

# The Hull & Structure Course Training Syllabus



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# Structure Modeling

## Class Overview

1. Primary and Non-primary Product Hierarchies
2. Naming Convention for Parts
3. Product Hierarchy and Nesting
4. Renaming Parts and Autonumber

## Planar Groups

1. Activate Automatic Beveling
2. Before You Begin Creating Planar Groups
3. Create Planar Groups
4. From a Hull Drawing
5. From Other Drawing Types
6. Interacting with Planar Groups
7. Editing Planar Group Settings
8. Understanding Planar Groups
9. Move Planar Groups

## Construction Lines

1. What Are Construction Lines?
2. Types of Construction Lines
3. The Default Layers for Different Lines
4. Hull Trace
5. PlanarGroupPlane
6. User-Defined Construction Line
7. Offset Construction Line
8. Relationships
9. Mirror
10. Identicals
11. Breaking Line Relationships

12. Trimming, Breaking and Polyline Edit
13. Editing Offset Construction Lines
14. Swapping and Replacing Construction Lines
15. Reviewing Properties of Construction Lines
16. Managing Relationships

## Plate Parts

1. Creating Plate parts
2. Editing Plate Parts
3. Splitting a Plate Part into Multiple Plate Parts
4. Boundary Diagnostics
5. Fixing Invalid Parts
6. Structure Display Options
7. Construction Line and Part Relationships

## Detailing

1. Flanging
2. Create and Modify Flanges on Plate Parts
3. Green
4. Adding and Modifying Green Material
5. Marking
6. Adding Contour Construction Lines and Cutouts
7. Adding User Construction Lines
8. Adding Marking Lines
9. Adding Dynamic Marking Blocks
10. Managing Datum Lines
11. Orientation Icons
12. Editing Piecemarks
13. Corner Treatments
14. Adding and Removing Corner Treatments
15. Moving Construction Lines Affects Parts

16. Bevel Standards
17. Adding and Removing Bevel Standards
18. Viewing and Verifying Bevel Solids
19. Weld Shrinkage
20. Managing the Weld Shrinkage Icon
21. Autobevel
22. Showing Bevel Angles on Plate Parts

## Profile Parts

1. Creating & Modifying Stiffeners
2. Creating Stiffeners and Loose Stiffeners on Plate Parts
3. Attaching Loose Stiffeners to a Plate
4. Editing Stiffeners
5. Creating & Modifying Face Plates
6. Trimming Profiles
7. Adding Cutouts in Profiles
8. Editing Added Cutouts
9. Inserting Welding Seam Reliefs
10. Profile Tools & Utilities
11. Extracting lines from stiffener (mold line, neutral axis)

## Curved Plates

1. Creating Curved Plates
2. Editing Surface Properties
3. Editing Surface Geometric Details
4. Editing Marklines
5. Replacing the Outer Toolpath
6. Adding and Removing Objects to and from a Curved Plate
7. Thinning Production Information
8. Extracting Production Information from a Curved Plate

## Plank Parts

1. Creating planks
2. Editing Planks
3. Editing Plank Collections
4. Splitting Plank Collections
5. Deleting Planks
6. Deleting Plank Collections

## Corrugated Plates

1. Creating Corrugated Plate from Corrugated Stock
2. Creating Corrugated Plate from Plate Stock
3. Modifying Corrugated Plate
4. Detailing Corrugated Plate
5. Adding Objects to Corrugated Plate
6. Corrugated Plate Tools
7. Extracting production information
8. Extracting the Cross section of Corrugated Plate

## Standard Parts and Standard Assemblies

1. Inserting a Standard Part
2. Inserting Standard Part on a Stiffener
3. Modify a Standard Part's Standard
4. Converting a Standard Part to a Structure Part
5. Inserting a Standard Assembly
6. Editing a Standard Assembly
7. Managing Part Names in a Standard assembly
8. Anchoring/Un-anchoring Standard Assemblies

## General Modeling

9. Learning Objectives
10. Drawing Options

11. Managing Structure Drawing Options and Visibility
12. Copying, Moving and Mirroring Parts
13. Mirroring Parts
14. Moving the Parts
15. Copying the Parts
16. Modifying Related Parts
17. Editing Parts that have Identicals or Mirrors
18. Replicating Parts to Other Planar Groups
19. Transferring Parts to Other Planar Groups
20. Automatic Cutouts
21. Making Identical Part Names the Same
22. Showing and Working with the List of Parts
23. Checking Planar Groups
24. Showing Unused Objects in Planar Groups
25. Part Information
26. Piecemark Editing
27. Orientation Icon Editing
28. Weld Shrinkage
29. Stiffener Editing
30. Structure Cutout Editing
31. Marklines Editing
32. Construction Line Editing
33. Miscellaneous Commands
34. Extract Components
35. Add Manual Cutouts



