Programme Specification

MET-HND-2019: Marine Electro-Technology HND

SQA Higher National Diploma awarded by Scottish Qualifications Agency (FHEQ Level 5)

Programme Status: Draft | Version: 1

Introduction

This programme specification provides a summary of the main features of the Marine Electro-Technology HND programme and the learning outcomes that you as a student might reasonably be expected to achieve and demonstrate on successful completion of the programme.

Further detailed information related to this programme and the College can be found in the following resources:

- Programme Handbook
- B&FC Student Handbook
- B&FC Admissions Policy
- Work based and placement learning handbook (for foundation degrees)
- Student guide to assessment and feedback

Key Programme Information

Programme Code	MET-HND-2019
Programme Title	Marine Electro-Technology HND
Teaching Institution	Blackpool and The Fylde College
Professional, Statutory and Regulatory Body (PSRB) Accreditation	None
UCAS Code	
Language of Study	English
Version	1
Approval Status	Draft
Approval Date	Not yet approved
JACS Code	Other: Other
Programme Leader	Biju Mathew

Programme Awards			
Award	**Award Type**	**Level**	**Awarding Body**
SQA Higher National Diploma	Higher National Diploma	Level 5	Scottish Qualifications Agency

Programme Overview

The qualification provides you with the knowledge required for a broad range of employment opportunities, but specifically those knowledge elements required with the Merchant Navy for Electro-technical staff. The qualification name reflects this specialism.

This programme is aligned to support your progression through knowledge acquisition at operational level and onto managerial level, as directed by the Standard of Training, Certification and Watchkeeping (STCW) 1978, as amended. This is achieved by meeting the requirements of the Maritime and Coastguard Agency (MCA) and approved by the Merchant Navy Training Board (MNTB.) In 2010 the International Maritime Organisation (IMO) introduced a new certification category for the position of Electro-Technical Officer (ETO). This will enable officers on Merchant Navy vessels to gain acknowledgement for their technical skills and hold ‘Certificates of Competency (CoC)’ at the Operational level. These new CoC requirements are to be introduced from January 2013 in the IMO ‘Standards of Training, Certification and Watchkeeping’ (STCW) convention as amended in 2010 (Manila 2010). To comply with this new

certification requirement, the maritime authority for the UK Government, the Maritime and Coastguard Agency (MCA) has accepted that new training schemes which meet the training profile for the current Deck and Engineering Operational level CoC will be acceptable for their award of an Electro-Technical Officer CoC.

This programme will develop your knowledge of electro technical systems and processes and engineering principles. You will learn how the role of the ETO is integrated with other roles and disciplines in the maritime industry and will be provided with the opportunity to identify and solve problems through the application of theory and develop you as a professional Electro Technical Officer.

Regarded as one of the UK's top nautical institutions, Fleetwood Nautical Campus (FNC) has strong industry partnerships, which could open the door to excellent employment opportunities. This programme is typically only available if you are sponsored by a shipping company or cadet training provider due to the sea phase requirements, which should ordinarily be completed on board ships.

The HND in Marine Electro Technology is delivered in such a way to align with the MNTB approved cadet programme taking three years. The HND elements, however, will only take a total of five terms or 20 months. For an individual wishing to complete the HND only, this could be achieved in a period of time less than the three year programme.

Phase 1

Before you begin your academic studies, you will participate in the Cadet Development Course – a four day programme that is a team-building exercise that serves as an ice-breaker between yourself and the other members of your cohort. It also starts you on a path to developing your teamwork, management and interpersonal skills mentioned below. This is continued in a more low-key way through adventure based training sessions that run alongside the main academic programme.

There are two key aspects to the maritime industry that this programme covers: engineering and management skills, all supported by the development of transversal (transferrable) skills/graduate attributes that you can utilise in any industry. Phase 1 introduces you to the key concepts of engineering skills, how ships carry out operations safely and the basis for the procedures underpinning it. The key objective here is not to make you experts in the fields of engineering, rather to equip you with the skills to learn in the workplace and to enable you to behave in a safe and appropriate manner, where risk management is an essential tool in everyday life.

