This gives bioinformatics a central position among research fields like pharmaceutics, biotechnology, gene technology, anthropology, agriculture, forensic science and chemistry, as well as clinical research and industrial applications. Bioinformatics is therefore a highly multidisciplinary field encompassing a broad range of in-depth knowledge. If you have a wide interest in biosciences, the ability to solve problems and reason methodically, and an enthusiasm for incorporating computer technology in your research, then the Master’s programme in Bioinformatics is definitely for you.

Why study Bioinformatics at the VU?
In addition to a growing Bioinformatics Department, the VU recently founded a broad-based bioinformatics institute, the Integrative Bioinformatics Institute VU (IBIVU). This is a multidisciplinary institute which brings together three faculties (Sciences, Earth and Life Sciences, Psychology and Education) and the VU University Medical Center, with the joint aim of expanding the knowledge of genetic and cellular processes which play a key role in areas such as multifactorial diseases (e.g. cancer), soil ecology (ecogenomics), neurobiology and biocomplexity. The IBIVU combines expertise from disciplines including mathematics (biostatistics, stochastics), artificial intelligence, high-performance computing, visualization, molecular cell physiology, genetic psychology and genomics. This inclusive approach provides you with a whole spectrum of projects in which you can actively participate. The IBIVU also has a number of contacts inside and outside the Netherlands, enabling you to complete a traineeship at other leading institutes.

The structure of the programme
The full Master’s programme in Bioinformatics takes two years and is worth 120 credits. As a rule, you will take approximately nine months of courses (45 credits) and complete fifteen months of practical training (75 credits). It is also possible to take individual parts of the programme, leading to degree component certificates at Master’s level.

Bioinformatics research is concerned with the information processes in living systems and with producing methods to analyse and integrate biological (genome) data.

The classes consist of:
- Compulsory courses 30 credits
- Optional courses 16-18 credits
- First traineeship 30-60 credits
- Second traineeship 15-30 credits
- Possible third traineeship 15-30 credits

Every student is allocated a mentor to help put together the Master’s programme that suits him or her best, using a flexible approach and in full consultation.

An overview of the compulsory courses
- **Sequence Analysis**
  Course/workshop on theory and applying techniques for sequence database searching, pairwise and multiple alignment, profile searching, and phylogeny (6 credits).
- **DNA/Protein Structure-Function Analysis and Prediction**
  Course/workshop on theory of DNA/protein sequence-structure-function relationships, which provides hands-on experience of associated methods (6 credits).
- **Genome Analysis: Structural and Functional Genomics**
  Course on theory and methods of genome mining, gene and gene function prediction, gene clustering, and genomic networks (6 credits).
- **Bioinformatic Data Analysis and Tools**
  Course on theory and methods in applied multivariate statistics, MCMC, data mining and bioinformatics methods development (6 credits).
- **Integrative Bioinformatics and Genomics**
  Theory and practice of integrative approaches and databases in bioinformatics, including E-cell modelling, AI (agent systems), metabolic pathways (metabolome), and integrative data mining of genome, proteome, metabolome, and physiome data (6 credits).
Optional courses
A range of optional courses is available, including Introduction to Bioinformatics, Statistical Genetics, Statistical Models, Machine Learning, Evolutionary Methods, Neural Networks, Data Mining Techniques, Scientific Visualization and Parallel Programming. Optional courses are provided by the IBIVU and the Biology, Mathematics and Computer Science Departments at the VU. You may also choose courses at other departments in consultation with your mentor.

Traineeships
Your traineeships will account for 75 of your credits. You will complete two or three traineeships, one of which will be more extensive than the others (minimum of 30 credits). The IBIVU’s broad, multidisciplinary structure allows you to work on a wide variety of subjects at the VU. External traineeships are also possible. Your third traineeship can also take the form of a literature survey.

Job opportunities
Bioinformatics graduates are very much in demand in the Netherlands, both in the academic world and industry. This is because recent and ongoing breakthroughs in biotechnology and medical and genomic technology have generated vast quantities of data on genetic and functional processes in living cells. All this information is of little use unless subjected to biological and/or medical analysis.

Admission requirements
The multidisciplinary nature of the Master’s programme in Bioinformatics means that it is open to motivated candidates with an appropriate qualification in most biology and science subjects. Depending on your specific background, it may be necessary for you to take a number of supplementary courses in biology, computer science or statistics to bring your knowledge in these areas up to standard.

Registration and enrolment
Vrije Universiteit
Student Services, main building
De Boelelaan 1105
1081 HV Amsterdam, The Netherlands
Telephone +31 (0)20 444 5020
(10 a.m. - 5 p.m. local time)

Further information
Information on the Internet:
www.few.vu.nl and ibivu.cs.vu.nl

For general information about eligibility, registration deadlines, visa requirements and the like, international students should contact:
International Programmes Manager, Faculty of Sciences
Vrije Universiteit, De Boelelaan 1083/ Room P-362
1081 HV Amsterdam, The Netherlands
Telephone +31 (0) 20 444 7499
Fax +31 (0)20 444 7509
E-mail fci@few.vu.nl

Otherwise contact:
Prof. Jaap Heringa
Integrative Bioinformatics Institute VU
Faculty of Sciences & Faculty of Earth and Life Sciences
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