By the end of the term, students having taken *Neural and Nonlinear Information Processing* will be expected to have learned:

1) A *new computing paradigm* based on the CNN (cellular neural/nonlinear networks) architecture.

2) Many non-trivial applications involving pattern recognition, including mission critical tasks requiring highly nonlinear and mathematical morphological algorithms.

3) How to emulate numerous low-level and high-level brain functions via a CNN algorithm.

4) The architecture and design of the CNN universal chip.

5) The new concept of *local activity* and the *local activity theorem*.

6) The mathematical characterization of complexity via the local activity principle.

7) How to implement and understand the *Game-of-Life* as a special case of CNN.

8) How the results of Wolfram’s *A New Kind of Science* book can be interpreted and emulated by a CNN algorithm.

9) The fundamental concept of *Chaos* via rigorous mathematical formulations.

10) The concept of fractals and its applications.

11) Many *complexity phenomena* as manifestations of local activity, namely, emergence, self organization, synergetics, dissipative structures, slaving principle, collective phenomena, far-from-equilibrium phenomena, etc.