

Proceedings
Enhancement of the Global Perspective for
Engineering Students by Providing an
International Experience

Engineering Conferences International

Year 2003

The International Master of Science in
Aerospace Engineering Program

Ivan A. Camelier
University of Colorado at Boulder

International Master of Science
Aerospace Engineering

The IMS Program

Ivan A. Camelier

IMS homepage

<http://www.colorado.edu/ASEN/IMS/index.html>

International Master of Science Aerospace Engineering

INTRODUCTION

IMS GOALS

MANAGEMENT

THE INSTRUCTIONAL PROGRAM

MOBILITY AND IMPLEMENTATION

FUTURE - THE IMPACT GROUP

CONCLUSION

International Master of Science Aerospace Engineering

In recent years there has been a change in the way that aerospace companies have organized themselves.

Most major engineering projects are now so costly that they are only feasible with multinational co-operation.

Industry has reacted by changing its organization what has added the range of skills required to the graduate engineer.

International Master of Science Aerospace Engineering

The system of higher education has been changing to adapt to industry new requirements.

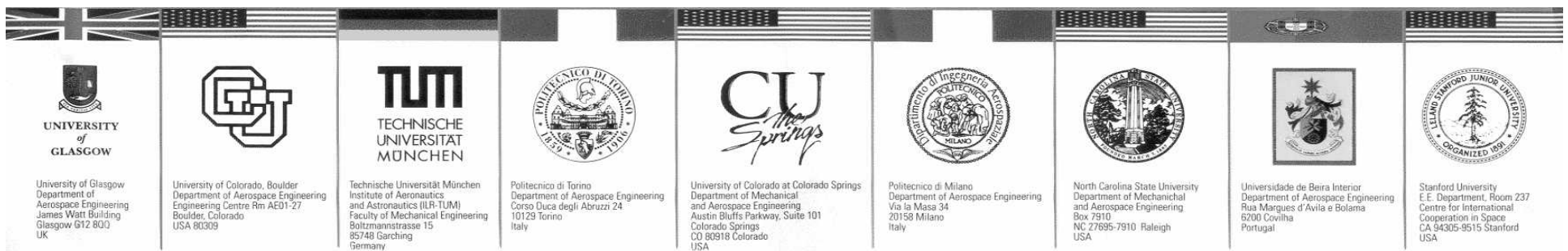
Great emphasis on encouraging more students to go into higher education, especially for what concerns high technology.

The perception by the aerospace industry that although there are more graduates they are differently prepared for industry, according to the University they got their degree.

International Master of Science Aerospace Engineering

One way to overtake this problem is to globalize the aerospace engineering education by harmonization of lectures programs complemented by exchange of students of different universities.

In this frame, an international cooperation program took place in the past years, with the participation of 4 US and 5 EU Universities.



International Master of Science Aerospace Engineering

In October 1998, the Department of Aerospace Engineering at the University of Glasgow secured, for the nine mentioned Institutions, a major funding from the European Community (EC) / United States (US) Cooperative Program in Higher Education and Vocational Training for a joint project on development of an International Master of Science (**IMS**) in Aerospace Engineering Degree Program.

International Master of Science Aerospace Engineering

INTRODUCTION

IMS GOALS

MANAGEMENT

THE INSTRUCTIONAL PROGRAM

MOBILITY AND IMPLEMENTATION

FUTURE - THE IMPACT GROUP

CONCLUSION

International Master of Science Aerospace Engineering

The Grant

Start: 01/09/1998

End: 30/08/2001 further extended to
30/08/2002

Administered by:

Fund for the Improvement of Post Secondary
Education (FIPSE), in the US.

European Commission's Directorate General for
Education and Culture (DGEAC), in Europe.

International Master of Science Aerospace Engineering

SOME ASPECTS OF THE ORIGINAL PROPOSAL

The universities in the joint EC-US consortia will cooperate to form the **IMS** degree program, based upon course and project curriculum modules developed under the grant.

Students will earn the degrees at their home institutions through participation in modules at home and abroad.

