Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Computer Science & Engineering
(Applicable from the academic session 2018-2019)

Computer Architecture
Code: PCC-CS402
Contacts: 3L

Name of the Course:	**Computer Architecture**	
Course Code: PCC-CS402	Semester: IV	
Duration: 6 months	Maximum Marks:100	
Teaching Scheme	**Examination Scheme**	
Theory: 3 hrs./week	Mid Semester exam: 15	
Tutorial: NIL	Assignment and Quiz: 10 marks	
	Attendance: 5 marks	
Practical: hrs./week	End Semester Exam: 70 Marks	
Credit Points:	3	
Objective:		
1	To learn the basics of stored program concepts.	
2	To learn the principles of pipelining	
3	To learn mechanism of data storage	
4	To distinguish between the concepts of serial, parallel, pipeline architecture.	
Pre-Requisite:		
1	Basic Structure of Computers, Functional units, software, performance issues software, machine instructions	
2	RAM, ROM, Memory management	

Unit	Content	Hrs/Unit	Marks/Unit
1	Introduction: Review of basic computer architecture (Revisited), Quantitative techniques in computer design, measuring and reporting performance. (3L) Pipelining: Basic concepts, instruction and arithmetic pipeline, data hazards, control hazards and structural hazards, techniques for handling hazards. Exception handling. Pipeline optimization techniques; Compiler techniques for improving performance. (9L)	12	
2	Hierarchical memory technology: Inclusion, Coherence and locality properties; Cache memory organizations, Techniques for reducing cache misses; Virtual memory organization, mapping and management techniques, memory replacement policies. (8L)	8	
3	Instruction-level parallelism: basic concepts, techniques for increasing ILP, superscalar, super-pipelined and VLIW processor architectures. Array and vector processors. (6L)	6	

| 4. | Multiprocessor architecture: taxonomy of parallel architectures; Centralized shared- memory architecture: synchronization, memory consistency, interconnection networks. Distributed shared-memory architecture. Cluster computers. (8L) Non von Neumann architectures: data flow computers, reduction computer architectures, systolic architectures. (4L) | 7 | |

Text/Reference Books:

1. V. Carl, G. Zvonko and S. G. Zaky, "Computer organization", McGraw Hill, 1978.
2. B. Brey and C. R. Sarma, "The Intel microprocessors", Pearson Education, 2000.
3. J. L. Hennessy and D. A. Patterson, "Computer Architecture A Quantitative Approach", Morgan Kauffman, 2011.
4. W. Stallings, "Computer organization", PHI, 1987.
5. P. Barry and P. Crowley, "Modern Embedded Computing", Morgan Kaufmann, 2012.
6. N. Mathivanan, "Microprocessors, PC Hardware and Interfacing", Prentice Hall, 2004.
7. Y. C. Lieu and G. A. Gibson, "Microcomputer Systems: The 8086/8088 Family", Prentice Hall India, 1986.
8. J. Uffenbeck, "The 8086/8088 Design, Programming, Interfacing", Prentice Hall, 1987.
9. B. Govindarajalu, "IBM PC and Clones", Tata McGraw Hill, 1991.
10. P. Able, "8086 Assembly Language Programming", Prentice Hall India6. Winfried Karl Grassmann and Jean-Paul Tremblay, Logic and Discrete Mathematics, PEARSON.
11. Rajaraman – "Computer Organization & Architecture", PHI
12. B.Ram – "Computer Organization & Architecture", Newage Publications

Course Outcomes:

On completion of the course students will be able to

PCC-CS402.1 Learn pipelining concepts with a prior knowledge of stored program methods

PCC-CS402.2 Learn about memory hierarchy and mapping techniques.

PCC-CS402.3 Study of parallel architecture and interconnection network