Course Title: Algorithms and Parallel Computing	**Number of Units: 1**
SSD : ING-INF/05	**CFU:** 6
Course aims: To deal with the basic ideas, methodologies, tools and software to design and develop algorithms in High Performance Parallel/Distributed Computing Environments. The Lab practice plays a key role in this one-semester course.	
Course Description: Classification and main functional characteristics of the parallel architectures. Parallel Algorithms Performance Evaluation Parameters. Methodologies to design and develop parallel algorithms and their strong dependency by the hardware/software architectures. Performance Evaluation and Scalability of parallel algorithms. Math model for analyzing parallel algorithms Load Balancing. Fault and Latency tolerant algorithms. Programming models and paradigms: cluster computing, multicore computing, network computing, GPU computing. The present cases of grid and cloud computing. Implementation of several algorithms in distributed and shared memory environments: examples of matrix computation and array sorting algorithms. Use of tools for message passing and for shared memory.	
Assumed Background: Computer Programming – basic level; C language – basic level; Use of Linux – basic level; Matrix Computation Algorithms – basic level; Array sorting Algorithms – basic level	
Assessment methods: Lab tests during the course; final written/oral test.	