

No.12040/38/2012-FTC (Trg.)
Government of India
Ministry of Personnel, P.G and Pensions
Department of Personnel and Training
Training Division

Block-4, Old JNU Campus
New Mehrauli Road, New Delhi-67
Dated 27th April, 2012

TRAINING CIRCULAR

Subject: The United Nations/Italy Long-term fellowship Programme on Global Navigation Satellite Systems (GNSS) and Related Applications.

The undersigned is directed to state that United Nations Office for Outer Space Affairs letter dated 12.3.2012 inviting nominations for the fellowship of Master in Navigation and Related Applications –four 12 months fellowship tenable at Politecnico di Torino, Turin, Italy from September, 2012. This fellowship programme is being offered, through the United Nations Office for Outer Space Affairs (UN-OOSA), by Politecnico di Torino (School of Information Technologies) and Istituto Superiore Mario Boella (ISMB) with the collaboration of Istituto Elettrotecnico Nazionale Galileo Ferraris (IEN), Turin, Italy, for candidates from developing countries and countries with economy transition.

2 The Master in Navigation and Related Applications (MNA) Programme starts in September 2012 and lasts for 12 months, including a period ranging from 3 to 4 months for hands-on pilot project (internship). The MNA Program study provides extensive background knowledge in navigation/localization systems as well as a detailed analysis on NAV/COM integration and environmental monitoring applications.

3 The candidates are required to have completed Master Degree or equivalent (5 years University Degree) in Aerospace Engineering, Electrical Engineering, Environmental Engineering, Communication Engineering, Information Technology or related subject (Other degrees in different technological fields can be considered by the Master Commission); be under the age of 40 years at the beginning of training course; be proficient in written and spoken English.

4. In addition to the above, the following information in respect of the nominated officers may please be furnished while furnishing the nomination:

- a) Whether attended any foreign training programme in the past? If so, the duration/detail thereof?
- b) Whether clear from vigilance angle?
- c) Age;
- d) Whether working in North East State/J&K?
- e) A brief in 50-100 words justifying the nomination.

..2/-

5. The selected participants will each receive a grant from Politecnico di Torino of about EUR 6,000 for the duration of their fellowship study (12 months) to cover housing, food, local transportation, etc. The offering institution will also cover tuition fee in full. International round trip air travel between the participant's international airport of departure and Turin, Italy will be provided by the UN-OOSA.

6. It is requested that the nomination of the suitable candidates may please be forwarded in the prescribed application form (Triplicate) to this Department in accordance with the eligibility criteria.

7. The applications should reach this Department through the Administrative Ministry not later than 8th May, 2012. Nominations received after the prescribed date will not be considered. The details of the programme and the application form may be drawn from Ministry of Personnel, Public Grievances and Pensions website (persmin.nic.in), which is available in "What is New" under the Department of Personnel and Training.


(N.K. Wadhwa)

Under Secretary to the Government of India

Copy to:

1. The Secretary, Department of Space, Lok Nayak Bhawan, New Delhi.
2. The Secretary, Ministry of Defence, South Block, New Delhi.
3. The Secretary, Department of Communications, Sanchar Bhawan, New Delhi.
4. The Secretary, Department of Science and Technology, Technology Bhawan, New Mehrauli Road, New Delhi
5. NIC with the request to post the circular along with the United Nations Office for Outer Space Affairs circular and the enclosed application form on the Department's website.



UNITED NATIONS
Office for Outer Space Affairs

LONG-TERM FELLOWSHIP OPPORTUNITY INFORMATION NOTE

The United Nations/Italy Long-term Fellowship Programme On Global Navigation Satellite Systems (GNSS) and Related Applications

1. **Thematic Area:** Global Navigation Satellite Systems (GNSS).
2. **Title:** Master in Navigation and Related Applications (MNA).
3. **Offering Institutions:** Politecnico di Torino (School of Information Technologies) and Istituto Superiore Mario Boella (ISMB), with the collaboration of Istituto Elettrotecnico Nazionale Galileo Ferraris (IEN), Turin, Italy.
4. **Executing Agency:** United Nations Office for Outer Space Affairs (UN-OOSA), Programme on Space Applications.

