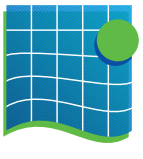
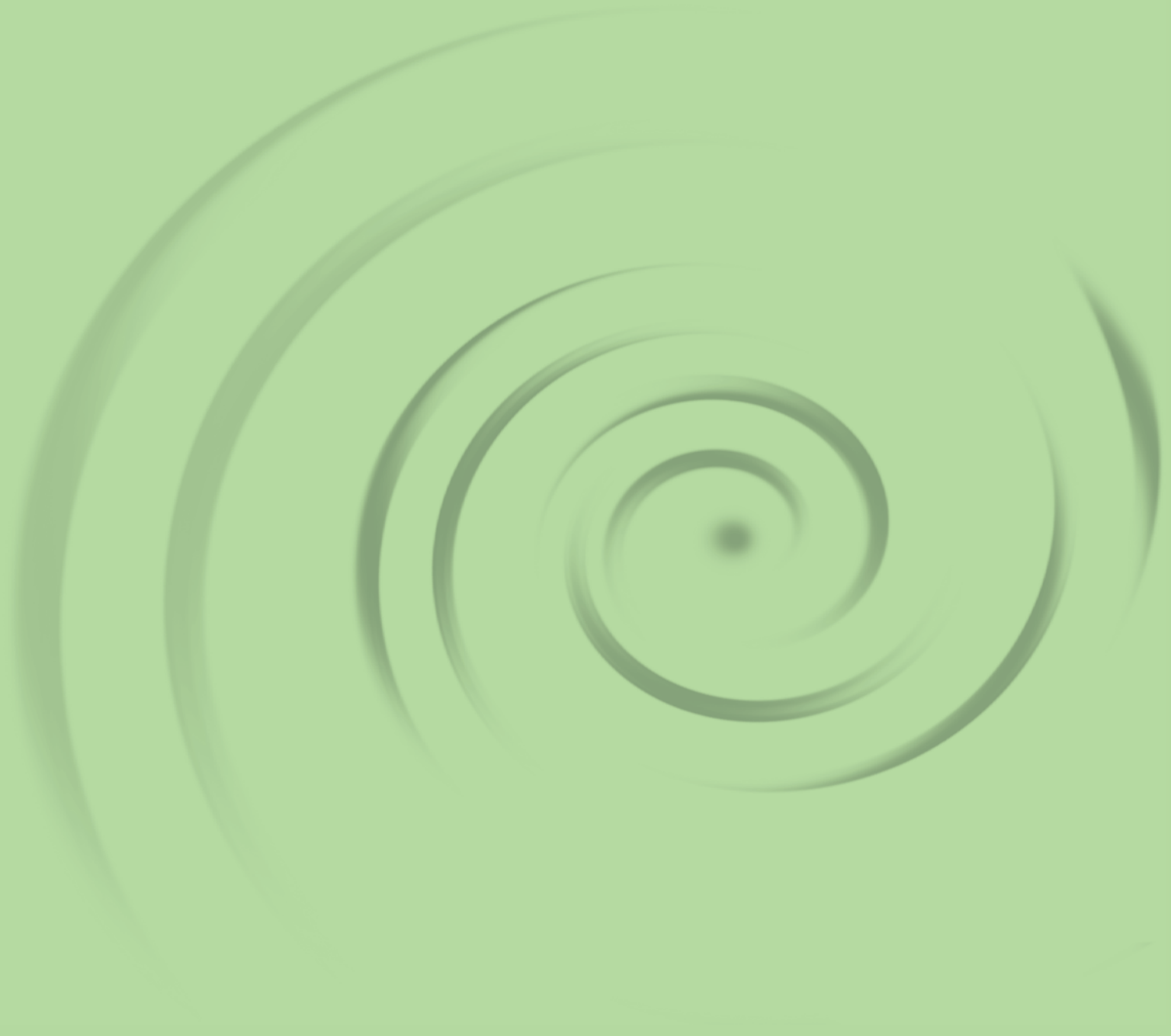
OCEANS OF OPPORTUNITY

A Guide to Marine Careers



Marine Institute
Foras na Mara



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INTRODUCTION

The Marine Institute has produced this brochure to introduce you to some of the exciting careers available in Marine Science, Engineering and Technology. We look in particular at a range of opportunities from entry to trained scientists, professional engineers and skilled technicians who are required in:

- Seafood (fisheries, aquaculture, seafood processing and seaweed)
- Shipping, Ports and Services
- Marine Renewable Energy
- Offshore Oil and Gas and Seabed Resources
- Marine and Coastal Tourism and Leisure including Cruise Tourism
- Marine Information Communication Technology
- Marine Biotechnology and Bioproducts

The Marine Institute, which operates under the aegis of the Department of Agriculture, Food and the Marine, is the national agency responsible for undertaking marine research and development. It critically informs policy, regulatory objectives, management and sustainable development strategies for Ireland's Marine Resources. It also provides a range of diverse services to a wide variety of clients across branches of Government, international organisations and the private sector.

As an island nation, Ireland has a long tradition of marine science and innovation stretching back to such pioneers as Francis Beaufort, John Holland and William Spotiswood Green. Today, Ireland's marine science community includes a wide range of Universities, Institutes of Technology, State and Semi-State bodies, commercial companies, organisations and individuals whose goals include the sustainable development of our marine resource through the application of science and technology.

Sea your Future - A guide to MARINE CAREERS

With 70% of the earth's surface covered by oceans, and 90% of the world's trade carried by ship, it is hardly surprising that there are lots of related career opportunities especially if you are interested in science, technology or engineering. Our oceans and seas are of great importance providing a trillion euro global market for marine products & services (including seafood, tourism, shipping, oil and gas, renewable ocean energy and new applications for health, medicine and technology).

Ireland's national maritime interests are inter-meshed with those of its neighbours in a variety of maritime sectoral areas including, inter-alia, shipping and transport, seafood production, communications, maritime safety, security and defence, surveillance, offshore industry, hydrocarbon, mineral and resource exploitation, offshore renewables and so on.

Taking our seabed area into account, Ireland is one of the largest EU states with sovereign or exclusive rights over one of the largest seas and oceans to land ratios of any EU State. The State of Ireland's land resource consists of 90,000 km^2 and 220 million acres (approx. 880,000 Km^2) of marine territory.

Ireland's maritime area:

- Contains some of the largest and most valuable sea fisheries resources in Europe;
- Possesses significant potential for oil and gas reserves;
- Is the western gateway for shipping to Europe's busiest sea ports;
- Is among one of the richest and most accessible ocean renewable energy (wave, tidal and wind) resources in the world;
- Possesses spectacular natural tourism opportunities;
- Offers the prospect of new enterprise activity arising from the development of a diverse genetic species resource for medical and industrial purposes;
- And possesses a range of technology test-bed opportunities which can facilitate the development of Innovative technologies, decision support and management tools for global marine markets.

Simon Coveney TD, Minister for Agriculture, Food and the Marine said,

"We need to change the way we in Ireland think about the sea and look for new opportunities to harness the potential of our 220 million acre marine resource. This government is determined to generate the momentum to drive forward a new era of sustainable economic development across the maritime sectors - we must avail of these opportunities to assist in our recovery. We want your help to shape our plan, to shape our future and to assist in our drive towards our nation's economic recovery".

Reap the rewards in a Marine Career

As you can see the marine environment offers a range of varied, challenging and exciting careers. In many cases you will be working with cutting edge science and technology. Marine science, technology and engineering can offer excellent career opportunities and once you have some experience in certain marine careers you can easily work on a freelance basis. This will give you the freedom to work where you like, when you like and for whom you like.

Sounds good?

If you enjoy biology, maths, physics, chemistry, electronics, computing or geology then you may be suited to a marine career. If you are interested in any of the careers described in this brochure, there are plenty of ways to find out more, such as:

- Talk to your careers advisor
- Contact the relevant organisations listed or look at their websites
- Use the information sources at the end of this brochure

Already qualified? There are career opportunities all over the world

In the marine environment there are lots of exciting opportunities at home and there are also opportunities all over the world. You can get advice on the comparability of your qualifications by contacting the National Qualifications Authority of Ireland www.qualificationsrecognition.ie or ENIC (European Network of Information Centres) or www.europass.ie

I want to work in MARINE BIOLOGY

Marine biologists study the fascinating animal, plant and microscopic life in oceans. An estimated 80% of all life on earth is found under the ocean surface. Plants and animals act as indicators of the effect of human activities on the planet, such as pollution and climate change. Marine biologists play a vital role in studying these effects.

What does a Marine Biologist do?

Marine biologists investigate all kinds of issues and problems such as:

- Over fishing has led to a reduction of world wide stocks of certain fish species
- Pollution has contributed to the loss of coral
- The release of hot water and other effluents by various industries has altered the ecological balance of the oceans
- Pollution has caused an increase in waterborne infections in humans
- The use of pesticides and artificial fertilisers in farming has had serious consequences on food chains
- Chemicals can cause 'gender-bending' and fertility problems in fish, shellfish and other aquatic organisms.

Who employs Marine Biologists?

Employers of marine biologist's include:

- Research and advisory bodies (such as the Marine Institute or Bord Iascaigh Mhara)
- University research teams
- Environmental charities and non-governmental organisations
- Commercial fisheries
- Government-run regulatory bodies
- Large industrial concerns such as offshore oil and gas exploration companies
- Environmental consultancies

What skills and personal qualities do you need?

A Marine Biologist needs:

- An affinity with the marine environment and an interest in aquatic life
- Excellent numerical skills (particularly sought by employers)
- Practical skills
- Patience and excellent observation skills
- The ability to work as part of a team
- Good standard of written and oral communication skills
- To be prepared to work outdoors in all weathers, including at sea

What about entry, training and qualifications?

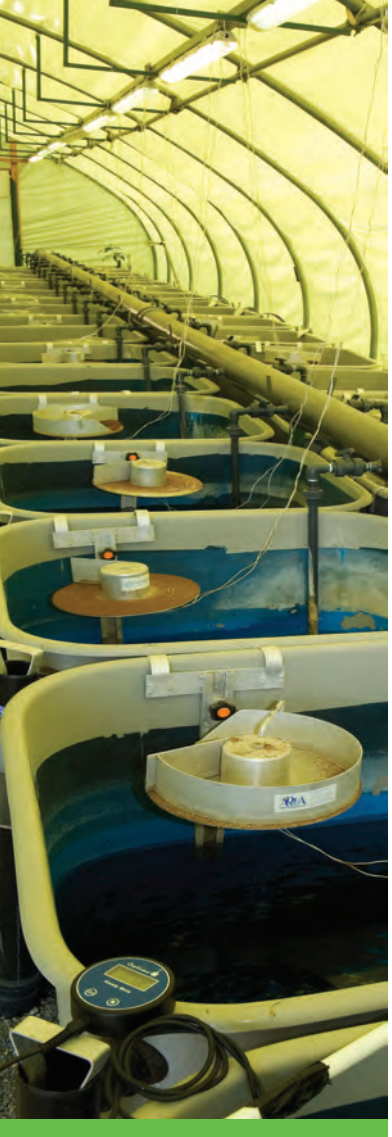
Marine biology is a popular career choice and there is a lot of competition for jobs. It's a really good idea to gain relevant experience as a volunteer as this will improve your prospects of finding a job. Why not join the Irish Whale and Dolphin group on their Observers programme, contact your local aquarium for volunteer work, sign up for the SMART Science@Sea two day programme (see page 31) or contact employers for work experience.