## Hull and Structure Catalog

1. What is Manager Designed For?
2. How to Set-up Permissions to Access Different Settings in Manager
3. General Overview of Manager (Main Menu)
4. Import and Export Manager Settings
5. Usage Log Functionality in all Libraries

### PROJECT SETTINGS

1. General Settings - AutoSave modes
2. General Settings - Units
3. General Settings - Bill of Materials
4. Hull Settings - Label Styles
5. Structure Settings - Remote Profile Cutouts
6. Structure Settings - Tolerances
7. Structure Settings - Auto-resize Settings
8. Structure Settings - Plate Part Piecemark Rotation
9. Structure Settings - Stiffener Marking Types
10. Structure Settings - Text Auto Orientation
11. Structure Settings – NC-Pyros Layers Settings
12. Colors Settings
13. Structure Settings - Nest settings and Optimizer
14. Structure Settings - Profile Plot Profile Lengths
15. Weld Module Settings
16. Reports

### MATERIALS LIBRARY

1. Structure of the Library
2. Materials
3. Grades
4. Material Characteristics
5. Where and How the Material Characteristics are Used

## MANUFACTURERS LIBRARY

1. Structure of the Library

## FINISHES LIBRARY

1. Structure of the Library
2. What Can Finishes Be Applied To?
3. Text Styles Library
4. Text Styles Locations
5. Reference to Text Style Templates
6. Defining Text Styles in Templates, Importing Text Styles into Manager

## NAMING CONVENTIONS

1. Why You Need Naming Conventions
2. Types of Fields in a Naming Convention
3. Available Settings for the DB Field
4. Settings of the AutoNumber Field
5. Manage Aliases Command
6. Generate Names command

## PRODUCTION OUTPUT – DIMENSION STYLES

1. Where to Use Styles
2. Label Styles
3. Type Carefully
4. Label Styles in BOMs

## PRODUCTION OUTPUT – BILLS OF MATERIAL

1. Where are BOMs Used?
2. BOM Settings
3. BOM Definitions
4. Fields
5. Formatting of Fields
6. Sorting

7. Merging Identicals (Pros and Cons)
8. Collectors
9. Reference to Label Styles
10. Reference to Table Styles in Templates

## PRODUCTION OUTPUT – PREDEFINED ASSEMBLY FORMAT

1. Predefine Templates to be used for any Specific Product Hierarchy Level

## STOCK CATALOG

1. Four general Types of Stock
2. Plate – Properties, Inventory and Sizes
3. Corrugated Plate
4. Profile
5. Shapes
6. Cutouts
7. Planks
8. Shapes
9. Sizes (length) and Quantities

## USER DEFINED ATTRIBUTES (UDAS)

1. Creating UDAs
2. Assigning UDAs to Parts, Stocks and Sizes. What is the difference?
3. Types of Attributes – Required, Deferred, Not Required
4. Using UDAs in Later Stages

## PLATE PARTS DETAILED SETTINGS

1. The Orientation Icon
2. Format
3. Markline Styles
4. Markline Styles Settings
5. Assigning Specific Styles to Different Groups of Lines
6. Flange Catalog

7. Types of Flanges
8. Inside Radius from Plate Stock Definition
9. Correction Factor Calculation
10. Meaning of the REnd Option
11. Corner Treatments
12. Types of Corner Treatments
13. Green Material Library
14. Bevel Standards
15. Bevel and Autobevel Settings
16. NC Machines Catalog
17. Assigning NC Machines to Plate Stock
18. How NC Machines Affect Nest Drawings

## PROFILE PARTS DETAILED SETTINGS

1. Endcuts Catalog
2. How to Create Endcuts
3. Assigning Endcuts to Stock
4. Profile Parts – Trimmed Length Notes and Information
5. Web/Flange Cuts
6. Mirroring Endcuts
7. Profile Green Standards Library

