



## JOINING INSTRUCTIONS INDIAN STUDENTS (OFFICERS)



**NATIONAL INSTITUTE OF HYDROGRAPHY  
C/O HEADQUARTERS, GOA NAVAL AREA  
VASCO DA GAMA – 403 802  
GOA, INDIA**

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**CHAPTER 1****WELCOME**

Dear Student,

**0101** I take this opportunity to congratulate you on your selection for the course and extend you a warm welcome. These instructions are being sent to you with a view to help you prepare better for the course and also for your stay at National Institute of Hydrography, Goa. You may study these instructions carefully, as they contain vital information about the station, the Institute, course contents, methodology of instructions and other important information.

**0102** At National Institute of Hydrography, our prime commitment is towards achieving the highest possible quality of training in the field of Hydrography and Allied Studies. The staff at National Institute of Hydrography strives to impart an optimal combination of Study, Adventure activities, Fun and Games to the students for the entire duration of the course. The course also helps you develop an intimate understanding of professional subjects such as Bathymetric data collection and processing, Nautical Charting, Coastal Zone Management and Industrial Offshore Surveys in addition to important HRD aspects of creativity, innovation, teamwork, physical fitness and self discipline.

**0103** Your role as a student has become more demanding with the increasing responsibility of handling the expanding horizons of technological applications in the field of Hydrography. It is therefore expected of you to come here adequately prepared to undergo the course. The standard of your preparation for the course would be assessed by your performance in the Entry Level Knowledge Test conducted within the first five days of your reporting to the Institute. The National Institute of Hydrography provides an ideal setting for studies, with its peaceful and tranquil environment and vibrant academic spirit.

**0104** My staff and I once again wish you a very happy, pleasant and fruitful stay at Goa.

Officer-in-Charge  
National Institute of Hydrography

## CHAPTER 2

### ABOUT THE NATIONAL INSTITUTE OF HYDROGRAPHY, INDIA

#### Introduction.

**0201** The National Institute of Hydrography was established at Mumbai in 1959. The Institute was shifted to Kochi in 1961 and from there to its present location at Alparqueiros Hill overlooking Mormugao Harbour at Vasco-da-Gama in the state of Goa in 1977. At this institute we train all categories of personnel involved in the field of Hydrographic surveying. This institute conducts various courses, specially tailored for different categories of personnel from the National Hydrographic Departments, and other maritime and port organisations, both Indian and international.

**0202** The institute is recognised as the Regional Training Centre in Hydrography for the countries of the Indian Ocean Region. Personnel from Bangladesh, Iran, Iraq, Malaysia, Nigeria, Oman, Seychelles, Mauritius Singapore, Sri Lanka, Maldives, Myanmar, Kenya, Indonesia, Sudan, Tanzania Vietnam & Thailand have been trained in this institute. Being an institute of international standing, we also receive very distinguished visitors from India and abroad. The students are given opportunities to interact with the dignitaries visiting the institute.



#### Location.

**0203** The National Institute of Hydrography is situated within the premises of the local naval base, namely INS Gomantak, atop the Alparqueiros Hill, in Vasco-da-Gama.

Vasco-da-Gama is a bustling port town in the state of Goa, and is situated on the south bank of Zuari river mouth. The town has a very rich maritime culture and is also very cosmopolitan in nature. Here you will come across people from all religious and social backgrounds and from various states of India and abroad. Mormugao Port, as the local seaport is known, is one of the major ports of India, capable of handling a wide range of cargo. However, the port specialises in iron-ore shipment. The Alparqueiros Hill where the institute is located overlooks this port and the estuary of Zuari river. The institute is about 5 kilometres from Dabolim Airport and is well connected by road.



### **Climate.**

**0204** The tropical climate in Goa is quite pleasant round the year with plenty of sunshine, except for the period of monsoons. The monsoon season, from June to September, is the period of heavy rainfall, and during this season Goa exudes a special charm. The average temperature normally lies between 17 C (Min.) and 38 (Max.). The place gets about 2610 mm of rainfall in a year. Goa guarantees a good time for all, irrespective of the time of one's visit. The details on various tourism attraction in India can be obtained from the following sites:-

- (a) [tourism.gov.in](http://tourism.gov.in)
- (b) [incredibleindia.org](http://incredibleindia.org)
- (c) [tourismofindia.com](http://tourismofindia.com)

## ORGANISATION AND TRAINING

### Command and Control.

**0205** The National Institute of Hydrography is under the direct control of the Flag Officer Commanding-in-Chief, Southern Naval Command, Kochi for all matters of training. For all professional matters pertaining to Hydrographic Surveying, the institute is guided by the Chief Hydrographer to the Government of India. The Flag Officer Commanding Goa Naval Area exercises local operational command at Goa. Commanding Officer INS Gomantak provides necessary local administrative support to the institute.



