



भारत सरकार/GOVERNMENT OF INDIA  
पत्तन, पोत परिवहन और जलमार्ग मंत्रालय  
MINISTRY OF PORTS, SHIPPING AND WATERWAYS  
नौवहन महानिदेशालय, मुंबई  
DIRECTORATE GENERAL OF SHIPPING, MUMBAI

DGS Circular No. 09 of 2022 [EAC Branch (Engineering)]	
File No. 13-40/1/2022-ENGG-DGS	Date: 12 <sup>th</sup> April, 2022
<b>Subject: Recommendatory guidelines for inclusion of multi-disciplinary courses in Marine Engineering stream from academic year 2022-2023 – reg.</b>	

The International Maritime Organization (IMO) based on the proposal of Member states has initiated a key strategic direction plan to integrate new and advancing technologies in the marine regulatory frame work. Accordingly, IMO has initiated Regulatory Scoping Exercise (RSE) for the use of Marine Autonomous Surface Ships (MASS) and set target completion year to deploy goal-based instrument for MASS suitable for all identified four degrees of autonomy by the year 2025.

Recalling the global education development reflected in the Goal 4 (SDG4) of the 2030 Agenda for Sustainable Development, adopted by India in 2015, seeks to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” by 2030. Towards achieving this goal there is a need to reconfigure the existing education system to support and foster learning, so that the critical targets and goals (SDGs) of the 2030 Agenda for Sustainable Development can be met.

Recalling further that in accordance with the Merchant Shipping (Maritime Labour) Rules, 2016 the Directorate, as the Indian Maritime Administration, has been entrusted with the responsibilities to encourage career and skill development and employment opportunities for seafarers, to provide the maritime sector with a stable and competent workforce for the upcoming technological developments.

Noting that the world is undergoing rapid changes in the knowledge landscape and that there have been various dramatic scientific and technological advances, such as the rise of big data, machine learning, and artificial intelligence and that they are being gradually introduced into the ships machinery and control system and that many unskilled jobs worldwide likely to be taken over by machines. Hence there is a need for a skilled work force to cater upcoming technology which will be in greater demand in the years to come.

Noting further that India being a prominent manpower supplying nation needs to take proactive approach in ensuring Indian seafarers are provided with learning opportunities in the latest developments.

Having Considered above, this Directorate now—

1. ENCOURAGES all the D.G approved Maritime institutes to incorporate courses set forth in Annexure from the academic year 2022-23 in the 4-yearmarine engineering degree program and the one-year Marine Engineering Course for Graduates (GME) program.
2. REQUESTS all the maritime institutes to develop suitable course curriculum incorporating the subjects outlined in Annexure while ensuring relevant requirements of accredited bodies, IMO Model course 7.02 &7.04 are duly complied with. Further, it is also to be ensured that students are not overworked in any of the semesters to complete these recommended courses.
3. ADVISES all the maritime institutes to obtain necessary approvals from the accredited bodies so as to grant suitable multi-disciplinary degree certification for these additional courses.
4. This is issued with the approval of Director General of Shipping.



  
(Gopi Nandan Papineni)

Engineer & Ship Surveyor-cum-DDG (Tech)  
Directorate General of Shipping

**To**

All Maritime Institutes (Pre-Sea)

**Copy to**

- a) Sr. PS to DG
- b) Sr. PS to Additional DG
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## ANNEXURE

### a) Objective of these courses:

The objective is to facilitate Marine seafarers to seamlessly migrate into evolving autonomous world midway in their careers or to perceive it parallelly during their extended leave periods. The list of subjects (8 no's) outlined in this Annexure will ensure students who undergo these courses attain basic overview of key elements required for the latest autonomous ship technology.

