COGNITION AND ITS COMPUTATION

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PRE-REQUISITES :   1st year college Mathematics and Biology

INTENDED AUDIENCE : Students interested in Neural and Cognitive Sciences

INDUSTRY SUPPORT : AI related industry

COURSE OUTLINE :

Information as representation of knowledge is the object of study of an emergent scientific field - Cognitive Science. Increasing applications in Human-centered design, BMI and BCI, where actors like the structural, functional and computational mechanisms of the brain are engaged, necessitates advanced knowledge and research in "Cognition and its Computation". The proposed course will dwell on the fundamentals of Cognitive Processing in humans and will also discuss some recent challenges, discoveries and some open problems. The course will include topics on both understanding natural and developing artificial cognitive information processing systems.

ABOUT INSTRUCTOR :

Prof. Sharba Bandyopadhyay works in the area of Auditory Neuroscience using experimental neurophysiology, computational and theoretical methods. Sharba's primary interest is in developmental and fast time scale plasticity

Prof. Rajlakshmi Guha is an Assistant Professor in the Centre for Educational Technology, IIT Kharagpur. She has done her PhD in Psychology. She has research interests in the areas of Cognitive Psychology, Social Psychology, Counselling Psychology, Perception, Attention, Memory processes, Physiological basis of emotion, and student's mental health etc.

COURSE PLAN :
Week 1: Introduction to Cognition and Computation
Week 2: Neurobiology of Cortical Networks
Week 3: Neural Plasticity
Week 4: Attention
Week 5: Perception
Week 6: Learning and Memory (I)

Week 7: Learning and Memory (II)
Week 8: Speech and Language (I)
Week 9: Speech and Language (II)
Week 10: Problem Solving and Decision Making
Week 11: Disorders of Language and Thought
Week 12: Open Questions