Professional Marine Biologists

The usual requirement for professional posts in marine biology is a degree in marine biology, zoology or biochemistry. A specialist interest in marine studies is helpful and there are some degree courses specialising in marine biology or marine science. It's also worth checking out courses that offer ecology or environmental studies as options to help you get a good understanding of how biology 'fits into' your marine interests. For information on entry requirements for degree courses, see page 28-29.

Laboratory assistants and technicians

The usual requirement for these posts is a National Certificate in a relevant biological science.



What about a career in AQUACULTURE?

The Irish aquaculture industry is market led with most of the produce being exported to meet the growing worldwide demand for marine and freshwater food. Aquaculture is the sea or land based cultivation of marine, brackish or freshwater aquatic organisms including zooplankton, shellfish (mussels & oysters) crustaceans (brine shrimps) echinoderms (sea urchins), finfish (salmon & trout) and aquatic plants (seaweed & other algae).

Fish farming is a form of animal husbandry in which there is some form of intervention in the rearing process to enhance shellfish or finfish production, such as regular restocking, feeding and protection from predators.

Shellfish farming is the cultivation of stocks of shellfish that has been practised in Ireland for over a century. Cultivation of native/flat oysters and blue mussels on managed natural beds is still carried out at a number of locations around Ireland.

Finfish farming (salmon and trout), began in Ireland in the 1970s and developed rapidly. In recent years, considerable research and development effort has been expended on extending the range of finfish species farmed and small quantities of turbot, cod and halibut are now being produced in Ireland.

What opportunities are there?

Fish farming is a growth area attracting people to work as farm managers, marine biologists, divers and highly skilled operatives who can detect changes in fish and shellfish behaviour and respond appropriately. The work is very varied and more like that of a farmer than a fisherman, but the same skills that apply to fishing easily transfer across to aquaculture.

Other opportunities exist for scientific and technical staff in research into fish diseases and viruses, laboratory staff (microbiologists, molecular diagnostics) who perform fish health inspections to ensure the product is safe for the consumer, support staff who manage and issue the certification process ensuring the product is safe to travel / export, field sampling staff who perform site inspections and collect samples, scientists and technical staff who are involved in fish rearing and husbandry activities.

What skills and personal qualities do you need?

- An affinity with the marine environment and an interest in aquatic life
- Practical skills
- Patience and good observation skills
- The ability to work in a team
- Flexibility (weather factors and fish life cycles may result in long days and weekends)
- To be prepared to work outdoors in all weathers – perhaps at sea

What about entry, training and qualifications?

In some areas no formal qualification are required. Formal qualifications range from a QQI Level 5 Certificate in Aquaculture to a General Science / Biology, Zoology, Environmental Science degree to Masters and PhD's. Bord Iascaigh Mhara http://www.bim.ie/ can help you develop your skills with training in fishing, fish farming and seafood processing.

Who employs Aquaculture staff?

Aquaculture related employers include:

- Research and advisory bodies
- University research teams
- Commercial fisheries
- Government-run regulatory bodies
- Fish processing plants, fish and hatchery farmers
- Environmental consultancies

What about a career in FISHING?

What opportunities are there?

Figures from 2014, show circa 11,000 persons employed in the Irish Seafood industry, of which 5,000 are Fishermen, just under 2,000 are Fish farmers, 3,000 involved in fish processing and 1,000 are involved in ancillary services.

Some fishermen work on small inshore day boats often in sight of land. Crews are small - usually only two or three people and the catch is landed fresh that day. Others fish offshore on larger vessels on trips lasting days or weeks, depending on the type and size of vessel.

Large boats require a crew that includes a skipper, a mate and engineer and highly skilled deckhands to operate the fishing gear, sort and pack the catch when it is brought onboard and aid in the general operation of the vessel. Every day brings fresh challenges and modern vessels are highly sophisticated with an incredible array of hi-tech navigation and fishing equipment, which requires skill and experience to master.

What about entry, training and qualifications?

For some jobs, there are no formal qualification required other than the essential safety at sea training. Formal qualifications range from a QQI Level 5 Certificate in Commercial fishing to Degrees, Masters and PhD's.

Training

For essential safety training for fishermen there is the BIM Basic Safety Training Card which comprises of three elements:

- Personal Survival Techniques (STCW-95 Certificate)
- Elementary First Aid (STCW-95 Certificate)
- Fire Prevention and Safety Awareness

If you are looking for practical training in a range of navigation and safety skills to assist you with your ambition to become a fisherman, skipper or second hand of a commercial fishing vessel why not start with QQI Certificate in Commercial Fishing (Level 5)

If you are looking to gain a basic understanding of the operation of marine diesel engines and associated machinery on small vessels, there is the QQI Level 5 Certificate in Marine Engineering Processes (Minor Award)

There is also the Safety Handbook for Fishermen at Sea and this as well as training and further information on the two QQI level 5 certificates and the basic safety training mentioned above is provided by Bord Iascaigh Mhara at http://www.bim.ie/

Considering FOOD SAFETY?

In 2014, the Irish seafood sector had an annual estimated sales value of €700 million and employed circa 11,000 people. The principal growth potential lies in increasing unit value through improved quality, better marketing and additional processing, additional non-Irish landings to Ireland and limited development of new species. The aquaculture sector comprises of finfish and shellfish farming enterprises. Ireland has an excellent environment for the production of high quality farmed fish and shellfish and it is principally on the basis of quality that the sector can compete successfully. Food Safety is a pivotal part of maintaining these levels of industry. All fish and shellfish that are available for human consumption must pass rigorous health and safety checks before they reach the market (and in some cases even before they are harvested) to ensure they do not pose a risk when consumed or pose a risk of cross contamination in to other food products. All food that is made available must comply with the legal requirements as set down by both EU and National legislation.

What does Food Safety entail?

Laboratory Analysts and Chemists investigate all kinds of issues and problems relating to food safety within fish and shellfish:

- Natural accumulating toxins within fish: molluscan shellfish such as mussels and oysters are filter feeders. From time to time they can accumulate naturally occurring biotoxins which are produced by phytoplankton in the water. If shellfish containing such toxins were consumed, these biotoxins could produce sickness and unpleasant side effects;
- Bivalve filter-feeding molluscan shellfish can accumulate human pathogenic bacteria and viruses when grown in sewage contaminated waters. Such shellfish represent a public health risk when consumed raw or only lightly cooked;
- Pollutants pose a risk when they have contaminated fish and shellfish habitats from pesticides, artificial fertilizers and sewage.

To mitigate these risks personnel can be responsible for a number of areas:

- Carrying out monitoring programmes to ensure that toxic shellfish are not harvested and placed on the market;
- Preparation of reports on biotoxin results to the shellfish industry and Government agencies;
- Participation in developing and implementing relevant aspects of INAB laboratory quality assurance system, as part of the Biotoxin Chemistry Unit;
- Taking responsibility for the technical aspects of preparation, analysis, data administration and preparing reports of phycotoxin and phytoplankton samples;
- To take all reasonable steps to ensure that food produced, distributed or marketed meets the highest standards of food safety and hygiene reasonably available.

The Marine Institute, for example, carries out a range of food safety programmes to ensure that Irish seafood products going into National and International markets are of the highest quality according to food safety standards. This monitoring complies with a range of EU law as well as national requirements. This work is carried out in conjunction with the **Food Safety Authority of Ireland** and the **Department of Agriculture Food and the Marine.**

Current programmes carried out by the **Marine Institute** include: Shellfish Biotoxins, Veterinary Drug Residue monitoring in farmed Fish, Shellfish Microbiology and Chemical Pollutants.

What skills and personal qualities do you need?

- An interest in food and food safety
- An interest in analytical chemistry and working with environmental samples.
- Excellent numerical skills
- Excellent organisational skills
- Highly safety conscious
- High levels of attention to detail
- The ability to work in a team
- Good written and oral communication skills
- The ability to remain motivated whilst carrying out repetitive tasks.

What about entry, training and qualifications?

Professional posts within Food Safety

The usual requirement for professional posts in food safety is a degree in biological science, chemistry or food science. A relevant degree can be followed by a postgraduate degree specialising in your area of interest.
For information on entry requirements for degree courses, see page 28-29.

Laboratory assistants and technicians

The usual requirement for these posts is a National Certificate in a relevant science.

Who are Employers in the area of Food Safety?

Employers in this field include:

- Research and advisory bodies (such as the Marine Institute or Bord Iascaigh Mhara)
- University research teams
- Commercial fisheries
- Food processors
- Government-run regulatory bodies (such as the Food Safety Authority of Ireland; Bord Bia; Teagasc)

What about future prospects?

In March 2015 the Irish Government and EU announced a €241 million development programme for the seafood sector up to 2020. At present our Seafood industry is worth in the region of €850 million annually, and it is estimated to reach a potential value of €1 billion by the year 2020.

I want to understand our Oceans... what about OCEANOGRAPHY?

Oceanography is the scientific study and description of the oceans. Oceanographers try to understand and predict how oceans work, and help us to use and conserve their resources. Because the oceans and the atmosphere are linked, marine meteorology is a related area of expertise. Marine meteorologists provide ocean and weather observations and forecasts for people who work at sea or who live on the coast.

What do Oceanographers and Marine Meteorologists do?

Oceanography combines many different scientific disciplines. Oceanographers can specialise in the following areas:

- **Physical oceanography** is the study of the temperature, density and salt content of the oceans, as well as tides, currents, waves and ocean circulation
- **Chemical oceanography** focuses on the chemical composition and properties of seawater and marine sediments, and the behaviour of pollutants
- **Geological oceanography** is concerned with the seabed, its composition, structure and formation
- **Biological oceanography** is the study of the many life forms that live in the sea.

A lot of an oceanographer's work is laboratory or desk based and involves the use of computer modelling. Although much data comes from automated sampling equipment and satellites, time is still spent in the field, gathering data from instruments deep below the surface of the ocean. Most oceanographers spend some time at sea on research vessels, possibly going down to the seabed, using diving equipment or submersibles.

