Graduate Skills – the view from a Professional Body and Learned Society

- IMarEST is The Institute of Marine Engineering, Science and Technology; the international professional body and learned society for all marine professionals.
- We are the first Institute to bring together marine engineers, scientists and technologists into one international multi-disciplinary professional body.
- IMarEST is the largest marine organisation of its kind with a worldwide membership based in over 120 countries.
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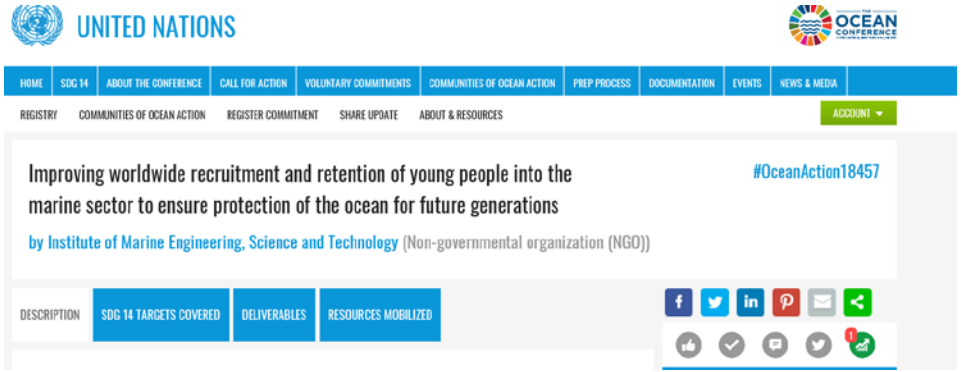


Questions for the panel :-

- How is the workforce evolving?
- What impact will that have on the skills and competencies needed by graduate students?
- How employers can assist, during formal education, co-curricular opportunities, professional development activities, or other means?
- What training should be a responsibility for the employer post-graduation versus what do employers expect students to have when they graduate?
- How can graduate students demonstrate that they have developed skills and competencies?

SKILLS REQUIRED BY EMPLOYERS

1. Data Management
2. Multidisciplinary
3. Risk and Uncertainty
4. Fieldwork
5. Translating Science
6. Numeracy
7. Sustainability Science
8. Modelling
9. Taxonomy
10. Energy Supply
11. Soil Science

- Applied oceanography
- Climate change science
- Coastal engineering
- Coastal geomorphology
- Descriptive physical oceanography
- Engineering
- Environmental Impact Assessment
- Geographic Information Systems
- Health and Safety Awareness of operations in the marine environment
- Hydrography
- Legislation & Policy
- Marine ecology and ecosystems
- Marine planning
- Matlab and other programming languages
- Offshore Renewables
- Seamanship and nautical knowledge
- Taxonomy

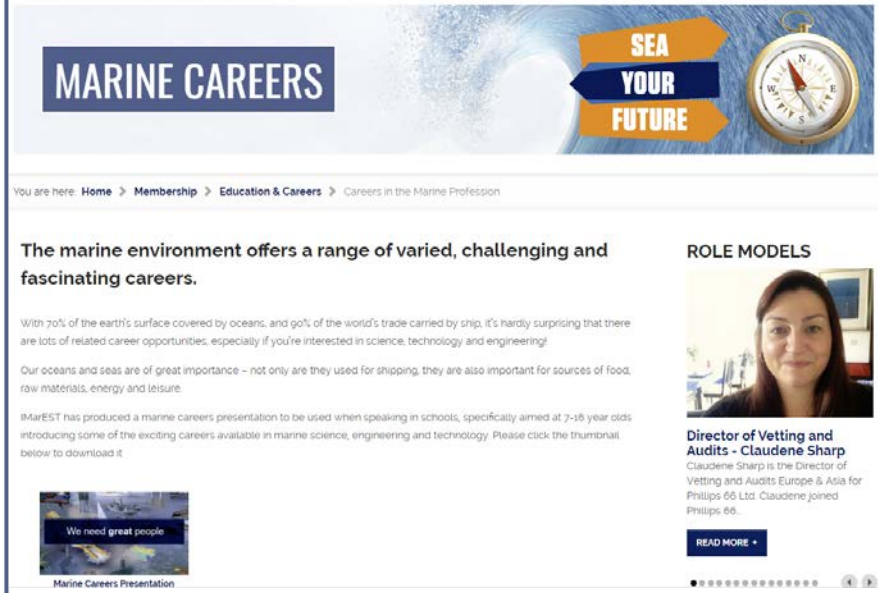
WHO IS RESPONSIBLE?

