

IHB File No. TA-6

**CIRCULAR LETTER 40 /2000**  
**15 September 2000**

**SECOND COURSE ON "NAUTICAL CARTOGRAPHY"  
AT THE INTERNATIONAL MARITIME ACADEMY (IMA),  
TRIESTE, ITALY**

Dear Sir,

The International Maritime Academy (IMA) in Trieste has informed the IHB, on behalf of the Italian Authorities, that a second course on "Nautical Cartography" has been scheduled in 2001.

The course will start on Monday 26 February 2001 and will end on 24 November 2001.

This second course is intended for twelve students from all countries. Government authorities responsible for Hydrography in their countries are requested to forward their candidates' applications to the International Maritime Academy (IMA), via Eduardo Weiss 15, 34127 Trieste, Italy (Telephone: +39 040 350829, Fax: +39 040 350322 and E-mail imoima@imoima.org) **through the ITALIAN EMBASSY in their country**, with a copy to the International Hydrographic Bureau. ***The nominations not sent to the Italian Embassies, will not be accepted,*** and therefore will not be taken into consideration for the selection. **Nominations must reach the IMA by 18 December 2000 at the latest.**

The support provided by IMA will cover travel expenses, local transport to Trieste, accommodation and food. **Money for other personal expenses (pocket money) must be provided by each STUDENT'S NATIONAL AUTHORITY. (See Annex 2, page 3).**

The course is of great importance for its objectives, its duration and the technical contents. It is hoped that the Hydrographic Community, and in particular the European Hydrographic Institutes are available and willing to give their support to IMA in terms of lecturers, on the basis of the requests which IMA will address directly to each country.

Information on the course programme and the logistics are provided in Annex 2. A copy of the Nomination Form is also attached (Annex 3).

On behalf of the Directing Committee,  
Yours sincerely,

Rear Admiral Giuseppe ANGRISANO  
President

- Annex 1 - Distribution list
- Annex 2 - Course Details & Logistics (in English only)
- Annex 3 - Nomination Form for Participation & Acceptance Form (in English only)

## **DISTRIBUTION LIST**

- All IHO Member States and the following countries:  
*Bangladesh, Bulgaria, Latvia, Israel, Madagascar, Malta, Mauritius, Mexico, Myanmar, Panama, Romania, Saudi Arabia, Seychelles, Slovenia.*
- EC DGVII Maritime Transport – Head of Division Mr. W. De Ruiter. Rue de la Loi 200, Brussels Belgium
- International Maritime Academy, Trieste, Italy. Via E. Weiss 15, 34127 Trieste, Italy
- Italian Ministry of Foreign Affairs, Directorate General for Cooperation to Development, Rome, Italy. Piazzale della Farnesina n°1, 00194 Rome Italy
- Italian Ministry of Foreign Affairs DGCS Ufficio XIII, viale Tiziano 80 – Rome, Italy
- Friuli-Venezia Giulia Region, Assessore Regionale ai Trasporti – Avv. W. Santarossa, via Giulia 75/1, 34125 Trieste, Italy.
- President of the Province of Trieste, Piazza Vittorio Veneto 4, 34132 Trieste, Italy.
- President of Trieste Port Authority, Punto Franco Vecchio, 34135 Trieste, Italy.
- University of Trieste – Magnifico Rettore, Piazzale Europa 1 (Rettorato), 34100 Trieste, Italy.
- President of Trieste Chamber of Commerce, Piazza della Borsa 14, 34100 Trieste, Italy.

## DETAILS OF THE COURSE

### Background

#### ▪ Requirements for the Course

At present nautical cartographers are trained at Hydrographic institutes through in-house training. This usually only applies, however, to Services with sufficient resources to make qualified nautical cartographers available for dedicated training requirements.

Generally speaking, HOs – having to deal with both traditional and innovative responsibilities - are usually affected by a lack of personnel, thus resulting in difficulties in providing didactic as well as production. Newly – established HOs obviously may not be in a position to engage in any in-housing training. It was therefore felt that there exists a need for an appropriate institution, capable of organizing and presenting courses for nautical cartographers, to proceed with the development of such a course (as was recently recommended by the IHB).

At present there is no nautical cartographic school in the Mediterranean area. It was recognized that in view of the ever developing automated cartographic technologies and the consequent pressures on the HO's to produce electronic nautical charts (ENC), a formal course in nautical cartography should be presented. The course should be offered by a recognized training institution and should offer subjects, of great interest to HO's, both for developed and for developing countries, in order to improve staff knowledge and introduce new technology.

