CP5074 COGNITIVE SCIENCE L T P C
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OBJECTIVES:

- To learn the basics of Cognitive Science with focus on acquisition, representation and use of knowledge by individual minds, brains, and machines.
- To study the mind and intelligence, embracing psychology, artificial intelligence, neuroscience and linguistics.
- To understand the role of neuro-science in the cognitive field.
- To learn about computational models for semantic processing.
- To appreciate the role of reasoning in cognitive processing.

UNIT I INTRODUCTION TO COGNITIVE SCIENCE 9

The Cognitive view –Some Fundamental Concepts – Computers in Cognitive Science – Applied Cognitive Science – The Interdisciplinary Nature of Cognitive Science – Artificial Intelligence: Knowledge representation -The Nature of Artificial Intelligence - Knowledge Representation – Artificial Intelligence: Search, Control, and Learning

UNIT II COGNITIVE PSYCHOLOGY 9

Cognitive Psychology – The Architecture of the Mind - The Nature of Cognitive Psychology- A Global View of The Cognitive Architecture- Propositional Representation- Schematic Representation- Cognitive Processes, Working Memory, and Attention- The Acquisition of Skill- The Connectionist Approach to Cognitive Architecture

UNIT III COGNITIVE NEUROSCIENCE 9

Brain and Cognition Introduction to the Study of the Nervous System – Neural Representation – Neuropsychology- Computational Neuroscience - The Organization of the mind - Organization of Cognitive systems - Strategies for Brain mapping – A Case study: Exploring mindreading

UNIT IV LANGUAGE ACQUISITION, SEMANTICS AND PROCESSING MODELS 9

Milestones in Acquisition – Theoretical Perspectives- Semantics and Cognitive Science – Meaning and Entailment – Reference – Sense – Cognitive and Computational Models of Semantic Processing – Information Processing Models of the Mind- Physical symbol systems and language of thought- Applying the Symbolic Paradigm- Neural networks and distributed information processing- Neural network models of Cognitive Processes

UNIT V HIGHER-LEVEL COGNITION 9

Reasoning – Decision Making – Computer Science and AI: Foundations & Robotics – New Horizons - Dynamical Systems and Situated Cognition- Challenges – Emotions and Consciousness – Physical and Social Environments – Applications

TOTAL : 45 PERIODS

OUTCOMES:

Upon completion of the course, the student will be able to

- Analyze the methods of knowledge representation in cognitive processing.
- Design cognitive architectures.
- Understand the connection between brain and cognition.
- Apply neural network models to cognition.
- Apply reasoning & decision making to design dynamic systems.

REFERENCES:

1. Neil Stillings, Steven E. Weisler, Christopher H. Chase and Mark H. Feinstein, Jay L. Garfield and Edwin L. Rissland, “Cognitive Science: An Introduction”, Second Edition, MIT press,1995.
2. José Luis Bermúdez, “Cognitive Science: An Introduction to the Science of the Mind”, Cambridge University Press, New York, 2014.
3. Robert L. Solso, Otto H. MacLin and M. Kimberly MacLin, “Cognitive Psychology, Pearson Education, 2007.

4. J. Friedenberg and G. Silverman, “Cognitive Science: An Introduction to the Study of Mind”, 2011.
5. Steven Pinker, “How the mind works”, W. W. Norton & Company; Reissue edition, 2009.
6. Carolyn Panzer Sobel and Paul Li, “Cognitive Science: An Interdisciplinary Approach”, 2013.
7. Paul Thagard, “Mind: Introduction to Cognitive Science”, 2nd Edition, MIT Press, 2005.

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CP5001 VIRTUALIZATION TECHNIQUES LT P C
3 0 0 3

OBJECTIVES:

- To understand the concepts of virtualization and virtual machines.
- To understand the implementation of process and system virtual machines.
- To explore the aspects of high level language virtual machines.
- To gain expertise in server, network and storage virtualization.
- To understand and deploy practical virtualization solutions and enterprise solutions.

UNIT I OVERVIEW OF VIRTUALIZATION 9

System Architectures - Virtual Machine Basics - Process vs System Virtual Machines - Taxonomy. Emulation: Basic Interpretation - Threaded Interpretation - Precoded and Direct Threaded Interpretation - Binary Translation. System Virtual Machines - Key Concepts - Resource utilization basics.

UNIT II PROCESS VIRTUAL MACHINES 9

Implementation – Compatibility – Levels – Framework – State Mapping – Register – Memory Address Space – Memory Architecture Emulation – Memory Protection – Instruction Emulation – Performance Tradeoff - Staged Emulation – Exception Emulation – Exception Detection – Interrupt Handling – Operating Systems Emulation – Same OS Emulation – Different OS Emulation – System Environment.

UNIT III HIGH LEVEL LANGUAGE VIRTUAL MACHINES AND SERVER VIRTUALIZATION 9

HLL Virtual Machines: Pascal P-Code – Object Oriented HLLVMs - Java VM architecture - Java Native Interface - Common Language Infrastructure. Server virtualization: Partitioning techniques - virtual hardware - uses of virtual servers - server virtualization platforms