**0206** National Institute of Hydrography functions under an Officer-in-Charge of the rank of Captain. The Officer-in-Charge of the institute is assisted by a Chief Instructor of the rank of Commander who is responsible for conduct and management of the training in the institute. The Institute has a highly qualified teaching faculty, consisting of 8 officers and 15 senior sailors. In addition, specialists in Hydrography and allied fields from various reputed institutions are invited as guest faculty from time to time for delivering lectures to the students.

**Course Officer.**

**0207** An Officer from the teaching staff will be designated as the Course Officer for a particular course. Your Course Officer will meet you, in person, on your arrival at the institute. Course Officer shall deal with all the administrative, personal and training matters of the course.

**Course Instructor.**

**0208** A sailor-instructor is designated as the Course Instructor for a particular course. The Course Instructor will interact with you on a day to day basis. He will be contact person for all your administrative requirements. Course Instructor may be contacted for seeking any assistance, e.g. Postal, Photocopying requirements, purchase of stationery etc.

**Class Leader.**

**0209** The senior most officer in each class will carry out the duties of the class senior. In addition one officer will be nominated as class leader per week in rotation. Some of the important duties of the class leader include: -

- (a) To maintain order and discipline of the class when no instructor is present.
- (b) To conduct class from place to place for instructional purposes, in an orderly manner.
- (c) Prepare the class room for the next instruction.
- (d) Know the whereabouts of the class/individuals.
- (e) To report to the instructors as per the training programme when the class is ready.
- (f) Maintaining the course diary.

**CONTACT INFORMATION****Telephone.**

**0210** The area code for Vasco-da-Gama is 0832. The National Institute of Hydrography can be called directly on 0091-0832- 2582808 which is manned through day and night. You may also call Naval Base (Gomantak) Exchange on any of the following telephone numbers: 0091-0832-2513950, 2513951, 2511531 to 2511540, which in turn will connect up the extension number you require. The extension number for NIH is 2808. Some of the important telephone numbers are as follows:

Officer-in-Charge	-	+91 832 2582800,
Chief Instructor	-	+91 832 2582802
Duty Personnel, NIH	-	+91 832 2582808
Officer of the Day, INS Gomantak-		+91 832 2582720
Fax	-	+91 832 2513419

**Postal Information.**

**0211** The institute's postal address is:

**National Institute of Hydrography  
C/o Headquarters, Goa Naval Area  
Vasco-da-Gama Goa - 403 802 (India)  
E-Mail address: [info-nih.goa@nic.in](mailto:info-nih.goa@nic.in)  
Web : [www.nih.gov.in](http://www.nih.gov.in)**



## **CHAPTER 3**

### **ADMINISTRATION**

#### **PREPARATION PRIOR TO ARRIVAL**

**0301** Some of the preparations that you are expected to make prior departing your country are elaborated in succeeding paragraphs.

#### **Educational Qualification Certificate**

**0302** You must bring your educational qualification certificate (B.Sc./B.E./B.Tech) issued by the University in original.

#### **ELKT.**

**0303** Students would be required to undergo an Entry Level Knowledge Test on reporting for the course. You are expected to be thorough in the knowledge of previous level course attended (Basic H). You will be tested for your knowledge on various aspects of Hydrography like Hydrographic Control, Hydrographic Practice and Tides etc. You are advised to prepare yourself for this test.

### **ARRIVAL AND STAY**

#### **Arrival.**

**0304** The National Institute of Hydrography is situated within the premises of the local naval base, namely INS Gomantak, atop the Alparqueiros Hill, in Vasco-da-Gama which is about 5 kilometres from Dabolim Airport and is well connected by road. NIH is about 2 kms from the Vasco railway station and 25 kms from Madgaon railway station. Prepaid taxi services are available from the airport/railway station to INS Gomantak.