Oceanographers

People who work in oceanography often work with marine meteorologists to research the effects of ocean on the climate and the long – term effects of climate change.

Operational marine meteorologists

Those who work as operational marine meteorologists collect weather and ocean data from weather stations, satellites and observation vessels. Data is fed into computers and this is used to predict weather changes.

Applied marine meteorologists

Applied marine meteorologists use various ocean modelling systems for wave, storm surge and ocean current forecasting. This helps organisations such as ferry operators and oil companies to plan their work.

Who employs Oceanographers/ Marine Meteorologists?

- Research teams at universities and energy supply companies
- National meteorological services, such as Met Éireann
- Companies in the water industry & energy supply companies
- Marine survey and consulting companies
- Ocean instrumentation manufacturers
- Environmental Consultancies.

What skills and personal qualities do you need?

An oceanographer or marine meteorologist needs:

- Analytical & problem solving skills
- Numerical skills
- ICT Skills
- The ability to work in a team and good communication skills.

What about entry, training and qualifications?

Oceanographers generally require a degree in physics, chemistry or maths and a postgraduate qualification in oceanography. There are a few specialised degree courses that cover oceanography or ocean science, often in combination with other subjects such as chemistry, geography, geology, computing or meteorology.

Meteorologists usually have degrees in maths, physics or meteorology, but other subjects may be accepted. Postgraduate courses in meteorology are also available for those with appropriate degree subjects. Technical and support staff are likely to need a Certificate / Diploma. There is also the NVQ level 4 in weather forecasting and Sail Cork run evening classes in Understanding the Weather. For further information see www.sailcork.com

I want to be a SURVEYOR of Oceans and Water

As a natural resource of raw materials, such as fuel and food, the seas and oceans of the world have never been so important. They also represent a very fragile environment whose exploitation must be carefully and considerately managed. It is the work of the hydrographic surveyor to chart these great wildernesses and to provide the expertise for their exploration and for much of the engineering needed for their development.

A person who surveys oceans is called a **Hydrographic Surveyor**. Traditionally, the hydrographer has been associated with making the sea charts that allow ships to navigate the world in safety. This is still an important role but, as a science and profession, hydrographic surveying has developed into an exciting, multi-disciplinary occupation. The hydrographer is involved with every aspect of ocean data from measuring currents, tides and waves, observing the ocean environment, mapping the ocean floor and exploring for the minerals that lie far beneath. Some of the activities hydrographers are involved in are:

- exploring for fossil fuels, such as oil and gas
- offshore engineering and construction
- charting the seas and oceans
- ports, harbours and coastal engineering operations
- trans-oceanic telecommunication cables
- similar work in lakes and inland waterways
- environmental studies.

Education and Qualifications

Hydrographic Surveyors generally require a degree and a number of colleges and universities offer suitable courses throughout Ireland and Europe. See page 28-29 for entry requirements.

The other route into training and education is via a military career, especially in the Navy. In some countries, surveyors are encouraged to add a professional qualification following graduation by becoming a Licensed Surveyor, or by joining a body such as the UK's Royal Institution of Chartered Surveyors (RICS).

The hydrographic surveyor is a specialist in precise positioning and data acquisition in marine environments. They are expected to work in a wide range of differing situations and applications from inland waters and rivers, to ports and the deep oceans. Graduate engineers and Scientists are also involved in new challenges such as harnessing sustainable energy from wind, waves and currents. Equipment has to be designed, built, installed and operated safely and cost effectively. You may find yourself working on exciting projects, such as wave power energy generators.

What skills and personal qualities do you need?

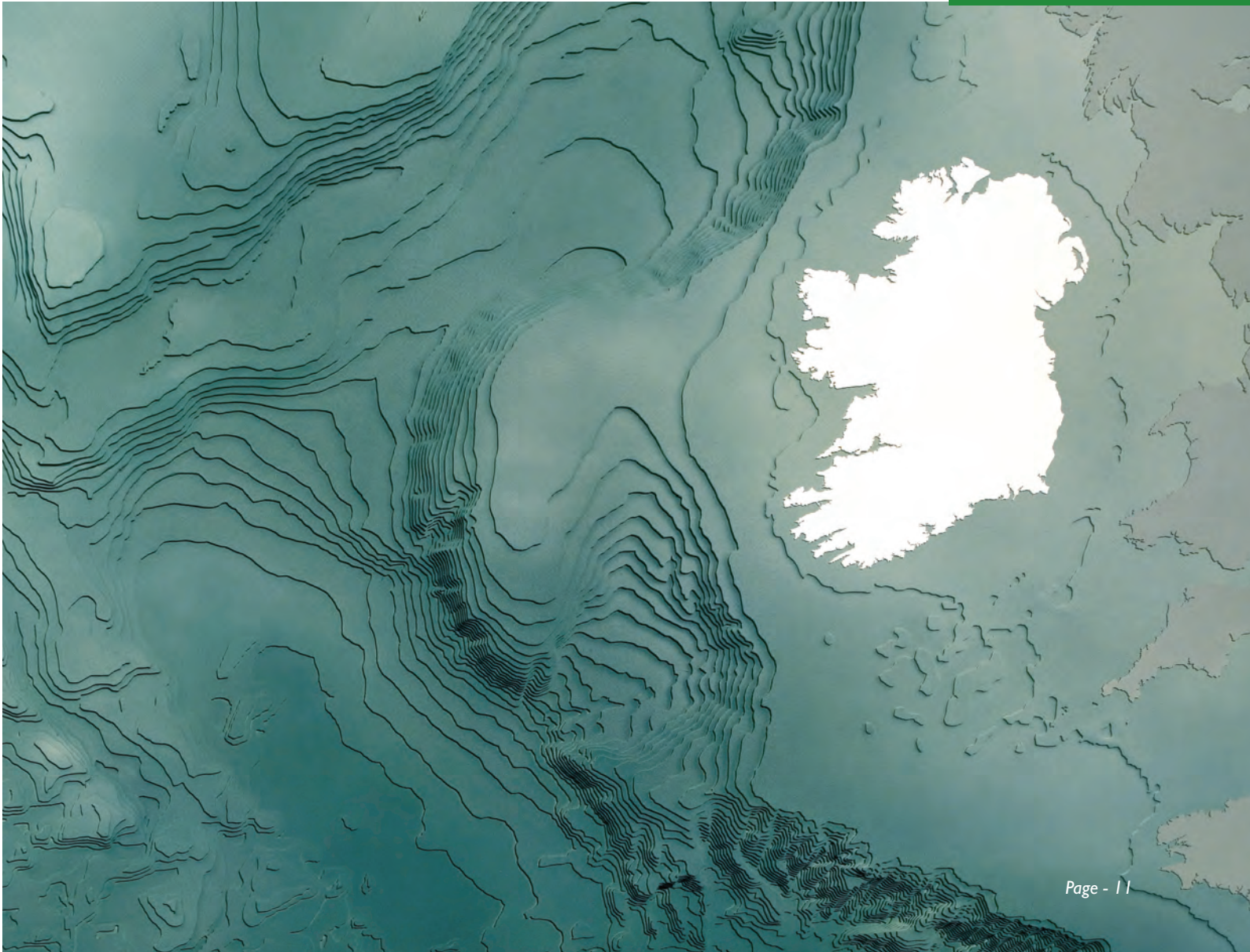
Hydrographic Surveyors need:

- Strong technical, analytical and administration skills.
- ICT Skills
- The ability to work in a team and good communication skills
- Ability to adapt to different organisational cultures & styles.
- Ability to work at sea.

Skills and Training

A hydrographic surveyor requires many skills – the key academic skills are acquired through specialist courses while others, such as seamanship and instrument handling, are acquired on-the job and via in-house training courses. In general, hydrographic surveyors enter the profession either with a relevant bachelor's degree in the surveying sciences (sometimes referred to as 'geomatics') or through a qualification gained in military (normally Navy) service. Other degree courses offering surveying options include geography and geophysics. Degrees in physics, mathematics or statistics can also offer points of entry especially for those who intend to specialise in processing or data manipulation.

To work offshore in any capacity it is usually necessary to complete a basic offshore safety induction and emergency training (BOSIET) course. This generally includes first aid, safety at sea, the basics of fire and fire fighting and helicopter underwater escape training (HUET).



What about OFFSHORE Marine Engineering?

The offshore sector includes everything from oil to gas exploration and extraction, and telecoms and power cabling, to wind farms, wave power and offshore mining.

The offshore oil and gas is concerned with the recovery of crude oil and natural gas from beneath the seabed to meet the world's energy needs. The industry uses innovative technology and techniques to find and extract oil and gas. It takes a high-tech, multi-disciplinary team effort. Engineers and Scientists are needed to work both onshore and offshore. There are also jobs for semi-skilled workers.

What opportunities are there?

There are three main areas of work in the offshore oil and gas industry:

- **Exploration** involves conducting surveys and tests to find worthwhile reserves of oil and gas.
- **Field development** involves deciding how to extract fuel, setting up production facilities and drilling wells.
- **Production and maintenance** involves operating and maintaining equipment. There are jobs offshore on support vessels, platforms and drilling rigs and on shore at terminals servicing the equipment and constructing new platforms.

There are also opportunities in engineering design, planning and project management. Offshore installations also need production operatives, welders, electricians, mechanics, storekeepers and cooks. There are also jobs for divers to maintain the platforms.

Underwater welding

This field of work is a high paying, much in demand, lucrative and rewarding profession. Underwater welding also takes a combination of skills. First you must be both a certified welder and a commercial diver. It is essential to have excellent diving skills and equally essential to place a premium on safety.

What about Marine Engineering?

Marine engineering is the branch of study that deals with the design, development, production and maintenance of the equipments used at sea and on board sea vessels like boats, ships etc. A Marine Engineer is a professional who is responsible for the operation, maintenance and repair of all major mechanical and engineered equipment on board a ship.

Graduate Jobs in offshore industries

Scientists and Engineers mostly work in labs or offices onshore, but they may spend occasional spells on offshore installations. Geologist/geophysicists study underground structures using computers and analysing data from seismic surveys to assess the prospects of finding oil or gas. They prepare reports, charts and presentations for the contracting company.

What skills and personal qualities do you need?

To work offshore, you need:

- To be fit and strong
- To be reliable, responsible and very safety – conscious
- To be prepared to work outside in all weathers
- Good team working skills
- Be prepared to work irregular hours and cope with periods away from home

What about entry, training and qualifications?

Before working offshore, you have to undergo an offshore survival course. The minimum age for working on an installation is 18. Basic offshore labouring work usually requires no formal qualifications, but relevant craft or technician experience or training helps. The profession is open to graduates of many disciplines but a degree in one of the following subjects considerably increases an applicant's chances such as: Hydrographic Surveying; Ocean Exploration; Land Surveying; Engineering; Marine Sciences; Civil Engineering; Physical/Mathematical/Applied Science; Geography/Cartography and Computer Science/Software Engineering.

