CU5004 HIGH PERFORMANCE SWITCHING ARCHITECTURES

DETAILED SYLLABUS

UNIT I LAN SWITCHING TECHNOLOGY

Switching Concepts, LAN Switching, switch forwarding techniques - cut through and store and forward, Layer 3 switching, Loop Resolution, Switch Flow control, virtual LANs.

UNIT II ATM SWITCHING ARCHITECTURES

Blocking networks - basic - and- enhanced banyan networks, sorting networks - merge sorting, rearrangable networks - full-and- partial connection networks, non blocking networks – Recursive network construction, comparison of non-blocking network, Switching with deflection routing – shuffle switch, tandem banyan switch.

UNIT III QUEUES IN ATM SWITCHES

Internal Queueing -Input, output and shared queueing, multiple queueing networks – combined Input, output and shared queueing - performance analysis of Queued switches.

UNIT IV PACKET SWITCHING ARCHITECTURES

Architectures of Internet Switches and Routers- Bufferless and buffered Crossbar switches, Multistage switching, Optical Packet switching; Switching fabric on a chip; Internally buffered Crossbars.

UNIT V IP SWITCHING

Addressing model, IP Switching types - flow driven and topology driven solutions, IP Over ATM address and next hop resolution, multicasting, Ipv6 over ATM.

REFERENCES

1. Achille Pattavina, "Switching Theory: Architectures and performance in Broadband ATM networks ",John Wiley & Sons Ltd, New York. 1998

2. Christopher Y Metz, "Switching protocols & Architectures", McGraw - Hill Professional Publishing, NewYork.1998.

3. Elhanany M. Hamdi, "High Performance Packet Switching architectures", Springer Publications, 2007.

4. Rainer Handel, Manfred N Huber, Stefan Schroder, "ATM Networks - Concepts Protocols, Applications", 3rd Edition, Addison Wesley, New York. 1999.

5. Rich Siefert, Jim Edwards, "The All New Switch Book – The Complete Guide to LAN Switching Technology", Wiley Publishing, Inc., Second Edition, 2008.

OBJECTIVES:

- To enable the student to understand the basics of switching technologies and their implementation LANs, ATM networks and IP networks.
- To enable the student to understand the different switching architectures and queuing strategies
- and their impact on the blocking performances.
- To expose the student to the advances in packet switching architectures and IP addressing and
- switching solutions and approaches to exploit and integrate the best features of different
- architectures for high speed switching.

OUTCOMES:

- The student would be able to identify suitable switch architectures for a specified networking scenario and demonstrate its blocking performance.
- The student would be in a position to apply his knowledge of switching technologies, architectures and buffering strategies for designing high speed communication networks and analyse their performance