COURSE CODE	COURSE TITLE	L	T	P	C
1152CS165	COGNITIVE SCIENCE	3	0	0	3

Course Category: Program Elective

A. Preamble :

To provide an introduction to the cognitive science, explore the underlying cognitive mechanisms for higher order process and to realize aspects of human cognition on machine.

B. Prerequisite Courses:

Sl. No	Course Code	Course Name
1	1150CS201	Problem Solving Using C

C. Related Courses:

Sl. No	Course Code	Course Name
1	1152CS137	Artificial Intelligence
2	1152CS140	Machine Learning Techniques

D. Course Outcomes :

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Familiarize with basic concepts of cognitive science	K2
CO2	Explore the internal mental process of human	K2
CO3	Understand emergence of language abilities from cognition perspective	K2
CO4	Understand the basic concepts and techniques of computational cognitive model	K2
CO5	Design and execute a project that leverages cognitive computing	K3

E. Correlation of COs with POs :

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**H**							**L**				**L**	**M**	**L**	**L**
CO2	**H**	**L**	**L**					**L**			**L**	**L**	**M**		**L**
CO3	**H**	**M**	**L**			**L**		**L**			**L**	**L**	**L**	**M**	
CO4	**H**	**M**	**L**			**L**		**L**			**L**	**L**	**L**	**L**	**M**
CO5	**H**	**M**	**M**			**M**		**L**			**M**	**L**	**M**	**M**	**H**

H- High; M-Medium; L-Low

F. Course Content :

UNIT I FOUNDATION OF COGNITIVE SCIENCE L-8

The Cognitive view –Benefits of cognitive science -The Interdisciplinary Nature of Cognitive Science - The Philosophical Approach - The Psychological Approach - The Neuroscience Approach-The Linguistic Approach - The Artificial Intelligence Approach

UNIT II COGNITIVE PSYCHOLOGY L-10

Cognitive Psychology –The Nature of Cognitive Psychology- A GlobalView of Cognitive Architecture–Representation: Proportional representation-Schematic representation-Attention- The Acquisition of Skill- Memory-Reasoning – Problem solving

UNIT III LANGUAGE AND COGNITIVE SCIENCE L-10

The Linguistic Approach: The Importance of Language - The Nature of Language- Language Acquisition- Philosophy and Linguistics- Cognition and Linguistics- Neuroscience and Linguistics- Artificial Intelligence and Linguistics: Natural language processing-Speech recognition

UNIT IV COMPUTATIONAL MODELS OF COGNITION L-8

Modeling Paradigms -Connectionist models of cognition: Key Properties of Connectionist Models- Neural Plausibility- Three Illustrative Models- Bayesian models of cognition - Dynamical systems approach to cognition.

UNIT V COGNITIVE COMPUTING L-9

Cognitive Computing- Foundation of Cognitive Computing –Elements of Cognitive System- - Building Cognitive Applications - IBM Watson- DeepQA Architecture –Watson Corpus-Question Analysis-Sentiment analysis-Question Classification - Hypothesis Generation- Scoring and Confidence Estimation -Case Study: Cognitive Healthcare Application

TOTAL: 45 Periods

G. Learning Resources

i. Text Books:

1. Neil Stillings, Steven E. Weisler, Christopher H. Chase and Mark H. Feinstein , “Cognitive Science: An Introduction”, Second Edition.

2. José Luis Bermúdez, “Cognitive Science: An Introduction to the Science of the Mind” , Cambridge University Press, New York,2010.

3. Ron Sun (ed.), “The Cambridge Handbook of Computational Psychology”, Cambridge University Press,2008.

4. Judith S. Hurwit , Marcia Kaufman and Adrian Bowles, “Cognitive Computing and Big Data Analytics”, Wiley, 2015.

ii. References Books:

1. Robert L. Solso, Otto H. MacLin and M. Kimberly MacLin,"Cognitive Psychology", Pearson Education, 2007.
2. J. Friedenberg and G. Silverman, "Cognitive Science: An Introduction to the Study of Mind ",2006.
3. Carolyn Panzer Sobel and Paul Li, "Cognitive Science: An Interdisciplinary Approach" ,2013.

Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", Third Edition, Prentice Hall,2009