Contact Person: The UN Expert on Space Applications
Address: Office for Outer Space Affairs
United Nations Office at Vienna
P.O. Box 500, A-1400 Vienna, Austria
Phone: +43-1-26060 4268
Fax: +43-1-26060 5830
E-mails: unpsa@unoosa.org, kurian.maniyanipurathu@unoosa.org

5. **Duration and Beginning Date:** 12 months, beginning 24 September 2012. Selected participants are encouraged to attend orientation meetings at Politecnico di Torino (starts on the first week of September 2012) and Italian language intensive course (starts on the second week of September 2012) prior the fellowship study.
6. **Deadline for Applications:** Application form and other required documents (see section 12 below) shall be received in the UN Office for Outer Space Affairs by **15 May 2012**. Selected candidates will be notified on the outcome of their application by 10 June 2012.
7. **Fellowship Language:** English only
8. **Total Number of Fellowships Available:** Four.
9. **Brief Programme Description:** The Master in Navigation and Related Applications (MNA) Programme starts in September 2012 and lasts for 12 months, including a period ranging from 3 to 4 months for hands-on pilot project (internship). The MNA Program study provides extensive background knowledge in navigation/localization systems as well as a detailed analysis on NAV/COM integration and environmental monitoring applications.

The MNA Programme includes 80 Educational European Credits (ECTS). Among the 80 credits, 50 credits are earned through taking courses, and 30 are completed as internship in



technical laboratories of ISBM and IEN, or hands-on project through a company operating in the field of navigation or in the production of navigation-related applications.

Selected participants should perform the pilot project in a technical lab in their own home country under the supervision of a local expert and in coordination with a member of the scientific committee of the MNA programme.

For additional details please see the attached booklet and visit the website of Politecnico di Torino: <http://didattica.polito.it/master/navigation/>.

10. Financial Arrangements: The selected participants will each receive a grant from Politecnico di Torino of about EUR 6,000 for the duration of their fellowship study (12 months) to cover housing, food, local transportation, etc. The offering institution will also cover tuition fee in full for these participants. International round trip air travel between the participant's international airport of departure and Turin, Italy (most direct and economic route) may be provided by the UN-OOSA.

11. Admission Requirements: The MNA Programme candidates are required to **have completed Master Degree or equivalent (5 years University degree)** in Aerospace Engineering, Electrical Engineering, Environmental Engineering, Communication Engineering, Information Technology or related subjects. Other degrees in different technological fields can be considered by the Master Commission.

Written and spoken English is required, together with basic knowledge in communication theory and electronics.

Candidates also should have some experience in the following areas:

- Principles of digital communications and signal processing;
- Basics of electromagnetic wave propagation;
- Basics of software tools (e.g. Matlab) and programming languages (e.g. C).

12. Application to the Fellowship Programme: Fully completed application form should be submitted in duplicate by mail to the United Nations Expert on Space Applications **no later than 15 May 2012**. It may also be sent through the Office of the Resident Representative of the United Nations Development Programme (UNDP) in applicant country. To accelerate processing of application, an advance copy should also be e-mailed or faxed directly to the Office for Outer Space Affairs. For additional details, please refer to the enclosed document "Terms of Participation in the Long-term Fellowship Programmes".

In addition to the enclosed UN-OOSA fellowship application form, all applicants are encouraged also to fill up the on-line application form of Politecnico di Torino as it will help to streamline the process of selecting recipients of the fellowship grants. Instructions on how to proceed with that and the link to appropriate webpage of Politecnico di Torino are available on the UN-OOSA website: <http://www.unoosa.org/oosa/en/SAP/gnss/fellowships.html>



Upon reviewing the received applications, the organizers will pre-select a group of most qualified candidates and may request those pre-selected candidates to complete an on-line application form available on the web site of Politecnico di Torino (if it has not been done before) and to provide some additional information/details. A final selection of 4 participants of the fellowship programme will be made by Politecnico di Torino and UN-OOSA on a basis of evaluation of application documents received.