International Master of Science Aerospace Engineering

Objectives of the IMS program:

To promote the development of competent technical and scientific managers in the field of aerospace engineering who have both international experience and the ability to work effectively in foreign locations with languages and cultures different from their own.

It is intended that the students of the IMS become, upon graduation, effective project leaders in international aerospace development.

International Master of Science Aerospace Engineering

The main activities carried out under the grant seek to:

- Provide expanded opportunity for overseas study to the students at participating universities.
- Produce a new degree that is equivalent in content across the universities of the EC and the US.
- Produce Masters level graduates with an expanded awareness of the global workings of Aerospace Engineering.

International Master of Science Aerospace Engineering

INTRODUCTION

IMS GOALS

MANAGEMENT

THE INSTRUCTIONAL PROGRAM

MOBILITY AND IMPLEMENTATION

FUTURE - THE IMPACT GROUP

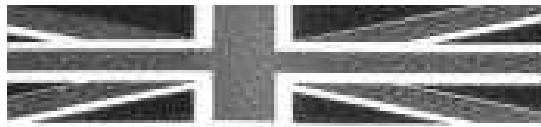
CONCLUSION

International Master of Science Aerospace Engineering

Two partner consortia will develop the program, one in Europe and the other in the US. Each consortium will consist of five/four members, principally University Departments of Aerospace Engineering.

Each consortium will have a consortium leader, responsible for the production, implementation and administration of that consortium's contribution to the overall IMS degree.

International Master of Science Aerospace Engineering



UNIVERSITY
of
GLASGOW

University of Glasgow
Department of
Aerospace Engineering
James Watt Building
Glasgow G12 8QQ
UK

EU Consortium Leader

Dr. Ladislav Smrcek



International Master of Science Aerospace Engineering

Other Members of European Consortium:

POLITECNICO DI MILANO

Prof. Amalia Finzi

TECHNISCHE UNIVERSITÄT MÜNCHEN

Dr. Albert Perpeintner

POLITECNICO DI TORINO

Prof. Michele Onorato

UNIVERSIDADE DA BEIRA INTERIOR

Dr. Ivan Camelier

International Master of Science Aerospace Engineering



US Consortium Leader

Dr. Alex Hoehn



International Master of Science Aerospace Engineering

Other Members of US Consortium:

NORTH CAROLINA STATE UNIVERSITY

Prof Fred DeJarnette

STANFORD UNIVERSITY

Prof. Bruce Lusignan

UNIVERSITY OF COLORADO(C.Springs)

Prof. Charles Foscha

International Master of Science Aerospace Engineering

The program administrators at the lead institutions are responsible for:

- coordinating the activities of their consortia,
- tracking the progress of the IMS program,
- distributing information to consortia members,
- performing longitudinal program evaluation
- reporting progress to the grant's funding agencies.

International Master of Science Aerospace Engineering

Each University in both consortia is involved in:

- establishing the IMS postgraduate degree,
- promoting the course offerings,
- identifying and delivering the modules that make up the IMS curriculum,
- disseminating information about the degree to potential employers in aerospace, to be continued

International Master of Science Aerospace Engineering

continued

- recruitment of students to participate in the IMS,
- establishing student advising and matriculation procedures,
- awarding the IMS degree to program students matriculated in the institution,
- ensuring that full recognition of the project will be made by their institution.

International Master of Science Aerospace Engineering

INTRODUCTION

IMS GOALS

MANAGEMENT

THE INSTRUCTIONAL PROGRAM

MOBILITY AND IMPLEMENTATION

FUTURE - THE IMPACT GROUP

CONCLUSION

International Master of Science Aerospace Engineering

The IMS program will extend over, at least, one-and-a-half academic years for each student.

The curriculum will be based upon coursework modules and individual project and research modules performed under the supervision of the faculty of the host university.

Credit towards the IMS degree will be modeled in a manner similar to the European Credit Transfer System (ECTS).

International Master of Science Aerospace Engineering

The **coursework modules** will be organized so that each participating partner in the US and the EU consortia will provide related sets of courses called modules.

The **project and research modules** will serve as the capstone project that will permit students to cement the gains in the knowledge they make in the coursework modules.

