



भारतीय समुद्री विश्वविद्यालय INDIAN MARITIME UNIVERSITY

(Central University, Govt. of India)

HEADQUARTERS

IMU-HQ/CA/18/19/2023-Minor Degree

30-01-2024

Circular No. 2401

Sub: Regulations for award of optional Minor Degree along with B.Tech. (Marine Engineering) Degree Programme.

Ref: 1. EC Agenda No: EC 2023-74-08 of 74th EC meeting held on 12.12.2023.
2. AC Agenda No: AC 2023-38-17 of 38th AC meeting held on 29.11.2023.

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The Executive Council resolved to approve the following regulations for award of optional Minor Degree along with B.Tech. (Marine Engineering) Degree Programme.

REGULATIONS FOR AWARD OF OPTIONAL MINOR DEGREE ALONG WITH B.TECH. (MARINE ENGINEERING) DEGREE PROGRAMME

This Regulation is applicable to the students admitted to B.Tech. (Marine Engineering) Degree Programme at Indian Maritime University and institutes affiliated to it, from the academic year 2023-24 onwards.

1. PRELIMINARY DEFINITIONS AND NOMENCLATURE

In these Regulations, with reference to the context of Minor Degrees:

- (a) "Controller of Examinations (COE)" means the authority of the University who is responsible for all activities of the End semester Examinations of the University.
- (b) "Course" means a theory or practical course that is normally studied in a semester, like Mathematics, Chemistry etc.
- (c) "Head of the Department (HOD)" means Head of the Department of IMU campuses/affiliated institutes offering B.Tech Marine Engineering programme.
- (d) "Minor Degree" means a secondary area of specialization that can be pursued along with the programme.
- (e) "NPTEL" means National Programme on Technology Enhanced Learning, an Indian e-learning platform for university-level science, technology, engineering, and mathematics (STEM) subjects.

(f) "Programme" means B.Tech. (Marine Engineering) Degree Programme.

(g) "University" means INDIAN MARITIME UNIVERSITY.

2. OBJECTIVES

The objectives of offering a Minor Degree with B.Tech. Degree are to allow students to formally explore and expand their domain knowledge in other disciplines of engineering, in order:

(a) To provide students with additional skills and knowledge that may enhance their competitiveness and employability in sector specific job markets, keeping in view the need of the hour for interdisciplinary expertise.

(b) To provide an opportunity for students to explore and pursue different fields of study in addition to their own Major (i.e. Marine Engineering).

(c) To enable students build knowledge and skills in areas that are identified as emerging technologies or thrust areas of engineering.

3. MINOR DEGREES OFFERED

(a) Minor Degrees are offered in Electronics Engineering, Electrical Engineering and Mechanical Engineering at present.

(b) Presently, the additional courses (Additional credits for Minor Degrees) to be offered shall be identified from NPTEL offerings. The list of NPTEL courses (Core and Electives) and their respective credit weightage offered for each Minor Degree viz. Electronics Engineering, Electrical Engineering and Mechanical Engineering, are enclosed as Annexure-1, Annexure-2, and Annexure-3 respectively.

(c) A student can opt for only one Minor Degree along with the Major programme.

(d) The options will be periodically reviewed and expanded to include other streams.

4. ACADEMIC REGULATIONS

(a) Pursuing a Minor Degree in addition to the Major Degree programme is the student's decision, and should be aligned with a student's educational and career goals.



(b) For acquiring B.Tech. Marine Engineering Degree with a Minor Degree, a student needs to earn an additional 18 credits (over and above the required credits for B.Tech. Marine Engineering programme).

(c) The subjects available for Minor Degree are given in Annexure 1-3 of this regulation. Students who are interested in Minor Degree should opt for 4 mandatory Core subjects and at least 2 electives to fulfil the requirement of 18 credits. Under each Core subject, students are permitted to choose one of the given courses. For each Minor Degree, a bouquet of electives (of 2 or 3 credits) shall be on offer. Students can choose electives from the list offered.

(d) Students enrolled for a Minor Degree are required to start their Minor Degree courses from the commencement of 2nd semester and should have successfully completed the courses for the chosen Minor Degree from the NPTEL portal, before the commencement of 8th semester. Possible paths to take up these courses are mentioned in Annexure-4.

(e) Minor Degree must be completed simultaneously with a Major Degree programme. A student cannot earn the Minor Degree after he/she has already earned his/her B.Tech. Marine Engineering.

