# Certificate Program:
## Shipyard Industry Marine Design Training

NSRP Project
Workforce Development – Kyle Jellison
General Dynamics Bath Iron Works

# NSRP Project

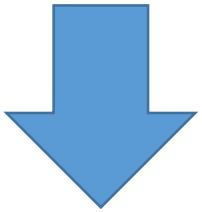
- BIW Design Training SME's
- Workforce Development
- Southern Maine Community College SME's


GENERAL DYNAMICS
Bath Iron Works

SOUTHERN MAINE COMMUNITY COLLEGE
envision a future

# A Need for Basic Training

- Shipyards are hiring entry level designers
- Unskilled labor
- Becoming more complicated



Basic Training to hit deck plate

1. Pre-Hire, Community College: Three-week Certificate
2. Post-Hire, Shipyard: New Hire Training
3. Apprenticeship: Hybrid of both

# Deliverable

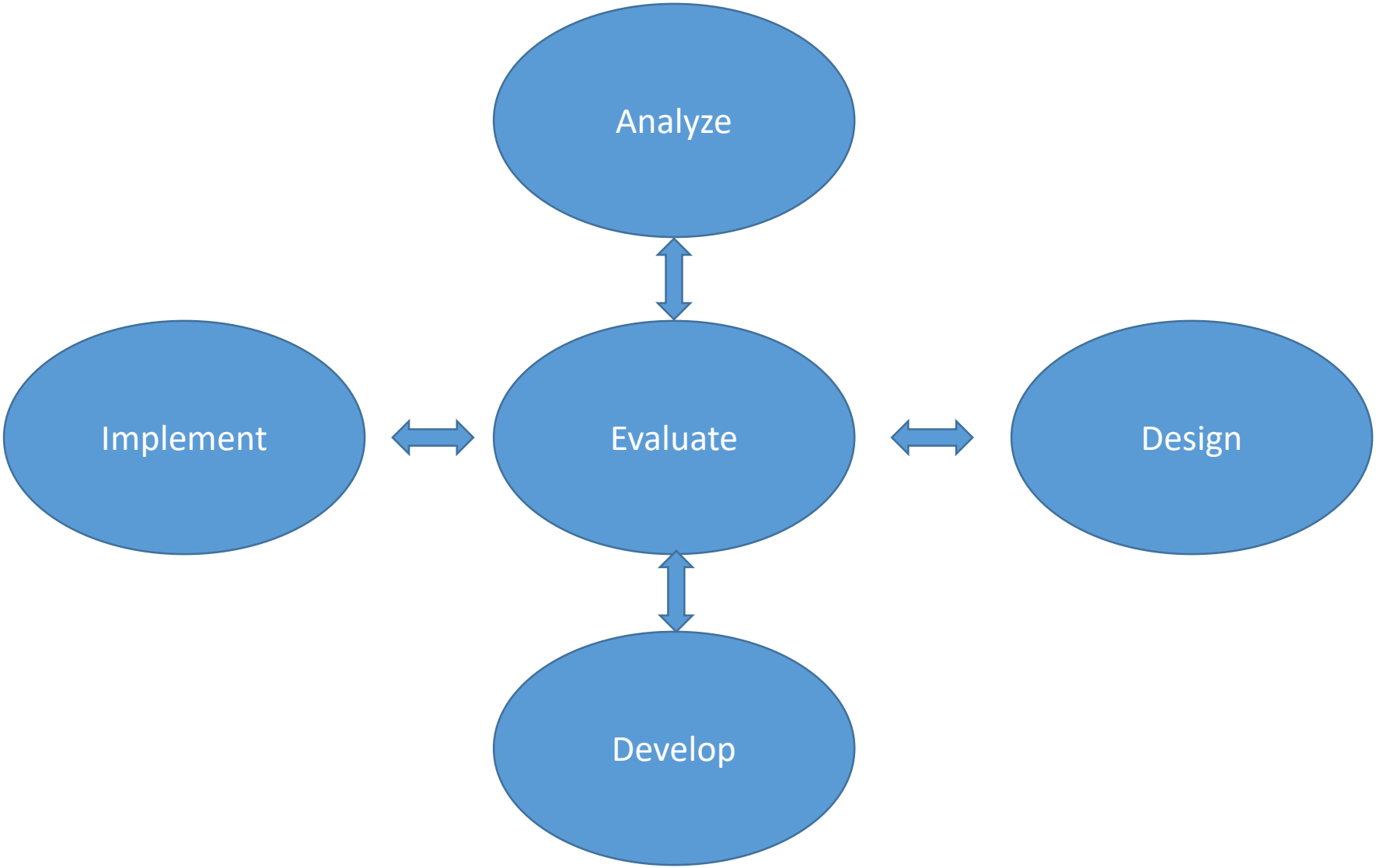
## Training Package

- Instructor's Guide
  - PowerPoint Presentation
  - Instructor Notes
- Student Guide
  - Lab Day Exercises
  - Hands-on Criteria

## Training Structure

- 120 Hours
  - Classroom – Hands-on
