

NSCI 1002: Social Neuroscience: Understanding Others Spring 20XX

Course Times: Tu/Th Lectures

Texts: Rita Carter, *The Human Brain Book*, Dorling Kindersley Ltd., 2014
Judith Horstman, *The Scientific American Day in the Life of Your Brain*, Jossey-Bass, 2014
Sandra Aamodt and Sam Wang, *Welcome to Your Brain*, Bloomsbury, 2009
Assigned Supplemental Readings

Credits: 3

Course Directors: Laura Been, PhD
Robert Meisel, PhD
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Course Objectives: We are all interested in the human condition as it pertains to ourselves and others. The field of neuroscience makes a special contribution to our understanding of the human condition as it can both help us understand ourselves and also how we interact in a world of other individuals. Historically there has been a dichotomy between disciplines that identify the abstract principles of the social world we live in and the biology of the organ (i.e., the central nervous system) we use to identify and coordinate those abstract principles as we function in our daily lives. By merging these disciplines and studying our interactions with the world on many layers of analysis from genes to social dynamics we develop a richer understanding of who we are as people. The objective of this course is to acquire a fundamental appreciation for how our nervous system solves these problems of understanding who we are in the context of the world around us.

Course Approach: The course will be composed of two weekly lectures. The lectures will be designed to engage students in discussion of the topics during class.

LECTURE SCHEDULE

Lectures 1 and 2: Introduction to Neuroscience 1002

Readings: Carter, pp. 8-13

Goal: An overview of the course topics along with the pedagogical approach will be presented. As there are no formal prerequisites for students enrolled in the course a basic orientation to techniques used to probe nervous system function in people will be presented.

These experimental tools will be the foundation for the experimental studies highlighted in each topical section of the class.

Lectures 3 and 4: Coming to Consciousness

Readings: Aamodt, Chapter 27; Horstman, 5 am-8am; Carter, 176-189

Goal: Daily patterns of sleeping and arousal are fundamental components of the lives of mammals. “Why do we sleep?” and “How do we make the transitions between periods of sleep and awakening?” are questions we will address in this section. The focus will be on both physiological regulation and how the nervous system modulates changes in sleep and wakefulness.

Lectures 5 and 6: Encountering Others: Face Perception; Mirror neurons; recognizing self

Readings: Aamodt, Chapter 24; Horstman, 9 am; Carter, pp. 122-123, 136-137

Goal: Face perception is one of the most fundamental processes in social interactions. This section will focus on key perceptual processes in recognizing faces along with their neurobiological underpinnings. Further, we use the faces of others as a part of our own process of socialization. Here we will examine the neurobiological underpinnings of face recognition and mimicry in the course of social encounters with others in our lives.

Lectures 7 and 8: Schizophrenia and Autism

Readings: Carter, pp. 244 and 249; TBD

Goal: Recent research suggests that there are links between schizophrenia and autism both at the clinical and neurobiological levels of analysis. One component of schizophrenia and autism is an altered response to the social signals of others. These lectures will continue the theme of social communication with a look at schizophrenia and autism as deficits in the developmental trajectory of neural processes underlying social communication.

Lectures 9 and 10: Stress of Life

Readings: Horstman, 10 am; Carter, pp.164, 240-241; TBD

Goal: There is both good stress and bad stress. Normally stress is a transient perturbation of the balance in your physiological systems, which is beneficial in times of crisis. The failure to adapt to or recover from stress is associated with many behavioral disorders. Here we will discover the neural and physiological processes underlying the good, the bad and the ugly consequences of stress.

Lectures 11 and 12: Decision Making: Economic choices; Emotional choices

Readings: Aamodt, Chapter 21; Horstman, 11 am; TBD

Goal: We are constantly making decisions throughout our waking lives. Some of the decisions are trivial and may be based on habit, whereas others may be more weighty requiring deliberation. These more weighty decisions are sometimes based on principles of behavioral economics, while others are borne from emotional responding. Interestingly, different neural systems underlie each of these decision making processes and we will discuss how the nervous system process information to help us make decisions based on economic choice versus emotional reactions.

Lectures 13 and 14: Decision Making: Ethical choices

Readings: Horstman, 11 am; Carter p. 140-141; TBD

Goal: Ethical decision making requires the ability to make choices among competing behaviors based on our evaluation of how our actions affect ourselves versus others. We will examine evolutionary and neurobiological approaches to discovering an intrinsic, natural basis for ethical choice.

Lectures 15 and 16: Oxytocin and Social Interactions

Readings: Aamodt, Chapter 20

Goal: Oxytocin is a hormone historically associated with a mother's bonding to her infant. More recently, studies of prairie voles have expanded that role to include inducing feelings of well-being in a way that promotes positive social interactions. These findings from voles are true for people as well. In this section we will examine the basic research from voles and discuss how oxytocin may be important for social interactions, including love and romance, in people.

Lectures 17 and 18: Chemical Senses

Readings: Aamodt, Chapter 8; Carter, pp. 96-101

Goal: Our senses of smell and taste are of keen importance in navigating the world around us. They of course are important sensory components for food, but they also signal danger in our environment, are sources of social communication, and are key parts of emotional memories. We will discuss the neural underpinnings of these senses and use that information to explore how these senses impact our lives.

Lectures 19 and 20: Humor

Readings: Horstman, 8 pm; Carter, pp. 170-171

Goal: Laughter is one of an infant's first social expressions and is common to people worldwide. Humor is a cognitive process that involves physiological and behavioral processes. We will take a look at the neural basis of humor to appreciate the role of humor in the human experience.

Lectures 21 and 22: Rhythms of Life

Readings: Aamodt, Chapter 4; Horstman, 1 am-2 am

Goal: Our lives are built upon layers of internal rhythms. We most commonly think of daily rhythms, but we also have ultradian rhythms that can be much shorter (e.g., your heartbeat) or much longer (e.g., reproductive cycles). We will talk about each of these types of rhythms and how they are controlled by the nervous system as well as health problems we experience when these rhythms go awry.

Lectures 23 and 24: Language; Spoken and Body

Readings: Aamodt, Chapter 11; Carter, pp. 142-151

Goal: Language is at the core of who we are as people and in our ability to interact with others in diverse and meaningful ways. In this section we will explore modern views of how the nervous system controls language, including its development and communication using body posturing and facial expression. We will also use animal models of complex verbal communication to enrich our understanding of the neural control of language in people.

Lectures 25 and 26: The Social Brain

Readings: Carter, pp. 132-139

Goal: We will finish up the semester by putting together what it means to be human in a neurobiological sense. What is the neural basis for romantic relationships? How do we develop cooperation, predict the actions of others, or recognize that others can have their own thoughts or feelings? What is the neural basis for empathy, sympathy or altruism? Ways in which future research can begin to develop a “social neurology” will be discussed.