Semester V

S.No	Course code	Course name	L	T	P	C
1	CS 304	Operating Systems	3	0	0	6
2	CS 303	Data Bases and Information Systems	3	0	0	6
3		Elective I / R&D I#	3	0	0	6
4		Elective II	3	0	0	6
5		HSS Elective 1*	3	0	0	6
6	CS 314	Operating Systems Laboratory	0	0	3	3
7	CS 313	Data Bases and Information Systems Laboratory	0	0	3	3
		Total credits				36

1	**Title of the course** (L-T-P-C)	**Operating Systems** **(3-0-0-6)**
2	**Pre-requisite courses(s)**	Computer Architecture
3	**Course content**	Process Management, Memory Management, Storage Management, Protection and Security, Virtual Machines, Distributed Systems
4	**Texts/References**	1. Avi Silberschatz, Peter Baer Galvin, Greg Gagne, ``Operating Systems Concepts'' 9th edition. Wiley.   2. Andrew S. Tanenbaum, Herbert Bos, ``Modern Operating Systems", 4th edition. Pearson

1	Title of the course (L-T-P-C)	**Data Bases and Information Systems** **(3-0-0-6)**
2	**Pre-requisite courses(s)**	--
3	**Course content**	Overview of data management systems. Relational model and query languages (relational algebra and calculus, SQL). Database design using the ER Model, ER Diagrams, UML Class Diagrams. Relational database design and normalization. Integrity and Security. Design and development of Web based information systems. Overview of storage structures and indexing, query processing and optimization, and transaction processing. Introduction to Big Data management concepts such as: distributed and scalabledata storage, including distributed file systems, keyvalue stores, column stores and graph databases, replication and consistency, and concurrent data processing using the Map Reduce paradigm. Introduction to decision support and data analysis, datawarehousing and data mining, and Information Retrieval.
4	**Texts/References**	Database System Concepts, 6th edition, by AbrahamSilberschatz, Henry F. Korth and S. Sudarshan, McGraw Hill, 2010.

1	Title of the course (L-T-P-C)	**Operating Systems Laboratory** **(0-0-3-3)**
2	**Pre-requisite courses(s)**	Computer Architecture
3	**Course content**	Laboratory Assignments related to the topics covered in the theory course: Process Management, Memory Management, Storage Management, Protection and Security, Virtual Machines, Distributed Systems
4	**Texts/References**	1. **Avi Silberschatz, Peter Baer Galvin, Greg Gagne**, ``Operating Systems Concepts'' 9th edition. Wiley. 2. **Andrew S. Tanenbaum, Herbert Bos**, ``Modern Operating Systems'', 4th edition. Pearson**.**

1	**Title of the course** (L-T-P-C)	**Data Bases and Information Systems Laboratory** **(0-0-3-3)**
2	**Pre-requisite courses(s)**	--
3	**Course content**	Use of database systems supporting interactive SQL. Two-tier client-server applications using JDBC or ODBC, Three-tier web applications using Java servlets/JDBC or equivalent. Design of applications and user interfaces using these systems. Data analysis tools. Laboratory project involving building data backed applications with Web or mobile app frontends.
4	**Texts/References**	Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database System Concepts 6th Ed, McGrawHill, 2010.