Marine Center

Course Overview

Fundamentals of Marine Technology

Curriculum Overview

I. Electronics and Electrical Systems
    (13 hours)
    a. Diagnostic tools
        i.   Digital volt meter
        ii. Oscilliscope
        iii. Megger
        iv. Power supplies
    b. Soldiering and cable splicing
        i.   Basic circuit design
        ii. Connector repair and splicing
    c. Batteries and battery charging systems
    d. Fiber optics and software/hardware interfaces

    e. Diagnostic tools
        i.   OTDR
        ii. Power meters
        iii. Fusion splice

I. Marine Fluid Power
    (8 hours)
    a. Hydraulic hose building and testing
    b. Hydraulic circuit design
    c. Hydraulic systems troubleshooting

I. Marine Sonar and Acoustics
    (10 hours)
    a. Basic sonar theory
        i.   Sonar equation
        ii. Speed of sound
    b. Sonar calibration
        i.   Patch test
        ii. Motion Reference Unit
        iii. Offsets
    c. Sonar systems and operations
        i.   Scanning
        ii. Side Scan
        iii. Multibeam
        iv. USBL

I. ROV
    (4 hours)
    a. ROV systems and operations
    b. ROV – Sonar/sensor integrations
    c. Software communication protocol
    d. Tether repair and troubleshooting

Fundamentals of Multibeam

08:00	Classroom Open – Coffee & Refreshments	Classroom Open – Coffee & Refreshments

08:15	**Introduction**
	• Instructor Introduction
	• Housekeeping
	• Outline
		Onboard MV Northwestern
		• Alongside:
		   o Safety Briefing
		   o Equipment Walkthrough incl connections
		   o QINSy Online Demo
		• Underway
		   o SV Profile Set-up and Execution
		   o Patch test Execution and Processing
		   o Surveys
		      • Flat Area / Pipeline / Wreck
		      • Backscatter Collection
		      • Water Column Collection

08:30	**Multibeam System Introduction** • Output examples • More than just the sonar…	
09:15	**Multibeam Principals** • Ceramics and Transducers	
10:00	**Coffee Break**	
10:20	**Positioning and Attitude** • GNSS Principals • IMUs • Inertial Navigations Systems	
11:00	**Water Column** • Overcoming Signal Loss • Refraction	
11:45	**Lunch Break**	

13:00	**Patch Tests**
	• Theory & Examples
		• Debrief boat operations
		   o Question/Answers
		
		• Introduction to Data Processing
		   o Demo
		   o Hands-on activity

13:45	**Backscatter and Water Column** • Theory and intro to data	
15:15	**Coffee Break**	
15:35	**Hardware Setup** • Line Diagram	
16:20	**Software Setup** • QINSy Template Creation	

Marine Project Management

Day	Course Content	PMBOK Section
1	Why PM?	1. Introduction
	Introduction to PM	
	Language of PM	
	Roles and organization structures	2. The Environment
	Role of the Project Manager	3. Role of the Project Manager
	Project Selection	1.2 Introduction – Foundational Elements
	Chartering projects	4. Integration Management
	Stakeholder & Communication Planning	13. Stakeholder Management
		10. Communications Management
	Project Scope - WBS	5. Scope Management
2	Project Scope (continues)	5. Scope Management
	Scheduling Projects	6. Schedule Management
	Resourcing Projects	9. Resource Management
	Budgeting	7. Cost Management
3	Performing: Earn Value Analysis	7. Cost Management
	Risk Management	11. Risk Management
	Quality	8. Quality Management
	Procurement & Supply Chain	12 Procurement Management