INDIAN INSTITUTE OF INFORMATION TECHNOLOGY
DESIGN AND MANUFACTURING (IIITDM) KANCHEEPURAM

INTRODUCTION OF NEW COURSE

Course Title	Reconfigurable Computing	Course No	CSE6XXX			
Specialization	Computer Science and Engineering	Structure (LTPC)	3	1	0	4
To be offered for	PG / Ph.D	Status	Core ☐		Elective ■	
Faculty Proposing the course	Noor Mahammad Sk	Type	New ■		Modification ☐	
Date of DAC	16 November 2018	Members Present in DAC	All Faculty Members of the Dept. External Members*			
Pre-requisite	Digital Logic Design, Computer Organization and Design, Computer Architecture, Operating System	Submitted for approval	39th Senate			
Learning Objectives	• To understand the fundamentals of reconfigurable computing and architectures. Articulate the design issues involved in reconfigurable computing Systems with a specific focus on FPGAs both in theoretical and application level. Discuss the performance trade-off involved in designing a reconfigurable computing and how to utilize them for solving challenging computational problems.					
Learning Outcomes	• Understand the new paradigm of Computing which offers flexibility, scalability and performance. Understand the notion of system/circuit redesign on the fly using dynamic reconfiguration. The student can able to optimize the given system specific to underlying reconfigurable hardware. Student can able to bring the notion of evolvable circuit on Reconfigurable hardware.					
Contents of the course *(With approximate break-up of hours)*	Introduction to Reconfigurable Computing – paradigms of computing. (3hrs) Reconfigurable Configurable Hardware – Device Architecture, Reconfigurable Computing Architecture, Reconfigurable Computing Systems, Reconfigurable Management.(10hrs) Programming Reconfigurable Systems – Compute Models and System Architectures, Programming FPGA Applications in HDLs, Spatial Computing, Stream computations, Data parallel FPGA applications, Operating System Support for Reconfigurable Computing. (12hrs) Mapping Designs to Reconfigurable Flatforms – Technology Mapping, FPGA Placement, Datpath Composition. (7hrs) Application Development – Implementing Applications with FPGAs, Hardware/software Partitioning, Mult-FPGA Systems: Logic Emulation Evolvable FPGAs, Network Packet Processing in Reconfigurable Hardware – (10hrs)					
Text Books	Scott Hauck André DeHo, Reconfigurable Computing, 1st Edition, Morgan Kaufmann, eBook ISBN: 9780080556017, Hardcover ISBN: 9780123705228					
Reference Books	1) M. Gokhale and P. Graham, Reconfigurable Computing: Accelerating Computation with FieldProgrammable Gate Arrays, Springer, 1st Edition, 2005, ISBN: 978-0-387-26105-8 2) N. Voros and K. Masselos (eds.), System-Level Design of Reconfigurable Systems-on-Chip, Springer, 1st Edition, 2005, ISBN: 978-0387261034. 3) C. Bobda, Introduction to Reconfigurable Computing: Architectures, Algorithms and Applications, Springer, 1st Edition, 2007, ISBN: 978-1402060885. 4) P. Lysaght and W. Rosenstiel (eds.), New Algorithms, Architectures and Applications for Reconfigurable Computing, Springer, 1st Edition, 2005, ISBN: 978-1402031274. 5) R. Cofer and B. Harding, Rapid System Prototyping with FPGAs: Accelerating the Design Process, Newnes, 1st Edition, 2005, ISBN: 978-0750678667. 6) R. Tessier, K. Pocek, and A. DeHon, Reconfigurable Computing Architectures, in Proceedings of the IEEE, vol. 103, no. 3, March 2015, pp. 332-354.					

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