ORGANIZACION HIDROGRAFICA INTERNACIONAL

Dossier del BHI N° TA-6

CIRCULAR No. 89/2004
16 de Diciembre del 2004

5ª CURSO SOBRE "CARTOGRAFIA NAUTICA"
EN LA ACADEMIA MARÍTIMA INTERNACIONAL (AMI)
Trieste, Italia.
(13 de Abril – 07 de Diciembre del 2005)

Estimado Director,

La Academia Marítima Internacional (AMI) de Trieste ha informado al BHI, en nombre de las Autoridades italianas, que se ha previsto un cuarto curso de "Cartografía Náutica" en el año 2005.

El curso empezará el miércoles 13 de Abril del 2005 y terminará el 7 de Diciembre del 2003.

Este curso está pensado para doce estudiantes de todos los países. Se solicita a las autoridades gubernamentales responsables de la Cartografía Náutica en sus países que envíen las solicitudes de sus candidatos a :

Academia Marítima Internacional (AMI),
vía Eduardo Weiss 15, 34127 Trieste, Italia
(teléfono: +39 040 350829, fax: +39 040 350322 y E-mail imoima@imoima.org)

a través de la EMBAJADA ITALIANA en su país, con copia a:

International Hydrographic Bureau (IHB)
4 Quai Antoine 1er - B.P. 445, MC 98011 Monaco CEDEX
Principality of Monaco
(Teléfono: +377 93108100 Fax +377 93108140 y E-mail info@ihb.mc)

Los nombramientos no enviados a las Embajadas Italianas, no serán aceptados y, por lo tanto, no serán tomados en consideración para la selección. **Los nombramientos deben recibirse en la AMI antes del 28 de Febrero del 2005 lo más tardar.**

La ayuda proporcionada por la AMI cubrirá los gastos de transporte, el transporte local a Trieste, el alojamiento y las comidas. **El dinero para gastos personales debe ser proporcionado por LA AUTORIDAD NACIONAL DE CADA ESTUDIANTE (véase el Anexo 2).**

El curso es de gran importancia en lo que respecta a sus objetivos, la duración y el contenido técnico. Se espera que la Comunidad Hidrográfica, y en particular los Institutos Hidrográficos europeos estén disponibles y deseen apoyar a la AMI en términos de conferenciantes, basándose en las solicitudes que la AMI enviará directamente a cada país.

La información sobre el programa y la logística del curso se proporcionan en el Anexo 2. Se adjunta también una copia del formulario de nombramiento (Anexo 3).

En nombre del Comité Directivo,
Atentamente,

Capitán de Navío Hugo GORZIGLIA
Director

Anexo 1 - Lista de Distribución;
Anexo 2 - Detalles y logística del curso; *(en inglés únicamente)*
Anexo 3 - Formulario de nombramiento para participar & Formulario de Aceptación. *(en inglés únicamente)*

ANEXO 1 a la Circular
del BHI No. 50/2002
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LISTA DE DISTRIBUCIÓN

Todos los Estados Miembros de la OHI;

Estados no Miembros de la OHI seleccionados, tal y como aparecen en el Anuario (incluyendo a Estados pendientes de convertirse en Miembros de la OHI);

Organización Marítima Internacional, División de Cooperación Técnica,
Sr. David EDWARDS, 4 Albert Embankment, London SE1 7SR.

Dirección General de la Comisión Europea - Energía y Transporte,
Sr. F. KARAMITSOS.

Academia Marítima Internacional, Trieste, Italia.

Ministerio Italiano de Asuntos Exteriores, Dirección General de Cooperación para el Desarrollo, Piazzale della Farnesina 1, 00194 Roma, Italia.

Ministerio Italiano de Asuntos Exteriores – Oficina IX de la DGCS,
viale Tiziano 80 – Roma, Italia.

Dr. Ricardo ILLY, Presidente de la Región de Friuli-Venezia Giulia,
via Carducci, 6, 34133 Trieste, Italia.

