Dear student,

In this letter we will give you some information about the analytical test.

The analytical test is meant to find out if you have the required basic mathematical and statistics knowledge for this Master program. Attached you will find the learning outcomes of the test.

In the interview we will discuss your results and discuss possible additional studying depending on your results.

There are many textbooks and a lot of online material that can be used to prepare for this test. The recommended textbook is Mathematics for Engineers by A. Croft and R. Davison (Pearson Education, ISBN: 9781292253640). Chapters 10 to 14, 18, 20, 21, 22 and 24 are NOT required for this analytical intake test.

You have to log in to <https://hhs.mobius.cloud/login> and use the inlogcodes from the email.

The test is restricted to one hour and you can take the test from home with a reliable internet connection. You have only one attempt.

Good luck with the test!

Best regards,

The teachers of the Master NLE

Any questions? Do not hesitate to ask us!

[Masternle@hhs.nl](mailto:Masternle@hhs.nl)

**Learning outcomes analytical test**

1

The student solves simple mathematical equations and is able to set them up and combine them for simple logical situations.

* The student solves first and second order equations, possibly using the quadratic formula (In Dutch: abc-formule).
* The student solves systems of two linear equations.
* The student solves simple equations containing a term with the variable raised to general power or a term with the variable in the exponent.
* The student sets up the above-mentioned types of simple equations for situations using logical thinking.
* The student differentiates mathematical functions and uses this to determine rates of change, maxima and minima.

2

The student differentiates the following standard functions: power, exponential, logarithmic and trigonometric functions.

* The student uses the linearity of differentiation.
* The student uses the product and chain rule of differentiation.
* The student determines rates of change, maxima and minima using differentiation.

3

The student integrates mathematical functions and uses this to determine  
areas and other relevant quantities.

* The student determines the antiderivative of the following standard functions: power, exponential and trigonometric functions.
* The student determines the antiderivative of a standard function, as specified in 3.2, of a linear function.
* The student computes areas under and between curves and relates them to relevant quantities.

4

The student uses and interprets summation notation

* The student sets up a formula for an arithmetic sequence of numbers\
* The student can calculate the sum written in ∑-notation using provided data or a given formula for the sum under consideration.

5

The student calculates combinations, permutations and probabilities for  
binomial distributions.

* The student knows when combinations or permutations are applicable and is able to calculate these numbers.
* The student calculates the probability for a certain outcome of an experiment to which the binomial distribution is applicable.