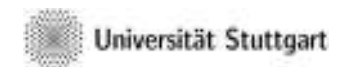




THIS IS TO CERTIFY THAT

Mr. Juan Pérez

Born on April 25th 1980, with passport number N1789794 issued in Sri Lanka has successfully fulfilled all academic requirement within the **Erasmus Mundus Master of Science in Computational Mechanics** at Swansea University, UK and Technical University of Catalunya, Spain, on June 30th 2009, and has qualified to obtain the diploma issued by the EM Consortium composed by: Universitat Politècnica de Catalunya, Swansea University, Ecole Centrale de Nantes and Universität Stuttgart.



Pedro Díez
Master Director



**UNIVERSITAT POLITÈCNICA
DE CATALUNYA**



**PRIFYSGOL CYMRU ABERTAWE
UNIVERSITY OF WALES SWANSEA**



Universität Stuttgart



Diploma Supplement

The Diploma Supplement follows the model developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international «transparency» and fair academic and professional recognition of qualifications (diplomas, degrees, certificates, etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which the supplement is appended.

1. INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION

- 1.1 *Family Name:*
XXXXXX
- 1.2 *Given Name:*
XXXXXX
- 1.3 *Date of birth (day/month/year)*
xx/xx/xxxx
- 1.4 *Student identification number/code:*
XXXXXXXXXX

2. INFORMATION IDENTIFYING THE QUALIFICATION

- 2.1 *Name of qualification and title conferred :*
Erasmus Mundus Master of Science in Computational Mechanics
Double degree:
- “Master of Science in Computational Mechanics” joint degree by Universitat Politècnica de Catalunya and University of Wales Swansea
- “Master of Science in Applied Mechanics” by Ecole Centrale Nantes
- 2.2 *Main fields of work accessible with the qualification:*
Science and engineering with high level in computational mechanics and applications, prepared for all executive positions in industry, scientific research and academic career.
- 2.3 *Name and status of awarding institution:*
- Universitat Politècnica de Catalunya (university)
- University of Wales (university)
- Ecole Centrale Nantes (higher education institution)
- 2.4 *Name and status of institution administering studies:*
- Universitat Politècnica de Catalunya (university)
- University of Wales Swansea (university)
- Ecole Centrale Nantes (higher education institution)

- 2.5 *Language (s) of institution/examination:*
English

3. INFORMATION ON THE LEVEL OF THE QUALIFICATION

- 3.1 *Level of qualification:*
Master’s degree (2nd cycle degree)

- 3.2 *Official length of the programme:*
2 academic years (120 ECTS)

Value of 1 ECTS: 27.5 hours (about 8 hours under the supervision of a teacher and 19,5 hours of homework)

- 3.3 *Access requirements:*

Candidates are required to hold an engineering degree on an appropriate discipline from a university recognised by at least one member of the Consortium¹ and have achieved a grade or classification that is well above the minimum required for a pass (for instance 2.i in the UK, “Notable” in Spain, “mention bien” in France, \leq 2.3 in Germany or similar grades), or be in the top third of their class ranking. Candidates with a similarly good degree in applied mathematics, physics or a similar science based subject will also be considered. In addition to this academic qualification, candidates whose first language is not English will be required to prove English language competency via a minimum IELTS score of 6.5 or an equivalent internationally recognised qualification. Other non-graduate qualifications, such as professional experience or accumulated ECTS credits are considered by the Board of Studies only if at least two members of the Consortium (one of which must be UWS or UPC) deem them to be appropriate for admission into postgraduate studies
A maximum of 60 students per year are admitted. Students are distributed evenly between partners of the Consortium.

4. INFORMATION ON THE CONTENTS AND RESULTS GAINED

- 4.1 *Mode of study:*
Full time.

