

## V.4 Integral Transformations

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| module designation       | <i><b>Integraltransformationen (Integral Transforms)</b></i>   |
| abbreviation             | <b>M-ITA</b>   |
| course                   | <i>Integral transformations and applications</i>   |
| Module manager           | <i>Prof. Dr. Georg Illies, Prof. Dr. Dietwald Schuster</i>   |
| lecturer                 | <i>Prof. Dr. Georg Illies, Prof. Dr. Dietwald Schuster,<br/>Prof. Dr. Oliver Stein</i>   |
| Lehrform / SWS           | <i>Seminar-based instruction with internship / 4 SWS</i>   |
| workload in hours        | <i>Attendance study: 60 h,<br/>Self-study: 90 h</i>  |
| credit points            | <b>5 ECTS</b>  |
| recommended requirements | <i>B-AN1,2; Analysis 1,2; B-LA1,2: Lineare Algebra 1,2;<br/>B-NM1: Numerical Mathematics 1</i>   |
| learning goals           | <ul style="list-style-type: none"> <li>• <i>Knowledge of important integral transformations (Fourier and related transformations) and their properties</i></li> <li>• <i>Insight into signal processing and information technology applications</i></li> <li>• <i>Development and implementation skills of algorithms based on integral transformations</i></li> </ul> |
| contents                 | <ul style="list-style-type: none"> <li>• <i>Methods of Fourier analysis and Laplace transformation</i></li> <li>• <i>Application of the Fourier methods in the image data compression</i></li> <li>• <i>Deconvolution and methods for improving resolution in image processing</i></li> <li>• <i>Radon transformation and basics of computer tomography</i></li> </ul> |
| literature               | <ul style="list-style-type: none"> <li>• <i>Strang, G.: Scientific computing, Springer 2010</i></li> <li>• <i>Bachman, G .; Narici, L .; Beckenstein, E .: Fourier and Wavelet Analysis, Springer, 2000</i></li> <li>• <i>Westermann, Th.: Mathematics for Engineers, Springer 2015</i></li> </ul>   |