# SARDAR PATEL UNIVERSITY
## Programme & Subject: M.Sc – Information Technology (Integrated)
## Semester: IX
## Syllabus with Effect from: June-2016

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|---|---|
| **Paper Code: PS09EIIT02** | **Total Credit: 4** |
| **Title Of Paper: Parallel Computing** | |

| Unit | Description in Detail | Weightage (%) |
|---|---|---|
| I | **Introduction to Parallel Processing:**<br>Introduction, Why parallel processing?<br>Parallel processing terminologies<br>Parallel Processing Architectures<br>Processor Organizations<br>Processor Arrays, Multiprocessors, Multicomputers | 25% |
| II | **Parallel Programming Platforms:**<br>Implicit Parallelism: Trends in Microprocessor Architectures<br>Limitations of Memory System Performance<br>Dichotomy of Parallel Computing Platforms<br>Physical Organization of Parallel Platforms<br>Communication Costs in Parallel Machines<br>Routing Mechanisms for Interconnection Networks<br>Impact of Process-Processor Mapping and Mapping Techniques | 25% |
| III | **Principles of Parallel Algorithm Design algorithms:**<br>Preliminaries<br>Decomposition Techniques<br>Characteristics of Tasks and Interactions<br>Mapping Techniques for Load Balancing<br>Methods for Containing Interaction Overheads<br>Parallel Algorithm Models<br>Sorting Algorithms: Odd-Even Transportation Sort, Bitonic Merge | 25% |
| IV | **Basic Communication Operations, algorithms**<br>One-to-All Broadcast and All-to-One Reduction<br>All-to-All Broadcast and Reduction<br>All-Reduce and Prefix-Sum Operations<br>Scatter and Gather<br>All-to-All Personalized Communication<br>Circular Shift<br>Improving the Speed of Some Communication Operations | 25% |

**Basic Text & Reference Books:-**


- Ananth Grama, Anshul Gupta, George Karypis, VipinKumar : "Introduction to Parallel Computing", Pearson Publication, Second Edition,2012.
- Quinn Michael J: "Parallel Computing – Theory and Practice", McGraw-Hill Pub., Second Edition, 1994.
- M. SasiKumar, Dinesh Shikhare, P. Raviprakash: "Introduction to Parallel Processing", Prentice Hall of India Publication,2004.