In addition, during Phase 1, you will also undertake vocational training involving several safety training courses designed to provide you with the basic training for seafarers.

Phase 2

During Phase 2, you will be working on board a ship as an ETO cadet, undertaking daily duties involving routine maintenance of electrical equipment's and testing. You will apply your knowledge and understanding from Phase 1 during this time, thinking about how underpinning theories and concepts relate to what you are experiencing in the day-to-day life of the ship.

If you are completing the integrated cadetship, during your sea phases you will complete a Training Record Book (TRB), a list of tasks that must be signed off by officers on board; this list is aligned to the industry's National Occupational Standards. You will also write up a Marine Electrical Operations workbook, showing you understand how to complete the tasks identified in the TRB.

Phase 3

Phase 3 will build upon the knowledge gained during your initial modules, as well as industrial

experience acquired during Phase 2. During this phase, you are expected to deepen your understanding of the subject areas and start to think more critically about the core concepts and theories in the field. You will also engage with some of the more advanced concepts of electrical engineering operations, such as electrical propulsions, marine data communications, radio communications and other systems used for safe navigation.

Phase 4

Phase 4 follows a similar focus to Phase 2 – you should now be focussing more on understudying the role of and the managerial concerns of the ETO.

Phase 5

Phase 5 will be the culmination of your studies, you will complete the mandatory short courses required for a ETO officer. You will use all of your acquired skills to prepare for the MCA Oral Exam, which you must pass to obtain your Certificate of Competency as an ETO Officer.

On successful completion of the HND award, you will have the opportunity to apply for associate membership of the Institute of Marine Engineering, Science and Technology (IMarEST) and subsequently gain Incorporated Engineer status with the Engineering Council with additional learning as outlined by IMarEST.

Admission Criteria

Entry to the HND award (Sponsored Students)

Entry onto the programme will be at least 48 UCAS points at level 3, or equivalent, which could be achieved with the following qualifications:

- National Certificate in Electrical/Electronics at Pass/Merit grade
- National Diploma in Electrical/Electronics at Pass/Pass/Pass grade
- National Diploma in Engineering at Pass/Pass/Merit grade
- Level 3 Diploma in Shipping and Maritime Operations at Pass

You will also be required to possess at least five grade C or higher GCSEs including English, Maths and Science, or equivalent.

Where non-UK qualifications are used to measure suitable entry level, you will require High School certificates with pass in 12th Standard (10+2) from recognised articulation board in Physics, Chemistry and Maths group in Class XII, and at least 50% in English Language (equivalent to minimum IELTS 5.0 standard)

Whilst the sea service articulated is an integral element of the certification to MCA Certificate of Competency, it does not form part of the HN award. For MCA certification a sea service requirement in excess of seven (7) months is required, with a suggested sea service of eight (8) months. Sea-going service will typically be achieved through sponsorship of a cadet programme by a shipping company or training provider.

In all cases, you will be informed that for progression into a career in the Merchant Navy a level of physical health and fitness is required. This will be assessed via the MCA Medical Standard as detailed within Merchant Guidance Notice (MGN) 264.

Non-standard entry (Non-Sponsored)

Experienced sea-farers with a minimum of 36 months sea-time will be exempt from requiring 48 UCAS points, as per MCA requirements.
Applicants for the experienced seafarer route will be directed to contact the MCA for a ‘Letter of Initial Assessment’ where an individual assessment will be undertaken.

Career Options and Progression Opportunities

The HND in Marine Electro-Technology has been designed to develop the skills and knowledge required by the maritime sector and industry. The retention rates on the current schemes are 95% and the existing trainees will gain employment at sea as ETO's on graduation. The current position of demand over trainee supply is expected to be maintained in the medium term, until the number of training schemes increase.

In addition the profile of the new STCW certification route will further increase the attractiveness of suitably skilled ETO's. This new route is designed to provide both a front ended academic training (Option 1) and provide an entry route for Standard Grade/GCSE entrants via the Marine Engineering Higher Education Access course (Option 2).