## STANDARD PARTS CATALOG

1. Creating a Standard Part in the Catalog
2. What can be a Standard Part and What Cannot

## STANDARD ASSEMBLY

1. Creating a Standard Assembly in the Standard Assembly Catalog
2. Example Use of Standard Assemblies
3. What can be a Component of a Standard Assembly and What Cannot
4. Defining a Product Hierarchy within the Standard Assembly and exploring how it interacts with the Overall Product Hierarchy

5. Parts Naming in Standard Assemblies
6. Purchased Assemblies

# Hull Modeling

## Hull Modeling Overview

1. Work Flow Overview
2. Hull Drawings
3. The Hull - Structure Relationship
4. Creating a Hull drawing
5. Introduction to Hull Objects & Hull Related Objects
6. Surfaces
7. Single Curved Surfaces
8. Double Curved Surfaces
9. Expanded Surfaces
10. Orientation Icons
11. Forming Templates
12. Forming Controls
13. Shell Surfaces
14. Surface Marklines
15. NURBS Curves
16. Porcupines
17. Curve Blocks
18. Stringer Shells
19. Stringers
20. Reflines
21. Pin Jigs
22. Labels
23. Getting Started
24. General Hull Utilities
25. Listing Hull Objects
26. Editing Hull Object Properties
27. Grip Points & OSNAPs

## Import to Hull Drawings

1. Importing IGES Files
2. Importing Rhino files
3. Importing ShipCAM Files

## Surfaces

1. Creating Surfaces
2. Creating a Surface from an AutoCAD Surface
3. Creating a Single Curvature Surface
4. Deck Surfaces
5. Creating a Deck Surface from the Centerline
6. Creating a Deck Surface from a Sideline
7. Creating a Surface from a Curve Block
8. Creating a Sweep One Rail Surface

## Design Surfaces

1. Analysis Tools
2. Analyzing Curvature
3. Calculating the Offset Table for Surfaces
4. Marking
5. Location Groups – Creating and Modifying Marklines from Sections
6. Create Planar Group Model Drawings from Hull Traces

## Plates

1. Split/Cut Plates
2. Using a Curve object to cut a Plate
3. Using an Intersecting Surface to Cut a Plate
4. Detail Marking
5. Marklines from Girth
6. Markline from a Projection
7. Iso-Strain Marklines

8. Iso-Curvature Marklines
9. Editing/Modifying Marklines
10. Extracting/Deleting Marklines
11. Editing the Properties of Marklines
12. Labeling Marklines
13. Editing Surface Properties

## Plate Expansion

1. Expansion Dialog Window
2. Mapping Back Marklines
3. Synchronizing Marklines
4. Calculating the Deformation Table
5. Displaying Strain Map

## Stringers & Stringer Shells

1. Stringer Shell usage
2. Shell Expansion Drawings
3. Stringers
4. Creating a Stringer Shell
5. Creating a Stringer Shell from a Group of Lines
6. Validating a Stringer Shell
7. Stringers
8. Creating Stringers
9. Stringers from Girth
10. Stringers from Projections
11. Stringers from Polylines
12. Stringers from Reference Lines
13. Editing Stringers
14. Edit Stringer Properties
15. View and Placement Model
16. Nudge Stringers



17. Extract from Stringers
18. Extracting Lines from Stringers
19. Extracting a Reference Line from a Stringer

## Export & Update Parts

1. Exporting Parts to Structure
2. Exporting Expanded Plates to Structure
3. Exporting Stringers to Structure
4. Update Parts
5. Update Curved Plate Parts
6. Updating Twisted Stiffener Parts
7. Relink Expanded Surfaces
8. Export to DWG
9. Export to ShipCAM
10. Export to GHS

## Shell Expansion & Reflines

1. Stringer Shell Definition Direction
2. Editing Stringer Shells
3. The Visual Representation of a Stringer Shell (3D/Expanded)
4. Editing Expansion Properties
5. Reference Lines
6. Create Reflines
7. Reflines from Girth
8. Reflines from Projection
9. Reflines from Polylines
10. Reflines from Stringers
11. Extract from Reference Lines
12. Extract Curves from Reflines
13. Extract Marklines from Reflines onto Shell Surfaces
14. Extract a Shell Expansion Surface Pair from a Stringer Shell

15. Mark Primary Girth Labels
16. Mark Secondary Girth Labels

## Pin Jigs

1. Pin Jig Drawings
2. Creating a Pin Jig Drawing
3. Preparing a Pin Jig Drawing
4. Move Plates to Origin
5. Autolevel
6. Move Plates above Minimal Pin Height
7. Creating Pin Jigs
8. Grid Type Pin Jig
9. On Seams Pin Jig
10. Update Pin Jig Table
11. Edit Pin Properties