- 4.2 *Learning Outcomes:*

- 4.2.1 *Knowledge and understanding*

On completion of the scheme a typical student has knowledge and understanding of:

- Basic numerical and mathematical techniques for the analysis of engineering problems
- Concepts of linear, nonlinear, static and dynamics of structures and the behaviour of fluids and soils
- Principles, techniques and computer simulation of structures and fluids
- Strengths and limitations of different analysis and modelling approaches (mathematical, computational)
-
- 4.2.2. Intellectual skills
- Upon completion of the scheme a student is able to:
- Approach, identify and formulate practical engineering problems independently

¹ Erasmus Mundus Consortium: Universitat Politècnica de Catalunya (UPC), University of Wales Swansea (UWS), Ecole Centrale Nantes (ECN) and Universität Stuttgart (US). See 6.1 for more details.

- Choose appropriate mathematical or computational techniques for the analysis of engineering problems
- Select, evaluate, interpret and, when necessary, generate data from a variety of sources
 - Set up appropriate numerical models for complex engineering problems
 - Critically analysis of the results to either refine the modelling assumptions and/or reach a reasonable conclusion
 - Conduct scientific research

4.2.3 Discipline-specific skills:

Upon completion of the scheme a student is able to:

- Use appropriate mathematical techniques for the analysis of engineering problems
- Program and use a computer to perform a numerical modelling
- Use appropriate analysis software
- Prepare technical reports
- Deliver technical oral presentations

4.2.4 Transferable skills

Upon completion of the scheme a student is able to:

- Apply logical thinking processes in problem solving
- Teamwork
- Write clear and concise reports
- Deliver clear and concise oral presentations
- Undertake life long learning
- Appreciate health & safety issues

4.3 Details of study

The Consortium issues an official transcript to each student on graduation. The transcript which presents the full details of the study is given over leaf.

Date of commencement of Programme: 1 October 2007

Particulars of courses pursued and completed by the student:

Term 1. Core courses and Electives (30 ECTS)

Location of Study: **Universitat Politècnica de Catalunya, Campus Nord**

Module	Result ²	ECTS credits
Numerical Methods for Partial Differential Equations	B	5
Finite Element Method	A	5
Continuum Mechanics	B	5
Computer Assignment	C	5
Seminar series in computational mechanics	B	3
Advanced programming for engineers and scientists	C	3
Pre and post-processing techniques in computational mechanics	A	4

End of Level Decision: Pass, proceed to minor

Term 2. Minor Courses (30 ECTS)

Location of Study: **Ecole Centrale Nantes**

Module	Result	ECTS credits
eXtended Finite Element Method and Level Set techniques	A	3
Multi-Scale Structural Analysis	E	3
Materials Modelling for Numerical Simulations	B	4

Fluid Mechanics	B	5
Numerical techniques for PDE's in fluids	B	5
Numerical and physical modelling strategies for viscous naval hydrodynamics	A	5
Computational methods for incompressible flows and applications to optimization and flow control	B	5

Minor: Engineering Fluid Dynamics

End of Level Decision: Pass, proceed to masters' thesis

Terms 3 and 4. (60 ECTS)

Module	Result ³	ECTS credits
Research Planning	A	5

Location of Study: **Universitat Politècnica de Catalunya**

Master's Thesis (40 ECTS)

Location of Study: **Ecole Centrale Nantes**

Title: XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Advisor: XXXXXX XXXXXXXXXXXX

Result: A

Practical Training (15 ECTS)

Placement: **RENAULT-competition**

Project: XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Advisor: XXXXXX XXXXXXXXXXXX

Result: A

End of Level Decision: Pass

4.4 Grading scheme (grade translation, and grade distribution guidance) :

ECTS grade	Percentage of successful students normally achieving the grade	Definition
A	10	EXCELLENT - outstanding performance with only minor errors
B	25	VERY GOOD -above the average standard but with some errors
C	30	GOOD -generally sound work with a number of notable errors
D	25	SATISFACTORY- fair but with significant shortcomings
E	10	SUFFICIENT - performance meets the minimum criteria
FX	-	FAIL- some more work required before the credit can be awarded
F	-	FAIL- considerable further work is required

² ECTS grading see 4.4

³ ECTS grading see 4.4

5. INFORMATION ON THE FUNCTION OF THE QUALIFICATION

5.1 Access to further studies :

Access to Doctorate Degrees (3rd cycle) and/or professional career opportunities.