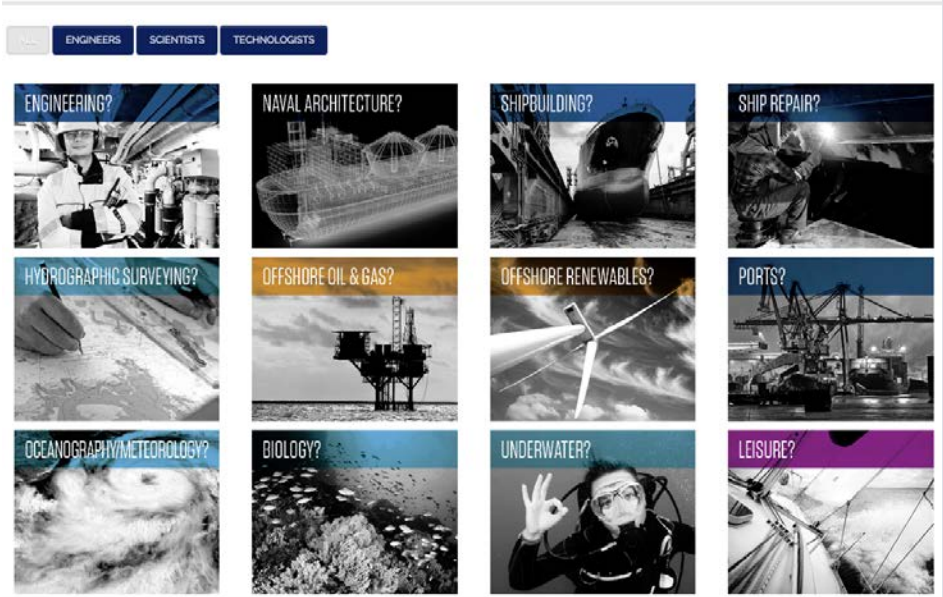
Skill	Primary Provider	Secondary Provider	Tertiary Provider
Critical and analytical thinking	Academic Learning	Work Experience	Professional Bodies
Research methods	Academic Learning	Work Experience	Professional Bodies
Advanced IT skills	Academic Learning	Work Experience	Hobbies and Other Interests
Presentation skills	Academic Learning	Work Experience	Volunteering
Foreign language	Academic Learning	Hobbies & Other Interests	Work Experience
Problem solving	Academic Learning	Work Experience	Hobbies and Other Interests
Numeracy	Academic Learning	Work Experience	
IT/computer literacy	Academic Learning	Work Experience	Hobbies and Other Interests
Willingness to learn	Academic Learning	Work Experience	Volunteering
Self-awareness	Hobbies & Other Interests	Work Experience	Academic Learning/Volunteering
Networking	Professional Bodies	Work Experience	Academic Provide/Volunteering
Planning and organisation	Work Experience	Academic Learning	Volunteering
Time management	Work Experience	Academic Learning	Volunteering
Project management	Work Experience	Academic Learning	Professional Bodies
Group/team working	Work Experience	Academic Learning	Volunteering
Initiative	Work Experience	Volunteering	Academic Learning
Interpersonal skills	Work Experience	Volunteering	Hobbies and Other Interests
Communication	Work Experience	Academic Learning	Volunteering
Leadership	Work Experience	Volunteering	Academic Learning
Customer service	Work Experience	Professional Body	Volunteering
Flexibility	Work Experience	Volunteering	Academic
Commitment/motivation	Work Experience	Academic Learning	Volunteering
Commercial awareness	Work Experience	Professional Body	Academic Learning