## Editing Surfaces

1. Offsetting Surfaces
2. Nudge Surfaces

## NURBS Curves

1. Creating NURBS Curves
2. Creating Free-form NURBS Curves
3. Creating NURBS Curves from Objects (Polylines)
4. Extracting a NURBS Curves from a Markline
5. Editing & Manipulating NURBS Curves
6. Edit the Properties of NURBS Curves
7. Join NURBS Curves
8. Split NURBS Curves
9. Continue a NURBS Curve
10. Extend NURBS Curves
11. Nudge NURBS Curves

12. Analyzing NURBS Curves
13. Displaying Porcupines
14. Calculating the Offset Table

## Curve Blocks

1. Creating Curve Blocks
2. Create a Curve Block from Curves
3. Create/Extract a Curve Block from a Surface
4. Editing Curve Blocks
5. Transpose a Curve Block
6. Resample a Curve Block
7. Trim a Curve Block
8. Split a Curve Block

# Production Documentation Essentials

1. What is a Production Drawing?
2. Production Objects
3. What is a BOM?

## OUTPUT DRAWING CREATION

1. What are Output Drawings
2. Creation Wizard

## BOMS

1. Creating BOM Definitions
2. BOM Field Options
3. Collector Options
4. Inserting a BOM Table
5. Table Options

## LABELING

1. Label Styles
2. Label Style Options
3. Automatic and Manual Labeling
4. Option 1: Auto Label All
5. Option 2: Label Viewports
6. Option 3: Viewport Options
7. Option 4: Auto Label Parts
8. Option 5: Manual Label
9. Leader Distribution Lines
10. Creating Leader Distribution Lines
11. Redistributing Leaders on Distribution Lines
12. Inserting New Leaders
13. Property Labels

## DRAWING DETAILS

1. Keywords
2. Viewport Options
3. Global Dimension to Point
4. Quality Matrix Label Options
5. Quality Matrix Matrix Options
6. Quality Matrix Dimension Points

## UPDATING DRAWINGS

1. Show Out-of-Date
2. Updating drawings

## BOM REVISIONS

1. Adding Revisions
2. Keywords
3. Viewing Revisions
4. Deleting Revisions

# Hull and Structure Documentation Drawings

## ASSEMBLY DRAWINGS

1. Drawing Naming Convention
2. Keymap Drawing
3. Keymap Configuration
4. Inserting BOM Information
5. Creating Assembly Drawings using the Wizard
6. Labeling an Assembly Drawing
7. Option 1: Auto Label All
8. Option 2: Label Viewports
9. Option 3: Viewport Options
10. Option 4: Auto Label Parts
11. Option 5: Manual Label
12. Utilities
13. Quality Matrix
14. Quality Matrix Label Options
15. Quality Matrix Matrix Options
16. Quality Matrix Dimension Points

## WELDS

1. Weld BOMs
2. Labeling Weld Symbols
3. Weld Symbol Table

## APPROVAL DRAWINGS

1. Insert Planar Group
2. Save as a Bound Approval Drawing

# Reports

## REPORT BASICS

1. Configure Project Details for Reports
2. General Overview of the Parts of the Reports Window
3. A Typical Workflow
4. Report menu Functionality
5. The Menu Bar - File
6. The Menu Bar - Reports
7. The Menu Bar - Window
8. Report Definitions and the Sources Tabs
9. The Tree View Pane
10. The Properties Pane
11. The Generate Report Button

## GENERATING REPORTS

1. An example of Generating a Product Hierarchy report
2. Viewing reports

## CREATING AND EDITING REPORT DEFINITIONS

1. Stock report Types
2. Product Hierarchy Report Types
3. Distributed Systems Report Types
4. Model Drawings Report Types
5. Other Report Types
6. Creating a New Report Definition
7. The Report Definition Window
8. Set Contents for New Reports
9. Report Actions
10. Editing an Existing report Definition
11. Changes in the Edit Report Definition Window

## 12. Changes in the Edit Report Menu

### USING REGULAR EXPRESSIONS (REGEX) TO FILTER REPORTS

1. Benefits of Reports Filtering
2. Regular Expressions Examples
3. Useful Regular Expressions References