5.2 Professional status conferred :

N/A

6. ADDITIONAL INFORMATION

6.1 Additional information:

This master was awarded as an Erasmus Mundus Master on XXXXX

Information of the members of the Consortium:

The University of Wales Swansea was established as a university in 1921. It offers degrees of the University of Wales at undergraduate and postgraduate level and has approximately 12,000 students. It is a Constituent Institution of the University of Wales.

The University of Wales, is the national federal university in Wales. It awards the degrees of its member institutions. It was established in 1893.

Universitat Politècnica de Catalunya is a public university that specialises in technical fields, in particular all engineering specialty, as well as architecture and several applied sciences. It offers degrees at undergraduate and postgraduate level. The university as we know it today was founded in March 1971 but its roots can be traced back to 1851 when the first engineering school is created in Barcelona. Today the university has approximately 28.000 students and 2.600 lecturers and has the highest ratio of foreign postgraduate students among all Spanish universities.

The Universität Stuttgart, founded in 1829, has integrated the social sciences and the humanities with engineering to become an internationally well known future-orientated place of research and study. Today the university is made up of 140 institutes in 14 faculties, with 5.000 employees and approximately 18.000 students of which around 4.000 are international students. It offers several degrees at undergraduate level as well as some international M.Sc. programs.

The Ecole Centrale of Nantes is a multidisciplinary engineering school. It offers several degrees mainly at the graduate level and has 1150 students (900 engineering students and 250 Master's and PhD students). The research is organized in 4 laboratories all recognized by the CNRS. These are equipped with extensive scientific and technological facilities. Located in the Loire valley and very near to the Atlantic ocean, the Ecole Centrale also benefits from an attractive cultural environment. Since 1991, the Ecole Centrale of Nantes is a member of the "Intergroupe des Ecoles Centrale" gathering almost 1000 researchers and graduating 1300 engineers every year.

The Consortium was formally established in May 2005, following a series of exploratory meetings to consider the feasibility of establishing a joint Master's degree in

Computational Mechanics, in response to a call from the European Commission for proposals to draw up joint master's schemes under the ERASMUS MUNDUS programme of the Bologna Process.

6.2 Further information sources:

<http://www.cimne.com/cm-master>

Memorandum of Agreement for the Erasmus Mundus Consortium Governing the European Master's Degree in 'Computational Mechanics'

Master of Science in Computational Mechanics Module Handbook 2007/08

7. CERTIFICATION OF THE SUPPLEMENT

7.1 Date (day/month/year):

25 June 2009

7.2 Signature:

Antoni Giró Roca

7.3 Capacity:

Rector of the Universitat Politècnica de Catalunya (coordinator institution of the Erasmus Mundus Consortium)

7.4 Official stamp or seal:

7.5 Diploma supplement number:

XXXXXX

8. INFORMATION ON THE HIGHER EDUCATION SYSTEM

Universitat Politècnica de Catalunya, University of Wales, Ecole Centrale Nantes and Universität Stuttgart are independent, self-governing bodies, empowered to develop and award their own degrees.

Diploma



The Universitat Politècnica de Catalunya, on behalf of the following Higher Education Institutions: **Swansea University, Ecole Centrale Nantes and Universität Stuttgart**, issues the official joint degree

Erasmus Mundus Master of Science in Computational Mechanics

with 120 credits ECTS to:

 _NAME

Born on _DATE in _PLACE with _NAC nationality, after having successfully accomplished all the academic requirements at the universities of _INSTITUTION 1 and _INSTITUTION2 .

The Rector of the Universitat Politècnica de Catalunya

Signature and date



UNIVERSITAT POLITÈCNICA
DE CATALUNYA



Swansea University
Prifysgol Abertawe



Centrale
Nantes



Universität Stuttgart