- Flexible Delivery
  - 3-weeks (8hrs/day)
  - 6-weeks (4hrs/day)
- Apprenticeship Program
  - Include OJT – Proficiencies
  - Supplement with Shipyard course

# The ADDIE Model

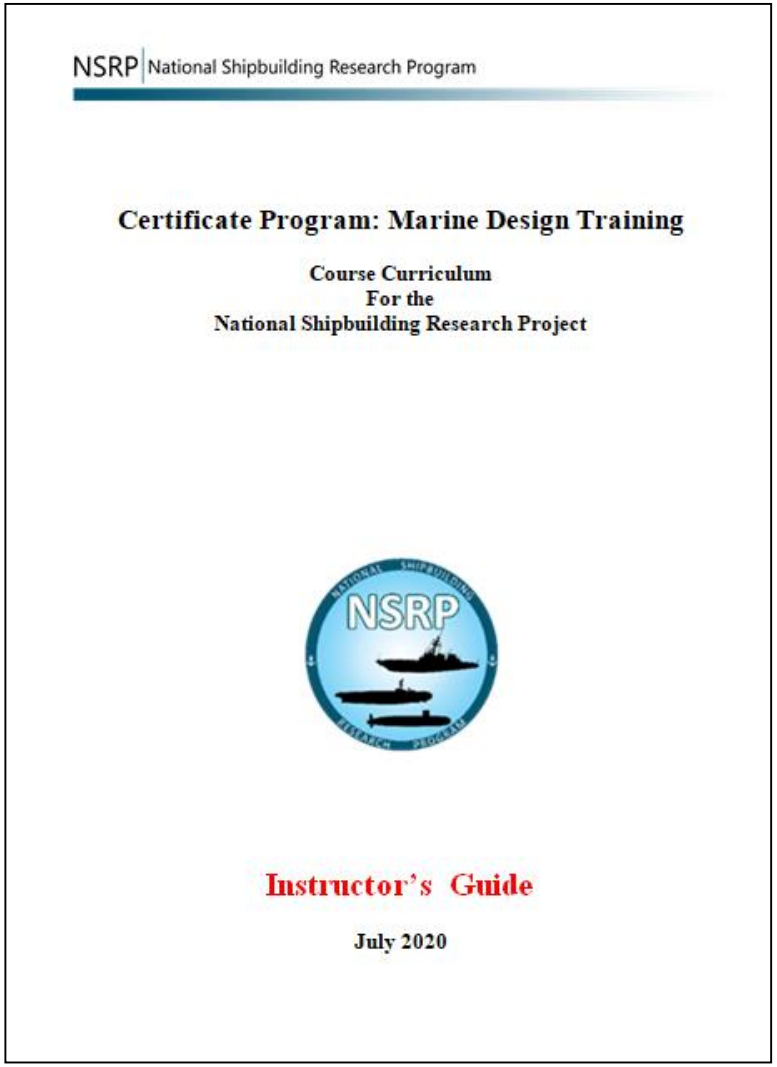


# Analysis

## Curriculum Foundation

- Rationale for Training
- Curriculum Goals
- Scope & Sequence

| Course Topic Areas |
| --- |
| Shipbuilding - Language of Shipbuilding, History of Shipbuilding, Structural Components (Primary and secondary), Ship Systems, Naval Warship Systems |
| Basic Math Skills - Distance Measuring, Defining and Characterizing Geometric Shapes, Conversions Between Numeric Systems, Using a Tape Measure or Scale |
| 2D Print Reading and Drawing - Orthographic Projection, Using and Interpreting Welding Symbols, Discipline Specific Drawing Data, |
| Computer Aided Design - Viewing 3D models in Ship Constructor, Developing Drawing in AutoCAD, Capturing and Digitizing Data in AutoCAD |


