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| 5.0 credits | 30.0 h | 2q |
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| Teacher(s) :                 | Hafner Christian ; von Sachs Rainer ;  |
| Language :                   | Anglais  |
| Place of the course          | Louvain-la-Neuve   |
| Prerequisites :              | <i>The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.</i>   |
| Main themes :                | You will learn how to use estimation methods based on kernels, smoothing splines, local polynomials and wavelets. You will describe and compare these methods by different criteria such as the mean square error, including bias and variance of the estimator. You will develop a profound understanding of these methods by applying them to the aforementioned variety of different domains of nonparametric curve estimation.   |
| Aims :                       | This course makes you familiar with the different basic techniques used in nonparametric curve estimation (of fixed and stochastic design regression functions, densities and spectral densities).<br><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i>   |
| Content :                    | The table of content of this course will be adapted towards the interests and background of the students. We will start by a series of more theoretical lectures which are followed by presentations prepared by you on a summary of some original research paper related to the topic treated.  |
| Other infos :                | References<br>GIJBELS, I. : Advanced nonparametric statistics. Syllabus du cours STAT 3120.<br>FAN, J. and GIJBELS, I. (1996). Local polynomial modelling and its applications. Chapman and Amp; Hall, New York.<br>SILVERMAN, B.W. (1986) : Density Estimation for Statistics and Data Analysis. Chapman and Hall, London.<br>HÄRDLE, W. (1990) : Applied Nonparametric Regression. Cambridge University Press, Cambridge.<br>JANSEN, M. (2001). Noise reduction by wavelet thresholding. Springer Lecture Notes in Statistics 161.<br>OGDEN, T. (1997) : Essential wavelets for statistical applications and data analysis. Birkhäuser, Boston.<br>SIMONOFF, J.S. (1996). Smoothing methods in Statistics. Springer.<br>WAND, M.P. et JONES, M.C. (1995). An introduction to kernel smoothing. Chapman and Hall, London. |
| Faculty or entity in charge: | LSBA   |

| <b>Programmes / formations proposant cette unité d'enseignement (UE)</b> |         |         |  |   |
|--|---------|---------|--|---|
| Intitulé du programme  | Sigle   | Credits | Prerequis  | Acquis d'apprentissage  |
|  | STAT9CE | 5       | -  |  |
| Master [120] in Statistics:<br>General                                   | STAT2M  | 5       | <a href="#">LANGL1330</a> and<br><a href="#">LSTAT2020</a> and <a href="#">LSTAT2150</a> |  |
|  | STAT2FC | 5       | -  |  |