

- Some Key Concepts from "Drugs and the Brain" - Fall 2008
- Useful as a guide for study; Not meant to be an exhaustive list

- **Lecture 1 (8/28)**

- ritual
- myth, worldview
- scientific materialism
- shamanism
- William James, radical empiricism
- drug, psychoactive drug
- pharmacology, psychopharmacology, pharmako
- medicine
- botany, ethnobotany
- plant medicines, power plants, plant teachers/maestras, allies

- **Lecture 2 (9/2)**

- power plants, allies
- Paracelsus
- Biblical Genesis story / forbidden nature of plant knowledge
- Holy Inquisition and the modern war on drugs
- routes of administration
- first-pass metabolism
- parenteral routes

- **Lecture 3 (9/4)**

- elimination of drugs from body
- brain, neurons, glia
- blood-brain barrier
- lipid bilayer membrane
- chemistry, alchemy
- atom, molecule
- hydrophobic, hydrophilic
- phospholipids

- **Lecture 4 (9/9)**

- molecular structures
- neuron
- synapse, synaptic components
- neurotransmitter, receptor
- agonist, antagonist
- CNS, somatic, autonomic
- sympathetic, parasympathetic

- **Lecture 5 (9/11)**

- Solanaceae plant family, genus *Solanum*
- Carl von Linné, Linnaeus
- alkaloid
- acetylcholine (ACh) receptors: muscarinic & nicotinic
- tropane alkaloids: atropine, hyoscyamine, scopolamine
- hallucination
- *Atropa belladonna*, *Mandragora officinarum*, *Hyoscyamus niger*, *Datura*, *Brugmansia*

- **Lecture 6 (9/16)**

- *Nicotiana tabacum*
- routes of administration
- Richard Evans Schultes
- Jean Nicot
- James I
- tobacco, shamanic uses, early history of USA
- nicotine, nicotinic ACh receptor
- acute "medicinal" effects of tobacco and nicotine
- acute toxic effects of nicotine
- LD-50
- tolerance
- tobacco-related mortality

- **Lecture 7 (9/18)**

- chronic toxic effects of nicotine and tobacco
- cardiovascular, carbon monoxide, respiratory disease
- light smoking and health
- effects of fetal development
- second-hand smoke
- tobacco and addiction
- additives to cigarettes

- **Lecture 8 (9/23)**

- Cuban tobacco, Cohiba cigars
- rewarding aspects of tobacco use
- tips for quitting smoking
- hookah
- clove cigarettes
- bidi cigarettes
- menthol cigarettes, proposed ban on flavored cigarettes
- prevalence
- National Household Survey on Drug Use and Health (NSDUH)

- **Lecture 9 (9/25)**

- insecticidal properties of nicotine, neonicotinoids
- Monitoring the Future data
- 8th -12th grade prevalence of tobacco use
- alcohol use prevalence
- alcohol laws in the USA
- chemistry of alcohol
- etymology of alcohol
- fermentation
- wine & beer
- beer admixtures
- malting
- distillation

- **Lecture 10 (9/30)**

- distilled alcoholic beverages, spirits

- azeotrope
- proof
- metabolism of by the liver
- blood alcohol level/concentration (BAL/BAC)
- therapeutic index
- NSDUH prevalences for alcohol
- economic cost data on alcohol
- fatty liver, hepatitis, cirrhosis

- **Lecture 11 (10/2)**
- Midterm Exam One

- **Lecture 12 (10/7)**
- acute and chronic effects of alcohol
- effects of alcohol on fetal development
- effects of light alcohol use
- alcohol pharmacology: GABA, glutamate, adenosine
- sedative-hypnotic drugs: alcohol, general anesthetics, inhalants, barbiturates, benzodiazepines, non- benzodiazepine pharmaceutical sedative-hypnotics
- addiction to and withdrawal from sedative-hypnotic drugs

- **Lecture 13 (10/9)**
- drug abuse
- abuse potential
- history of drug laws in US
- whiskey tax and Whiskey Rebellion
- Harrison Narcotics Act
- Controlled Substances Act and Schedules

- **Lecture 14 (10/14)**
- Controlled Substances Analogue Act
- relationship between federal and state law
- medical marijuana
- *Cannabis sativa*, *Cannabis indica*
- medicinal and psychoactive properties of marijuana
- hashish, hash
- routes of administration of Cannabis