NSRP National Shipbuilding Research Program

Certificate Program: Marine Design Training

Course Curriculum
For the
National Shipbuilding Research Project

Instructor's Guide

July 2020

# Design & Development

## Curriculum Foundation

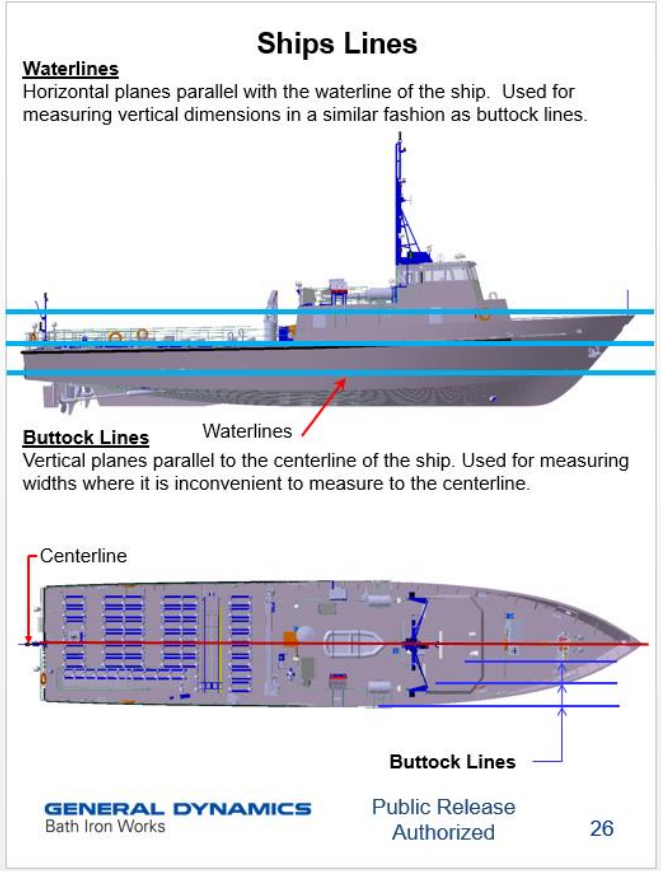
- Content Scope & Sequence


| Week 1 |
| --- |
| Language of Shipbuilding |
| World of Ships - Video |
| History of Shipbuilding |
| Interpreting Requirements |
| High Voltage and Electrical Safety |
| Hazardous Materials and Environments |
| Orthographic Projection |
| Interpreting 2D Drawings |
| Using and Interpreting Welding Symbols |
| Discipline Specific Drawing Data |
| 2D Drawing Exam |
| Basic Math Skills - Defining and Characterizing Geometric Shapes |
| Basic Math Skills - Conversions Between Numeric Systems |
| Lab - Manipulating Geometric Information |
| Using a Tape Measure or Scale |