(f) A student can graduate with a Minor Degree only if he/she fulfils the requirements for his/her regular B.Tech. Marine Engineering programme as well as the requirements for the Minor Degree.

(g) Transfer of credits from a Minor Degree courses to regular B. Tech. Marine Engineering programme courses and vice-versa shall not be permitted.

5. ELIGIBILITY

(a) A student should not have any backlog at the end of 1st semester to be eligible for the Minor Degree option.

(b) Prior approval of the Head of the Department of respective institution for the enrolment into Minor Degree is mandatory.

6. COURSE REGISTRATION & FEES

(a) The interested students shall submit their names along with the Minor Degree of their choice (Electronics, Electrical or Mechanical) through the concerned HOD within 10 days of the publication of their 1st semester results.

(b) The Head of the Department will announce the list of students eligible for pursuing the Minor Degree and submit the final consolidated list

of eligible students for information and records to the office of the Controller of Examinations of the university.

(c) The students shall pay the applicable fee online to IMU.

(d) Any expenses incurred towards the courses on NPTEL platform (for Minor Degree) are to be met by the students in accordance with instructions on NPTEL portal. IMU shall not bear responsibilities for the same. The students should familiarise themselves with the NPTEL guidelines.

7. RESULTS AND AWARD OF MINOR DEGREE

(a) After obtaining the requisite credits for Minor Degree, the students are to submit their NPTEL certificates for completion to the Head of the Department.

(b) The results of NPTEL courses (after verification of the certificates submitted by the students) will be uploaded in the IMU portal at the end of the 7th semester (i.e., before commencement of 8th semester) by the respective Campus Directors/Principals of Affiliated Institutes of IMU.

(c) The students successfully completing the Minor Degree shall be awarded with the Degree designated as "B.Tech. Marine Engineering with Minor Degree in (Field specialization)".

Example: Students successfully completing B.Tech. Marine Engineering with Minor in Mechanical shall get a Degree as "B.Tech. Marine Engineering with Minor Degree in Mechanical".

8. These regulations shall come into force for the students who have joined the university from the Academic Year **2023-24**.

Note:

1. FAQs on Minor Degree Programme – B.Tech (Marine Engineering) is available on the website.


CONTROLLER OF EXAMINATIONS

To:

All Campus Directors of IMU/ Principals of Affiliated Institutes

Copy to:

1. Vice Chancellor
2. Pro- Vice Chancellor
3. Registrar/CoE
4. FO (i/c)
5. DR (A,L&S)/ AR(Academics)
6. IT - for uploading the same in IMU website
7. File

ELECTRONICS							
Core/ Elective	Course Name	Duration	SME Name	Institute	NPTEL ID	credits	domain
Core 1	Network Analysis	12 weeks	Prof. Tapas Kumar Bhattacharya	IIT Kharagpur	108105159	3	Power Systems and Power Electronics
	Fundamentals of Power Electronics	12 weeks	Prof. Vivek Agarwal Prof. L Umanand	IISc Bangalore	108101126	3	Power Systems and Power Electronics
Core 2	Microprocessors and Microcontrollers	12 weeks	Prof. Santanu Chattopadhyay	IIT Kharagpur	108105102	3	Control and Instrumentation
	Linear System Theory	12 weeks	Prof. Ramkrishna Pasumarthy	IIT Madras	108106150	3	Control and Instrumentation
Core 3	Information Theory	12 weeks	Prof. Himanshu Tyagi	IISc Bangalore	108108168	3	Communication and Signal Processing
	Analog Communication	12 weeks	Prof. Goutam Das	IITKGP	117105143	3	Communication and Signal Processing
Core 4	Semiconductor Devices And Circuits	12 weeks	Prof Sanjiv Sambandan	IISc Bangalore	108108112	3	VLSI Design
	Power Management Integrated Circuits	12 weeks	Prof. Qadeer Ahmad Khan	IIT Madras	108106159	3	VLSI Design
Elective 1	Digital Signal Processing	12 weeks	Prof. C. S. Ramalingam	IIT Madras	108106151	3	Communication and Signal Processing
Elective 2	Principles and Techniques of Modern Radar Systems	12 weeks	Prof. Amitabha Bhattacharya	IIT Kharagpur	108105154	3	Communication and Signal Processing
Elective 3	Microelectronics: Devices to Circuits	12 weeks	Prof. Sudeb Dasgupta	IIT Roorkee	108107142	3	Control and Instrumentation
Elective 4	Analog Electronic Circuit	12 weeks	Prof. Shouribrata Chatterjee	IITD	108102112	3	Control and Instrumentation
Elective 5	Optical Engineering	12 weeks	Prof. Shanti Bhattacharya	IIT Madras	108106161	3	Photonics
Elective 6	Optical Fiber Sensors	12 Weeks	Prof Balaji Srinivasan	IITM	108106173	3	Photonics
Elective 7	Applied Linear Algebra	12 weeks	Prof. Andrew Thangaraj	IIT Madras	108106171	3	Control and Instrumentation
Elective 8	Mathematical Aspects of Biomedical Electronic System Design	12 Weeks	Prof. Chandramani Singh	IISc Bangalore	108108180	3	Control and Instrumentation
Elective 9	Semiconductor Opto-electronics	12 Weeks	Prof. M.R. Shenoy	IIT Delhi	115102103	3	Photonics
Elective 10	Introduction to Photonics	12 weeks	Prof. Balaji Srinivasan	IIT Madras	108106135	3	Photonics