13. Responsibilities of the Nominating Government/Agency/Organization: The nominating government agency, organization or academic institution should bear the following costs on behalf of the selected participant for the duration of the fellowship programme:

- All expenses in the home country for preparation of travelling abroad, including passport, entry visa, medical examinations, inoculations, and other miscellaneous items, and domestic travel to and from the international airport of departure for Italy, in the home country;
- Salary and related allowances to which a participant may be entitled in his/her country during the period of the fellowship programme study;
- Life insurance and health insurance for the participant for the duration of the fellowship programme study.

14. Additional information: The latest information on/updates to the fellowship programme will be available on the website of the UN Office for Outer Space Affairs:
<http://www.unoosa.org/oosa/en/SAP/gnss/fellowships.html>

Applicants are also advised to familiarise themselves with information from Politecnico di Torino website: <http://didattica.polito.it/master/navigation/>.



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**Terms of participation in the long-term fellowship programmes
offered through and/or administered by
the United Nations Programme on Space Applications**

1. Participation

Applicants should be (i) nationals of developing countries or countries with economy in transition, (ii) duly nominated by their governments, (iii) age of candidate should not exceed forty (40) years, (vi) should have the academic and professional backgrounds required by the specific fellowship programme, and (v) should be able to make professional use of the experience gained in the study programme.

2. Documentation Required

- a) **Fellowship Application Form** - should be (i) duly completed by the applicant (two copies), (ii) certified on behalf of the nominating government by the certifying officer* and (iii) forwarded by the certifying officer to the United Nations Expert on Space Applications by mail or through the Resident Representative of the United Nations Development Programme (UNDP) in the applicant's country.

An advanced copy of completed and certified application form should be directly send by fax or e-mail to the Office for Outer Space Affairs.

Documents (b) and (e) described below should be completed and forwarded directly to the United Nations Expert on Space Applications by the institution(s) or individual(s) providing the requested information but definitely not by the applicant(s):

- b) **Referee Reports.** Three (3) completed Referee reports should be sent by the 3 referees, one of whom should be the employment or study supervisor of applicant, directly to the United Nations as indicated on the form.
- c) **Academic certificate.** Two official copies of the education certificate as well as academic transcripts indicating the subjects and examination grades (marks) received in each subject should be submitted directly to the United Nations Expert on Space Applications.
- d) **Curriculum vitae** signed and dated by applicant.

* The certifying officer shall not be lower in rank than the Head of the applicant's Department, Institution or Ministry. The certifying officer attests to the accuracy of the information provided by the applicant in his/her application form and the *bona fide* status of the applicant in his/her institution.



- e) **Diploma or certificate of competence in the language of the fellowship programme.** If the official language of the applicant's country is different from the language of the fellowship programme, a diploma or certificate of competence in the language should be submitted directly to the United Nations Expert on Space Applications. This diploma/certificate should be issued by an accredited language institution or by the local UNDP upon satisfactory establishment of the applicant's competence in the language concerned.

3. **Administrative Arrangements**

a) **Responsibilities of the United Nations**

The United Nations will advertise the information on available fellowships and will, in consultation with the offering government/institutions, select qualified applicants as recipients of fellowship award.

The United Nations also may provide a number of selected participants with international round trip air ticket between the participant's international airport of departure and Turin, Italy.

b) **Responsibilities of the nominating government/agency**

The nominating government/agency will bear the following costs on behalf of the selected participant:

- i) All expenses in the home country for preparing the abroad travelling, including passport and visa fees, medical examinations, inoculations, and other miscellaneous items, and domestic travel to and from the international airport of departure, in the home country;
- ii) Salary and related allowances to which a participant may be entitled in his/her country during the period of the fellowship programme;
- iii) Life insurance and health insurance for the benefit of the participant for the duration of the fellowship programme study.