### b) List of courses:

S. No	Subject(s) / Topic(s)	Course Content	Remarks / Suggestions
1	Computer Fundamentals and Networking	As prescribed in All India Council for Technical Education (AICTE) or Indian Maritime University (IMU)	<ul style="list-style-type: none"><li>Part of B.Tech/ GME Curriculum or National Programme on Technology Enhanced Learning (NPTEL)</li><li>NPTEL Ref Code: NOU20_cs03 [<a href="https://onlinecourses.swayam2.ac.in/nou20_cs03/preview">https://onlinecourses.swayam2.ac.in/nou20_cs03/preview</a>]</li></ul>
2	Computer programming language	As prescribed in AICTE or IMU	<ul style="list-style-type: none"><li>Part of B.Tech /GME Curriculum or NPTEL</li><li>NPTEL Ref Course: Introduction to Problem Solving and Programming [<a href="https://archive.nptel.ac.in/courses/106/102/106102066/">https://archive.nptel.ac.in/courses/106/102/106102066/</a>]</li></ul>
3	Statistics and data analysis using python and R	As prescribed in AICTE or IMU	<ul style="list-style-type: none"><li>Part of B.Tech Curriculum/GME or NPTEL</li><li>NPTEL Ref Courses:<ol style="list-style-type: none"><li>Python Basics: [<a href="https://nptel.ac.in/courses/106106145">https://nptel.ac.in/courses/106106145</a>]</li><li>Python for Data Analysis [<a href="https://nptel.ac.in/courses/106107220">https://nptel.ac.in/courses/106107220</a>]</li><li>R Programing: [<a href="https://onlinecourses.nptel.ac.in/noc21_ma75/preview">https://onlinecourses.nptel.ac.in/noc21_ma75/preview</a>]</li></ol></li></ul>
4	Artificial Intelligence	As prescribed in AICTE or IMU	<ul style="list-style-type: none"><li>Part of B. Tech Curriculum /GME or NPTEL</li><li>NPTEL ref code: noc22-cs56</li></ul>
5	Machine Learning	As prescribed in AICTE or IMU	<ul style="list-style-type: none"><li>Part of B.Tech Curriculum/GME or NPTEL</li><li>NPTEL ref code: noc22-cs24</li></ul>
6	Internet of Things (IOT)	As prescribed in AICTE or IMU	<ul style="list-style-type: none"><li>NPTELrefcode:noc22-cs53</li></ul>
7	Computer Security. (Information Security)	As prescribed in AICTE or IMU	<ul style="list-style-type: none"><li>NPTELrefcode:noc22-cs23 [<a href="https://nptel.ac.in/courses/106106129">https://nptel.ac.in/courses/106106129</a>]</li></ul>
8	Computer Architecture	As prescribed in AICTE or IMU	<ul style="list-style-type: none"><li>NPTEL(RefCode:noc22-cs15) [<a href="https://nptel.ac.in/courses/106106166">https://nptel.ac.in/courses/106106166</a>]</li></ul>

### c) Course implementation guidelines

1. The Course content shall be designed on topics defined in AICTE or IMU syllabus and shall be limited to over view of the topic.
2. The duration of each course shall be at least 15 hours (considering 1 hour per week for a 15-week semester). This is taking into consideration the existing Marine Engineering curriculum and co-opting the new courses.
3. The following methodologies may be adopted to include the subjects as part of curriculum:
  - i. Design and frame syllabus as part of the B. Tech/GME curriculum and obtain approval of DGS and concerned University, as applicable.
  - ii. Universities can approve relevant NPTEL course and the marks awarded by NPTEL certification can be credited towards fulfillment of the B. Tech Program without any changes in the existing DGS approved programs. In such cases, no further approval from D.G Shipping is required as the existing D.G approved course is not diluted.
  - iii. GME program to include the topics mentioned under Para (b) i.e., 8 no's of subjects as part of electives wherein at least 4 subjects need to be completed.
  - iv. GME candidates who have completed any of the topics mentioned under Para (b) in their earlier 4-year B. Tech program may be exempted from re-doing those topics.
  - v. Courses to be designed and developed with relevant assignment/project-based learning & assessment to enable application of learning.
4. NPTEL ref codes suggested in the remarks column of Para (b) are given for information purpose and any equivalent or updated courses may also be incorporated.
5. In view of New Educational Policy 2020 on multi-disciplinary education, it is envisaged that most of the courses may become redundant in coming years and hence this circular shall be reviewed based on inputs received from stakeholders.

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