ELECTRICAL

Core/ Elective	Course Name	Duration	SME Name	Institute	NPTEL ID	credits	domain
Core 1	Control System Design	12 weeks	Prof. G R Jayanth	IISc Bangalore	115108104	3	Control and Instrumentation
	Control Engineering	12 Weeks	Prof. Ramkrishna Pasumarthy	IITM	108106098	3	Control and Instrumentation
Core 2	Electromagnetic Theory	12 weeks	Prof. Pradeep Kumar K	IITK	108104087	3	Photonics
	Applied Electromagnetics For Engineers	12 weeks	Prof. Pradeep Kumar K	IIT Kanpur	108104099	3	Photonics
Core 3	Probability Foundations For Electrical Engineers	12 weeks	Prof. Krishna Jagannathan	IITM	108106083	3	Communication and Signal Processing
	Signals and Systems	12 weeks	Prof. Kushal K. Shah	IISER Bhopal	108106163	3	Communication and Signal Processing
Core 4	Power System Protection	12 weeks	Prof. Ashok Kumar Pradhan	IIT Kharagpur	108105167	3	Power Systems and Power Electronics
	DC Power Transmission Systems	12 weeks	Prof. Krishna S	IIT Madras	108106160	3	Power Systems and Power Electronics
Elective 1	Fiber Optic Communication Technology	12 weeks	Prof. Deepa Venkitesh	IIT Madras	108106167	3	Photonics
Elective 2	Design Of Photovoltaic Systems	12 weeks	Prof. L Umanand	IISc	117108141	3	Photonics
Elective 3	Control and Tuning Methods in Switched Mode Power Converters	12 Weeks	Prof. Santanu Kapat	IIT Kharagpur	108105180	3	Power Systems and Power Electronics
Elective 4	Power Quality	12 Weeks	Prof. Bhim Singh	IIT Delhi	108102179	3	Power Systems and Power Electronics
Elective 5	Industrial Instrumentation	12 weeks	Prof. Alok Barua	IIT Kharagpur	108105064	3	Control and Instrumentation
Elective 6	Power Electronics	12 weeks	Prof. G. Bhuvaneshwari	IIT Delhi	108102145	3	Power Systems and Power Electronics
Elective 7	Power System Engineering	12 weeks	Prof. Debapriya Das	IIT Kharagpur	108105104	3	Power Systems and Power Electronics
Elective 8	Power system analysis	12 weeks	Prof. Debapriya Das	IIT Kharagpur	117105140	3	Power Systems and Power Electronics
Elective 9	Network Analysis	12 weeks	Prof. Tapas Kumar Bhattacharya	IIT Kharagpur	108105159	3	VLSI Design
Elective 10	Fundamentals of semiconductor devices	12 weeks	Prof. Digbijoy N. Nath	IISc Bangalore	108108122	3	VLSI Design