- **Lecture 15 (10/16)**
- Cannabis as fiber
- Cannabis seeds and nutrition
- mental and physical effects of Cannabis
- set and setting
- cannabinoids
- THC
- anandamide, endocannabinoids
- retrograde signaling

- **Lecture 16 (10/21)**
- retrograde signaling
- toxicity of Cannabis smoke

- Cannabis in Amsterdam
- Holland and USA prevalence comparisons
- caffeine and other xanthines
- physiology of caffeine
- dependence and withdrawal
- adenosine, adenosine receptors
- primary plant sources of caffeine

- **Lecture 17 (10/23)**
- *Coffea arabica*
- aromatic characteristics of coffee
- roasting, chemistry
- coffee and capitalism
- coffee and world history: Africa, Middle East, Europe
- Alfred Peet
- espresso

- **Lecture 18 (10/28)**
- caffeine content numbers
- taurine
- *Camellia sinensis*
- green tea, black tea
- Dutch and British East India Companies
- tea and the American revolution
- kola
- guarana
- yerba maté
- *Theobroma cacao*
- cacao beans and chocolate

- **Lecture 19 (10/30)**
- Benzedrine
- amphetamine and chemical relatives of amphetamine
- synaptic neurochemistry, CNS and PNS effects
- norepinephrine and dopamine in the brain
- medicinal uses of amphetamine and related drugs
- potential toxic effects
- addiction potential
- *Ephedra*
- ephedrine, pseudoephedrine
- ADHD and prescribing of amphetamine-type stimulants
- routes of administration
- cathinone, *Catha edulis*, khat

- **Lecture 20 (11/4)**
- voting rights of prisoners and former prisoners
- levmetamfetamine
- stereoisomers
- *Erythroxylum coca* (Mama Coca): history, effects, nutritional properties
- cocaine: chemistry, neural mechanism, effects, routes of administration
- cocaine in commercial products

- **Lecture 21 (11/6)**

- Midterm Exam Two

- **Lecture 22 (11/11)**

- Veteran's Day Holiday - no class

- **Lecture 23 (11/13)**

- crack cocaine (freebase cocaine): chemistry, routes of administration, effects
- cocaine and addiction
- James Olds (1954) experiment regarding learning in rats
- reward-reinforcement pathway
- effects of dopamine in the "pleasure pathway"
- statistics for the growth of gambling industries
- William Bennett
- video and computer game addiction

- **Lecture 24 (11/18)**

- addiction treatment
- 12-Step Programs (AA, etc)
- *Papaver somniferum*
- opium
- medicinal effects of opium
- routes of administration of opium
- Opium Wars
- Friedrich Wilhelm Sertürner
- opiate/opioid molecular structures
- semi-synthetic opioids

- **Lecture 25 (11/20)**

- semi-synthetic and synthetic opioids
- fentanyl, carfentanyl
- acute toxicity of opioids
- antagonists at opioid receptor (e.g., naloxone)
- routes of administration of pharmaceutical opioids
- addictive potential of opioids
- opioid addiction treatment
- endorphins
- neuropeptides
- psychedelics

- **Lecture 26 (11/25)**

- psychedelics/hallucinogens/psychotomimetics/entheogens
- effects of psychedelics on the mind
- strong variation with dose and set & setting
- tryptamines and phenethylamines
- lysergic acid diethylamide
- Albert Hofmann
- ergot and ergotamine
- Aldous Huxley
- Timothy Leary

- LSD threshold and typical doses

- Augustus Owsley Stanley III
- LSD blotter paper
- possible adverse effects of LSD

- **Lecture 27 (11/27)**

- Thanksgiving Holiday

- **Lecture 28 (12/2)**

- flashbacks and memory
- 5HT-2A receptors
- raphe nuclei
- LSA
- psilocybin, psilocin
- *Psilocybe* mushrooms
- Gordon Wasson
- Maria Sabina
- "Good Friday Experiment" and its contemporary replication

- **Lecture 29 (12/4)**

- DMT
- ayahuasca
- ayahuasca-based religions
- ayahuasca legal issues in USA
- peyote cactus
- mescaline
- Arthur Heffter
- Huichol
- MDMA
- *Salvia divinorum*
- nitrous oxide
- William James