**
5. **SubD**
6. **UVN Editing**
7. **Continuity Matching**
8. **Edges**
9. **Rebuilding**
10. **Clipping Planes**
11. **Planing Hull Modelling**
    - 11.1. .. Bow Cone, Developable/Continuity
    - 11.2. .. Chines and Knuckles
    - 11.2.1. One Surface
    - 11.2.2. Two Surfaces
12. **Displacement Hull Modelling**
    - 12.1. .. Parallel Middlebody, Flat of Side and Bottom
    - 12.2. .. Modelling Accurate Bilge Radii
13. **Parametric Lines Plan**
14. **Conclusion**

Course Schedule

Day 1

Session 1.1
- NURBS Curves and Surfaces - Anatomy
- Practice Exercise 1.1

Session 1.2
- NURBS Curves and Surfaces - Control
- Practice Exercise 1.2

Session 1.3
- Planing Hull Project Part 1

Day 2

Session 2.1
- NURBS Curves and Surfaces - Surfaces
- Practice Exercise 2.1

Session 2.2
- NURBS Curves and Surfaces - Surfaces
- Practice Exercise 2.2

Session 2.3
- Planing Hull Project Part 2

Day 3

Session 3.1
- Surface Analysis and Fairing - Creation
- Practice Exercise 3.1

Session 3.2
- Surface Analysis and Fairing - Editing
- Practice Exercise 3.2

Session 3.3
- Displacement Hull Project Part 1

Day 4

Session 4.1
- Surface Analysis and Fairing - Analysis
- Practice Exercise 4.1

Session 4.2
- Displacement Hull Project Part 2

For more information about the full course:
Rhino3D for Marine Design
please contact im-sm@innovmarine.com