Whilst the HND programme has been identified as the approved route to ETO for the Merchant Navy, in the event of a student wishing to withdraw it is possible to complete some additional modules and achieve the HNC Marine Engineering as an exit award. Due to the nature of the modules and the alignment to the HNC Marine Engineering, it is possible to identify the modules outstanding and enrol a student onto such modules in order to achieve the required 96 SCQF credits and award the individual with a SQA HNC Marine Engineering, if they wish to do so.

On successful completion of the HND award students will have the opportunity to apply for associate membership of the Institute of Marine Engineering, Science and Technology (IMarEST) and subsequently gain Incorporated Engineer status with the Engineering Council with additional learning as outlined by IMarEST

Students who successfully complete the HND Marine Electro Technology will also have the opportunity to progress to higher level qualifications. They can progress to a number of higher education programmes which match their career aspirations. Current articulation routes includes Northumbria University validated B.Eng. in Marine Engineering, one year top-up award. Currently we are exploring other top up degree with other universities.

Programme Aims

1 Develop the ability to analyse and plan tasks commonly encountered in the workplace.
2 Develop approaches to problem solving and critical thinking.
3 Develop an evaluative and reflective approach to work and studies.
4 Develop the ability to plan and organise studies.
5 Develop skills for employability and allow for progression to higher qualifications.
6 To enable the learner to consolidate knowledge and skills to enhance career progression.
7 To develop Core Skills required by employers.
8 To develop skills which are transferable to other employment opportunities.
9 Progression within the SCQF framework.
10 Prepare learners for oral examinations for ETO certification at the Operational level.
11 Contribute towards developing skills to enable learners to contribute to the safe and effective operation and maintenance of merchant vessels.
12 Contribute towards developing skills to enable learners to work with others in safe and effective manner.
13 Contribute towards developing skills to deal with emergency situations.
14 Develop awareness of current maritime legislation.
15 Provide an award that on successful completion will allow learners to progress to a degree in an engineering related discipline area.
16 Develop a range of project management skills.
17 Develop the analysis and synthesis skills necessary to ensure the efficient operation of the electrical, electronic and control elements within a modern merchant vessel.

Programme Learning Outcomes

Level 5

Upon successful completion of this level, students will be able to:

1. Evaluate personal performance, progression, knowledge and skills
2. Interpret and communicate ideas and essential data
3. Relate social, ethical and legal issues to the working environment
4. Identify the scope, implications and consequences of marine legislation.
5. Implement an analytical and diagnostic approach to problem solving
6. Identify, explain and discuss the principles and concepts used in the operation of marine electrical, electronic and propulsion systems.
7. Apply concepts and principles to the operation of marine electrical, electronics and propulsion systems
8. Apply information, principles and concepts to a variety of practical applications, including applications in the workplace
9. Recognise and implement safe working practices in a range of contexts including workplace situations.
10. Plan projects and implement time management

Programme Structure

Pathway	Module	Level	Credits	Coursework	Practical	Written Exam
Stage 1						
All	DG3J35: Electronic Fault Finding (Mandatory)	5	8	50%		50%
	DG4H33: Mathematics for Engineering 1: Electronics and Electrical (Mandatory)	4	8			100%
	DG4L34: Mathematics for Engineering 2 (Mandatory)	4	8			100%
	DN3Y34: Fundamentals of Control Systems and Transducers (Mandatory)	4	8	25%		75%
	DX4834: Distributed Control Systems (Mandatory)	4	16			100%
	F90W34: Marine Engineering: Electrical and Electronic Devices (Mandatory)	4	8			100%
	F90X34: Marine Engineering: Electrical Motors and Generators (Mandatory)	4	8			100%
	FY9E34: DC and AC Principles (Mandatory)	4	8			100%
	FY9R34: Power Electronics (Mandatory)	4	8	25%		75%
	FY9T34: Analogue Electronic Principles (Mandatory)	4	16	25%		75%
	H01V34: Electrical Safety (Mandatory)	4	8	25%		75%
	H0EK34: Pneumatics and Hydraulic Systems (Mandatory)	4	8	70%		30%
	H1ST34: Marine Electro-Technology: Graded Unit 1 Examination (Mandatory)	4	8			100%
	HJ4434: Marine Legislation and Leadership (Mandatory)	4	8	30%		70%
	HJ4634: Propulsion (Mandatory)	4	8			100%

