University of Technology Computer Engineering Department Academic Year 2023-2024 3st Year- Second semester- All Branches	

CE335	Digital Signal Processing	2 Hr/Week	2Units

Contents of syllabus	Hours
1. Discrete Fourier Transform • DFT • Properties • Time-shift theorem • Correlation • Complex conjugation • Real and imaginary sequences	6
2. Fast Fourier Transform • Matrix Formulation • Decimation in Time Algorithm • Decimation in Frequency Algorithm	4
3. Z Transform • Definition and Properties • Convergence Theorems • Inverse Z Transform: **Computation based on residue theorem** and Partial Fraction Method	4
4. Digital Filters Realization • Realization: Direct, Direct canonic, Parallel, and Cascade	2
5. FIR Design • Nonrecursive filters • Impulse Response Symmetries • Frequency Response	8

• Location of Zeros • Use of a discrete-time window function	
6. IIR Design • Recursive filters • Bilinear transformation	**6**

References:

1. **Li Tan, "Digital Signal Processing: Fundamentals and Applications", Elsevier, 2008.**