

MARINE TRANSPORTATION

NEW COURSE SYLLABI

1. **Course:** MT-42XX ECDIS
2. **Credits:** 3
3. **Contact Hours** 45 1 integrated lecture/lab per week (3 hours duration)
4. **Course Coordinator:** Captain Karen Arnold
5. **Textbook:** *The Electronic Chart Display and Information System (ECDIS): An Operational Handbook (with CD)*
Adam Weintrit, 2009
6. **Course Information:**

Description: The course is designed to enhance navigational safety as a result of the correct operation of ECDIS equipment by the officer in charge of a navigational watch. The integrated lecture/lab experience will allow students the opportunity to practice each required proficiency task on individual ECDIS simulation stations as the topic is covered (IMO requires that each student have access to their own ECDIS workstation during training.) The course content covers the theory of ECDIS, regulations and requirements governing the use of ECDIS; knowledge of raster and vector charts; capabilities and limitations of ECDIS equipment; practical knowledge of the various features of the ECDIS; ENC/SENC data presentation; practical passage planning on the ECDIS; practical route monitoring on the ECDIS; open water, coastal, and advanced navigational exercises using the bridge simulators in the Electronic Navigation Lab (ENL); back up arrangements and operational requirements for ECDIS; alarms and indications, managing settings; practical ENC updating; RADAR, ARPA overlays, AIS information display.

Prerequisites: MT-3121 Navigation II and MT-3222 ARPA

7. **Course Goals and Objectives:**

At the completion of the course the student will be able to:

- Operate an ECDIS and use its functions for safe navigation
- Understand the difference between a raster and vector chart.
- Understand the capabilities and limitations of ECDIS.
- Perform the Basic Tasks listed in the Proficiency Checklist for the NaviSailor 3000i.
- Perform all tasks associated with overall presentation of the display.
- Perform the Intermediate Tasks in the Proficiency Checklist for the NaviSailor 3000i.
- Perform the Navigator Tasks listed in the Proficiency Checklist for the NaviSailor 3000i.

This course (pending approval by the USCG National Maritime Center) meets the requirements of STCW 1995 as amended by Manila 2010 and is based on the newly revised IMO Model Course 1.27 (2010 edition, Manila amendments).

8. ECDIS Lesson Topics:

Lesson Number	Topic
<u>Elements of ECDIS:</u>	
Class meeting number 1	
1	Introduction to ECDIS
2	Purpose of ECDIS
3	ECDIS value to navigation
4	Limitations of ECDIS: Correct and Incorrect use of ECDIS
Class meeting number 2	
5	ECDIS work station start up, stop and screen layout
6	Vessel position
7	Position source
8	Heading and drift vectors
Class meeting number 3	
9	Basic navigation
	Simulator exercise 1: Open sea (basic integrated navigation)
Class meeting number 4	
10	Understanding chart data
11	Chart quality and accuracy
12	Chart organization
<u>Watchstanding with ECDIS:</u>	
Class meeting number 5	
13	Sensors
14	Ports and data feeds
15	Chart selection
16	Chart information
Class meeting number 6	
17	Changing the settings
18	Chart scaling
19	Information layers
Class meeting number 7	
	Simulator exercise 2: Coastal waters (chart display settings)
20	System and position alarms
21	Depth and contour alarms
<u>ECDIS route planning:</u>	
Class meeting number 8	
22	Vessel maneuvering characteristics
23	Route planning by table
24	Route planning by chart
Class meeting number 9	
25	Track limits
26	Checking voyage plan for safety

Simulator exercise 3: Coastal and confined waters (navigation alarms and route scheduling)

Class meeting number 10

27 Embedded tide, current and climate almanac
28 Route schedule
29 User charts in route planning

ECDIS Targets, Charts and System:

Class meeting number 11

30 ARPA tracked target overlay
31 AIS functions
32 Radar overlay (RIB) functions

Class meeting number 12

33 Procuring and installing chart data
34 Installing chart corrections
Simulator exercise 4: Confined waters (advanced integrated navigation with ECDIS)

Class meeting number 13

35 System reset and backup
36 Archiving with ECDIS data management utility
37 Data logging and logbook
38 Playback

ECDIS Responsibility and Assessment:

Class meeting number 14

39 Responsibility
40 Effective navigation with ECDIS

Class meeting number 15

Final exam: written multiple choice

Simulator exercise final: Coastal and confined waters (underway ECDIS navigation assessment)

10. Proficiency Checklist for NaviSailor 3000i ECDIS:

These tasks are most effectively mastered by:

- Following a developmental sequence, and
- Practicing them in a navigational context (underway setting)