Stage 2 Stage exit award: SQA Higher National Diploma (Awarded by Scottish Qualifications Agency)						
All	DG3134: Applications of Programmable Logic Controllers (Mandatory)	4	8	25%		75%
	DG4034: Implementing Small Local Area Networks (Mandatory)	4	8		25%	75%
	DN3T34: Electrical Systems in Potentially Explosive and Gas Hazardous Environments (Mandatory)	4	8			100%
	DN4335: Switchgear and Protection of High Voltage Systems (Mandatory)	5	8	50%		50%
	DN4935: Transformers (Mandatory)	5	8	25%		75%
	DN4C35: Applications of Power Electronics in Electrical Motor Drive Systems (Mandatory)	5	8	25%		75%
	H1FC35: Marine Navigation Systems (Mandatory)	5	16			100%
	H1FD35: Radio Communications (Mandatory)	5	16	25%		75%
	H1SV35: Marine Electro-Technology: Graded Unit 2 (Mandatory)	5	16		100%	
	HJ4535: Management (Mandatory)	5	8	100%		

Course Options

There are no options avaliable with this HND.

Study Workload

The timetable is designed so that contact time is concentrated in 2-3 days to allow you to meet other committements you might have. In that time you will undertake lectures, practical work, seminars and tutorials. The expected teaching hours for a module vary are about 40 taught session which includes lecturers, seminars and workshops. The students are expected to do 40 hours idependent learning as well.

Programme Delivery: Learning and Teaching

Throughout your programme you will learn and be assessed in a range of ways to support the overall aims and outcomes of the programme in order to equip you with the appropriate skills for roles within the maritime industry. Employers will be looking for a range of skills and competencies, including innovation and initiative. They will be keen to employ strong communicators and team players. The programme is designed to promote the development of these qualities alongside core technical competencies and academic engineering knowledge.

Units

Each unit has its own teaching, learning and assessment strategy to suit specific aspects of the

curriculum. You will progress through the units via a range of learning and assessment styles, and the supportive structure of the programme allows you to build on knowledge developed in earlier units. You will be encouraged to adopt a holistic approach to your studies, allowing you to develop as a professional with a wide range of skills and competencies, and a clear understanding of how all the individual elements of your higher national diploma fit together in a maritime context.

Resources

The resources to support you in your studies include books, e-books and journals, as well as the college's virtual learning platform. You will have access to a learning resourse centre, which provides access to all relevant publications, as identified on the reading lists. You will receive access to maritime specific documents and eBooks with membership to Witherby publications and regs4ships. Additionally, as a maritime cadet you are entitled to free student IMarEST membership and this will allow you to access international journals and e-books relating to all areas of the programme. Videotel's Networked Video on Demand (NVOD) is used in the classroom to provide access to a repository of information videos designed for training industry professionals. Moodle provides an online platform for programme resources, allowing you to access materials to supplement your classroom based studies 24 hours a day, 7 days a week.

Practical resources are used to reinforce theories and provide an opportunity for research in many of the units across the HND. These include the laboratory where you will build, model and analyse circuits and components as part of the Process and Control and Pneumatics and Hydraulics unit.

Simulation of engineering environments and system operations are conducted in the Engine Room Simulator (ERS). The simulator is used in several of the units to provide a basis for application of theories.

Independent learning

Effective learning is more likely when you are given, and accept responsibility for your own learning and have some control over the learning context. Each unit has been designed to support small group work structured to facilitate cooperative learning and enable some autonomy. Many units include problem based learning where a group works collaboratively to solve a particular problem, then reflects on the outcomes in order to apply them at sea or in further tasks. You will develop an ability to define problems, identify and acquire the skills and knowledge needed to solve them, and then work through the solution. You will be required to take responsibility for your own and the groups learning.