#### **Reception.**

**0305** Based on your MOVEREP arrangements will be made to pick you up from the railway station/airport if the MOVEREP is made at least six working days in advance. On arrival you will be received by a representative of National Institute of Hydrography, who will be in Naval Uniform. Trainees arriving by buses/taxis or those arriving without prior notification are advised contact any of the following on telephone, at any time of day or night, if facing difficulties to get to the Institute:-

- |     |                                  |   |                      |
|-----|----------------------------------|---|----------------------|
| (a) | Officer of the Day, INS Gomantak | : | 2513950/51 Ext. 2720 |
| (b) | Duty Staff at Institute          | : | 2582808              |

### **Accommodation.**

**0306** Inliving officers will be provided accommodation at the Goa Naval Area Mess, which is located just next to the institute. They will be charged for this accommodation and messing at the prescribed rates. You are requested to familiarise yourself with the Goa Naval Area Officer's Mess rules on arrival. All officers automatically become members of the Goa Naval Area Mess on reporting. The bills are to be cleared by Cheque/ cash on or before the 10th day of every month. The married naval officers with families may also be allotted married accommodation as per the current quartering rules and waiting period.

### **Clothing.**

**0307** You are to be in possession of summer uniforms including ceremonial uniforms as applicable to your service, at the time of reporting to the National Institute of Hydrography. Sufficient stocks of uniform accessories like cap badges, buttons and stripes should be carried as these are not available in India. You will be required to attend formal parades and mess functions, hence requirement of good ceremonial uniforms need no further emphasis. In addition Long H officers will be required to be in possession of winter uniforms during their attachment to NHO, Dehradun. You are also required to be in possession of sufficient items of games rig. In Goa, tropical clothing is required throughout the year. A list of clothing required is placed at **Appendix A.**

## CHAPTER 4

### CONDUCT OF COURSES

**0401** The Long 'H' course offered by this institute have been recognized as **Category 'A'** course in ***Nautical Charting Surveys, Surveys for Coastal Zone Management and Industrial Offshore Surveying*** by the *IHO-FIG Advisory Board on Standards of Competence for Hydrographic Surveyors*. On successfully completing the Long 'H' course, the officers possessing the requisite qualification at graduate level and considering the credit points which are duly approved by the university will be awarded with Post Graduate Diploma in Hydrography by the Goa University. Alternatively, if the student officer has also completed his Basic Hydrography Course at this Institute, he will be awarded with Master of Science Degree in Hydrography instead of Post Graduate Diploma. The aim and details regarding other eligibility and duration of the course are given in the succeeding paragraphs.

#### Aim.

**0402** The aim of the Long Hydrographic Course is to train officers to effectively undertake all the tasks pertaining to conduct of Hydrographic Survey and off-shore surveys for nautical charting, coastal zone management and industrial requirements and subsequent production of nautical charts and publications including electronic charts. On completion of the course they will be able to independently plan and execute Hydrographic Surveys as Senior Hydrographic Surveyor onboard Survey Ships.

#### Eligibility and Entry Level Qualifications.

**0403** The Officers selected to undergo this course should meet the following minimum criteria:-

- (a) A Bachelor of Science (BSc.) Degree/ Bachelor of Engineering (BE)/ B Tech or equivalent Nautical Background degree from a recognized University.
- (b) Have qualified Basic Hydrographic course in India or equivalent from any other International Hydrographic Organisation (IHO) recognized category 'A' / 'B' institute or equivalent, from a country other than India.
- (c) Holder of a valid Bridge watch keeping certificate or equivalent commercial certification obtained onboard a seagoing vessel with commensurate nautical and seamanship knowledge.  
Or  
Commensurate knowledge of nautical navigation and seamanship experience in vessel handling, onboard coastal crafts and inland water transport.
- (d) Must have a 3 to 5 years experience in Hydrographic surveying onboard a hydrographic survey vessel or at a shore based hydrographic survey unit suitably equipped with survey launches/ craft capable of undertaking all types of coastal/

inshore hydrographic surveying operations.

- (e) A working knowledge in computers and standard application software.
- (f) Be proficient in English, as medium of instruction in the institute is English.

