Parallel Computing

ECTS: 3 ECTS

COORDINATOR: José A. Alvarez Dios (joseantonio.alvarez.dios@usc.es)

UNIVERSITY WHERE THE COORDINATOR IS: USC

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? No

LECTURER 1: Carlos Fernández Sánchez (carlosf@cesga.es)

UNIVERSITY WHERE THE LECTURER 1 IS: USC

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? No

SUBJECT CONTENTS

Programming parallel computers using MPI and OpenMP under languages C and Fortran.

METHODOLOGY

Once the theoretical part is learnt, the students will try to understand program examples to be able to build their own software.

These skills are worked on exercises proposed in class, where we start from a sequential problem to transform it into a parallel one. In practicing exercises students will similarly work on their own on other problems of that type, and the assessment is carried out verifying these skills from the deliverables, taken into account with equal weight, that is, 0.2 for each of them.

LANGUAGE USED IN CLASS: Spanish

IS IT COMPULSORY TO ATTEND CLASS? Students can attend via conference system, In the university where the teacher is.

BIBLIOGRAPHY

Parallel Programming in C with MPI and OpenMP. Michael J. Quinn (McGraw-Hill Science/Engineering/Math, 2003).

Introduction to Parallel Computing, Second Edition, by Ananth Grama, Anshul Gupta, George Karypis, and Vipin Kumar (Addison -Wesley, 2003).

Parallel Programming with MPI, by Peter Pacheco (Morgan Kauffman Publishers, 1997).

Parallel Programming, by Barry Wilkinson and Michael Allen (Prentice Hall, 1999).

SKILLS

Basic:

CG1: To have knowledge that provide a basis or opportunity for originality in developing and / or applying ideas, often within a research context, knowing how to translate industrial needs in terms of R & D in the field of mathematics Industrial.

CG3: To be able to integrate knowledge in order to state opinions using information that even incomplete or limited, include reflecting on social and ethical responsibilities linked to the application of their knowledge.

Specific:

CE4: To be able to select a set of numerical techniques, languages and tools, appropriate to solve a mathematical model.

CE5: To be able to validate and interpret the results, comparing them with visualizations, experimental measurements and functional requirements of the physical engineering system.

Numerical simulation specialization:

CS2: To adapt, modify and implement software tools for numerical simulation.

These skills are worked on exercises proposed in class, where we start from a sequential problem to transform it into a parallel one. In practicing exercises students will similarly work on their own on other problems of that type, and the assessment is carried out verifying these skills from the deliverables, taken into account with equal weight, that is, 0.2 for each of them.

WILL YOU BE USING A VIRTUAL PLATFORM? No.

WILL YOU BE USING ANY SPECIFIC SOFTWARE? Yes. MPI, OpenMP, Fortran and C compilers

CRITERIA FOR THE 1ST ASSESSMENT OPPORTUNITY

Assessment of students will be done through assignments and exercises that they will deliver, all of them equally weighted. Skills CG1, CG3 and CE4 are emphasized in exercises, and CE4, CE5 and CS2 in the assignments.

CRITERIA FOR THE 2ND ASSESSMENT OPPORTUNITY

The same as in the 1º assessment opportunity.