Basic Tasks

1	Identify all control panels, task panels, operational panel buttons multi-panel
2	Enable/disable auto-hide (show) of control panel; move control panel windows
3	Set screen color palette - Day/Night/etc.
4	Open all tasks - leave open and become familiar with tabs for each task panel
5	Set orientation of main display - N/H/C
6	Set mode of main display
7	Select dual display - alignment mode/orientation/scale choice
8	Drop and return ownship symbol - view, then ahead, F8, icon, position dropped
9	Reposition ownship in relative motion
10	Use ERBL offset; info window; from ownship for CPA & TCPA; VRM options
11	Select vector length - fixed/variable
12	Select chart by position & when position is dropped - active list/table
13	Find/load chart anywhere - view (review) and enter repeatedly
14	Select chart autoloading options - on/fix/off
15	Set chart autoscale - on/off, manual scaling in chart area window
16	Select correct scale to show chart layers - zoom, use + & -, scale, zoom box
17	Select chart display categories - Shift F7/Shift F8 hot keys
18	Obtain chart object information - vector chart, user chart (Add info)
19	Set Anti-grounding - Safety Contour/Depth
20	Set area approach - category selection, time before approach
21	Set navigational danger approach - distance

Overall Presentation of Display

22	Select position and time from best available source
23	Cancel/verify/modify position offset
24	Select chart and scale appropriate to location
25	Create uncluttered display, depending upon context and conditions
26	Choose main or dual display in best mode and orientation to view ownship
27	Load a pre-checked and approved route for monitoring; load existing schedule
28	Select safety parameters appropriate to location, route monitored and traffic

Intermediate Tasks

29	Create route plan - rough draft, save, WP editor, scaling with + & -	
30	Edit route plan - Focus on route, fine tune, data entry, link, delete	
31	Adjust distance calculations in route planning	
32	Perform safety check in route planning - Function Panel/Check Editor	
33	Create and modify Route Schedule ETD, ETA, speeds - Function Panel/Schedule	
34	Select Route Data in Multi-Panel	
35	Use waypoint selection - auto/manual	
36	Set/select Route Monitoring alarms - Monitoring/Navigational Alarms	
37	Select Route Monitoring features to show - Monitoring/Route Monitoring	
38	Select Navigation Alarm features to show - Monitoring/ Navigational Alarms	
39	Observe alarm condition (Alarm panel) - active/general/area	
40	Set Time Zone for ship's time	
41	Select time icon to display - UTC/ship's time	
42	Observe and assess target information - display buttons, Target Table, tracks, view	
43	Sort targets in table - name, alias, CPA, TCPA	
44	Select AIS target identifier, set AIS voyage data; manage AIS messages	
45	Search for targets listed in table	
46	Set and select target alarm - CPA, TCPA	
47	Assess dangerous target(s) - graphically	
48	Set anchor watch guard ring and alarm	
49	Select tidal information (Task/Tides) - Diagram, table, find place	
50	Observe tide and current information	
51	View Logbook - Select date and event groups (filter); got to log book entry on chart	
52	Make manual entry in the Ship Log - Event button, enter remarks	
53	Unload and load existing Add Info charts - Info panel A and B, Task panel	
54	Select Add Info features to show/hide	
55	Create Add Info with attributes - name and save, view hidden/danger	
56	Edit existing Add Info chart - resave, delete, restore, merge, object search	
57	Select Manual Correction features to show/hide	
58	Manual Correction - show all/hide all/got/shift/delete objects	
59	Create Manual Corrections with attributes - view/hidden/timing/attached file	
60	Activate Man Overboard function - interpret course-to-steer to return	

Navigator Tasks

61	Install/delete chart data - Chart manager	
62	Install chart updates - proprietary chart format (TX-97, for example)	
63	Install chart updates - ENC chart format (S-57)	
63	Create and modify User Graphic configuration	
65	Select chart data formats for initialization - Advanced Databases	
66	Modify sensor attachments - ports, rate	
67	Modify ownship setup	
68	Select System Time by GPS	
69	Select Entry timing for automatic log entry - configure watch cycle	

Navigator Tasks (cont)

70	Copy files using Data tool - between hard drive and external media
71	Convert (.txt) and View Logbook files using Data Tool; Print log selection
72	Import ECDIS Add Info files using Data Tool - .cra copied and .ai
73	Import ECDIS Route files using Data Tool - .rte copied as .rt3
74	Convert (.cvt) and View Rout to Text files using Data Tool; Print route plan
75	Create SAR date - load as Route to monitor
76	Copy route plan to external media from route planning
77	View and copy route plan as Excel table from route planning
78	Delete route plan(s) - Route panel, Windows Explorer, Data Tool
79	View track history graphically from Route Monitoring
80	Playback - select date, start position, Cursor data entry
81	Set up network configuration - Master and Slave (Slave in Backup mode)
82	Equalize route files from Master to Slave station
83	Equalize Add Info files from Master to Slave station
84	Equalize manual updates from Master to Slave station
85	Connect AIS Pilot Plug - configure for positional information
86	Set DR for AIS targets
87	Set and delete training targets