Special consideration will be given to applicants in the case of their nominating government/agency taking responsibility for covering the round-trip international travel fair from home country to Turin, Italy.

c) **Applicants for a fellowship programme should note that the United Nations and the government/institutions offering the fellowships will NOT assume responsibility for the following expenditures:**

- i)* Any costs incurred by dependent or spouse who accompany the participant;



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- ii) Costs incurred by the participant with respect to travel insurance;
- iii) Loss or damage of personal property while enrolled in the fellowship programme;
- iv) Compensation in the event of death or disability of the participant in connection with his/her enrolment in the fellowship programme;
- v) Any claim toward expenses incurred by participants other than what is specified in the fellowship programme description document.

d) **Termination of fellowship.**

The United Nations, in consultation with the offering government/institutions, reserves the right to terminate the fellowship programme of any participant upon commencement of the study if:

- i) the participant's academic background regarding the subject of the fellowship programme is found to be inadequate; and/or
- ii) the participant's knowledge and understanding of the language of the fellowship programme are found to be inadequate to pursue the programme of study; and/or
- iii) the participant fails to observe proper conduct during the course of the fellowship programme study; and/or
- iv) the participant withdraws himself/herself from the fellowship programme without any reasonable justification accepted by the offering institution.

In the above cases of the fellowship termination, the UN Office for Outer Space Affairs and offering government/institutions reserve the right to claim from participant or his/her nominating agency cost of air ticket (if it was provided by the United Nations) and/or of the fellowship grant received by the time of termination.

4. Deadlines for Receipt of Applications

Only applicants whose completed application forms and all other supporting documents are received by the United Nations in Vienna before or by the deadline established for the fellowship programme, will be considered in the selection process for the fellowship concerned.

Special notice: Applicants should note that selection of fellowship recipients is made on a very competitive basis, as a large number of applications are generally received for a limited number of available fellowships.



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FELLOWSHIP APPLICATION FORM

(To be filled in by typing or in block letters)

**The United Nations/Italy Long-term Fellowship Programme
On GNSS and Related Applications (Turin, Italy)
(deadline for submission: 15 May 2012)**

Nominee's full Name: Nominee's institution and country:	Please attach a recent photo here																
<p>Hereby is nominated for the UN/Italy long-term fellowship programme on GNSS and Related Applications. The nominating agency/organization will be able [] will not be able [] to provide nominee's international roundtrip air travel ticket to Turin, Italy.</p> <p>The nomination is certified by</p> <p>_____</p> <p style="text-align: center;">(Name of head of nominating organization)</p> <p>_____</p> <p style="text-align: center;">(Official title of certifying officer)</p> <p>_____</p> <p style="text-align: center;">(Signature of head of nominating organization)</p> <p style="text-align: right;">_____</p> <p style="text-align: right;">Official seal of institution and its e-mail address</p> <p>Date:</p>																	
<p>COMPLETED APPLICATION FORMS AND ANNEXES SHOULD BE SENT <u>IN</u> <u>DUPLICATE</u> TO THE UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS</p> <p>Selected candidates will be notified by e-mail by 10 June 2012. Those candidates should then confirm their acceptance of the offer no later than in 5 days after notification.</p>																	
<p>Name, official title and professional relationship of three referees who are familiar with the applicant's work and qualifications:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 45%;">Name</th> <th style="width: 30%;">Title</th> <th style="width: 20%;">Relationship</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1.</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2.</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3.</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Name	Title	Relationship	1.				2.				3.			
	Name	Title	Relationship														
1.																	
2.																	
3.																	

PERSONAL HISTORY

Family name:	First name:	Other names:		
Date of birth:		Place of birth:		
Official mailing address:		Home address:		
Phone: Fax: E-mail: E-mail 2:	Nationality/Citizenship	Gender	Marital status	
Person to contact in case of emergency: Relationship: Address: Phone: Fax: E-mail:				

EDUCATION

Institution	Dates	Field	Degree

Please indicate your specialization:

- | | |
|--|--|
| <input type="checkbox"/> Electrical Engineering | <input type="checkbox"/> Environmental Engineering |
| <input type="checkbox"/> Aerospace Engineering | <input type="checkbox"/> Computer Science |
| <input type="checkbox"/> Communication Engineering | <input type="checkbox"/> Information Science |
| <input type="checkbox"/> Information Technology | <input type="checkbox"/> Physics |
| <input type="checkbox"/> Mechanical engineering | <input type="checkbox"/> Other: |