Who are the typical employers?

- Research and advisory bodies
- International oil and gas organisations, drilling, maintenance and specialist service contractors
- Organisations involved in renewable energy
- Offshore contractors, Engineering design consultancies, Suppliers of materials and equipment

Want to work with UNDERWATER ROBOTS?

The "robots" in question are specialised devices called ROVs – remotely-operated vehicles. These are small submarines which are tethered to the surface by an umbilical cord through which electrical power is passed down to the vehicle. The same umbilical also allows telemetry control, video and other sensor data to pass to and from and enables the ROV pilot to 'fly' their mini-submarine through a huge – and ever increasing – variety of tasks. ROVs are being used at greater and greater depths, far beyond that at which divers may operate. All ROVs are very complex pieces of equipment, often weighing several tons when out of water and considerable technological and engineering challenges are involved in operating them.

The work you could be involved in:

- Launching and "flying" your vehicle by remote control from the surface of the water to depths of up to 165 metres (some ROVs can dive to 4,000 metres)
- Operating equipment such as cameras and interpreting data, sometimes in poor visibility, from video or sonar displays to calculate and keep track of the position of your vehicle
- Navigating the ROV's route, avoiding hazards such as moving parts of the ship
- Operating robotic arms (if your vehicle has them), to perform simple tasks such as picking up items from the seabed
- Judging the changing weather conditions, if necessary altering the dive programme at short notice
- Relaying information during the dive, verbally on to videocassette and computer
- Regularly maintaining the ROV and its associated equipment and carrying out repairs on location
- Carrying out technical tasks: for example, rigging and operating small boats and basic electronic and hydraulic construction
- Writing technical reports and ordering spare parts by computer

How to become a Remotely Operated Vehicles (ROV) PILOT/TECHNICIAN

A career as a ROV pilot/technician offers you the unique experience to combine your engineering, technology, computer and science skills in an ocean environment. Training courses are available at a number of schools which allow newcomers to the industry to learn the basics. Qualifications required are an honours degree or above in electronic, electrical, mechanical or hydraulic engineering or related disciplines or suitable training & time-served experience in other industries. Employers normally require ROV personnel to have a good background in electronics or hydraulics. Experience with pneumatics, plant maintenance or electrical or mechanical engineering may also be of interest to prospective employers.

The following organisations have ROV Training Programmes:

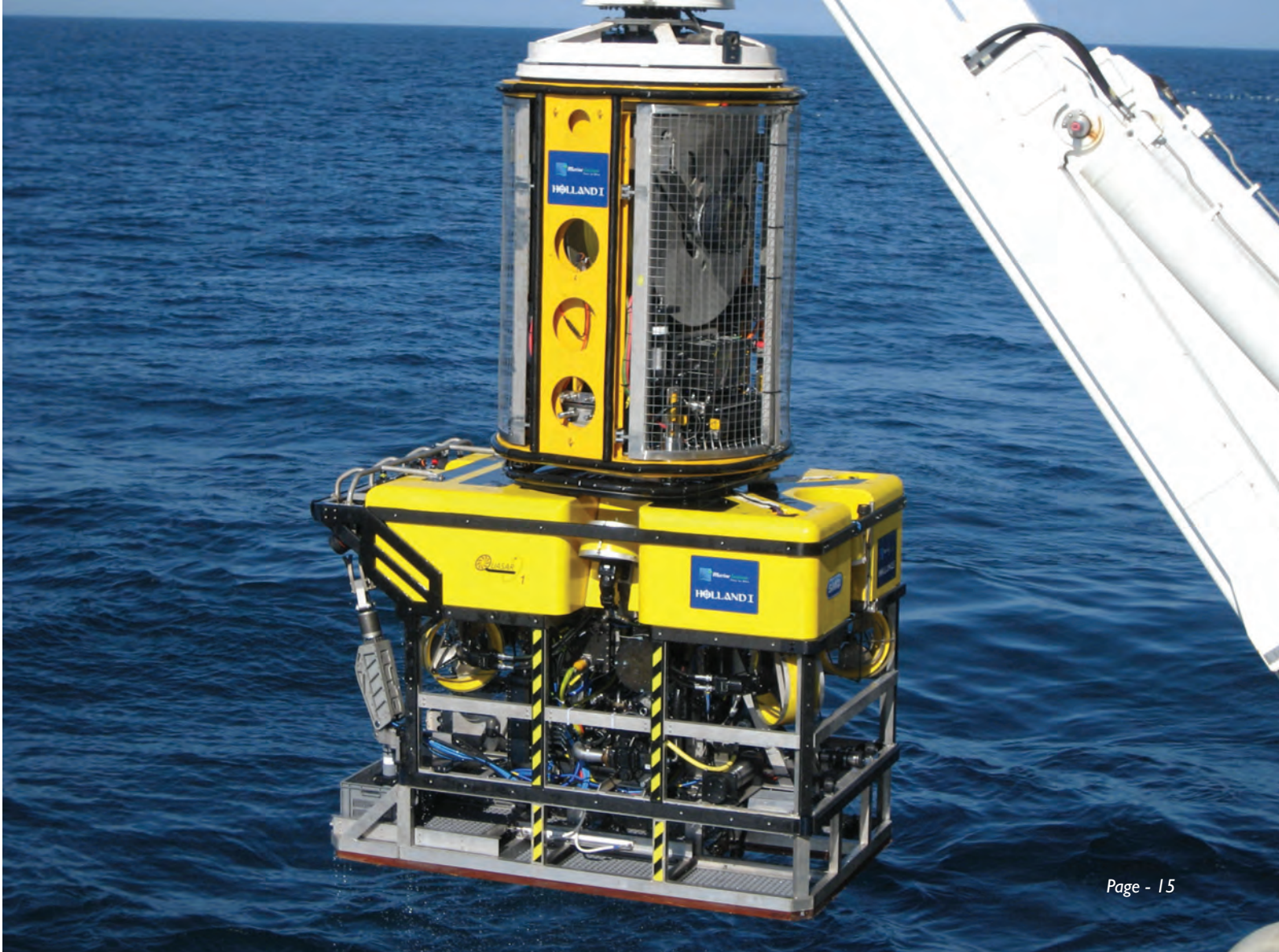
Maritime Training & Competence Solutions Ltd (MTCS) - http://www.mtcs.info/
International Maritime Contractors Association (IMCA) - http://www.imca-int.com/
The Underwater Centre - http://www.theunderwatercentre.co.uk/index.asp
SubNet Services Ltd - http://www.subnetservices.com/

To work offshore in any capacity it is usually necessary to complete a basic offshore safety induction and emergency training (BOSIET) course. This generally includes first aid, safety at sea, the basics of fire and fire fighting and helicopter underwater escape training (HUET). In many regions, someone who has not successfully completed a course of this nature will not be permitted to work offshore.

Working Conditions and Prospects

Most ROV personnel are employed directly by one of the ROV operators or contractors. ROV work is normally constant around the year and is less 'seasonal' than diving. ROV personnel can expect to travel overseas. They have to be resourceful, resilient and be able to work in a team environment.

As well as the oil and gas industries, ROV pilot technicians find work in research institutions, civil engineering, the defence and security industry, environmental sciences and marine archaeology.



I want to be a DIVER... Taking the plunge can be deeply rewarding

One area that almost certainly has a high degree of job satisfaction is diving and underwater work. Many people fall madly in love with diving and the underwater world on vacation, and many go on from there to get their PADI certificate and carry on diving as a hobby. But what if you love diving so much that you want to do it for a living?

Diving Instructor

This is the daddy of underwater jobs. If you're prepared to put in the time training, you may find a job for life, such as working for any coastal resort in the world. First you need to get your PADI Divemaster training which hones your dive knowledge and leadership skills. Once you have that you need to get your PADI Assistant Instructor and PADI Open Water Scuba Instructor certifications. Diving instructors get to work in the most beautiful spots in the world. Various Diving courses take place throughout Ireland. To find a course in our area see the following links:
www.oceandivers.ie/, www.scubadivewest.com/, www.divegalway.com/

Underwater Photographer

This job combines the glamour of being a diving instructor with the challenges and interest of being a diver. Using underwater cameras and advanced photography techniques, there is a market for underwater photographers. If you're a photographer with a hankering for working underwater and diving, this is the job for you. Whether you specialise in underwater portraits, shipwrecks, nature and marine life photography or filming for movies, all you need to do is find your niche and build your portfolio.

Underwater Tour Guide

This job is a fun choice and generally requires the same qualifications as a diving instructor. It has the potential for the same social interaction if working in a resort, although underwater tour guides can also be involved in more interesting diving. One example would be a tour guide who takes divers to swim with sharks, or around shipwrecks.

Underwater Archaeologist

An underwater archaeologist is involved in studying the wealth of human history that lies submerged at the bottom of lakes, seas and oceans of the world. An underwater archaeologist spends all their time unearthing these lost treasures. You could be examining anything from shipwrecks to exploring lost, underwater cities. The work is scientific with equal amounts of time spent on dry land researching treasures and planning the next excavation. If you're fascinated by history and enjoy diving then a career as an underwater archaeologist could be ideal for you.

I want to travel the world... working in the MARITIME INDUSTRY

Working in the maritime industry is a truly international career path, that can bring you around the world and offer a lifelong career at sea and ashore. Jobs in the maritime industry can start out sea or shore based but typically lead from training in a sea-based role to a later career on shore in a wide variety of roles.

Sea Based Roles

Mercantile Officers

Presently, Irish Cadets are trained at the National Maritime College (NMCI) of Ireland in Cork. The Irish government has recognised the importance of the maritime industry to Ireland by investing €57 million in the construction of NMCI. Located close to the naval base, it caters for 780 students and bring together training for the Merchant Marine and Irish Naval Service.

What does an Irish Mercantile Marine Officer do?

A mercantile Officer will be involved in the sailing, loading and operation of ships. There are two main disciplines as an Officer. You can train as a Deck Officer involved in the navigational and communications aspects of vessel operations or as an Engineering Officer, where you will train in the mechanical operation of vessels. A third option has recently been added, the Electrical Technical Officer was added to cater for the increased demand for maritime electrical engineers as more and more vessels rely on diesel electric power plants, particularly in the cruise industry.

What about entry, training and qualifications?

