Course Code	CSE561
Course Name	Probabilistic Graphical Models
Credits	4
Course Offered to	UG/PG
Course Description	This course will introduce the basic concepts of probabilistic graphical models. Graphical Models are a unified framework that allow to express and manipulate complex probability distributions in a compact and efficient way. They allow to one to reach mathematically sound conclusions in presence of limited and noisy observations. Many machine learning applications are tackled by the use of these models

Pre-requisites		
Pre-requisite (Mandatory)	Pre-requisite (Desirable)	Pre-requisite(other)
Probability and Statistics		

Post Conditions*(For suggestions on verbs please refer the second sheet)		
CO1	**CO2**	**CO3**
Students are able to construct Bayesian and Markov network representation for a given problem.	Students will know and able to apply techniques to do exact and approximate inference in the probabilistic graphical models.	Students are able to understand how to learn parameters and structure for graphical models.

Weekly Lecture Plan

Week Number	**Lecture Topic**	**COs Met**	**Assignment/Labs/Tutorial**
1	Introduction and Probability Refresher	CO1	
2	Bayesian Networks	CO1	
3	Bayesian Networks	CO1	
4	Markov Networks	CO1	
5	Markov Networks	CO1	
6	Variable Elimination	CO2	
7	Clique Tree Inference	CO2	
8	Loopy BP	CO2	
9	MaxProd BP	CO2	
10	Sampling: MCMC	CO2	
11	Gibbs Sampling	CO2	
12	Parameter Learning	CO3	
13	Parameter Learning	CO3	

Assessment Plan

Type of Evaluation	% Contribution in Grade
Quiz	20
Assignment	10
Mid-sem	20
End-sem	30
Homework	10
Presentation	10

Resource Material

Type	Title
Textbook	Probabilistic Graphical Models: Principles and Techniques, Daphne Koller and Nir Friedman, MIT Press, 2009
Textbook	Bayesian Reasoning and Machine Learning, David Barber, Cambridge University Press