Course Code	Course Name	Teaching Scheme (Hrs./Week)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical/Oral	Tutorial	Total
BEITC801	Storage Network Management and Retrieval	04	02	---	04	01	---	05

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
BEITC801	Storage Network Management and Retrieval	20	20	20	80	25	---	25	150

Course Objectives:

a. Study and evaluate the need for Storage networking, current storage technologies: SAN, NAS, IP storage etc., which will bridge the gap between the emerging trends in industry and academics.

b. Understanding and building Storage networks and its backup and recovery techniques.

c. Study the information retrieval system as per different application in storage networks.

Course Outcomes:

1) Students will be able to evaluate storage architectures, including storage subsystems, SAN, NAS, and IP-SAN, also define backup, recovery.
2) Examine emerging technologies including IP-SAN.
3) Define information retrieval in storage network and identify different storage virtualization technologies.

Prerequisite: Computer Networks, Database Management Systems and Operating Systems

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours
I	NEED FOR STORAGE NETWORK	INTRODUCTION:- Limitations of traditional server centric architecture,. Storage centric architecture and its advantages. BASICS OF STORAGE NETWORK:- Intelligent Storage Systems (ISS), Data protection (RAID implementation methods).RAID arrays ,Components, RAID technologies, RAID levels, RAID impact on disk, performance & RAID comparison.	**10**
II	STORAGE NETWORK ARCHITECTURE	SCSI, SAN: FC SAN FC Protocol Stack, IP Storage, Infiniband, Virtual Interfaces	**08**
III	ADVANCED STORAGE TECHNOLOGY	NETWORK ATTACHED STORAGE (NAS):- Local File systems, Network File systems and file servers, Shared Disk File systems: Case study, Comparison: NAS, FC SAN and iSCSI SAN. STORAGE VIRTUALIZATION:- Virtualization in I/O path, Limitations and requirements, Definition of Storage Virtualization, Storage virtualization on Block and file level, Storage virtualization on various levels of Storage network, Symmetric and Asymmetric Virtualization.	**14**
IV	STORGAE NETWORK BACKUP AND RECOVERY	BC Terminology, BC Planning Lifecycle, General Conditions for Backup, Recovery Considerations, Network Backup Services Performance Bottlenecks of Network Backup, Backup Clients, Back up file systems, Backup Databases, Next Generation Backup.	**06**

V	INFORMATION RETRIEVAL IN STORAGE NETWORK	Overview, Abstraction , Information System, Measures, from Data to Wisdom, Document and Query Form, Query structures, The matching process, Text analysis: Indexing, Matrix representation, Term extraction, Term association, , Stemming , Multilingual retrieval systems	**10**

Text Books:

1. ULF Troppen, Rainer Erkens and Wolfgang Muller , " Storage Networks Explained: Basic and Applications of Fibre Channel SAN, NAS and ISCSI and Infifniband " , Wiley
2. EMC Educational Services, "Information Storage and Management", wiley India
3. R. R. Korfhage, "Information Storage and Retrieval", Wiley

References:

1. Richard Barker and Paul Massiglia, " Storage Area Network Essentials: A Complete Guide to Understanding and Implementing SANs" , Wiley.
2. Robert Spalding, " Storage Networks: The Complete Reference", Tata McGraw Hill
3. W. Curtis Preston, "Using SANs and NAS", O'Reilly

Term work: based on Laboratory Practical's/ Case studies and assignment

1. Term work shall consist of 10 practical implementation, case studies and study of simulators or tools available.
2. Study and implementation of simulation tool Navishpere and Unisphere related to storage network management.
3. Case study on Building and implementing SAN.
4. Study and implementation of any information retrieval tool.

Theory Examination:

• Question paper will comprise of 6 questions, each carrying 20 marks.
• Total 4 questions need to be solved.
• Q.1 will be compulsory, based on entire syllabus where in sub questions of 2 to 3 marks will be asked.
• Remaining question will be randomly selected from all the modules.

Weight age of marks should be proportional to number of hours assigned to each module.