Please state an average score/mark of passed exams during your final study: _____
(please indicate a score system - _____ e.g. 1-20 or A-F,
and maximum grade obtainable - _____ e.g. 20 or A)

Those who come from a university which uses credits, please specify the type of system:

- | | |
|---|---------------------------------------|
| <input type="checkbox"/> - ECTS (European system) | <input type="checkbox"/> - USA system |
| <input type="checkbox"/> - Other (specify): | |

Publications - list any relevant publications (papers or articles) (Attach an extra page if necessary.):
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Relevant courses, workshops, seminars or meetings you have attended in the last five years:			
Location	Title of activity	Duration (dates)	Sponsors

Please state briefly your reasons for applying to participate in this Fellowship Programme:

EMPLOYMENT RECORD

PRESENT POST: Title, unit and organization

Dates:	Address of organization (including telephone and fax numbers, and e-mail address):
Functions of organization:	
Name of supervisor:	
Description of your work	

PREVIOUS POST: Title, unit and organization

Dates:	Address of organization (including telephone and fax numbers, and e-mail address):
Functions of organization:	
Name of supervisor:	
Description of your work	

RELEVANT TECHNICAL BACKGROUND/EXPERIENCE

Elements of Signal Processing <input type="checkbox"/> YES <input type="checkbox"/> NO	Elements of Digital Transmission <input type="checkbox"/> YES <input type="checkbox"/> NO	Elements of Communication Systems <input type="checkbox"/> YES <input type="checkbox"/> NO	Elements of Navigation Systems <input type="checkbox"/> YES <input type="checkbox"/> NO
Basics of Communication Receiver Technology <input type="checkbox"/> YES <input type="checkbox"/> NO	Basics of Timing <input type="checkbox"/> YES <input type="checkbox"/> NO	Basics of Electromagnetic Wave Propagation <input type="checkbox"/> YES <input type="checkbox"/> NO	Programming Languages:

CERTIFICATION OF KNOWLEDGE OF ENGLISH

Name of candidate:	
ABILITY TO UNDERSTAND SPEECH <input type="checkbox"/> Understands without difficulty <input type="checkbox"/> Understands almost everything <input type="checkbox"/> Requires frequent repetition	ABILITY TO SPEAK <input type="checkbox"/> Speaks fluently <input type="checkbox"/> Speaks intelligibly <input type="checkbox"/> Speaks haltingly
ABILITY TO WRITE <input type="checkbox"/> Writes with ease and accuracy <input type="checkbox"/> Writes slowly <input type="checkbox"/> Writes with difficulty	ABILITY TO READ <input type="checkbox"/> Reads fluently <input type="checkbox"/> Reads slowly <input type="checkbox"/> Translates with difficulty
Other remarks:	
TOELF Certificate: <input type="checkbox"/> YES <input type="checkbox"/> NO	
Certification by language examiner.	
Language tested by	

(Name)	

(Title of examiner)	

(Institution, city, country)	
Date of examination:	_____
Signature of examiner:	Seal of Language Institution

Please enclose your Curriculum Vitae, signed and dated by you, to this application form.

CANDIDATE'S CERTIFICATION

I hereby certify that the statements that I have made in this application form are true, correct and complete.

If selected, I hereby confirm that I will comply with the Terms of Reference of the Programme and I will make myself available for duration of the entire Fellowship.

Date:

Signature of candidate:

This form, FULLY COMPLETED, should be submitted in duplicate by mail to the United Nations Expert on Space Applications, Office for Outer Space Affairs, United Nations Office at Vienna, Vienna International Centre, P.O. Box 500, A-1400 Vienna, Austria, **no later than 15 May 2012**. You may also send this application form through the Office of the Resident Representative of the United Nations Development Programme (UNDP) in your country.

To accelerate processing of your application, you should also fax an advance copy directly to the Office for Outer Space Affairs, fax: (+43 1) 26060 5830, or e-mail it to the following addresses: unpsa@unoosa.org, kurian.maniyanipurathu@unoosa.org

IMPORTANT: In addition to the current form, all applicants are encouraged also to fill up the on-line application form of Politecnico di Torino as it will help to streamline the process of selecting recipients of the fellowship grants. Instructions on how to proceed with that and the link to appropriate webpage of Politecnico di Torino are available on the UN-OOSA website: <http://www.unoosa.org/oosa/en/SAP/gnss/fellowships.html>

NOTE: THIS APPLICATION IS VALID ONLY IF ALL AND EVERY INFORMATION REQUESTED IS PROVIDED.

