**Introspection and the Functions of Consciousness:**

- Consciousness – Moment-by-moment awareness of ourselves, our thoughts, and our environment
- Introspection – The process of “looking within” to observe one’s own thoughts, beliefs, and feelings
- Ineffable – Indescribable
- Cognitive inference – Considerable support machinery that makes our ordinary perception, thinking, and memory possible
  - Unconscious inference – Only being aware of the output from various mental processes
  - Automatic functions
    - Executive control breaks the automatic process and may require consciousness
- Anterograde amnesia – Disruption of memories from damage of the hippocampus
  - Have memory without awareness of it
- Implicit memory – Memory that is separate from conscious awareness
- blindsight – Ability of a person with a lesion in the visual cortex to reach toward or correctly guess about objects in the visual field even though the person reports seeing nothing

**The Neural Basis for Consciousness:**

- Mind-body problem – The difficulty in understanding how the mind and body influence each other – so that physical events can cause mental events and vice versa
- Descartes felt the Pineal gland was the “portal” between the mental and physical world
  - Incorrect
- Reticular activating system – Controls overall arousal level of the forebrain to control cycling of sleep and wakefulness
- Neural correlates of consciousness – Specific brain states that seem to correspond to the content of someone’s conscious experience
- Readiness potential – The brain preparing a ready signal before the body is aware of making a decision
- Attention links the activity of different neural systems
  - Workspace neurons connect one area of the brain to another
    - Communication between the neurons is selective
    - Create a “unified experience”
- Global workspace hypothesis – A hypothesis about the neural basis of consciousness that states specialized neurons (workspace neurons) give rise to consciousness by allowing us to link stimuli or ideas in dynamic, coherent representations
- Working memory – The memory that you keep ideas in while working with them

**Sleep:**

- Arousal level is controlled by cells in hypothalamus
- Circadian rhythms are controlled by the hormone melatonin in the pineal gland
  - Controlled by external factors like time of day
- Electroencephalogram (EEG) – Records voltage changes occurring at the surface of the scalp
- Alpha rhythm – Regular waxing and waning of electrical potential at a rhythm between 9 and 12 Hz of a person who is relaxed but away with eyes closed
- Beta rhythm – Voltage is lower and the frequency is higher with difficult to observe up and down patterns of a person who is actively thinking or attends to some stimulus with the eyes closed
- Hypnagogic imagery – Vivid but fleeting imagery during sleep stage 1
- Sleep spindles – Bursts of rapid brain-wave activity in 1 to 2 second spans in stage 2
- K complexes – Very high amplitude waves in stage 2
- Delta rhythm – Slow, large waves when a person is in slow-wave sleep (stage 4)
  - Starts in stage 3 but dominates in stage 4 (slow-wave sleep)
- REM sleep – Sleep with rapid eye movements, EEG patterns similar to wakefulness, speeded heart rate and respiration, near-paralysis of skeletal muscles, and highly visual dreams
  - Also known as paradoxical sleep
- Sleep paralysis – Muscular paralysis of REM sleep persists for a few moments past awakening, leaving the person conscious but temporarily unable to move
REM rebound – If a person does not have a usual amount of REM sleep or it is interrupted, the next time the person sleeps the body will try to make up for it
- The body might function better with more sleep because cellular waste products might be removed from metabolic activities
- Another reason might be because hormones that promote body repair occur in higher rates when asleep
- REM sleep might sustain brain circuits since synapses need activity to remain active
- Sleeping might reset overstimulated neurons
- Sleep, from an evolutionary view, might be a way to spend inactive time when vision is of no use
  - In this view, sleep deprivation is just the body fighting against natural rhythms
- REM sleep is where most dreams occur
  - Dreams here tend to be more pictorial with the dreamer as a character
- Dreams happen in slow-wave sleep
  - Dreams here tend to be of summaries and generally boring dreams
- Freud believed the subconscious desires came in hidden forms in dreams known as manifest content
- The meaning of the dream, according to Freud, is in the latent content (actual wishes and desires expressed symbolically through the manifest content)
- Activation-synthesis hypothesis – Dreams may be just a byproduct of the sleeping brain’s activities, which are later assembled into a semicoherent narrative
  - During REM sleep, the pons produces bursts of neural activity that activate areas in the lateral geniculate nucleus (visual processing) with activity in the occipital cortex
  - This activity is described as PGO waves (Pons, Geniculate, Occipital)
  - High activity in the limbic (emotional) and motor cortex (movement) during dreams
  - Diminished activity in prefrontal cortex (planning and analysis) when sleeping

**Hypnosis:**
- Hypnosis – Highly relaxed, suggestible state of mind in which a person is likely to feel that his/her actions and thoughts are happening rather than being produced voluntarily
- Posthypnotic instructions – Instructions on how to behave after hypnosis that are usually effective
- Posthypnotic amnesia – Instructing a person to forget certain events that happened during the hypnotized state
  - The amnesia can be “lifted” if instructed, during hypnosis, to retrieve the memory
- Hypnotic analgesia – Pain reduction through hypnotic suggestion
- Hypnotic virtuosi – Those that are powerfully influenced by hypnosis
- Dissociation – A mental state in which we shift out of our normal “first-person” perspective
  - Two streams with one as a surrenderer to a hypnotist and one as a hidden observer

**Religious States:**
- Meditation lowers blood pressure, stress hormones, and enhances immune response
  - Increase in alpha rhythms
- Meditation, when done frequently, can make neural activity occur in the brain that are anatomically distant from another and have the neurons fire in synchrony

**Drug-Induced Changes in Consciousness:**
- Depressants – Drugs intended to decrease neural activity
  - Most common is alcohol
- Stimulants – Drugs to promote neural activity
  - Most common is caffeine
- Drug tolerance – The need for a higher dose to achieve the same effect
- The body has natural anandamide neurotransmitters, but THC (major component of marijuana) is chemically similar and may activate these cannabinoid receptors
- Hallucinogens – Drugs that change perception and trigger sensory experiences in the absence of any inputs
• Withdrawal – Consequence of drug dependence that occurs when the drug is withheld, such that the person feels strong cravings and psychological and medical distress
• There is a difference between psychological and physical dependence
  o Psychological dependence, however, can create stress which can disrupt biological functions