There are a range of academic courses available at the National Maritime College of Ireland: www.nmci.ie

Higher Certificate in Science in Nautical Studies: This course allows for a more vocational route to becoming a ship's captain, particularly for those who have a serious interest in a career in the maritime industry but may not have obtained enough points in the CAO for the Bachelor of Science in Nautical Science. Application for this course is directly to the NMCI and not through the CAO system.
Bachelor of Science in Nautical Science: Train to become a deck officer and ultimately become a ship's captain.
Bachelor of Engineering in Marine & Plant Engineering: Train to become a ship's engineer and eventually becoming chief engineer.
Bachelor of Engineering in Marine Electrotechnology: Electrical Technical Officers are in great demand from the cruise industry and also ashore in the marine electronic and aviation instrumentation maintenance industries.

Career change - Fishing Skipper Conversion

Courses are now available at the National Maritime College of Ireland (NMCI) to allow qualified fishing skippers to convert their licenses to merchant marine licenses and serve aboard merchant vessels. Fishing skippers, because of their unique knowledge of the sea and their unique experience managing small vessels in difficult conditions are particularly sought after in the offshore industry. The vessels they operate typically work servicing oil fields, offshore wind farms and other offshore installations, or work as 'chase' vessels for giant seismic survey vessels or cable layers.

Who employs Mercantile Officers?

Irish Ship owning or operating companies such as Ardmore Shipping, Arklow Shipping, Mainport Shipping, Irish Continental Group, Commissioners of Irish Lights, Stena Lines, P&O Ferries take NMCI graduates as well as international employers in the cruise, oil, offshore supply and standby, bulk, container, and general cargo sectors. There is a high demand for NMCI qualified graduates and the NMCI has consistently seen almost 100% of students finding employment immediately after graduation.

More information can be found on www.nmci.ie

I want to work in SHIPPING... Shore Based Roles

It is important to understand that while many qualified deck and engineering officers are quite happy spending their career at sea, their training and experience is also in high demand ashore. Below is an indicative selection of sectors and jobs that actively seek out deck and engineering officers to fill roles. More information can also be found online on www.maritimecareers.ie

What about Ship Management?

Ship Managers generally do not own ships; instead they agree a contract with ship owner to efficiently operate, manage and maintain their fleet. They may provide full management (crewing, technical management and commercial management) or specialize in the provision of crew, of managing the technical requirements of a vessel or managing the commercial operation of a vessel (finding and transporting cargo).

Ship managers will also be expected to provide ship owners with regular financial and technical reports on the ships under management.

What does a Ship Manager do?

The skills listed below are common attributes for individuals engaged in maritime management:

- Technical Supervision
- Manning
- Purchasing
- Insurance and Protection & Indemnity advice and arrangement
- Accounting and cost control
- Chartering and commercial management
- Quality Assurance/Quality Control
- Systems analysis and implantation
- Ship management is normally carried out by ex-deck and engineering officers as they have a particular experience and knowledge of vessel operations.

Who employs Ship Managers?

Third party ship management companies operate around the world. Competition between ship management companies is at a high level, which encourages innovation and provides career opportunities for hard-working ship managers.

What about entry, training and qualifications?

Usually, Ship Managers have a Class 1 Engineer certificate or equivalent technical qualification and have sailed as a Chief Engineer or Master of seagoing ships. Previous shore-based employment is also often requested, to prove good financial management skills, and confidence in writing reports and in the use of computers.

What skills and personal qualities do you need?

You need to be a good communicator and highly organised. Often you will have to think on your feet and sort out all the equipments of the ship's crew and ship owner as well as deal with port and customs official and suppliers. Normally, you will be juggling the responsibilities and demands of more than one vessel at a time, so strong organisational skills are a must.

What about future prospects?

Taking care of the ships that cross the oceans is a specialist career that offers good career prospects for able individuals.

What about SHIPBROKING?

How do you find a ship to carry the cargo you have just sold to a buyer or how do you buy a vessel if you want to be a shipowner? The answer is to talk to your shipbroker.

What does a Shipbroker do?

The role of a shipbroker is to act as an intermediary between the two parties to a contract, whether they are shipowners and charterers in the chartering market, or buyers and sellers in the Sale and Purchase market. He or she will be involved in many stages of the deal: presenting the business to potential clients, negotiating the main terms of the fixture or sale, finalising details of the contract and following through to conclusion.

The size and type of vessel involved ranges from coasters carrying a few hundred tons to tankers able to lift several hundred thousand tons, and includes containerships, gas carriers, cruise ships, oil-rigs or ferries.

What skills and personal qualities do you need?

A ship broker can come from any walk of life, straight out of school or university or ex-seafarers. Experience at sea is not a necessity. Any graduate with a finance, business or economics background that has an interest in international trading and finance would be well advised to consider shipbroking as a career. As a personality, you need to be tenacious, organised and have a good head for figures and markets. You should also enjoy the challenge of working in a fast paced international environment.

What about entry, training and qualifications?

The Institute of Charter Shipbrokers of Ireland provide a series of educational courses and qualifications in Ship Broking as a post graduation qualification. These courses cover the main maritime market sectors that Irish trade fall into, for instance. Their website is: http://www.icsirishbranch.ie

On entering the ship broking industry, a Broker can study for the Institute of Chartered Shipbrokers qualifications either through an adult education centre including some universities on a part time basis or through the Institute's own correspondence college Tutor Ship a good option for seafarers and students not able to attend lectures. Experience at sea can help, economics, commerce, business degrees are useful.

There are also graduate programmes available in some shipbroking companies, log onto www.maritimecareers.ie for more information.

Who employs Shipbrokers?

Today the career of shipbroking covers dry cargo chartering, tanker chartering, sale and purchase of ships, liner agency, port agency and ship management. Broking houses, either competitive or in house, within the ship owning companies, or charterers (e.g. oil companies, grain houses, commodity traders) are a typical example of employer.

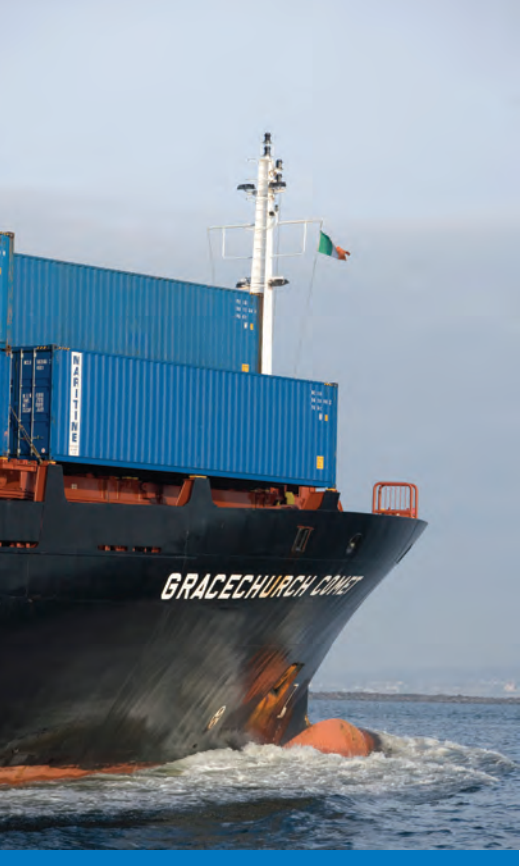
Traditional ship broking centres such as London are now competing with emerging centres as technology allows us to move away from the traditional market locations. New areas such as Ireland, South Africa, India and China are seeing more brokers being set up to service the increasing business. There are also significant markets in such places as Oslo, London, Hamburg, Paris, New York, Houston Vancouver, Singapore, Hong Kong, Shanghai, Tokyo, Dubai, and New Delhi.

Sales & Purchase Brokers

The Sale and Purchase market for second hand vessels provides the opportunity for owners to realise capital gains on their assets i.e. ships. Many operators will buy when the chartering market is low and sell when high the value of each ship type tends to have its particular reaction to the market. Fewer deals are done in S&P but the values and hence earnings for the broker are higher.

What about future prospects?

Over 90% of the world's trade is moved by sea so as long as there is cargo to be moved and sold; there will be a demand for shipbroking services. The offshore industry is now an emerging market for ship broking but there is still demand for traditional Sales & Ship Purchase brokers, Dry & Wet Cargo Charter brokers, Bunkering Brokers.



What about FREIGHT FORWARDERS?

Freight forwarders, also known as freight clerks or shipping clerks, deal with arranging the movement of goods. It is their job to find the most appropriate and cost-effective way of moving goods between countries, and co-ordinate the arrangements.

What does a Freight Forwarder do?

Freight forwarders speak with carriers, such as road, rail, air and sea companies, and confirm transport arrangements. They also liaise with clients, advising them of the costs of transporting goods and the arrangements that have been made.

When working on behalf of an importer, it may be necessary to clear goods through customs, arrange the payment of duties and taxes, and organise the delivery of goods to the importer's premises.

Duties include:

- Selecting safe routes and carriers (road, rail, sea and air)
- Booking transport cargo space
- Dealing with transport rates, insurance and schedules
- Making calculations by weight, volume and cost
- Using a computer to input freight details and routes
- Preparing quotations and invoices
- Preparing contracts such as Bills of Lading and Letters of Credit
- Communicating with carriers and clients by letter, phone, fax and email.

What about entry, training and qualifications?

The qualifications needed to start work and train as a freight forwarder vary between employers. Some freight forwarding employers look for people with a good level of general education e.g. some have a relevant diploma or degree. Others would expect you to have a basic business or supply chain management degree.

What about future prospects?

A large number of companies operate as freight forwarders in Ireland. These include local, national and international freight forwarding companies, as well as major retail companies, manufacturers, warehousing and distribution firms, and the armed forces. There may be opportunities for experienced staff to work overseas on a temporary or permanent basis.

It is possible, with training and experience, to advance to a supervisory or management job. Courses include international transport, logistics supply chain management and transport management. Business degree and diploma courses may also be relevant. Experience in road or rail transport operations can also be used as entry into this field.

More information is available from the the Irish International Freight Association on http://www.iifa.ie

What about MARINE INSURANCE?

Marine Insurance is a form of insurance which is primarily concerned with the protection of goods in transit and the means of transportation. Originally written to cover ships and their cargos at sea, it was gradually extended to cover inland from the place of departure to the place of consignment. Marine Insurance is traditionally associated with the Lloyds Market in London.

What does a Marine Insurance Broker do?

Brokers are important providers of maritime insurance. Brokers are central to the efficient working of the marine insurance market providing an important reservoir of expertise and experience. Like intermediaries in any business sector, brokers face competition from other service providers, as well as from the internet and the increasing opportunities, which it is said to provide for clients to deal directly with underwriters.

Ship-owners are keenly aware of the cost of buying insurance, which forms a significant percentage of their outgoings. The continuing strength of the core-marine broking community says a great deal about the value of the services and the expertise, which it brings to a highly competitive global market. Experienced and competent brokers are likely to remain a constituent part of marine insurance business for as long as Europe remains a dominant centre for marine insurance business.