Dr. Lodovico SONEGO, Asesor Regional de Transportes, Región de Friuli-Venezia Giulia, via Giulia 75/1, 34125 Trieste, Italia.

Prof. Domenico ROMEO, Universidad de Trieste – Magnifico Rettore, Piazzale Europa 1 (Rectorado), 34100 Trieste, Italia.

Presidente de la Provincia de Trieste, Piazza Vittorio Veneto 4, 34132 Trieste, Italia.

Presidente de la Autoridad Portuaria de Trieste, Punto Franco Vecchio,
34135 Trieste, Italia.

Presidente de la Cámara de Comercio de Trieste, Piazza della Borsa 14,
34100 Trieste, Italia.

ANEXO 2 a la
Circular del BHI No. 89/2004
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DETAILS OF THE COURSE

- **Aim of the course**

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 scheme, 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 digitising existing traditional charts in the standard format or alternatively, verifying – when necessary – a third party's digitisation;
- 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 related National Cartographic Services responsible for nautical cartography and should at least hold the following requirements:
- four years service at a National Hydrographic Office or related National Cartographic Service and in addition an acceptable University Degree or a CAT B Course in Hydrography or Cartography.
- strictly relevant professional experience
- English language competence
- computer skills.

The selection of the students will be carried out by the Commission IHB – IMA which will examine case by case the curricula.

- **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 was produced by an international Working Group, with the co-ordination of the IMA and the supervision of the IHB.

The course was submitted to the FIG – IHO Advisory Board to obtain recognition "A" level.
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 35 weeks. Lessons will be, generally, 7 hours per day, from Monday to Friday, for a total number of 1240 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.

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 (Law of the Sea – Delimitations).

Term examinations will be conducted on conclusion of modules 8 and 15 and will be used together with the test marks and project marks, to determine the following formula:

Term Mark = [(Avg Test Mark + Avg Project Mark) x 40/100] + (Term Exam Mark) x 60/100.

MODULES

Subject Area	Hours
1. General	**10**
1.1 Introduction	2
1.2 International Organisations	4
1.3 National Organisations	4
2. Basics	**209**
2.1 Mathematics and Statistics	80
2.2 Information Technology and Communication	100
2.3 Grid Computation	21
2.4 Project 0	8
3. Geodesy	**70**
3.1 General figure of the Earth	7
3.2 Geometrical Foundations related to the Geodetic Reference Ellipsoid	21
3.3 Geodetic Datums and Datum Transformation	21
3.4 Fundamentals of Three –Dimensional Geodesy	14
3.5 Project 1	7
4. Chart Projections	**70**
4.1 General Concepts of Geodetic Projections	18
4.2 Mercator Projection	7
4.3 Gaussian Conformal Mapping – Transverse Mercator	14
4.4 Universal Transverse Mercator System (UTM)	7
4.5 Conformal Lambert Projection	7
4.6 Universal Polar Stereographic Projection	7
4.7 Project 2	10

Subject Area	Hours
5. Marine Geography	**35**
5.1 General Geography of the Earth	4
5.2 Marine Geology and Sedimentology	12
5.3 Methods and Instrumentation used by marin geologists	7
5.4 Oceanography	12
6. Navigation	**35**
6.1 General Principles	7
6.2 Types of Navigation	4
6.3 Systems and Methods	7
6.4 Port and Coastal Traffic Control	3
6.5 Project 3	14
7. Nautical Charts	**63**
7.1 Introduction	6
7.2 Definitions	6
7.3 Specifications	14
7.4 Chart Schemes	9
7.5 Production Systems and Methods	14
7.6 Project 4	14
8. Cartographic Data	**80**
8.1 General	2
8.2 Topography	4
8.3 Hydrography	4
8.4 Navigational Aids and Navigational Systems	3
8.5 Sailing Directions and Other Textual Information	3
8.6 Tides – Vertical Datums	4

