

Foundations of Cognitive Science: CGS 601A

Course Title: Foundations of Cognitive Science

Course Number: CGS 601A

Credits: 3-0-0-0[9]

Prerequisite: None

Proposer: K. M. Sharika

Course objectives: To introduce students with the fundamentals of cognitive science, i.e. *the study of the mind*! The course begins with the origins of the field and goes on to familiarize students with its interdisciplinary perspectives on how the mind is organized and processes information. We end with a brief overview of the dynamical systems and the situated/embodied cognition approaches in cognitive science.

- History/ emergence of cognitive science(Bermudez) **[4 lectures]**
 - reaction against behaviorism in psychology
 - theory of computation & the idea of an algorithm
 - linguistics & the formal analysis of language
 - information processing models in psychology
- The integration challenge **[4 lectures]**
 - cognitive science is interdisciplinary(Butz & Kutter)
 - levels of explanation(Bermudez)
 - tackling the challenge (Bermudez)
- Information processing models of the mind(Bermudez) **[6 lectures]**
 - Physical symbol systems & the language of thought
 - Applying the symbolic paradigm
 - Neural networks & distributed information processing
- Organization of the mind
 - How are cognitive systems organized? (Bermudez) **[4 lectures]**
 - Brain basics from a computational perspective (Butz & Kutter) **[5 lectures]**
- Cognitive processes
 - Primary visual perception (Butz & Kutter) **[5 lectures]**
 - Attention (Butz & Kutter) **[5 lectures]**
 - Basics on learning, memory & cognitive maps (Butz & Kutter) **[5 lectures]**
- Dynamical systems, embodied& situated cognition (Bermudez) **[3 lectures]**

References:

- 1) Cognitive science by Jose Luis Bermudez, Second edition
- 2) How the mind comes into being by Martin V. Butz & Esther F. Kutter, First edition
- 3) Conscious mind, resonant brain by Stephen Grossberg
- 4) Research articles from academic journals

Proposer's signature: K. M. Sharika

Convenor, PPGC Chairperson, SPGC