GUJARAT TECHNOLOGICAL UNIVERSITY

VLSI SIGNAL PROCESSING
SUBJECT CODE: 3716103

Type of course: Elective

Prerequisite: NA

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE(E)	PA (M)	PA (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Introduction to DSP systems, Pipelined and parallel processing		
2	Iteration Bound, Retiming, unfolding, algorithmic strength reduction in filters and Transforms		
3	Systolic architecture design, fast convolution, pipelined and parallel recursive and adaptive filters, Scaling and round off noise		
4	Digital lattice filter structures, bit level arithmetic, architecture, redundant arithmetic		
5	Numerical strength reduction, synchronous, wave and asynchronous pipe lines, low power design		
6	Programmable digit signal processors		

Reference Books:

1. J.G. Proakis, Manolakis “Digital Signal Processing”, Pearson, 4th Edition
2. Gonzalez and Woods, “Digital Image Processing”, PHI, 3rd Edition
3. S. K. Mitra. “Digital Signal Processing – A Computer based Approach”, TMH, 3rd Edition, 2006
4. A. K. Jain, “Fundamentals of Digital Image Processing”, Prentice Hall
5. KeshabParhi, “VLSI Digital Signal Processing Systems – Design and Implementation”, Wiley India

Course Outcome:

After learning the course the students should be able to:

1. Acquired knowledge about DSP algorithms, its DFG representation, pipelining and parallel processing approaches

2. Ability to acquire knowledge about retiming techniques, folding and register minimization path problems
3. Ability to have knowledge about algorithmic strength reduction techniques and parallel processing of FIR and IIR digital filters
4. Acquired knowledge about finite word-length effects and round off noise computation in DSP systems