International Master of Science Aerospace Engineering

Mobility is a primary feature of the proposed IMS program.

Mastery of a foreign language will be a required element of the course for students

Cultural instruction received in the host country is another important subject of the exchange program.

International Master of Science Aerospace Engineering

INTRODUCTION

IMS GOALS

MANAGEMENT

THE INSTRUCTIONAL PROGRAM

MOBILITY AND IMPLEMENTATION

FUTURE - THE IMPACT GROUP

CONCLUSION

International Master of Science Aerospace Engineering

All students will be matriculated in an academic institution of one of the two consortia, and each student will also study at the overseas facility of the other consortium.

Mobility funds will be provided through the grant to cover the major part of the student's travel expenses. The students native funding for living expenses will be expected to cover the living expenses incurred by the student in the host country.

International Master of Science Aerospace Engineering

During the first year of the grant the structure of the course will be established, the syllabus and the content of the modules will be defined and the details of the proposed exchange programs will be finalized.

International Master of Science Aerospace Engineering

In the second year of the grant a pilot first year of the IMS degree program would be conducted, with consequent modification of management structures and exchange programs in the light of gained experience.

International Master of Science Aerospace Engineering

At the beginning of the third year the IMS students will start another wave of overseas stays.

During the year there will be an active iteration of the IMS plan intended to guide exchanges in the years following the grant, when money for faculty travel, investigations, and adjustments in the program structure may be more limited.

International Master of Science Aerospace Engineering

At the completion of the grant (the end of the third/forth year), cooperation between the consortia should be fully in place, and the first IMS degrees should be awarded.

As already mentioned, the program was extended to the forth year without increase of the original grant.

International Master of Science Aerospace Engineering

Two annual meetings with all the members will help to implement, to establish, and to evaluate the IMS degree program.

The lead institutions will carry out a longitudinal evaluation of the IMS program. This evaluation will be documented in the final report of the third year, and for any further years of the exchange program.

International Master of Science Aerospace Engineering

As a result of the experience obtained with the program the institutions, at the end of year three, signed a Memorandum of Agreement. Some of the most important points in the following slides:

International Master of Science Aerospace Engineering

Each university will exchange up to a maximum of five (5) students each year, beginning in 2002. This number may be varied by mutual agreement.

All exchange students must enroll and pay tuition and/or other appropriate fees to the home institution. They will not be required to pay equivalent fees to the host institution.

International Master of Science Aerospace Engineering

All institutions will enroll the exchange students as full time, non-degree students.

All institutions will provide the appropriate counseling and other assistance to the exchange students.

At the end of each semester, the host institution will provide an official transcript of credits for each exchange student.

International Master of Science Aerospace Engineering

INTRODUCTION

IMS GOALS

MANAGEMENT

THE INSTRUCTIONAL PROGRAM

MOBILITY AND IMPLEMENTATION

FUTURE - THE IMPACT GROUP

CONCLUSION

International Master of Science Aerospace Engineering

The program's initial funding is now finished. In the last meeting of year four (April 2002) the IMS members, to continue the program, agreed to sign a Memorandum of Understanding.

In this MoU it was decided to form the International **Masters Program in Aerospace Core Technologies (IMPACT)** Group.

The MoU contains, with some small changes, the same items of the Memorandum of Agreement.

International Master of Science Aerospace Engineering

The group will bid together to advertised aerospace projects to obtain funding for teachers trips and students exchanges.

The group is now open to the admission of new University members.

The new members have to be approved by the EU and US institutions. Once approved they will become part of the IMPACT group.

International Master of Science Aerospace Engineering

The agreement continues to be applied to exchanges of **postgraduate** students.

It is accepted, however, that **final year** students from the partner institutions with a **five year undergraduate degree course** be included in the exchange program. Such students may participate depending on the approval of the host university.

International Master of Science Aerospace Engineering

INTRODUCTION

IMS GOALS

MANAGEMENT

THE INSTRUCTIONAL PROGRAM

MOBILITY AND IMPLEMENTATION

FUTURE - THE IMPACT GROUP

CONCLUSION