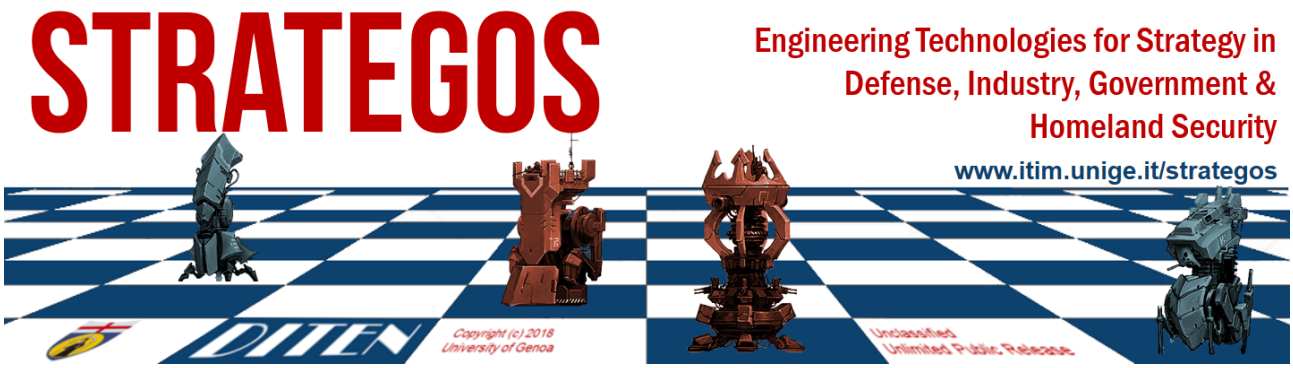

STRATEGOS

Master of Science on Modelling, Engineering and Strategies on Operations and Systems

Course: Computational Intelligence

SSD: INF/01

Credits: 4

Tentative Schedule:

1 Lecture of 4 hours in a row per week for 10 weeks including frontal lectures, Class exercises and home-works.

Teachers, Email, URL:

Prof. Francesco Masulli, francesco.masulli@unige.it,

URL: **person.dibris.unige.it/masulli-francesco**

unige.it/off.f/2019/ins/37844.html

Assistants for Exercises:

TBF

Education Objectives:

The course presents a systematic introduction to the fundamentals and applications of computational intelligence models that are advanced data processing methods inspired to natural systems which encompass artificial neural networks, fuzzy logic systems, evolutionary computing, swarm intelligence, and machine learning. Relevant algorithmic and computational topics, such as the classification and regression, will be addressed both from the theoretical point of view and through practical programming exercises using Python language.

Course Program & Elements:

Neural Networks; Fuzzy Logic Systems; Evolutionary Computing; Swarm Intelligence; Neuro-Fuzzy and Fuzzy Neural Systems; Hybrid Intelligent Systems, Machine Learning; Classification, Regression Learning, Clustering.

Teaching Approach:

Frontal Lectures on theory of Computational Intelligence methods, theoretical and programming exercises, introduction to home-works (to be carried out individually or in groups of two students)

Evaluation and Final Exam:

The final exam will be carried out as an oral exam, where the student will demonstrate the acquisition of the theoretical aspects of Computational Intelligence presented during the Course and will include the discussion of home-works. The final evaluation will also take into account the active attendance of lessons.

Timetable:

To be Finalized (TBF)

Time Zone:

CET (GMT+1)

Prerequisites:

The Course does not require specific prerequisites, being accessible to University students and including all the elements and references necessary; therefore basics know-how in engineering, mathematics, statistics and computer programming in Python could be useful to improve the student's learning curve and performance. An introduction to programming in Python is provided by W35 Seminar: Programming (Programming and Code Development Foundations)

References

- ***Textbook: Andries P. Engelbrecht: Computational Intelligence - An introduction, Wiley, 2007.***
- ***Selection of relevant journal papers***
- ***Lecture notes***