Provision of Non-Technical Skills

"Employers were asked to determine who they felt had the responsibility for ensuring that marine scientists they recruit have or are developing the non-technical skills required by the workforce. **Nearly all employers felt that the basic non-technical skills should be developed during the period of academic learning** with some suggested that these skills should be developed in the period of early education (i.e. pre University or College for example). This is contradictory to the results provided by **individuals that suggested a mix between employer and academic provider would be required**"

MARINE CAREERS





https://www.imarest.org/membership/education-careers/careers-in-the-marine-profession

BUILDING CAREERS MATRICES

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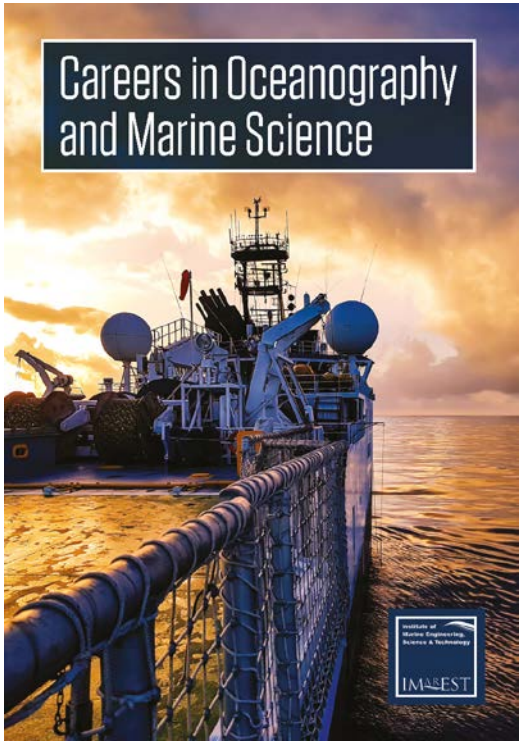

	EXAMPLE ACTIVITIES	KEY SKILLS AND EXPERIENCE
Metocean Consultant	▪ Metocean strategy for offshore/coastal developments ▪ New approaches to data analysis ▪ Technical report writing ▪ Data analysis	▪ Applied oceanography ▪ Detailed understanding of specific metocean processes ▪ Knowledge of engineering design and operating codes/ standards.
Numerical modeller	▪ Forecast / hindcast numerical models (atmospheric, waves, hydrodynamics) ▪ Data analysis ▪ Data assimilation ▪ Coding ▪ Technical report writing	▪ Applied maths ▪ Good understanding of meteorological and/or oceanographic processes ▪ Computational skills
Physical modeller	▪ Scale model testing of e.g. wave structure interaction ▪ Data analysis ▪ Technical report writing	▪ Applied maths ▪ Good understanding of oceanographic processes
Forecaster	▪ Weather forecasting ▪ Ocean forecasting ▪ Synoptic analysis ▪ Analysis and interpretation of measurements ▪ Offshore meteorology	▪ Meteorology ▪ Oceanography
Metocean Analyst	▪ Quality control ▪ Project management and review of numerical studies ▪ Project management and review of metocean measurement campaigns ▪ Statistical data analysis ▪ Metocean process interpretation ▪ Technical report writing	▪ Numerate ▪ Good grounding in meteorology and oceanography ▪ Statistics ▪ Extreme value analysis ▪ Critical thinking, understanding of end applications
Data Scientist	▪ Data management ▪ Application of big data and analytics ▪ Using SCADA control system and other data protocols	▪ Data science, exposure to analytics, cleansing, etc. ▪ Data visualisation
Technical Author	▪ Writing equipment user manuals, etc.	▪ Good literary skills combined with technical knowledge

