

Inter-Institutional postgraduate program
Data Analysis & Machine - Statistical Learning (DAMSL)



University of Crete
Dept. of Math & Applied Mathematics
Dept. of Computer Science



FORTH
Inst. of Applied & Computational
Mathematics (IACM)
Inst. of Computer Science (ICS)

STUDY GUIDE
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1. The postgraduate program "Data Analysis and Machine – Statistical Learning"

The Departments of Mathematics & Applied Mathematics, Computer Science of the University of Crete and the Institutes of Applied and Computational Mathematics (IACM), Computer Science (ICS) of the Foundation for Research and Technology (FORTH), organize the Inter-institutional Master's Program "Data Analysis and Machine - Statistical Learning". Its purpose is to specialize in the interdisciplinary area of Data Analysis with an emphasis on Machine Learning and related Statistical Methods. The program awards a Postgraduate Diploma in "Data Analysis and Machine - Statistical Learning". The program is administered by the *Program Study Committee (PSC)*.

2. Student selection process

Interested candidates should hold a university degree from an accredited higher education institution. The master's program is aimed for Greek and international students and accepts students with disabilities and/or special educational needs. The buildings of the participating institutions are accessible to people with special needs and the classrooms have been supplied with seats suitable for wheelchairs.

The following are indicative selection criteria:

- bachelor's degree grade
- relevant undergraduate/graduate
- candidate's bachelor thesis if any
- any publications in peer-reviewed international journals and/or her/his participation in conferences
- professional or research experience related to the subject of the program.
- awards or patents
- written assessment
- interview
- letters of recommendation

There is a call for applications in the spring of every year. The applications of the candidates should be accompanied by the relevant documents, according to the announcement.

The evaluation of the applications is the responsibility of the Evaluation Committee appointed annually by the PSC. The Evaluation Committee considers: the candidate's earlier performance (grades, courses, assignments), letters of recommendation, knowledge of the English language, and any other criteria such as e.g. personal interview and/or written exams. The PSC may decide further criteria, which are considered during the selection process.

Successful candidates are contacted by email. The selected candidates are invited to register in the program within a deadline.

3. Duration of studies

The duration of studies for the Postgraduate Diploma is three (3) academic semesters. Part-time study is possible in special cases of students who are unable to meet the requirements of full-time study, upon the approval of PSC. The duration of part-time study cannot exceed twice the normal duration of the program.

4. Study curriculum

All courses are taught in English and the master project is also written in English. To complete the program, 90 ECTS are needed from which 70 ECTS are from course work and 20 ECTS from the Master Project. The master project is mandatory for all students. The courses are divided in: *Preparatory*, *Core* and *Elective*. *Preparatory* are advanced undergraduate courses which may be needed to fill possible gaps necessary to follow the program. Each *Preparatory* course is 5 ECTS which includes 2hrs/week lectures plus homework and/or lab assignments and a final exam and/or project. A maximum of 10 ECTS can be credited from *Preparatory* courses. There are three *Core* courses which are mandatory for all students and account for total of 30 ECTS. The remaining required ECTS can be completed by taking *Elective* courses. *Core* and *Elective* courses are 10 ECTS each and include 4hrs/week lectures plus homework and/or lab assignments and a final exam and/or project.

The indicative course schedule is structured as follows:

Semester A (20-30 ECTS)

- Data Structures (5 ECTS)
- Numerical algorithms (5 ECTS)
- Probabilities (5 ECTS)
- Mathematical and Computational Statistics (10 ECTS)
- Introduction to Machine Learning (10 ECTS)

Semester B (30 ECTS)

- Introduction to Data Science (10 ECTS)
- Two (2) elective courses with 10 ECTS each

Semester C (30 ECTS)

- Master's Project (20 ECTS)
- One-two (1-2) elective courses with 10 ECTS each

An indicative list of courses is provided in Appendix I

5. Internships

The opportunity for an optional Internship (Practical Training) is provided in the public and private sector organizations. The Internship earns 10 ECTS, in addition to the required 90

ECTS for the completion of the Master's Degree. Students are eligible to undertake the Internship after successfully completing the first academic semester of the program.

6. Tuition Fees

The tuition fees for the entire program are:

- a) €1500 for students from European Economic Area (EEA) countries
- b) €3000 for students from non-EEA countries

The tuition fees are essential to cover the program's operating costs. Tuition fees are paid in two installments: the first during enrollment in the M.Sc. program in the first academic semester, covering two-thirds (2/3) of the total amount, and the second during enrollment in the M.Sc. program in the third academic quarter, covering the remaining amount, to a bank account specified by the University of Crete.

In case of definitive withdrawal from the M.Sc. program, the paid tuition fees are non-refundable, and a certificate is issued for the successfully completed courses.

In case of a suspension of studies request, the M.Sc. student must have settled all financial obligations at the time of the application. Otherwise, the program is obliged to proceed with the removal of the student. In special cases, scholarships may be granted, not exceeding 30% of admissions per year. In the case of part-time, one-sixth (1/6th) of the total amount is paid each semester and the remaining amount the last semester before graduation.

7. Scholarships and awards

The Master's program may grant scholarships of excellence and awards to its students, at the expense of its budget, based on their academic performance and individual or family financial situation. Additionally, it may offer reciprocating scholarships. The number of scholarships and awards and the criteria for their distribution, as well as any other relevant matter, lies within the jurisdiction of the PSC.

8. Educational process

The teaching of program courses is carried out in person. There is the possibility for a percentage of the courses to be offered through distance learning methods, provided that it is considered necessary, with a decision made by the PSC. If the educational process is conducted using distance learning methods, these cannot exceed twenty-five percent (25%) of the credit units of the Master's program and the percentage will be determined by the PSC.

9. Participation in Erasmus Program

Postgraduate students of the Departments' Postgraduate Programs have the opportunity to undertake part of their studies abroad through the Erasmus Program. The attendance of courses can take place at selected higher education institutions with which the Department has established bilateral agreements, and which can be found on the Department's website. Each mobility takes place in one of the 30 European countries for a period of 3-6 months with full recognition of the mobility period. In case of mobility for studies, students should enroll in courses equivalent to the curriculum of the postgraduate programme, in order to

secure up to 30 ECTS per semester. On the Department's website, students can find a description of the relevant procedure, selection criteria, and ranking.

APPENDIX I Indicative list of courses

The table below shows an indicative list of courses. This list may be changed by the Program Study Committee.

Preparatory, Core and Elective Courses		
Courses	Course Type	ECTS
Data Structures	Preparatory	5
Numerical algorithms	Preparatory	5
Probabilities	Preparatory	5
Introduction to Data Science	Core	10
Introduction to Machine Learning	Core	10
Mathematical and Computational Statistics	Core	10
Deep Learning	Elective	10
Optimization	Elective	10
Machine Vision	Elective	10
Signal analysis	Elective	10
Numerical Analysis	Elective	10
Numerical Approximation of DEs	Elective	10
Information Retrieval	Elective	10
Development of Scientific Software	Elective	10
Computer Aided Geometric Design	Elective	10
Geometric Algorithms	Elective	10

Design and Analysis of Algorithms	Elective	10
Information Theory	Elective	10
Modeling in Physical Sciences	Elective	10
Big Data Analytics	Elective	10
Time series analysis	Elective	10
Topics in Statistics	Elective	5/10
Topics in Data Science	Elective	5/10
Advanced Machine Learning	Elective	5/10

[Here](#) is a detailed catalogue of courses.