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UNITED NATIONS
Office for Outer Space Affairs

REFEREE'S REPORT

The United Nations/Italy Long-term Fellowship Programme
On GNSS and Related Applications
1 year, starting in September 2012, Turin, Italy
(deadline for submission: 15 May 2012)

Name of applicant _____
First Middle Last or family

Country of applicant _____

Name of referee _____
First Middle Last or family

Title of referee _____

Affiliation and mailing address of referee _____

The portion above should be completed by applicant

To the referee: Please complete the sections below. Your accurate evaluation of the applicant named above is essential to the successful implementation of the United Nations Programme on Space Applications. Your comments on the applicant will be kept confidential.

1. I have known this applicant (check as appropriate) as a graduate student (), as a research assistant (), as a professional colleague (), other ()
2. I was acquainted with the professional work of the applicant from _____ to _____
3. I had an excellent _____ good _____ fair _____ poor _____ opportunity to observe his/her professional work.
4. In comparison with other individuals of similar training and experience, what is your evaluation of the applicant with respect to the following:



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Knowledge of fundamentals in subjects relevant to or required for the fellowship programme:
Outstanding _____ Good _____ Average _____ Poor _____

Ability to make good scientific judgements:

Ability in self-expression:

Knowledge of language of the course:

5. In comparison with other individuals of similar training and experience, what is your evaluation of the applicant with respect to overall scientific or engineering ability:

Outstanding _____ Good _____ Average _____ Poor _____

6. The applicant will have _____ will not have _____ adequate opportunities in his/her country to make use of the skills to be gained through this fellowship programme.

7. If you respond in item (6) that the applicant will have adequate opportunities in his/her country, please describe the specific details of such opportunities.

8. Other comments that you think might be helpful in assessing the applicant's ability and potential.

Signature of referee _____ Date _____

NOTE: In order to a proper evaluation of the applicant, the referee should kindly return this form (completed) directly to the United Nations Expert on Space Applications, Office for Outer Space Affairs, Vienna International Centre, P.O. Box 500, A-1400 Vienna, Austria, e-mails: unpsa@unoosa.org and kurian.maniyanipurathu@unoosa.org.

receive a Master degree in Navigation and Related Applications.
Participants selected by UN-OOSA will receive a financial support for the tuition fee and for other expenses during their study.

Full details on the fellowship programme and application procedures will be available shortly both on OOSA web site (<http://www.oosa.univie.ac.at>) and on the web site of Politecnico di Torino (<http://www.didattica.polito.it/master/rit>).

Internships

Students will acquire 30 ECTS doing a pilot project in a lab or a company operating in the field of navigation, that is duration goes from a minimum of 4 months to a maximum of 6 months, depending on specific agreements with the hosting company.

How to Apply

For details please consult the web site or call the contact people listed below.



For information, Please Contact:

Master Logistic Coordinator
Master office
Politecnico di Torino - Gestione Didattica
Phone: +39 011 564 791/508
e-mail: master.universitari@polito.it

Web Sites
Visit our web sites for more information:
<http://didattica.polito.it/master/navigation>
<http://www.oosa.univie.ac.at>

a joint initiative of



with the collaboration of



POLITECNICO DI TORINO
Corso Duca degli Abruzzi, 24
10129 Torino - Italy
www.polito.it

MASTER
on Navigation
and Related Applications
Information on the Master Program and on
the United Nations/Italy Long Term
Fellowship Program Hosted by ISMB and
Politecnico di Torino.

Politecnico di
Torino



The Master on Navigation and Related Applications is a joint initiative of Politecnico di Torino (Iii Faculty, School of Information Technologies) and Istituto Superiore Mario Boella (SMB) with the collaboration of Istituto Elettrotecnico Nazionale Galileo Ferraris (IEN) and the United Nations Office for Outer Space Affairs (UN-OOSA).