### **Duration.**

**0404** The duration of the Long Hydrographic Course for international students will be 39 weeks. Details of the same are as follows:-

<b>Duration Weeks</b>	<b>Period</b>	<b>Remarks</b>
04	31-03-16 to 30-04-16	Pre course refresher for int students only
23	02-05-16 to 08-10-16	Prof phase including 02 weeks Attachment to NIO.
04	10-10-16 to 05-11-16	NIH practical phase
02	07-11-16 to 19-11-16	Leave. Midterm break
02	21-11-16 to 02-12-16	NHO, Dehradun
09	06-12-16 to 04-02-17	MWC (Kochi)
0.5	06-02-17 to 08-02-17	C-LABS, Kochi
0.5	09-02-17 to 11-02-17	SEAMANSHIP SCHOOL
03	13-02-17 to 04-03-17	SNOM, Kochi
0.5	06-03-17 to 08-03-17	NIH for O/G/ DE-REG/POC

### **Award of Post Graduate Diploma/ MSc (Hydrography).**

**0405** The Long Hydrographic Course at NIH, in addition to being a category 'A' course recognized by the International Hydrographic Organisation (IHO), is also affiliated to the Goa University. On successful completion of the course the officer is awarded with Post Graduate Diploma in Hydrography by Goa University. If the student has also completed his Basic Hydrography Course at this Institute, he will be awarded with M.Sc. Degree in Hydrography instead of Post Graduate Diploma in Hydrography. This option is open to all students undergoing Long Hydrographic course who are eligible as per Goa University guidelines. Registration for Post Graduate Diploma /MSc (Hydrography) is subject to clearance from Goa University. The eligibility criteria for registration for Post Graduate Diploma/ MSc (Hydrography) in Goa University are as follows:-

- (a) Indian Naval Officers, Officers from friendly Foreign Navies and Civilian personnel of Port Trust, Minor Port Survey Organisations, Inland Waterways Authority of India and other Maritime Organisations from India and abroad, with B.E./ B.Tech degree / B.Sc.(with Maths & Physics) or equivalent with nautical background, shall be eligible.
- (b) International students who have completed Basic 'Hydro' Course (deemed equivalent to first two semesters) from any other International Hydrographic Organisation (IHO) recognised category 'A' / 'B' institute or equivalent, from a country other than India, shall be eligible to register with Goa University for award of Post Graduate Diploma. And if the student has completed his Basic 'Hydro' course from this institute, he will be eligible to register with Goa University for M.Sc. Degree in Hydrography. Both Diploma and Degree are subject to AIU clearance and transfer of credits.
- (c) Student officers should have 3 to 5 years of experience in the field of Hydrography.

### **Course Fee and Certificates**

**0406** The course fee for Post Graduate Diploma/ Master of Science (Hydrography) Degree is approximately INR. 10,000.00. It is mandatory for officers to carry their original certificates issued by various institutes/colleges/universities etc. related to their educational qualifications (Bachelor's Degree) and other courses qualified by them including institute/university leaving certificates and university migration certificate at the time of reporting for above course towards registration at Goa University for Post Graduate Diploma/Master of Science (Hydrography) Degree. The list of certificates required to enroll in the University for award of Diploma/MSc degree is as follows:-

- (a) Graduation Certificate issued by the University, including mark sheets for all the years clearly showing the various subjects.
- (b) Migration Certificate (In this certificate the previous University has to certify that the students had qualified in degree course and that the University has no objection for the student's admission to Goa University (India) for "M.Sc. (Hydrography)".
- (c) School/institute/University leaving Certificate (having proof of Date of Birth)
- (d) Post Graduation Certificate issued by the Goa University towards registration for MSc.
- (e) Any certificate of additional qualification.

**Course Curriculum.**

**0407** The main subjects which will be covered in the professional phase are given in **Appendix B**. Details of reference material / books which will be of use during the course is given in **Appendix C**.

**CONCLUSION**

**0408** With increasing responsibility which is a natural consequence of the expanding horizons of technological applications to Hydrographic surveying, your role as a student has become more demanding. The National Institute of Hydrography has a lot to offer you. Sincerity and diligence in your every endeavor will help you to get the best out of the training.

**0409** Finally, we wish you a happy time during your stay at Goa. It is hoped that you will fully utilise the facilities provided at this institute and conduct yourself in every sphere in such a way that both National Institute of Hydrography and your Navy are proud of you.