	EXAMPLE ACTIVITIES	KEY SKILLS AND EXPERIENCE
Research Scientist	▪ Novel data analysis or modelling. ▪ Development of new observation techniques ▪ Development & testing of hypotheses and fundamental understanding of air-sea-ice interactions. ▪ Publication of results in peer-reviewed journals	▪ Theory of meteorological and/ or oceanographic processes ▪ Applied maths and statistics ▪ Curiosity ▪ Scientific writing skills ▪ Ability to obtain competitive funding ▪ Ability to be self-critical and accept criticism
Field Oceanographer	▪ In-situ observations, sampling, deployment & recovery of instruments and sensors, working from ships or platforms	▪ Physical or chemical oceanography, applied physics, mathematics, understanding of mechanical and electronic systems. ▪ Ability to work at sea. ▪ Resourcefulness
Software developer	▪ Web displays ▪ Data processing software ▪ GIS knowledge	▪ Computer science with focus on front end or back end. ▪ Mathematics ▪ Signal processing
Instrumentation engineer	▪ Product development ▪ Calibration / maintenance ▪ Deployment	▪ Electronics design ▪ Practical ▪ Spending time at sea
Systems engineer	▪ Instrumentation integration ▪ Satellite systems ▪ Autonomous systems ▪ Using SCADA control system	▪ Electronics, networking ▪ Systems engineering
Project Manager	▪ Project planning and team coordination ▪ Logistics ▪ Budgeting and financial reporting. ▪ Risk assessments	▪ Organisational skills ▪ Good communication ▪ Leadership skills ▪ Negotiation
Sales/Business Development	▪ Business development ▪ Tendering ▪ Sales engineer	▪ Outgoing personality ▪ Numerate, attention to detail ▪ Communication
Trainer	▪ Trainer ▪ Experience	▪ Personable ▪ Patient

STUDENT MEMBERSHIP IS FREE!

https://www.imarest.org/membership-application/student-application

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www.imarest.org

WHY JOIN AS A STUDENT MEMBER?

Free Student membership is available for undergraduates, postgraduates, cadets, apprentices and trainees for the duration of their studies. Join now to develop your knowledge and skills, and build networks for a career in the marine industry.

- Enhance your job prospects and earning potential by demonstrating your commitment to initial professional development by using the post nominals *SIMarEST* (on business cards, CV & email signatures) and boosting your skill-set through training and education.
- Be better connected by meeting and networking with other like-minded professionals and students through Nexus (member-only network) or joining a student section.
- Apply for funding and awards like student bursaries to support your research and learning.

After your studies, join the Graduate Pathway as an Associate Member (*AIMarEST*) with the chance to engage in technical activities, and the opportunity to gain interim or professional registration (such as CEng, CSci and CMarTech) which reflects your experience and professional competence.

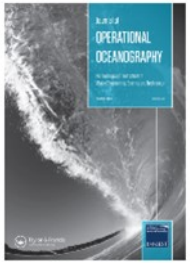
LEARNING AND RESOURCES

Ask IMarEST

Our member query service where we will help to answer any technical questions you may have relating to marine engineering, science and technology.

The Digital Archive

A searchable, evolving digital archive of full-text content unlocking over 120 years of IMarEST published material online.



