Proposed Lecture Duration	Segment	Topic	Subtopic
	Data Representation:	CSV, JSON, XML	Syntax, DOM, Elements, Attributes, Validator, Certificate, Parser
		Web Ontology	RDF, Triples, Relation, OWL, Examples of ontology driven applications
		NoSQL	Features, Types, Dynamic schemas, Storing mechanism, Query mechanism, Manipulating data in NoSQL, Preparing, exploring, extracting, and model building, Graph database
		Distributed Database	Database design, query optimization, Concurrency control, security
		Blockchain (Bitcoin)	Hashing, Public Key Cryptography, Building blocks of blockchain, Chaining Blocks, Mining, Types of Blockchains, Case Study
	Data Analytics:	Vector based document representation	TF, IDF, TF-IDF, SVD (LSA, LSI)
		Probabilistic Approach	LDA, Markov Chain, Hidden Markov model,
		Clustering Techniques	K-means, K-medoids Expectation–Maximization (EM), DBSCAN, Mean-Shift, Agglomerative Hierarchical Clustering
		Classical Algorithms	Support Vector Machine (SVM), Random Forest / Graph
		Deep Neural Network, ANN	Embedding Matrix, CNN, RNN, LSTM, Transfer Learning, GAN
		Distributed Computing	HADOOP, Apache SPARK,
		Semantic Web Technologies	SparQL
		Model Evaluation Strategy	Evaluation measures, Evaluation results analysis and visualization,
		Validation Strategy	Significance Testing (t-test, ANOVA, wilcoxon test, etc.), Cross Validation, Overfitting Problem,
	Problem Workthrough:	Problem Formulation	Formulating a real-world problem based on the topics discussed throughout the lectures