**0410 Wish You All the Best.**

### **GUIDE TO CLOTHING REQUIRED**

1. Tropical (white) uniform is worn throughout the year at Goa.
2. International students will need the following items of clothing during their stay at Goa:-
  - (a) Uniform A minimum of six sets of summer working dress, two sets of summer ceremonial dress and mess dress. For Long Hydrographic Course two sets of winter dress for attachment at National Hydrographic Office, Dehradun. (Patterns as prescribed by the rules of your country)
  - (b) Civil Lounge Suit, long sleeved shirts, necktie and casual wear appropriate to the local tropical climate.
  - (c) Sports Outfit White T-Shirt, white shorts and white gym shoes are compulsory.
3. Light woolen clothing may be required during December and January.

**MAIN SUBJECTS - LONG HYDROGRAPHIC COURSE**

<b><u>SL.</u></b>	<b><u>SUBJECT</u></b>
HC01	Concepts of Geodesy and Projection
HC02	Positioning Afloat
HC03	Water Levels and Flow
HC04	Offshore Surveying
HC05	Horizontal Control and Statistics
HC06	Vertical Control and Types of Surveys
HC07	Underwater Acoustics and Bathymetric Techniques
HC08	Maritime Legal Aspects
HC09	Hydrographic Data Management, Specification and practices
HC10	Project Survey
HC11	Case Study/ Professional Research Paper
HC12	Hydrographic Control, Hydrography To Support Port Management And Coastal Engineering
HC13	Nautical Charting Hydrography
HC14	Maritime Meteorology and Physical Oceanography

**Note:-**

- (a) HC 01 to HC 11 & HC 13 are major subjects  
HC 12 and HC 14 are minor subjects



**DETAILS OF REFERENCE MATERIAL**

1	Admiralty Manual of Hydrographic Surveying <b>Volume I &amp; II</b>
2	International Hydrographic Organization Special Publication S-44 <i>IHO Standards for Hydrographic Surveys</i> , 5th Edition, February 2008 <a href="http://www.iho.shom.fr/publicat/free/files/S-44_5E.pdf">http://www.iho.shom.fr/publicat/free/files/S-44_5E.pdf</a>
3	International Hydrographic Organization Publication C-13 <i>Manual on Hydrography</i> (2005, corrected December 2010) <a href="http://www.iho.shom.fr/PUBLICATIONS/download_M13.htm">http://www.iho.shom.fr/PUBLICATIONS/download_M13.htm</a>
4	Chapter 9: "Sonar" - <i>Digital Elevation Model Technologies and Applications: The DEM Users Guide</i> , by Lloyd Huff and Guy Noll, in the book edited by David Maune (2007), 2nd Edition, ASPRS publications, ISBN 1-57083-082-7 <a href="https://eserv.asprs.org/eseries/source/Orders/index.cfm">https://eserv.asprs.org/eseries/source/Orders/index.cfm</a>
5	Seabeam Multi-beam Sonar Theory of Operations Manual at <a href="http://www.mbari.org/data/mbsystem/sonarfunction/SeaBeamMulti-beamTheoryOperation.pdf">http://www.mbari.org/data/mbsystem/sonarfunction/SeaBeamMulti-beamTheoryOperation.pdf</a>
6	Chapter 11: "Acoustic multi-beam survey systems for deep-draft navigation projects" in the US Army Corps of Engineers <i>Hydrographic Engineer Manual</i> (2002, corrected Apr 2004) at <a href="http://140.194.76.129/publications/eng-manuals/em1110-2-1003/toc.htm">http://140.194.76.129/publications/eng-manuals/em1110-2-1003/toc.htm</a>
7	Chapter 11 "Sounding methods" by de Jong, Lachapelle, Skone & Elema (2003) <i>Hydrography</i> ISBN13: 978-90-407-2359-9 <a href="http://www.vssd.nl/hlf/landmeet.html#hydro">http://www.vssd.nl/hlf/landmeet.html#hydro</a>
8	The MB-System Cookbook <a href="http://www.mbari.org/data/mbsystem/mb-cookbook/index.html">http://www.mbari.org/data/mbsystem/mb-cookbook/index.html</a>
9	<i>Principles of underwater sound</i> , by R.J. Urick (1983) 3rd Ed. Peninsula Publishing, ISBN 0-932146-62-7 <a href="http://www.peninsulapublishing.com">http://www.peninsulapublishing.com</a>
10	Geodesy by G Bomford
11	Basic Geodesy by Rockville
12	Datums and Map Projection by J Iliffe
13	Elements of cartography by AH Robinson