Marine insurers can provide tailored solutions to such problems as:

- Transit insurance
- War and strikes risks
- Stock throughputs
- Terrorism and political exposures
- Trade disruption
- Marine business interruption
- Piracy Cover
- Delay and loss of market.

What about entry, training and qualifications?

Some Marine Insurance companies look for people with a good level of general education e.g. some have a relevant diploma or degree to start off as a Claims Executive. Others would expect you to have a basic business or maritime degree.

If you are interested in becoming a Marine Insurance Underwriter, you would have to have some background in Maths or Actuary.

If you have sailed as a Chief Engineer or Master of seagoing ships, this can give you a basic understanding of the industry and therefore provide you with skills for entry to a claims executive or claims investigator role.

What skills and personal qualities do you need?

Marine Insurance in a multi-million dollar industry. As a personality, you need to have an eye for detail, a good grasp of legal and contract negotiations and be able to manage commercial relations in an effective manner.

What about future prospects?

While working in the maritime insurance sector, people could find themselves working in a number of different areas.

The following list suggests possible career areas available:

- Passenger Vessel insurance
- Boats & Yachts insurance
- Commercial Marine insurance
- Professional liability insurance.

For more information on the insurance market log onto the Lloyds of London Website:
http://www.lloyds.com/About_Us/Careers/Graduate_careers/

I want to work in NAVAL ARCHITECTURE

A Naval Architect is a professional engineer who is responsible for the design, construction and repair of ships, boats, marine vessels and offshore structures, both civil and military. These include merchant ship, passenger/vehicle ferries, warships, submarines and underwater vehicles, high-speed craft, offshore drilling platforms, workboats e.g. fishing vessels, tugs, pilot vessels and yachts.

What does a Naval Architect do?

The role of a Naval Architect is to assure that the vessel will survive any reasonable weather when handled with prudence, and yet still perform its function efficiently. The Naval Architect is responsible for the strength, stability, speed, trim and weight of the vessel. They should have an adequate knowledge of the principal items entering into the vessel such as machinery, cargo, fittings, etc.

Modern engineering on this scale is essentially a team activity conducted by professional engineers in their respective fields and disciplines. It is the Naval Architect who integrates his/her activities and takes ultimate responsibility for the overall project.

To undertake all these tasks the Naval Architect must have an understanding of many branches of engineering and must be in the forefront of high technology areas such as computer aided design (CAD) and calculation. He or she must be able to utilise effectively the services provided by scientists, lawyers, accountants and business people of many kinds.

Work activities cover the functions that are required for the entire process of designing and preparing vessels for sea. Naval Architects also ensure that vessels remain safe once at sea. Activities include:

- Preparing designs and detailed drawings to required standards
- Checking owners' requirements and the feasibility of projects
- Using computer simulation and scale model testing
- Ensuring that the design meets the safety rules and standards set
- Organising repair operations
- Procuring materials and equipment to fit out vessels.

What about entry, training and qualifications?

A degree in an engineering discipline is required. In particular, the following subjects may improve your chances:

- Marine engineering
- Aeronautical engineering
- Civil/structural engineering.

In Ireland you can attend the National Maritime College of Ireland in Cork to train in this area. For more information log onto www.nmci.ie

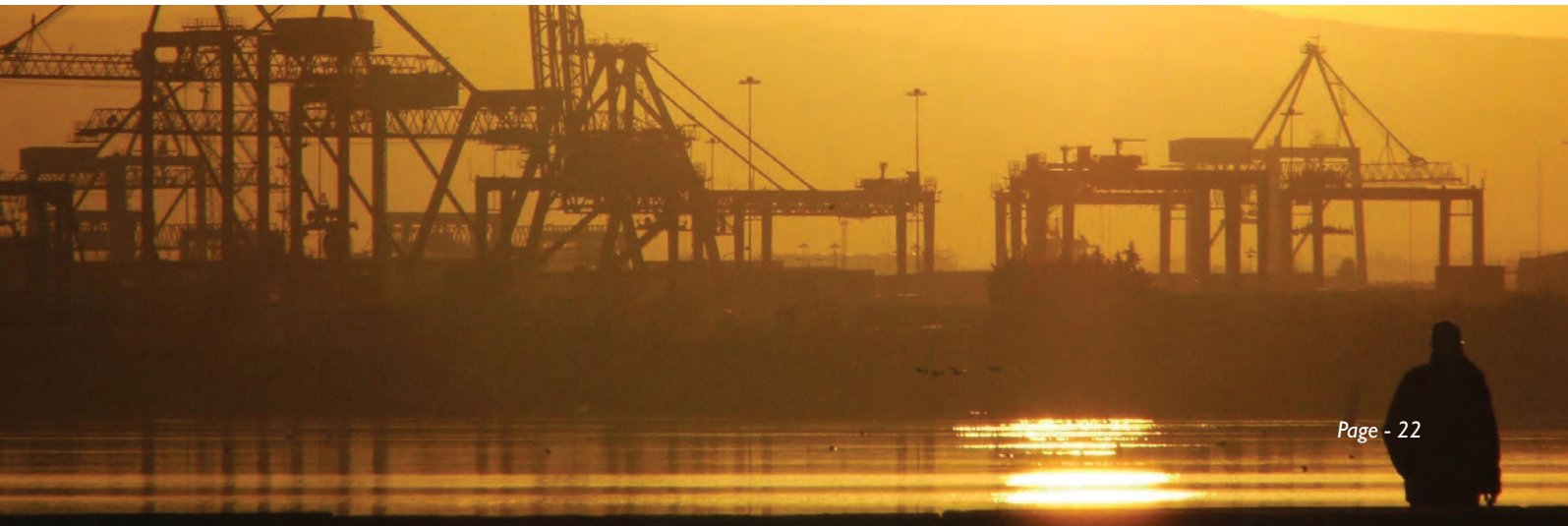
What skills and personal qualities do you need?

A Naval Architect requires the ability to communicate clearly in speech and writing with others inside and outside the engineering profession, sound judgment and qualities of leadership. The education and training given to the Naval Architect are designed to develop these skills and to lead him or her to recognised qualifications and professional status.

What about future prospects?

Naval Architects have a wide range of employment opportunities. They are involved in such a wide variety of work. The main areas are as follows:

- Design
- Construction and Repair
- Consultancy
- Regulations, Surveying and Overseeing
- Research and Development
- Education/Training
- Operations.



What about MARITIME TRANSPORT & LOGISTICS?

Maritime Transport & logistics activities play a crucial role in Ireland's maritime sector. Transport is a significant component of the total logistics input to business, and given Ireland's location on the periphery of Europe, it has tended to represent a cost disadvantage relative to our main competitors. It is now acknowledged that Irish business can achieve a major improvement in competitiveness through increased skills in the traditional transport functions as well as in activities such as warehousing, inventory control, materials management and information technology.

What would you do?

Transport is one of the main component factors taken into account when determining the final price of a product. Logistics is the process of planning, implementation and control of both the physical and information flow, as well as the storage of raw materials, semi-finished and finished products, from point of origin to the end consumer in the most efficient and effective way possible.

Typical duties would include:

- Manage the workload and resources available to provide a world-class standard customer service
- Managing the logistics and transport functions
- Carrying out performance assessments, assessment of training needs, disciplinary issues, recruitment etc.
- Ensuring the fleet replacement policy is adhered to and that ships are of an appropriate standard
- Monitoring stock levels and the condition of ships/cargo
- Playing an active role in the development and application of health and safety systems
- Vehicle maintenance and specifications.

What about entry, training and qualifications?

Transport and logistics: Dublin Institute of Technology.

The Dublin Institute of Technology offer a four year honours degree programme in Transport and Logistics. This will develop the knowledge and skills necessary for a challenging business career in management with a specialty in logistics and supply chain management. Extensive exposure to real world logistics through their class work and a paid in-company work placement which is undertaken in the third year of the programme. Log onto www.dit.ie for more information.

What about future prospects?

Irish industry will require new recruits annually across a range of logistics skills. A wide range of career opportunities in general management as well as in a wide range of specialist logistic roles including, but not limited, to the following:

- Supply Chain Manager
- Business Development Manager
- Transportation Manager
- Warehouse Operations Manager
- Traffic Manager
- Purchasing Manager
- Consultant
- Import Agent
- Logistics Specialist
- Materials Manager
- Export Coordinator
- Production Manager
- Quality Assurance Manager
- Systems Support Manager (MIS)
- Shipping Coordinator
- Inventory Coordinator
- Customer Service Manager
- Operations Manager.

How about MARINE INFORMATION AND COMMUNICATIONS TECHNOLOGY?

"All across the world, next generation information and communications technologies are needed to allow the sustainable economic development of our oceans which, as a source of food, transport and energy is our greatest natural resource. Ireland has up to 220 million acres of marine area and, as a country with a strong expertise in ICT, has significant potential to be a world leader in the provision ICT enabled decision support tools to the global marine sector."
Dr. Peter Heffernan, CEO of the Marine Institute.

What can Marine ICT Personnel do?

The technology sector is growing by the second and changing everyday. Here are some of the latest developments in the Marine Information Communication Technology (ICT) Sector regarding software development:

- Gaming technologies are being investigated for the creation of virtual oceans and to act as interactive design tools for marine spatial offshore explorations
- Unmanned, autonomous and remotely operated underwater vehicles are being developed at the Mobile Marine Robotics Research Centre of the University of Limerick
- 3D computer simulation of marine data have been created by the company RealSim
- SmartBay, Ireland's National Facility for Marine ICT was set up to provide a real world test environment for the development of technology products and services for the global marine sector
- IBM has web portals that display data on environmental conditions
- Intel have developed a wireless communication system to help transmit data from the marine environment in real time.

At Dublin City University the MESTECH Marine & Environmental Sensing Technology Hub has successful projects underway in the areas of visual sensing, the prevention of biofouling in the aquatic environment and specialised sensing platforms that can provide biological and chemical analysis remotely.

What about entry, training and qualifications?

The IT sector is an ever changing industry, so training and education in this field is continuous. Starting off a degree in Electronic and Computer Engineering or computer systems is a good way to begin. As Marine ICT is a highly specialised environment, a Masters degree in the area you are interested in is helpful for your career prospects. An interest in ICT is important as are excellent problem solving skills.
See page 28-29 for entry requirements.

What about SOCIO-ECONOMICS?

Those interested in Business studies or Humanities also have a very valuable place in the marine. The socio-economic sector is a developing area that needs highly skilled professionals in the area of economics and research to provide support and innovation to the non-scientific side of the marine. The study of socio-economics brings together some of the most important approaches to understanding the economic, social and human world. The idea behind it is that, to understand social and human phenomena you must approach them from the complementary disciplines of economics and sociology. The economics part centres on how scarce resources are allocated, the issues of unemployment, inflation and economic growth, analysis of government policy and contemporary global economic issues. The sociology part focuses on how society and social life influences people and helps shape their lives and includes studying the influence of the media, work, gender, globalisation, inequality and multiculturalism on individuals and society.