Academic support

If you have subject specific issues or would like a focused learning environment to work, clinics are available each evening from Monday to Thursday. Typically there are at least two staff members available each evening providing support for a range of subjects and levels. This is used to provide support where you may be struggling or want to further develop skills and knowledge. This is in addition to the Partners for Success framework where subject lecturers and personal tutors can identify support mechanisms for entire groups or yourself as an individual to support and ensure that you are provided with the best possible opportunities to engage fully with your learning experience and the full life of the college. You will be able to access a wide range of additional enhancements during your studies to support you in your learning and ultimately with your employment prospects. The College works to provide a supportive ethos and an enabling culture which builds individuals, communities and economic prosperity.

Programme Delivery: Assessment

Assessments will be set to test your understanding rather than your ability to memorise and reproduce knowledge or processes.

Assessments have been developed to measure your successful completion of all elements of the programme, and as you progress between units you will complete assessments to demonstrate your achievement of the learning outcomes stated in the unit specifications. Formative and summative assessments provide a wide ranging indication of your progress and development, and include traditional examinations and coursework submissions as well as practical exercises. The majority of the units you undertake will be summatively assessed by examination, as this methodology is recognised by industry bodies. In addition to examinations, you will be required to write essays for the Management unit focusing on marine legislation and safety management systems and management theory, and a reflective report will be used during the Distributed Control Systems unit, to review your performance when analysing a process control system with the view to identifying and implementing improvements through various control methods.

Programme Delivery: Work Based and Placement Learning

Sponsored Students

There is no requirement to undertake workbased and placement learning to achieve HND. However, to suceesfully complete the an approved cadet programme the student needs to complete 8 months sea-going service.

The MNTB attaches prime importance to planned and progressive shipboard training that is an integral part of your overall training programme;

- is managed and co-ordinated by the company or training organisation sponsoring the trainee;
- is delivered aboard ships where the quality of training can be monitored, supported and supervised by personnel who have an understanding of the training programme and its specific objectives and are qualified in the work for which training is being undertaken.

The programme of practical training on board ship, documented in the MNTB Training Record Book (TRB), will provide evidence to MCA of the planned training which you have undertaken during the periods of sea service under the guidance/supervision of ships' staff in accordance with STCW requirements. Completion of the programme of shipboard training will be overseen by your company, through the designated shipboard training officer.

Verifiable signatures of ships' staff will be required to attest to satisfactory completion of tasks. At the time of examination for a certificate of competency, MCA will carry out an evaluation of your TRB by checking that tasks have been completed and signed off by ships' staff, whose identity can be verified. Relevant National Occupational Standards are included in the TRB to help guide you and ships' staff signing off tasks as to the standards expected.

Your progress throughout the programme and between phases will be monitored by sea staff, company training managers and programme staff and duly reported at relevant stages, to ensure that progress to the next stage of the programme runs smoothly and that all relevant aspects – particularly with regard to TRB tasks, are completed as required and any particular issues regarding the programme and individual progress is dealt with appropriately and in a timely manner.

During your sea phase, you will be required to apply your knowledge and skills in a practical setting. In Phase 1 you will be provided with a platform for analysis of operations, encouraging the development of conceptual links between theory and practice. You will focus on the functional and practical aspects of operations, with scope to consider the role of teamwork, leadership and management. This will pave the way for the management unit.

Non-Sponsored Students

There is no requirement to undertake workbased and placement learning to achieve HND.

Programme Delivery: Graduate Skill Development

Fleetwood Nautical campus have a strong track record of delivering creative and increasingly evidence-driven initiatives to support students' graduate skills development, increasingly in partnership with employers. The proposed HND Marine Electrotechnolagy programme emphasis on both subject specific knowledge like understanding engineering principles as well as with transferable skills. Transferable skills like numercy skills, analysis skills, enetrprise and creativitty, teamwork, problem solving skills, communication , time mangement skills, decision taking skills etc will be developed as apart of lectures, class works, practicals and assesments. Theses skills are developed in context with the subject bench mark statements, professional and regulatory body requirements. These transferebale skills will help our gradutes for transission,

not only from classroom to workplace but through out their career.