This brochure provides information on the Master Program and on the United Nations/Italy Long-term Fellowship Programme Hosted by Istituto Superiore Mario Boella (SMB) and Politecnico di Torino.

motivation and Overview

Innovative, added-value services and applications strictly related to user positioning information are acquiring more and more importance due to the potential benefits for the world-wide community.

Nowadays, civil users are able to fix their position on the basis of ranging signals broadcast by GPS satellites, but the problem is that GPS remains a military system and this fact limits the diffusion of potential services (with particular reference to critical and safety-of-life applications).

For this reason, the Galileo system which represents the European initiative in the field of GNSS (Global Navigation Satellite Systems) will be a real boost for the introduction of navigation and positioning applications in the worldwide wireless nano-market. Galileo, fully deployed by 2008, is acquiring a large sharing. In fact countries like China, India and Latin America are expressing a strong interest in participating to Galileo definition, deployment and test.

In addition, it has to be remarked that terrestrial locating systems based on wireless communication networks and the integration of GNSS signals with communication signals (e.g., WLAN and Galileo) will represent a natural way for the diffusion of navigation-related services.

In the next future a substantial amount of skilled personnel will be engaged in production and management of innovative navigation-oriented applications (Location Based Services - LBS). At the same time, short time-to-market is becoming a must for companies engaged in the development of navigation hardware, services and applications, which require advanced technical skills as well as a broad vision of the navigation/localization technologies at large.

The Master in Navigation and Related Applications is an effective answer to the work market demands in terms of high level technicians endowed with a broad vision of the navigation/localization world but also with specific skills.

Admission Requirements

The Master program is addressed to graduate students having completed a Master Degree (typically a 5 years curriculum after the high school) or an equivalent title in Electrical Engineering, Aerospace Engineering, Environmental Engineering, Communication Engineering, Information Technology or related subjects. Other degrees in different technological fields could be taken into account by the Master Commission.

Written and spoken English is required (English is the official language of the Master), together with basic notions in communication theory and electronics.

Cultural Prerequisites

To profitably follow the Master program, candidates should have some background in the areas:

- Principles of digital communications and signal processing
- Basics of electromagnetic wave propagation
- Basics of software tools (e.g. Matlab) and programming languages (e.g. C)

No basic knowledge in navigation is required.

Course Schedule and Syllabus

The duration of the Master program is 12 months including a period ranging from 4 to 6 months for pilot projects (internships). It provides an extensive background in navigation/localization systems as well as a detailed analysis on NAVICOM integration and environmental monitoring applications or a specific training on timing.

The program includes 60 ECTS (Educational Credits), 50 corresponding to courses, 30 to an internship in a lab or a company operating in the field of navigation (or in the production of navigation-related applications) and/or in the technical laboratories of SMB and IEN.

It should be remarked that students could prepare the pilot (final) project in a technical lab in their own home country under the supervision of a local tutor and the coordination of a member of the scientific committee of the Master.

Courses are divided in 5 main modules:

Module No.	Topic	Period	Number of credits
0	Basics of communication systems and digital signal processing	Winter	8
1	Satellite navigation systems, Fundamentals and Microchip description of general systems GPS and Galileo		16
2	Receiver technologies and application of landline navigation	Spring	14
3	GNSS application areas - 3rd Semester: Communication integration and GNSS technologies for environmental monitoring - 4th Semester	Summer	18
4	Pilot project	Fall	30

The teaching staff includes many internationally known researchers from Politecnico di Torino, SMB, IEN and from European Universities, but also experts operating in companies involved in navigation programs.

Course Fee and Financial Support

The tuition fee is € 8000. For a limited number of students, financial support will be given as grants, fully covering tuition fee and possibly providing partial support for other expenses.

The UN/Italy Long-term Fellowship Programme on GNSS and Related Applications

The United Nations Office for Outer Space Affairs (UN-OOSA), Istituto Superiore Mario Boella (SMB) and Politecnico di Torino are currently working together on the development of the long-term fellowship programme which will provide students/specialist from developing countries and countries with economy in transition with an opportunity to