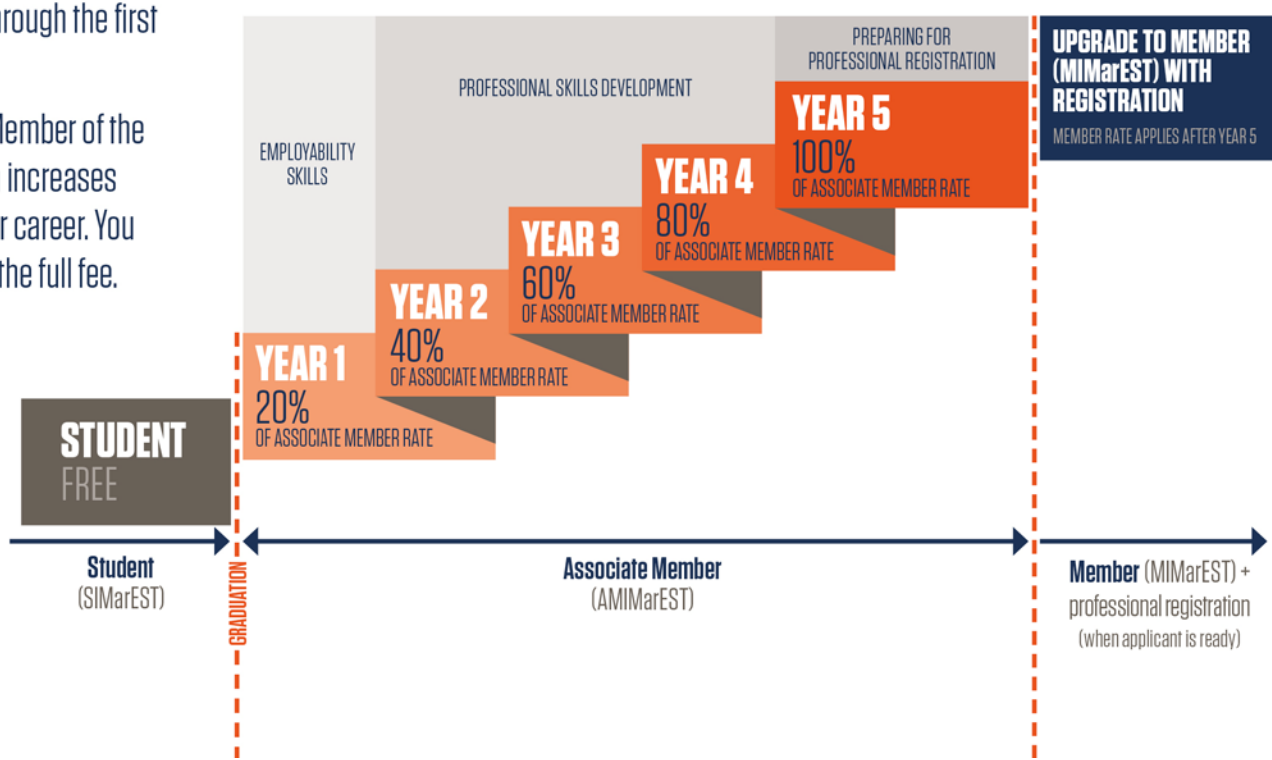
THE MARINE PROFESSIONAL

WHAT IS THE 5-YEAR GRADUATE PATHWAY?