#### ▪ Aim of the course and prospective users

The aim of the course is to train nautical cartographers, to be employed at Hydrographic Services and at other cartographic bodies, able to perform the following:

- Elaborate a cartographic scheme in accordance with local coastal morphology, maritime traffic and port features;
- Plan a new chart, selecting proper projection size and scale, in accordance with pertinent cartographic scheme;
- Evaluate extant hydrographic and topographic data, in order to produce charts with both traditional and electronic systems;
- Compile a new chart, using traditional means as well as computer aided cartographic systems, in compliance with INT specifications;
- Acquire working knowledge of photomechanical and printing techniques, in order to be able to understand and evaluate issues connected with the production of traditional charts;
- Convert a traditional chart into an electronic chart, by digitizing existing traditional charts in the standard format or alternatively, verifying – when necessary – a third party's digitization;
- Acquire basic knowledge of the structure of geographically defined relational databases
- Update charts in both traditional and digital formats;
- Acquire awareness of legal aspects connected with nautical cartography

- **Attendees (entry requirements)**

Course applicants should belong to a Hydrographic Service or to other bodies responsible for nautical cartography and should at least hold a Higher School Completion Certificate.

- **Total duration**

9 months (1 academic year)

- **Number of participants**

In order to ensure maximum didactic efficacy, classes should not exceed 12 students.

- **Languages**

The course will be held in English

- **Course certificate, diploma**

The model course is produced by an international Working Group, with the co-ordination of the IMA and the supervision of the IHB.

The course will be submitted to the FIG – IHO Advisory Board to obtain recognition.

Upon successful completion of the course, a document will be issued by the IMA certifying that the holder has successfully completed a course in Nautical Cartography.

## COURSE OUTLINE

The duration of the course will be 9 months (40 weeks). Lessons will be, generally, 7 hours per day, from Monday to Friday, for a total number of 1400 hours.

The course has been subdivided into the following 15 modules.

Every module contains specific segments which are developed taking into consideration the requirement of the course and the time allocated.

The programme includes complementary activities such as visits to cartographic institutes and printing organizations.

Most modules end with a practical project. All aspects will be evaluated and will be used for determining the final course work.

Tests will be given on completion of the following modules: basics, geodesy, chart projections, databases, GIS applications, legal administrative aspects.

<i>Modules</i>	<i>Hours</i>		
<b>GENERAL INTRODUCTION .....</b>	<b>5</b>	4.6 Cartographic Projections .....	14
<b>1. Basics.....</b>	<b>120</b>	4.7 Summary of Geodesy and Projections .....	4
1.1 Mathematics and Statistics .....	70	4.8 Project 2 .....	7
1.2 Computers.....	50	<b>5. Navigation .....</b>	<b>70</b>
<b>2. General .....</b>	<b>20</b>	5.1 General Principles .....	7
2.1 Introduction .....	4	5.2 Types of Navigation .....	6
2.2 International Organizations.....	8	5.3 Systems and Methods .....	15
2.3 National Organizations	8	5.4 Port and Coastal traffic.....	3
<b>3. Geodesy.....</b>	<b>70</b>	5.5 Hydrographic notes .....	4
3.1 General Figure of the Earth.....	7	5.6 Project 3 .....	35
3.2 Geometrical Foundations relate to Geodetic Reference Ellipsoid.....	14	<b>6. Nautical Charts .....</b>	<b>70</b>
3.3 Reference Systems- Geodetic Datums.....	14	6.1 Introduction .....	4
3.4 Fundamentals of Three-Dimensional Geodesy	14	6.2 Definitions.....	6
3.5 The Geodesic (Orthodromic) and Loxodromic Curve on the Ellipsoid	14	6.3 Specifications .....	14
3.6 Project Work: 1 .....	7	6.4 Chart Schemes.....	9
<b>4. Chart Projections.....</b>	<b>70</b>	6.5 Production systems-methods .....	2
4.1 General Theory.....	14	6.6 Project 4 .....	35
4.2 Mercator Projection .....	3	<b>7. Cartographic data .....</b>	<b>105</b>
4.3 Gaussian Projections.....	14	7.1 General .....	2
4.4 Lambert Projection.....	7	7.2 Topography .....	4
4.5 Polar Stereographic .....	7	7.3 Hydrography .....	4
		7.4 Navigational Aids and Navigational Systems .....	3
		7.5 Sailing Directions and other textual information .....	3