Subject Area	Hours
8.7 Photogrammetry and Aerial Photography	9
8.8 Satellite Imagery	9
8.9 Oceanographic Data	4
8.10 Marine Geology and Magnetic Data	3
8.11 Data Evaluation	6
8.12 Data Preparation	6
8.13 Data Assimilation	6
8.14 Quality Control	3
8.15 Project 5	14
9. Field Data	**70**
9.1 Preparation of Survey	7
9.2 Execution of Survey	24
9.3 Data Processing	7
9.4 Project 6	32
10. Traditional Cartography	**112**
10.1 Compilation	18
10.2 Drafting	3
10.3 Printing	7
10.4 Quality Control	7
10.5 Cartographic Maintenance	7
10.6 Project 7	70
11. Computer Assisted Cartography	**206**
11.1 Types of Digital Data: Raster, Vector	4
11.2 Digital Cartographic Systems	4
11.3 Data Capture Methods	10
11.4 Modelling Geographic Data in the Computer.	10
11.5 Data Conversion Procedures	5
11.6 Data Acquisition Processing	10
11.7 Products	3
11.8 Quality Control	9
11.9 Cartographic Symbols Design	8
11.10 Digital Elevation Models	28
11.11 Spatial Databases	10
11.12 Project 8	105
12. Data Bases	**24**
12.1 Data Base General Concepts	3
12.2 Data Base Management System..	7
12.3 Relational Data Model	7
12.4 Object Oriented Data Base	7
13. ENC Production	**158**
13.1 Theoretical Overview	25
13.2 Procedures, Methods and Tools	79
13.3 Project 9	54
14. Geographic Information System..	**35**
14.1 Introduction to GIS	4
14.2 Geographic Information	4
14.3 Data Input	4
14.4 Data Output	4
14.5 Data Storage and Management	5
14.6 GIS Implementation	7
14.7 GIS Applications	7
15. Legal Administrative aspects	**42**
15.1 Product Liability	7
15.2 Copyright and Contracts	7
15.3 Law of the sea	7
15.4 Delimitation Zones	14
15.5 Project 10	7

PROJECTS

The projects to be completed at the end of each module are the following:

Project 0: The Project is based on a step-by-step development of simple applications in Delphi, by the students.

Project 1: Carry out spheroid transformation for a charted area, in order to determine the (plotted) x,y,z shifts at various chart scale coverages.

Project 2: Prepare projection calculations and overlapping compilation plots for each of the following projections: Mercator, Lambert, Gnomonic and Gauss.

Project 3: Plan a voyage, emphasising the types of navigation and the characteristics of the cartographic documents used or necessary

Project 4: Study and detail a specification of a chart scheme including the preparation of a development plan and the cost/effort evaluation.

Project 5: Collect, evaluate and prepare all source data for the area specified in the chart specification prepared in Project 4.

Project 6: Carry out a field survey, to collect miscellaneous data/information for the specified area.

Project 7: Prepare a chart compilation in accordance with the INT chart specification the projection plot prepared in Project 2 and the source data gathered in Projects 5 and 6.

Project 8: Using the chart specified in Project 4 and the data collected in project 5 and 6, digitise all relevant source data and then prepare a digital compilation of the same chart prepared in Project 7. Digital colour separation plates are to be prepared on completion of the compilation.

Project 9: Using geometric primitives from the digital data prepared in Project 7, prepare an ENC cell based on the S 57 standard (including all phases up to validation).

Project 10: Prepare lines of delimitation between opposite and contiguous states.

Anexo 2 a la Circular
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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.

Accident insurance will be provided by IMA.
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

ANEXO 3 a la Circular
del BHI No. 89/2004
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COURSE ON NAUTICAL CARTOGRAPHY
From 13 April to 7 December 2005

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.....

   TITLE……

2. Mailing address .....

   .....

   .....

   Telephone (including country and local code) .....

   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.....

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……...

……..

12. Organisation .....

13. Education (please attach Curriculum Vitae) .....

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…….

14. Relevant professional experience.....

.....

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15. English Language Competence .....

16. Computer skills .....

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 13.4. – 7.12.2005).

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 .....