A commitment to lifelong learning and career development

The HND in Marine Electro-Technology supports lifelong learning through learning mobility which aims to attain new competences and knowledge as identified by the International Convention on Standard of Training, Certification and Watchkeeping for Seafarers (STCW) certification for Electro-Technical Officers (ETOs) on board vessels. The proposed programme is a direct result of the maritime labour market analysis. The analysis pointed out the shortage of skilled Electrical Technical Officers (ETO's) on board ships. The units are designed such that it will give you the knowledge and understanding of current and future technological developments.

Collaborative teamwork and leadership skills

During your sea phase you will work as team, communicating with team members, taking leadership roles when needed, managing groups, and working towards a common goal. In the work based learning module you will analyse the objectives and performance of individuals, the roles and responsibilities and performance of teams and will present a written report and deliver an oral presentation.

We support your development of independence in academic and practical skills through the levels of the programme, most prominent in the assignments and projects where you will be responsible for managing your work.

Ethical, social and professional understanding

Mapping of the programme content to the requirements of a HND set by Merchant Navy Training Board (MNTB) ensures that the module delivery and assessment considers legal, social and ethical issues to enhance your professional development.

Communication, information and digital literacies

The Graded Unit 2 provides an opportunity to develop these skills which are then applied in assessments throughout the programme. This will assist you in researching; engaging critically with material; utilising digital technologies effectively to support discovery, analysis and dissemination of information; collaboration; and reflection. In units throughout the programme you will be required to communicate in a range of formats to meet assessment criteria, report writing, design documents, reflective accounts, and use a range of digital technologies related to specialist areas.

Global citizenship

With increased focus on educating engineers for the global economy, the HND syllabus is designed in accordance with the requirements of International Maritime Academy (IMA). To build your global skills and competency, the programme was developed liaised with international maritime companies likes Princess Cruises, BP, Chiltern Maritime, Shell and V ships. The department have got close links with Kuwait Shipping Companies. The HND is delivered by faculty, from electrical engineering department, mechanical engineering department, marine management department and mathematics departments, who have different ethnic and cultural background. By bringing faculty together from different academic background students explore global markets in marine industry, marine laws, and marine technological developments globally.

Research, scholarship and enquiry skills

You will be facing a new culture of working in research project in marine electrical engineering field. The assignments will be led and managed by you in an area including significant research and development with limited supervision; this will enable you to independently research

unfamiliar concepts effectively.

Enterprise and entrepreneurial awareness and capabilities

Blackpool and Fylde College believes that students should be entrepreneurial in order to understand the global market well and handle business pressures. The management unit outlines the tools, attitudes and knowledge needed for it. The units are designed as per the feedback and inputs from industry. You will explore role of mangers and learn the basics of maritime business, learn how to support employees to be more innovators, how to manage interdisciplinary teams, how to communicate effectively and how to think critically, which are the key attributes for a successful entrepreneur.

Study Costs: Equipment Requirements

All the equipment and resources students needed are provided by B&FC at no extra cost.

Study Costs: Additional Costs

Equipment - the student will be required to purchase a scientific calculator. These can be purchased from any supplier therefore prices may vary, however full guidance can be provided on what to purchase by contacting Fleetwood Campus.

Related Courses

Aerospace Engineering - BEng Hons Degree

Aerospace Engineering - Foundation Degree

Electrical and Electronic Engineering - HNC

Engineering (Aerospace) - BEng Hons Degree

Engineering (Mechanical) - BEng Hons Degree

Engineering (Mechatronics) - BEng Hons Degree

Mechanical Engineering - HNC

Marine Engineering – HND

Marine Engineering – Foundation Degree

Marine Electrical and Electronics Engineering – Foundation Degree