7.6 Tides-vertical datums .....	4	10.5 Products.....	3
7.7 Photogrammetry and aerial photography.....	4	10.6 Quality control .....	9
7.8 Satellite imagery.....	4	10.7 Project 8 .....	105
7.9 Data evaluation.....	6	<b>11. Databases .....</b>	<b>56</b>
7.10 Data preparation .....	6	11.1 Relational databases .....	24
7.11 Data assimilation .....	6	11.2 Object oriented databases.....	32
7.12 Quality control .....	3	<b>12. ENC Production .....</b>	<b>266</b>
7.13 Project 5 .....	56	12.1 Theoretical overview .....	49
<b>8. Field data .....</b>	<b>105</b>	12.2 Procedures, methods and tools .....	133
8.1 Topography .....	8	12.3 Project 9 .....	84
8.2 Hydrography .....	8	<b>13. Cartographic maintenance .....</b>	<b>49</b>
8.3 Reconnaissance .....	7	13.1 Traditional .....	7
8.4 Oceanography .....	8	13.2 Digital.....	7
8.5 Marine geology .....	4	13.3 ENC.....	7
8.6 Project 6 .....	70	13.4 Project 10 .....	28
 		<b>14. GIS applications .....</b>	<b>70</b>
9. Traditional cartography .....	140	14.1 Principles and criteria .....	6
9.1 Compilation .....	20	14.2 Theoretical approach .....	39
9.2 Drafting .....	3	14.3 Special issues .....	25
9.3 Printing.....	3	<b>15. Legal Administrative aspects .....</b>	<b>35</b>
9.4 Quality control .....	9	15.1 Product liability .....	7
9.5 Project 7 .....	105	15.2 Copyright.....	2
<b>10. Computer assisted cartography .....</b>	<b>140</b>	15.3 Recommendations .....	2
10.1 Types of digital data: raster, vector .....	4	15.4 Resolutions .....	2
10.2 Digital cartographic systems .....	4	15.5 Law of the sea .....	6
10.3 Data capture methods .....	10	15.6 Delimitation zones.....	7
10.4 Migration procedures .....	5	15.7 Distribution of cartographic products .....	2
		15.8 Project 11 .....	7

### Complementary Activities

**Visits:** Technical visits will be held during the weeks dedicated to the ENC Production module

**Final Tests** 14 hours at the end of the course

## LOGISTICS

**Accommodation:** Twin-bedded rooms (two students per room) for the entire period of the course.

**Food arrangements:** breakfast, lunch and dinner will be provided by IMA.

Health and accident insurance will be provided.

**Pocket money and other personal expenses will be at the charge of the organization to which the student belongs.**

Assistance in obtaining a visa may be provided by IMA, but should be the responsibility of the national organization.

Prepaid air tickets will be made available at a selected air company (will be communicated by IMA) in the country.

**Note: The air ticket will have to be refunded in case of non-completion of the course**

**COURSE ON NAUTICAL CARTOGRAPHY**  
From 26 February to 24 November 2001

**NOMINATION FORM FOR PARTICIPATION**

A completed nomination form should be submitted to the Director of the International Maritime Academy,\* Trieste, Italy **THROUGH THE ITALIAN EMBASSY**\*\*, with a copy to the IHB Monaco\*\*\*. Nominations should be made as early as possible, using a separate form for each nomination, indicating clearly the Government's priority if more than one participant is nominated:

1. FAMILY NAME .....
- FIRST NAME .....
- OTHER NAME .....
2. Mailing address .....
- .....
- .....
- Telephone .....
- Fax .....
- E-Mail .....
3. Nearest airport where air travel will commence and terminate:  
Name of airport .....
- Location .....
4. Date of birth .....
5. Sex:     Male            Female
6. Place of birth .....
7. Nationality .....
8. Passport No. ....
9. Date and Place of Issue .....

---

\* International Maritime Academy, via Eduardo Weiss 15, 34127 Trieste, Italy. (Fax: +39 040 350322.  
e-mail: <imoima@imoima.org>)

\*\* **The nominations not transmitted to the Italian Embassy will not be accepted and taken into consideration**

\*\*\* International Hydrographic Bureau, BP445, MC 98011 MONACO CEDEX, Principality of Monaco.(Fax: +377 93 10 81 40; e-mail: <info@ihb.mc>).

10. Person to notify in case of emergency:

Name .....

Address .....

.....

Telephone .....

Fax .....

E-Mail .....

11. Present position and description of duties .....

.....

12. Educational background .....

.....

.....

13. Previous experience .....

.....

.....

Nominee's signature .....

**The above-mentioned person is nominated as our first/second possible participant in the course**

Name and signature of Government official authenticating this nomination .....

Title .....

**ACCEPTANCE FORM**

I hereby accept the invitation of the International Maritime Academy (IMA) to participate in the Course on Nautical Cartography (from 26.02.2001 – 25.11.2001).

I confirm that:

1. I will refrain from engaging in political, commercial and any activities other than those governed by the course programme;
2. I will advise the Academy immediately if I am unable to attend the course; and
3. I will travel to Trieste, Italy and return to my home country at the end of the course, as appropriate, by the route designated by the Academy.

Signature of Participant .....

Name of Participant .....  
(Printed)

Address .....  
.....  
.....

Date .....