What does a Marine economist do?

At present in Ireland many Marine Socio-Economists are focusing on *The Sea Change Strategy (A Marine Research, Knowledge and Innovation Strategy for Ireland: 2007-2013)* in developing a national marine socio-economic research capability to not only assemble national statistics on the value of Ireland's marine and maritime resources and their socio-economic and regional impacts, but to use this data as a dynamic tool for economic planning and investment as well as informed policy planning and implementation. The impacts which are targeted in Sea Change Strategy include:

- Competiveness and sustainability
- Economic stimulation and diversification
- Research capacity increases
- Regional development and North-South Co-operation
- Public service improvements; and
- Improvements in environmental quality and management

What about entry, training and qualifications?

There are many courses in Ireland focused on Socio-economics, some with a broader foundation such as Business Studies or Commerce degrees or some more focused such as a Bachelor of Arts in Economics.

Following on from an undergraduate degree there are both research and taught postgraduate courses to choose from in many specialities throughout the socio-economic spectrum.

I want to be an ACADEMIC

What do academics do?

An academic is someone who holds an advanced degree and works as a researcher at a college or university. Academics generally work within a university, combining research, teaching and administrative duties.

How do I become an academic?

Academia is a competitive profession. Unsurprisingly, there is a strong emphasis on excellent qualifications. Most people entering academia are at the level of lecturer or above, and are now expected to have a doctoral level qualification, such as a PhD, EngD, DPhil, DBA etc. This shows that you can both carry out research professionally and communicate your findings in an academic setting. In order to get accepted on to a doctoral research programme, you would normally need a good first degree (a 2:1 or 1st class honours undergraduate degree) and often a Masters degree.

Your discipline

The routes which academics take to achieve success in their careers can vary widely, particularly between disciplines:

- Science, engineering and technology disciplines
- Humanities disciplines
- Clinical and other professional disciplines

Science, engineering and technology disciplines

Although every academic career is unique, there are some well trodden science, engineering and technology (SET) pathways. There are three main types of permanent academic roles. The vast majority of academics have combined research and teaching roles. A much smaller number of academics focus mainly on research, or mainly on teaching. Depending on your ultimate aim, you may follow slightly different pathways:

- Research and teaching academic roles
- Research focused academic roles
- Teaching focused academic roles

Academic careers overseas

Many academics spend time outside their home country to gain wider experience and to help establish an international reputation. If you are considering spending part of your academic career outside Ireland, these external resources may help explain alternative pathways and career considerations.

Academic Careers Observatory, Careers by Country (European University Institute)

www.eui.eu/.../academiccareersobservatory/index.aspx

This website provides an excellent description of academic careers in almost forty countries, including EU and non-EU countries.

Academic Career Maps in Europe (League of European Research Universities)

http://www.leru.org/index.php/public/extra/careermapseurope/

This website provides a visual representation of academic career pathways for a number of European countries.

Pathways to 'research and teaching' academic roles

In specific subjects, a common route to getting a permanent 'research and teaching' lecturing job (whilst staying within academia) is: Undergraduate degree, Masters degree, PhD, post-doctoral research post, research fellowship, Lecturer.

Funding

Research Councils, universities, charities, foundations, trusts, professional bodies and overseas governments may offer funding awards. Generally, the number of funding awards for science subjects is greater than for the arts and social sciences, and there are less opportunities for funding at masters level than PhD. To maximise your chance you should apply to as many sources of funding as possible.

- Ask your prospective university - if Research Council or institutional funding such as bursaries or scholarships is available they will advertise it, usually on their websites
- Contact the course admissions tutor and enquire if any specific funding awards are available. He/she should be able to outline how students who completed the course have funded their studies.

SUPPORT FUNCTIONS within the Marine Sector

Within the Marine sector there is a countless amount of career prospects for those who do not have a scientific or engineering background or a desire to work outside or at Sea! Finance, Human Resources, Administration, Customer Service, Public Relations, Marketing, Facilities or IT, to name a few, are all support functions within companies which are needed for it to run smoothly.

What do support staff do?

There are many different functions within the area of support:

- The finance department within many companies are responsible for invoicing, budgeting, payroll, tenders and much more.
- Human Resources takes care of all the recruitment and selection needs of the company, as well as learning & development requirements, performance management, compensation and benefits etc
- Public Relations and Communications are responsible for handling media queries, press releases, running educational or corporate events and using new media channels in the promotion of the company. Marketing departments are responsible for the branding of the company and getting the companies name known.
- IT support takes care of all communications equipment, develops and maintains databases where each department keeps all information that is generated, troubleshooting equipment, maintaining intranet and extranet sites and external websites. Software development is another function of IT within companies and is discussed on page 24.

What about entry, training and qualifications?

As support services cover such a large variety of areas there are a huge variety of courses to choose from. Business degrees, FAS courses, adult education courses to PhD's and many in between have a range of courses suited to support services within a company. It is worth keeping in mind work experience is also important in this area and any time spend in the field you are interested in will be of help when starting your career.

ENTRY REQUIREMENTS

Find out what subjects you will need at leaving cert level, or equivalent, for the career that you are interested in. When choosing what to do it's particularly important to seek advice for the career you are interested in. In your school, college or local career service library, consult up to date further and higher education prospectuses, course reference books, websites and databases.

The information below gives you an overview of the National Framework of Qualifications, summary of third level courses available and training opportunities within Ireland.

Third level education in Ireland is made up of four sectors, the Universities (7 colleges), the Institutes of Technology (14 colleges), the Colleges of Education (5 colleges), and independent Private colleges. The first three are substantially State funded and take part in the government free fees scheme, whereas Private colleges are all fee paying.

Qualifications in Ireland are included in the National Framework of Qualifications www.nfq.ie. Third level courses (undergraduate) can lead to qualifications at 3 NFQ Levels depending mainly on the time needed to achieve the required skills and knowledge for the award as follows:

NFQ Level 6 – Higher Certificate, two years full time

NFQ Level 7 – Ordinary Bachelors Degree, three years full time

NFQ Level 8 – Honours Bachelors Degree, normally three or four years full time, sometimes more.

Minimum Entry requirements – Universities

National University's of Ireland (University College Dublin, University College Cork; NUI Galway; NUI Maynooth); **University of Limerick;Trinity College Dublin; Dublin City University.** The current minimum entry requirement for the universities listed above is generally 6 subjects, including English, Irish and a third language. In 2 of these subjects, students must have achieved grade C at Higher Level.

Minimum Entry requirements - Institutes of Technology

- Level 8 (Honours Degree) courses: students generally require a minimum of grade C in 2 subjects at Higher Level and grade D in 4 other subjects, including Maths and Irish/English.
- Levels 6 and 7 (Higher Certificate and Ordinary Degree): students require 5 grade Ds, including Maths and Irish/English.
- Minimum Entry requirements - Institutes of Technology - Colleges of education require a minimum of 3 grade Cs on Higher-Level papers, including Irish, and three grade Ds, including Maths and English.

MARINE SCIENCE and some of the related courses in Ireland

Please see http://www.cao.ie/courses.php for information on course qualifications. A brief overview is provided below.

NUIG

Bachelor of Science (Marine Science): This is a four-year degree leading to a BSc Honours. At the end of the degree, students will have improved their knowledge about the marine environment and will have developed thinking, practical and personal skills.

NUIG Degree

Honours Bachelor (Earth and Ocean Sciences): Earth and Ocean Sciences involve the study of the physical processes that affect our planet and its oceans. In this field, you will study areas that are topical, such as climate change and the management and conservation of our oceans.

Galway-Mayo IT

Degree - Ordinary Bachelor Applied Freshwater and Marine Biology: Study an exciting mix of subjects including Marine Biology, studies of rivers and lakes, ecology and zoology.

IT Sligo

Degree - Honours Bachelor Environmental Science: Managing the environment is critical for the future of the planet and mankind. This course presents exciting opportunities and challenges to contribute to this important endeavour.

IT Sligo

Degree - Ordinary Bachelor Science in Energy, Sustainability & the Environment: The modules on this course begin with diversity of life, the environment around us, ecological methods, earth science, introduction to renewable energies, chemistry, biology and information technology.

MARINE SCIENCE and some of the related courses in Ireland Cont...

IT Sligo

Higher Certificate in Science in Fisheries Management: This course provides practical and theoretical training in different areas of fisheries management including the aquatic environment, fish biology, fisheries development and protection.

UCC

Masters in Applied Science - Marine Biology: This MSc programme trains and educates graduates in multiple areas of Marine Biology and to provide an understanding of the disciplines which impinge upon these areas in order to meet the growing demand for such personnel at home and abroad.

UCC

BSc Biological and Chemical Sciences: Biological and Chemical Sciences is the largest and most flexible entry area in Science, with eleven degree streams available through it.The programme is designed to foster an inter-disciplinary approach across a wide range of biological, biotechnology, medical, chemical, pharmaceutical and ecological research areas.

Ulster University - Coleraine

The marine science degree is for you if you are fascinated with our marine and coastal environments. The seas and oceans play an increasingly important role in our daily lives, influencing global climate and weather patterns, providing a source of food, minerals and materials.

Trinity College

B.A.I. (Hons) Engineering: The B.A.I. (Engineering) degree programme is based on two years of general engineering, followed by two years of specialisation.

Cavan Institute

Level 5 Certificate in Applied Ecology: Certificate in Environmental Science - Sustainable Development: This course is ideally suited to students who wish to prepare themselves for employment in the many industries to the Environment. Diminishing water supplies, climate change, threats to biodiversity, sustainable living, alternative energy and energy conservation are among the areas which will see huge increases in employment.

Limerick IT

Bachelor of Science Environmental & Chemical Analysis: This programme will enable you to work in the chemical or environmental section of the pharmaceutical, chemical, food or biotechnology industries; local authorities and other regulatory bodies. These industries are worth in excess of €40 billion a year to Ireland and a significant number of the employees are third level graduates.

TRAINING AND WORK EXPERIENCE Opportunities within Ireland

Cork Institute of Technology's NMCI

National Maritime College is the designated national centre for the education and training of personnel for the Merchant Navy and is Ireland's only Nautical College. The National College of Ireland offers degree courses in Nautical Science and Marine and Plant Engineering and a Certificate in Navigational Studies (Seamanship) which will suit school leavers and those with experience of working aboard merchant ships or fishing vessels.