Mechanical							
Core/ Elective	Course Name	Duration	SME Name	Institute	NPTTEL ID	credits	Comments
Core 1	Vibrations of structures	12 weeks	Prof. Anirvam Dasgupta	IIT Kharagpur	112105197	3	It is core group of vibration subject, which are most important syllabus of
	Dynamic Behaviour of Materials	12 weeks	Prof. Prasenjit Khanikar	IIT Guwahati	112103278		
	Acoustic and Noise Control	12 weeks	Prof. Abijith Sarkar	IIT Madras	112106225		
Core 2	Fundamentals of Combustion	12 weeks	Prof. V. Raghavan	IIT Madras	112106299	3	It is core group of Thermal, this subjects caters need for industry
	Transport Processes I: Heat and Mass Transfer	12 weeks	Prof. V. Kumaran	IISc Bangalore	103108123		
	Energy conservation and waste heat recovery	12 weeks	Prof. Prasanta Kumar Das Prof. A Bhattacharya	IIT Kharagpur	112105221		
Core 3	Theory of Production Processes	12 weeks	Prof. Pradeep K. Jha	IIT Roorkee	112107239	3	It is core group of Manufacturing and production engineering
	Manufacturing Systems Technology I & II	12 weeks	Prof. Shantanu Bhattacharya	IIT Kanpur	112104188		
	Product Design and Manufacturing	12 weeks	Prof. J. Ramkumar	IIT Kanpur	112104230		
	Principles of Industrial Engineering	12 weeks	Prof. D K Dwivedi	IIT Roorkee	Course ID not available in July'23		
Core 4	Aqueous Corrosion and Its Control	12 weeks	Prof. V. S. Raja	IIT Bombay	113101098	3	It is core group of Metallurgy science
	Mechanical Behaviour of Materials (Part - I)	12 weeks	Prof. Shashank Shekhar Prof. Sudhanshu Shekhar Singh	IIT Kanpur	113104104		
Elective 1	Non-Conventional Energy Resources	12 weeks	Prof. Prathap Haridoss	IIT Madras	121106014	3	
Elective 2	Surface Engineering For Corrosion And Wear Resistance Application	12 weeks	Prof. Indranil Manna Prof. Jyotsna Dutta Majumdar	IIT Kharagpur	Course ID not available in July'23	3	
Elective 3	Finite Element Method: Variational Methods To Computer Programming	12 weeks	Prof. Atanu Banerjee Prof. Arup Nandy	IIT Guwahati	Course ID not available in July'23	3	
Elective 4	Surface Engineering of Nanomaterials	8 weeks	Prof. Kaushik Pal	IIT Roorkee	Course ID not available in July'23	2	
Elective 5	Power Plant Engineering	8 weeks	Prof. Ravi Kumar	IIT Roorkee	Course ID not available in July'23	2	
Elective 6	Basics Of Finite Element Analysis - I	8 weeks	Prof. Nachiketa Tiwari	IIT Kharagpur	Course ID not available in July'23	2	
Elective 7	System Design for Sustainability	12 weeks	Prof. Sharmistha Banerjee	IIT Guwahati	107103081	3	
Elective 8	Machinery Fault Diagnosis and Signal Processing	12 weeks	Prof. Amiya Ranjan Mohanty	IIT Kharagpur	112105232	3	
Elective 9	Operations Management	12 weeks	Prof. Inderdeep Singh	IIT Roorkee	112107238	3	
Elective 10	Welding Metallurgy	12 weeks	Prof. Pradeep K. Jha	IIT Roorkee	113107092	3	
Elective 11	Techniques of Material Characterization	12 weeks	Prof. Shibayan Roy	IIT Kharagpur	113105101	3	
Elective 12	Numerical Methods for Engineers	12 weeks	Prof. Niket S Kaisare	IIT Madras	127106019	3	
Elective 13	Introduction to robotics	12 weeks	Prof. Asokan T Prof. Balaraman Ravindran Prof. Krishna Vasudevan	IIT Madras	107106090	3	
Elective 14	Technologies for clean and renewable energy production	12 weeks	Prof. P. Mondal	IIT Roorkee	103107157	3	
Elective 15	Nonlinear Vibration	12 weeks	Prof. S. K. Dwivedy	IIT Guwahati	112103300	3	

Minimum Total credits

18

Three paths to achieve this minor

Path 1	
Sem 1	
Sem 2	1 Core
Sem 3	1 Core
Sem 4	1 Core
Sem 5	1 Core
Sem 6	1 Elective
Sem 7	1 Elective
Sem 8	

Path 2	
Sem 1	
Sem 2	1 core
Sem 3	1 core
Sem 4	1 core
Sem 5	1 core+1Elective
Sem 6	1 Elective
Sem 7	
Sem 8	

Path 3	
Sem 1	
Sem 2	
Sem 3	2 core
Sem 4	2 core
Sem 5	2 Electives
Sem 6	
Sem 7	
Sem 8	

N.B: Electives subjects worth 6 credits to be completed by choosing either 2 subjects of 3 credits or 3 subjects of 2 credits respectively.