

Contents

Page

Foreword	viii
Introduction	1
Purpose of the model courses	1
Use of the model course	1
Lesson plans	2
Presentation	2
Implementation	2
Course objective	3
Entry standards	3
Course intake limitations	4
Textbooks	4
Training and the STCW 1978 Convention, as amended	4
Responsibilities of Administrations	6
Validation	6
Part A: Course Framework for all functions	7
Aims	7
Objectives	7
Function 1	7
Function 2	7
Function 3	8
Entry standards	8
Course certificate	8
Staff requirements	8
Teaching facilities and equipment	8
Teaching aids (A)	10
Videos (DVDs), CD-ROMs, CBTs (V)	10
IMO references (R)	11
Textbooks (T)	12

Function 1: Electrical, Electronic and Control Engineering at the Operational Level	17
Part B1: Course Outline	20
Timetable	20
Lectures	20
Course outline	20
COURSE OUTLINE	21
Part C1: Detailed Teaching Syllabus	23
Introduction	23
Explanation of information contained in the syllabus tables	23
Part D1: Instructor Manual	55
Guidance Notes	55
1.1 MONITOR THE OPERATION OF ELECTRICAL, ELECTRONIC AND CONTROL SYSTEMS	55
1.2 MONITOR THE OPERATION OF AUTOMATIC CONTROL SYSTEMS OF PROPULSION AND AUXILIARY MACHINERY	59
1.3 OPERATE GENERATORS AND DISTRIBUTION SYSTEMS	59
1.4 OPERATE AND MAINTAIN POWER SYSTEMS IN EXCESS OF 1,000 VOLTS	60
1.5 OPERATE COMPUTERS AND COMPUTER NETWORKS ON SHIPS	61
1.6 USE ENGLISH IN WRITTEN AND ORAL FORM	62
1.7 USE INTERNAL COMMUNICATION SYSTEMS	62
Function 2: Maintenance and Repair at the Operational Level	65
Part B2: Course Outline	68
Timetable	68
Lectures	68
Course outline	68
COURSE OUTLINE	69
Part C2: Detailed Teaching Syllabus	71
Introduction	71
Explanation of information contained in the syllabus tables	71
Part D2: Instructor Manual	94
Guidance Notes	94
2.1 MAINTENANCE AND REPAIR OF ELECTRICAL AND ELECTRONIC EQUIPMENT	94
2.2 MAINTENANCE AND REPAIR OF AUTOMATION AND CONTROL SYSTEMS OF MAIN PROPULSION AND AUXILIARY MACHINERY	97
2.3 MAINTENANCE AND REPAIR OF BRIDGE NAVIGATION EQUIPMENT AND SHIP COMMUNICATION SYSTEMS	97
2.4 MAINTENANCE AND REPAIR OF ELECTRICAL, ELECTRONIC AND CONTROL SYSTEMS OF DECK MACHINERY AND CARGO-HANDLING EQUIPMENT	98
2.5 MAINTENANCE AND REPAIR OF CONTROL AND SAFETY SYSTEMS OF HOTEL EQUIPMENT	99

Function 3: Controlling the Operation of the Ship and Care for Persons on Board at the Operational Level	101
Part B3: Course Outline	104
Timetable	104
Lectures	104
Course outline	104
COURSE OUTLINE	105
Part C3: Detailed Teaching Syllabus	107
Introduction	107
Explanation of information contained in the syllabus tables	107
Part D3: Instructor Manual	126
Guidance Notes	126
MARPOL technical annexes	126
Annex I	127
Control of oil from machinery spaces	127
Oil Record Book (Part I, Machinery Space Operations)	127
Precautions which should be taken to prevent accidental pollution by oil	127
Sewage	127
Part E: Evaluation	130
Initial/Diagnostic assessment	130
Formative assessment	130
Summative assessment	131
Evaluation for Quality assurance	131
Assessment Planning	131
Validity	131
Reliability	132
STCW Code	132
Compiling tests	133
Quality of test items	133
Advantages and disadvantages of oral and practical tests	133

APPENDICES	135
Purpose	135
Training objectives	135
Entry standards	135
Teaching facilities and equipment	135
Guidance notes	136
Appendix 1 – Basic Engineering Science	136
Appendix 2 – Mathematics	137
Appendix 3 – Thermodynamics	138
Appendix 4 – Mechanical Science	139
Appendix 5 – Industrial Chemistry	139
Appendix 6 – Basic Electricity and Electronics	141
Teaching aids (A)	141
Textbooks (T)	141
SUPPORTING KNOWLEDGE OUTLINE	142
 APPENDIX 1:	
BASIC ENGINEERING SCIENCE	144
 APPENDIX 2:	
MATHEMATICS	148
 APPENDIX 3:	
THERMODYNAMICS	153
 APPENDIX 4:	
MECHANICAL SCIENCE	158
 APPENDIX 5:	
INDUSTRIAL CHEMISTRY	161
 APPENDIX 6:	
BASIC ELECTRICITY AND ELECTRONICS	165
 Guidance on the implementation of model courses	169