SMART PROGRAMME

Science@Sea The Strategic Marine Alliance for Research and Training (SMART) is a marine science partnership programme designed to further develop capacity in carrying out offshore operations on board research vessels for third level students of marine-related science and technologies. Science@Sea courses provide undergraduate and postgraduate students with the opportunity to gain practical experience in carrying out marine science research offshore. The two-day intensive ship-based training courses provide a multidisciplinary ecosystem approach to studying the marine environment using core marine disciplines including oceanography, benthic ecology, fisheries biology and geoscience. Courses are recognised by the Institute of Marine Engineering, Science and Technology (IMarEST) as contributing towards the continuous professional development (CPD) of marine scientists. Science@Sea courses are run each autumn. You can be notified of upcoming courses by contacting ***smart@gmit.ie*** to be added to the mailing list.

Marine Institute Graduate training opportunities

The Stagiaire Scheme, a Graduate Work Experience Programme, offers recent graduates (in the last two years) a 50 week contract. We provide valuable work experience and learning & development opportunities in a range of business areas from science to technical and administration areas that support their securing employment in the future. Additionally all Stagiaires participate in a training programme that includes developing communication skills; personal development programmes; planning & organisation skills; Health & Safety in the Workplace and a variety of on the job training activities. They are also supported in their transition from the programme into the work place via an outplacement programme that aids with CV preparation, interview skills and job searching. Positions advertised on the Marine Institute's website www.marine.ie

Marine Institute Bursar Scheme

The summer bursary scheme is a work experience programme aimed at undergraduates of Universities, Institutes of Technology and National Institutes for Higher Education. The Bursary Scheme is strictly limited to undergraduates who have completed 2 years study in a relevant discipline. Bursaries are offered for an eight week paid work period during the summer holidays across a range of our business areas. Information is circulated in January each year to universities and colleges and the information on each bursary available can be found on the Marine Institute website www.marine.ie (from January annually) or speak to your careers officer for further information.

Marine Institute Cullen Fellowship

The Cullen Fellowship programme provides research training opportunities for scientists in marine and related disciplines leading to master's and PhD degrees. Set up in memory of Anne Cullen (1958-2013), who made a significant contribution to the work of the Marine Institute over 35 years, the Cullen Fellowship provides fellowships to postgraduates to work on projects relevant to the Marine Institute whilst studying for a higher degree. The Fellowships may be offered in all areas of Marine Institute research activity . More information on the Cullen Fellowships can be found at http://www.marine.ie/Home/site-area/research-funding/research-funding/marine-institute-cullen-fellowships

USEFUL INFORMATION

The Irish Maritime Development Office
www.imdo.ie

Part of the Marine Institute is Ireland's first dedicated development, promotional and marketing agency for the shipping services sector. They have a dedicated website promoting careers at sea www.maritimecareers.ie that has lots of ideas about the diverse range of employment roles available to suit individuals both at sea and on-shore.

The Strategic Marine Alliance for Research and Training (SMART)
www.smartseaschool.com

Smart is a marine science partnership programme designed to further develop capacity in carrying out offshore operations on board research vessels for third level students of marine-related science and technologies.

The National Maritime College of Ireland
www.nmci.ie

The National Maritime College of Ireland provides degree courses in Nautical Science and Marine and Plant Engineering and a Certificate in Navigational Studies (Seamanship) which will suit school leavers and those with experience of working aboard merchant ships or fishing vessels.

Marine Institute
www.marine.ie

The Marine Institute is the national agency responsible for Marine Research, Technology Development and Innovation (RTDI). We seek to assess and realise the economic potential of Ireland's 220 million acre marine resource; promote the sustainable development of marine industry through strategic funding programmes and essential scientific services; and safeguard our marine environment through research and environmental monitoring.

SmartOcean Cluster
www.smartocean.org

The SmartOcean cluster was launched in 2010, with the goal to harness Ireland's natural marine resources and specialist expertise in Marine Science and ICT and to establish Ireland as a leader in the development of high value products and services for the global marine sector.

Smartbay Ireland
www.smartbay.ie

Smartbay Ireand was formed in 2012 and is the company dedicated to the operation and development of the Smartbay Platform - Ireland's national facility for Marine ICT.

The Irish Whale and Dolphin Group (IWDG)

http://www.iwdg.ie

IWDG is dedicated to the conservation and better understanding of cetaceans (whales, dolphins and porpoise) in Irish waters. The Group was founded in 1990 to establish an Irish stranding and sighting scheme and to campaign for the declaration of Irish territorial waters as a whale and dolphin sanctuary.

Qualifax™

www.qualifax.ie

Qualifax is the National Learners' Database. It provides information on a wide range of courses across further and higher education and training. It includes a range of useful tools such as an events calendar, interest assessment and information on student grants. Qualifax became part of the National Qualifications Authority in January 2008.

Europass

www.europass.ie

is an initiative which aims to help you make your skills and qualifications clearly and easily understood in Europe - whether you are enrolling in an education or training programme, looking for a job, or getting experience abroad.

The Institute of Marine Engineering, Science & Technology

http://www.imarest.org

Was established in London in 1889, is the leading international membership body and learned society for marine professionals, with over 15,000 members worldwide. The IMarEST has a strong international presence with an extensive marine network of 50 international branches, affiliations with major marine societies around the world, representation on the key marine technical committees and non-governmental status at the International Maritime Organization (IMO).

Qualifications Recognition

http://www.qqi.ie

Qualrec provides information on the level of Irish qualifications on the National Framework of Qualifications (NFQ).

For information on how your Irish qualification may be viewed abroad, staff in the ENIC-NARIC network will be able to help.

Careers Advice, Grants and Volunteering

Careers Advice

http://www.careersportal.ie
The website provides access lots of careers ideas. Click a career title to see all the information available. This site has several new and enhanced features where you now have the facility to create and update your own career 'Action Plan'. You can plan your ongoing education and training in line with your identified career. You can view up-to-date Labour Market Information on occupations/careers including trends and future skills needs.

http://www.imca-int.com/careers/overview.html
The imca-int.com website promotes offshore safety, addresses technical matters and on a variety of other issues as well as a brief guide to marine contracting and a range of exciting opportunities in careers zone.

http://www.careersportal.ie/
The careersportal.ie is Ireland's national careers portal. This site brings together a wide range of career related information aimed at career seekers, career guidance professionals as well as careers information for those at secondary school, third level students and working people.

Grants

Irish Deck & Engine Merchant Navy Cadets

Ireland now offers an excellent source of high quality Deck and Engineering Officer Cadets to meet the future needs of the shipping industry. Once accepted to Nautical College, Irish Cadets undergo training to their 1st Certificate of Competency. Financial support from the Irish Governments seafarer-training scheme (ISEAS 1) is available to companies to provide a training berth to cadets. A training grant may be available to cover all costs for mandatory training courses.

The Irish Maritime Development Office

The IMDO invites applications from companies and individuals seeking funding to support qualified students following an approved training programme leading to a higher certificate of competency at the National Maritime College of Ireland.

International Maritime Internships

http://www.maritimecareers.ie/onshore-careers/Pages/Index.aspx

Autumn and Winter are the traditional application dates for internships. There are a number available in the international Maritime industry e.g. ABS, BP, Shell, Clarkson, etc.

The Student Grant

http://www.studentfinance.ie/

This is the main source of financial assistance and anyone who is thinking of embarking on further study should investigate whether they are eligible, and, if so, submit an application. The Student Grant section of studentfinance.ie is the most comprehensive source of information about the available schemes that you will find anywhere in Ireland. They also provide information on course fees and details on eligibility requirements for free fees. In addition, you will find out all you need to know about other sources of assistance for students, such as the Fund for Students with Disabilities, the Back to Education Allowance and the Student Assistance Fund.

Volunteering

Voluntary Maritime Training

Are you looking for something different and want to know more about seafaring? There are a number of voluntary organisations in Ireland which can provide unique insights into the vast range of opportunities within maritime careers. You must be 17 years+.

Naval Service Reserve

http://www.military.ie/reserve/organisation/naval-service-reserve

The Naval Service Reserve (NSR) trains men and women to supplement and aid the Naval Service. Contact 021 4864700 or email nsrcadre@eircom.net for more details.

The RNLI Charity

http://www.rnli.org.uk/rnli_near_you/ireland

Provide a 24-hour lifeboat search and rescue service around the coasts of the ROI and UK. The RNLI also works to promote sea and beach safety.

Irish Coast GuardVolunteers

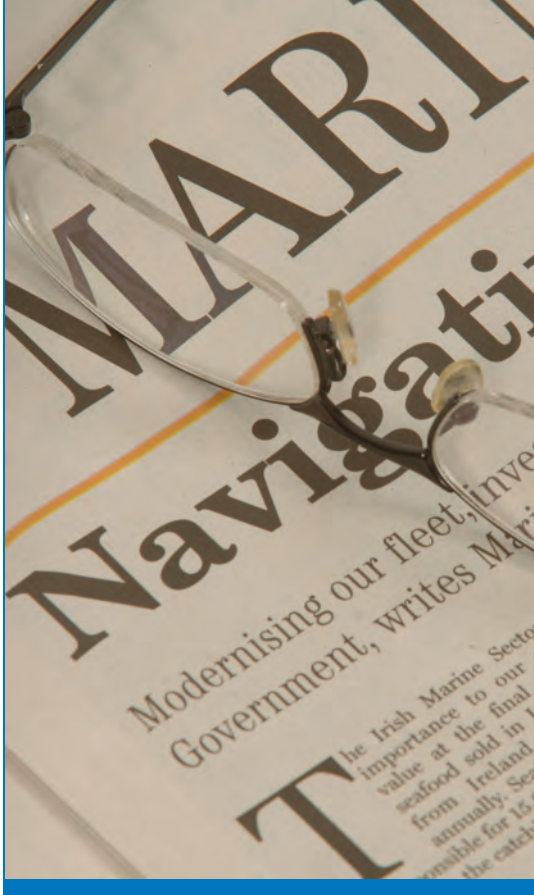
http://www.dttas.ie

The Irish Coast Guard (IRCG) is a nationwide emergency organisation and is a division of the Department of Transport. Enrolement application forms for voluteering can be downloaded from the website and sent to admin@irishcoastguard.ie

Secondary Schools - Sea Scouts (From 6 years+)

https://en.wikipedia.org/wiki/Scouting_Ireland

Since the launch of the one programme, Sea Scouts follow the same scheme as the rest of Scouting Ireland with a focus on water activities. The scout section follow the spirit of Adventure with Tom Crean the famous Irish seaman and Antarctic explorer. From an activity perspective the scouts have Adventure Skills badges. There are 9 skills, Sailing, Rowing, Paddling, Emergencies, Camping, Pioneering, Backwoods, Hillwalking and Air with 9 levels within each of these skills. Other skills can be pursued with Special Purpose Awards which allow the Sea Scout to incorporate activities like snorkeling, power-boating etc.



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