# Design & Development

## Curriculum Foundation

- Content Scope & Sequence

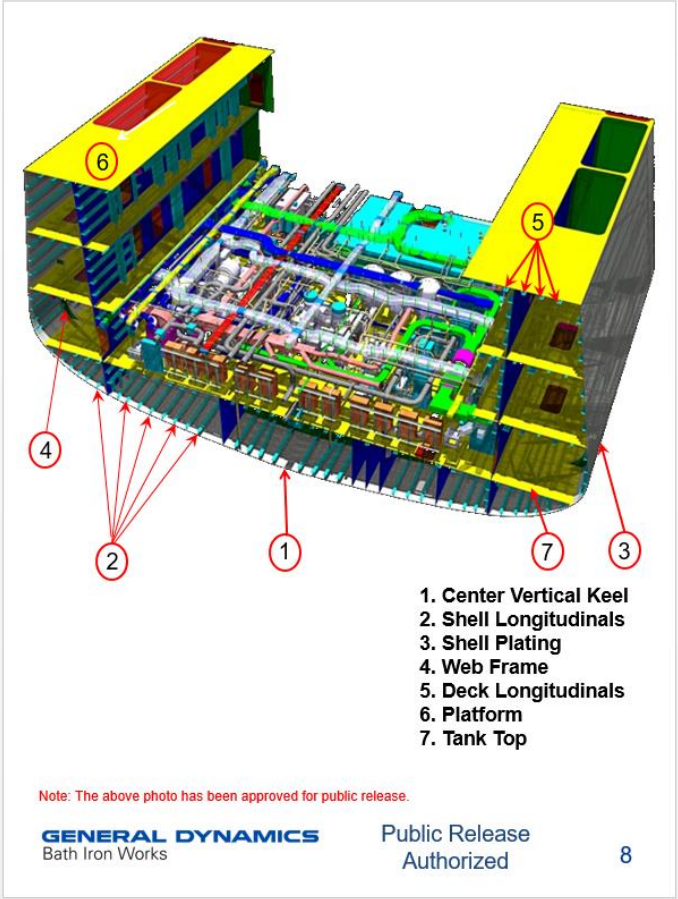



| Week 2 |
|---|
| Naval Warships - Combat Systems |
| Structural Components - Primary, Secondary |
| Shipyard Specific Lab - Structural |
| Naval Warships - Damage Control |
| Ships Systems - Electrical and Cabling |
| Shipyard Specific Lab - Electrical |
| Naval Warships - Sensors and Weapons |
| Ships Systems - Plumbing, Piping, Valves |
| Shipyard Specific Lab - Plumbing, Piping, Valves |
| Naval Warships - Communications Systems |
| Naval Warships - Networks |
| Ships Systems - Outfitting |
| Shipyard Specific Lab - Outfitting |
| Ship systems exam - knowledge based |
| Viewing Computer Models of Ships |

# Design & Development

## Curriculum Foundation

- Content Scope & Sequence




| Week 3 |
| --- |
| Introduction to CAD - drawing environment |
| Introduction to CAD - lines, coordinates, osnaps |
| Introduction to CAD - otrack, labs |
| Introduction to CAD - review labs, selection methods |
| Introduction to CAD - properties, inquiries, plines, rectangles |
| Introduction to CAD - modification tools |
| Introduction to CAD - review labs, temporary tracking, text |
| Introduction to CAD - polygons, arrays, hatch |
| Introduction to CAD - scale, align, cloud |
| Introduction to CAD - dimensioning |
| Introduction to CAD - blocks, stretch |
| Introduction to CAD - paper space/model space |
| Final Practical Exam - Shipyard Specific |
| Course Critiques and Admin |

# Evaluation

**Pilot Run**

*Apprentices from Trades*

October 2020

December 2020


NSRP
National Shipbuilding Research Program

**DAILY PILOT AUDIT SHEET**
**SHIPYARD INDUSTRY MARINE DESIGNER TRAINING**

| Administrative Information | |
|---|---|
| Trainer Name: | Evaluator Name: |
| Course/Lesson: | |
| Date: | Start/Stop Time: |

| Ratings | | | |
|---|---|---|---|
| **Skills Based Learning** | *Majority* | *Minority* | *None* |
| **Knowledge Based Learning** | *Majority* | *Minority* | *None* |
| **Audience Appropriate Content** | *Too Complex* | *Appropriate* | *Too Simple* |
| **nt** | *Majority* | *Minority* | *None* |
| **nt** | *Need to deliver later* | *Appropriate* | *Need to deliver sooner* |
| | *Need more time to cover* | *Proper pace* | *Need less time to cover* |
| **o** | *Very relevant - will apply content routinely* | *Relevant – will apply occasionally or supports learning* | *Not relevant* |
| | *Great for Pre-Hires* | *Better for post-hire training* | *Does not support need* |

