

## Course descriptor B31SC

Course code	B31SC
Course title	Digital Signal Processing
Credits	15
School	Engineering and Physical Sciences
SCQF Level	11
Semester	1
Aims	<ul style="list-style-type: none"> <li>• To provide students with the knowledge &amp; skills to tackle significant signal processing tasks including their features, boundaries, terminology and conventions.</li> <li>• Use a range of specialised DSP skills and techniques, which are at the forefront of DSP practise</li> <li>• To enable students to apply critical analysis, evaluation and synthesis to a range of DSP problems.</li> <li>• To enable students to apply a range of DSP techniques using DSP development tools.</li> </ul>
Syllabus	<ul style="list-style-type: none"> <li>• Revision: Continuous – and discrete – time systems in time and frequency domains using Fourier Analysis (as covered in B38SA and B38SB)</li> <li>• Statistical properties of signals: Probability density functions, cumulative distribution function, correlation, power spectrum density, moments</li> <li>• Fast Fourier Transform (FFT): decimation in time and frequency, twiddle functions and butterflies (DIF &amp; DIT), FFT processing rates; fast convolution</li> <li>• Digital filters: FIR and IIR filters, lowpass, bandpass, and highpass transformations, finite precision effects, window functions, realisation of digital filters, transformation of analog filter designs.</li> <li>• Multirate signal processing, upsampling and downsampling, spectral properties</li> </ul>

Learning Outcomes	
Subject Mastery	<ul style="list-style-type: none"> <li>• Develop a critical understanding of complex DSP concepts.</li> <li>• Use a range of specialised DSP techniques on DSP boards.</li> <li>• Demonstrate originality and critical analysis in specific DSP problems.</li> <li>• Use a significant range of advanced DSP techniques and practices.</li> </ul>

Personal Abilities	<ul style="list-style-type: none"><li>• Use of DSP software development environment.</li><li>• Ability to direct &amp; take responsibility for own work.</li><li>• Undertake critical evaluations of a wide range of experimental work</li></ul>
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Assessment method	80% written examination, 20% course work
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