<table>
<thead>
<tr>
<th><strong>Course title</strong></th>
<th>Digital Signal Processing</th>
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<tr>
<td><strong>Department</strong></td>
<td>04 Electrical Engineering and Information Technology</td>
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<tr>
<td><strong>Hours per week (SWS)</strong></td>
<td>4</td>
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<td><strong>Number of ECTS credits</strong></td>
<td>5</td>
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<td><strong>Course objective</strong></td>
<td>Mastering the basics of digital signal processing systems and knowledge of implementation options with digital signal processors (OSP).</td>
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<td><strong>Prerequisites</strong></td>
<td>Undergraduate course in signal and systems and fourier theories</td>
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<tr>
<td><strong>Teaching methods</strong></td>
<td>Seminaristic teaching and laboratory experiments</td>
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<tr>
<td><strong>Assessment methods</strong></td>
<td>Examination 90 min</td>
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<td><strong>Language of instruction</strong></td>
<td>English</td>
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<tr>
<td><strong>Name of lecturer</strong></td>
<td>Prof. Dr. Christoph Rapp</td>
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<tr>
<td><strong>Email</strong></td>
<td><a href="mailto:rapp@ee.hm.edu">rapp@ee.hm.edu</a></td>
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| **Course content** | * Analysis of discrete-time signals and systems in time and frequency domain, sampling and reconstruction, OFT I FFT, difference equation, discrete convolution, z-transform, stability and complexity considerations.  
* Specific applications of the OFT I FFT (short-term OFT, spectrogram, effects of different window functions)  
* Design of Digital FIR and IIR filter (standard design methods, bilinear transform, realization structures for minimized computational effort or for robustness against numerical errors. IIR realization in the “2nd order sections” -form)  
Special fitters (allpass filter, differentiator, Hilbert filter, Nyquist filter)  
* Basics of sample rate conversion (interpolation, decimation)  
* Computer exercises using MATLAB I SIMULINK and labs with signal processor evaluation kit and C/C++ development environment. |
| **Remarks** | - |