# Course: Adaptive Filters — credits: 5

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| **Course code** | SEVM21AF |
| **Name** | Adaptive Filters |
| **Study year** | 2026-2027 |
| **ECTS credits** | 5 |
| **Language** | English |
| **Coordinator** | B.D. Williams |
| **Modes of delivery** | Lecture<br>Project-based learning |
| **Assessments** | Adaptive Filters - Assignment |

**Learning outcomes**

At the end of this module the student is able to:

- understand the link between Fourier analysis and the Z-transform.
- create and understand how a digital filter (FIR/IIR) works.
- clean data using advanced filtering techniques, including the Wiener filter, (normalized) Least-Mean-Square (LMS) adaptive filters, Recursive Least Squares (RLS) adaptive filters, and Kalman filtering.
- describe systems in the time-domain and/or frequency domain using stationary discrete-time stochastic processes and models, such as autoregressive (AR) and moving-average (MA) models.

**Content**

The course covers the following topics:
Z-transform, FIR and IIR filters, stationary discrete-time stochastic processes and models, (normalized) Least-Mean-Square adaptive filters, Recursive Least Squares Adaptive Filters and Kalman filtering, model simulation tools, model-based reasoning.

**Included in programme(s)**

Smart Systems Engineering

**School(s)**

Engineering, Life Sciences & ICT

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