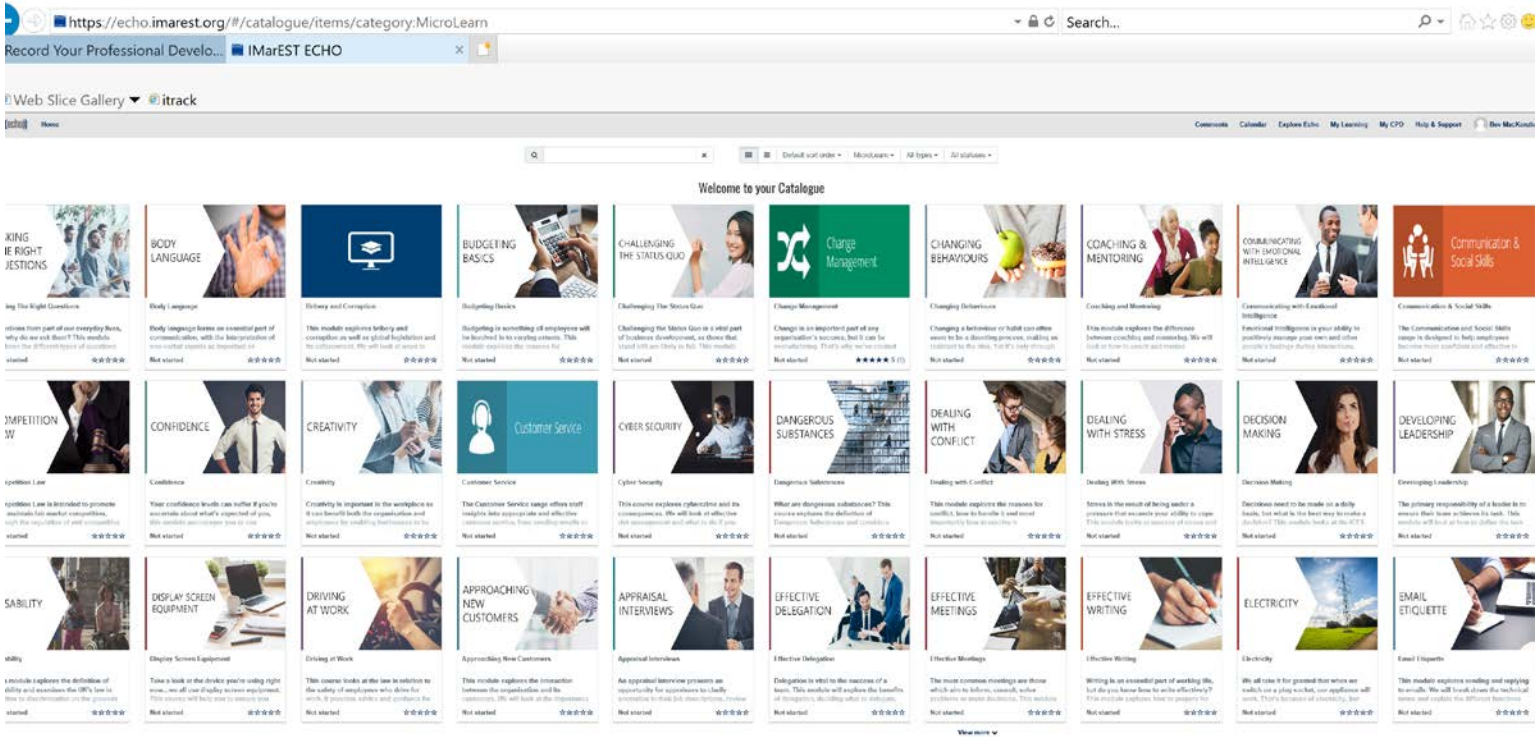
One of our core aims as a learned society is to develop the next generation of marine experts. To help us do this, we have developed a graduate pathway to guide you through the first five years of your career.

It means that you can become an Associate Member of the IMarEST for a significantly reduced fee (which increases gradually each year) for the early years of your career. You will get all the same benefits as those paying the full fee.

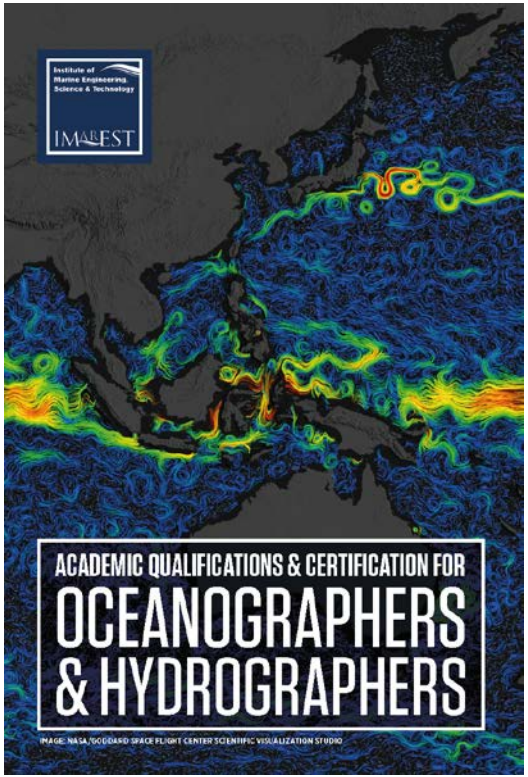
Alongside this, we have a developed a support plan to help you develop your employability skills, your professional skills and prepare you for applying for professional registration (Technician, Registered/Incorporated, Chartered status) over the five years.



ONLINE IPD MANAGEMENT



PROFESSIONAL RECOGNITION



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Email seayourfuture@imarest.org