

13-EC565 RECONFIGURABLE COMPUTING

SYLLABUS

Introduction Goals and motivations - History, state of the art, future trends - Basic concepts and related fields of study - Performance, power, and other metrics - Algorithm analysis and speedup projections - RC Architectures - Device characteristics - Fine-grained architectures - Coarse-grained architectures . **Fpga Design** FPGA Physical Design Tools -Technology mapping - Placement & routing - Register transfer (RT)/Logic Synthesis - Controller/Data path synthesis - Logic minimization .**Parallel Processing** RC Application Design - Parallelism - Systolic arrays -Pipelining - Optimizations - Bottlenecks - High-level Design - High-level synthesis - High-level languages - Design tools. **Architectures** Hybrid architectures- Communication - HW/SW partitioning - Soft-core microprocessors- System architectures -System design strategies - System services - Small-scale architectures - HPC architectures - HPEC architectures - System synthesis - Architectural design space explorations. **Case Study** Case Studies- Signal and image processing - Bioinformatics - Security - Special Topics - Partial Reconfiguration - Numerical Analysis -Performance Analysis/Prediction - Fault Tolerance

TEXT BOOK

1. Paul S. Graham and Maya Gokhale “Reconfigurable Computing Accelerating Computation with Field-Programmable Gate Arrays” springer .