**Comments (continued on back of sheet)**

# Implementation

**General Public**

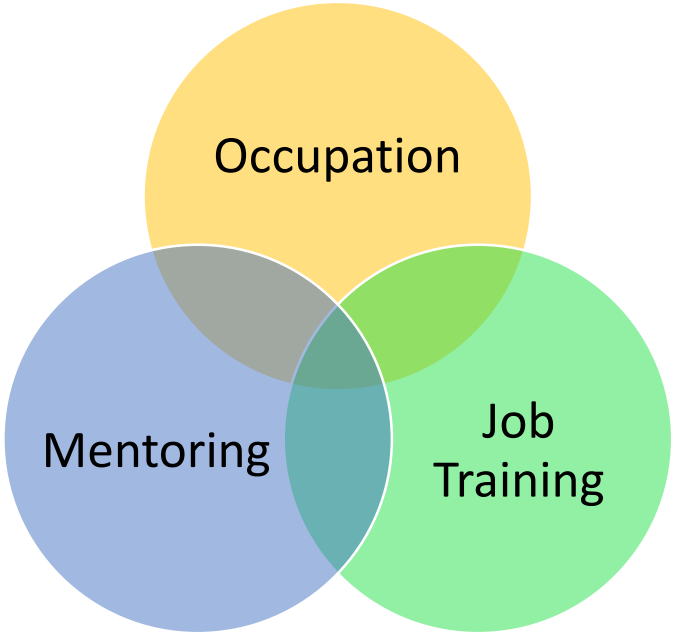
April 2021

# Timeline

A
D
D
I
E

| Title | Description | Team Member(s) | Receiver | Due Date |
|---|---|---|---|---|
| Analysis & Design - Curriculum Data Gathering | Gather Data from Community Shipbuilders and Partners to define what is to be learned and the process by which learning will occur | BIW EB | BIW | 3/1/2020 |
| Course Development | Process of authoring and producing the course materials - "Core Body of Knowledge" | BIW SMCC | BIW | 10/1/2020 |
| Implement Pilot | Process of installing the project into real-world context | BIW SMCC | BIW | 10/1/2020 |
| Evaluate and Revise | Process of determining the adequacy of the instruction | BIW SMCC | BIW | 2/15/2021 |
| Final Report - at 11 Months | Generate a Report of Findings & Recommendations | BIW | ATI | 5/15/2021 |

# Sponsored Apprenticeship




**OCCUPATION: Basic Manufacturing Technician**

**SOC:** 17-3029.09 **NAICS Code:** 336611
**TERM:** 2000 hours **RTI Hours:** 144 hours

| SKILLS TO BE LEARNED ON THE JOB | | Hours Required | Hours Attained | Proficient As of Date | Supervisor Signature |
|---|---|---|---|---|---|
| | **MANUFACTURING TECHNICIAN SKILLS CHECKLIST** | | | | |
| | Set up and verify the functionality of safety equipment | | | | |
| | Adhere to all applicable regulations, policies, and procedures for health, safety, and environmental compliance | | | | |
| | Calibrate or adjust equipment to ensure quality production, u tools such as calipers, micrometers, height gauges, protra or ring gauges | | | | |
| | Inspect finished products for quality and adheren specifications | | | | |
| | Monitor and adjust production processes and productivity | | | | |
| | Troubleshoot problems with equi | | | | |
| | Test products or subassen | | | | |
| | Select cleaning mat | | | | |
| | Set up and op current goo procedures | | | | |
| | Plan and lay out wo requirements | | | | |
| | Install new manufacturing equipment | | | | |
| | Start up and shut down processing equipment | | | | |
| | Prepare and assemble materials | | | | |
| | Build product subassemblies or final assemblies | | | | |
| | Maintain inventory of job materials | | | | |
| | Clean production equipment or work areas | | | | |

UNDER DEVELOPMENT FOR MARINE DESIGN

# Technology Transfer

- NSRP Meetings
  - Workforce Development
  - Other Panels

- Industry Partners
  - GD Electric Boat
  - GD NASSCO
  - Austal, USA
  - NMEC


Kyle Jellison
Kyle.Jellison@gdbiw.com

# Questions?