

**GIAN course at IIT Allahabad**  
**Cerebral Cortex Plasticity and Modelling**  
**August 7-16, 2016**

Each day:

10 am – 12:30 pm: Tutorial, Lab [30 min tutorial, 2 hr exercise or demo]

3:30 pm – 5:00 pm: Lecture 1

5:00 pm - 5:30 pm: break

5:30 pm - 6:45 pm: Lecture 2

Lecture wise reading material:

**7 Aug 2016**

Lecture1. [Book] Kandel and Schwartz 5<sup>th</sup> edition Theoretical Approaches to Neuroscience: Examples from Single Neurons to Networks

1. **Reference chapters:** Neuronal Dynamics *online book* From single neurons to networks and models of cognition Wulfram Gerstner, Werner M. Kistler, Richard Naud and Liam Paninski Foundation of Neuronal Dynamics

Lecture2.

1. Appendix F
2. Appendix A

**8 Aug 2016**

Lecture1. **Chapter I:** Dale Purves 3<sup>rd</sup> edition Studying the Nervous Systems of Humans and Other Animals

Lecture2. **Chapter 11:** Dale Purves 3<sup>rd</sup> edition Central Visual Pathways

**9 Aug 2016**

Tutorial, Lab-1.

1. **Chapter 1 and 2:** Neural Encoding I And II: Firing Rates and Spike Statistics Theoretical Neuroscience Dayan and Abbott
2. **Chapter 3:** Neural Decoding Theoretical Neuroscience Dayan and Abbott

Lecture1. **Chapter 2:** Kandel and Schwartz 5<sup>th</sup> edition Nerve Cells, Neural Circuitry, and Behavior

Lecture2.

1. **Chapter 3:** Kandel and Schwartz 5<sup>th</sup> edition Genes and Behavior
2. **Appendix F:** Kandel and Schwartz 5<sup>th</sup> edition Theoretical Approaches to Neuroscience: Examples from Single Neurons to Networks;

**10 Aug 2016**

Lecture1. **Chapter 8:** Plasticity and Learning Theoretical Neuroscience by Dayan and Abbott

Lecture2.

1. **Part IX:** Kandel and Schwartz 5<sup>th</sup> edition Learning and Memory
2. **Chapter 8:** Plasticity and Learning Theoretical Neuroscience by Dayan and Abbott

**11 Aug 2016**

Lecture1.

1. **Chapter 67:** Kandel and Schwartz 5<sup>th</sup> edition Prefrontal Cortex, Hippocampus, and the Biology of Explicit Memory Storage Hebbian Synaptic Plasticity page 1592-1599
2. **Chapter 8:** Plasticity and Learning Theoretical Neuroscience by Dayan and Abbott

Lecture2. **Chapter 57:** Kandel and Schwartz 5<sup>th</sup> edition Repairing the Damaged Brain