

Course Title & Number: Biology of Addiction, DAR H158

Competency Area: **SCIENTIFIC REASONING** (Goal: Students will become familiar with science as a method of inquiry. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.)

Faculty submitting the Learning Outcomes: Sandra Valente, Ph.D.

Date: 11/30/2013

[Instructions: Please match the Learning Outcomes in the left hand column to those of the course you are submitting for Gen Ed approval. List the corresponding course outcomes in the right hand column to indicate a match.]

BOR TAP's Learning Outcomes	Corresponding Outcomes for Course Named Above
1. Explain the methods of scientific inquiry that lead to the acquisition of knowledge. Such methods include observations, testable hypotheses, logical inferences, experimental design, data acquisition, interpretation, and reproducible outcomes.	<ul style="list-style-type: none">• Describe the methods of inquiry that lead to scientific knowledge in the field of addiction research and be able to distinguish science from pseudoscience.• Describe specific scientific methods involved in conducting research in the addictions including forming hypotheses, designing experiments to test hypotheses, and collecting, analyzing, interpreting, and reporting data in the areas of addiction treatment, biological basis of addiction, and impact of addiction on behavior.
2. Apply scientific methods to investigate real-world phenomena, and routine and novel problems. This includes data acquisition and evaluation, and prediction.	<ul style="list-style-type: none">• Students will be able to draw appropriate scientific conclusions from evidence and experimental data derived from NIDA and SAMSHA data on addiction trends and treatment outcomes.• Students will analyze statistics on rates of substance abuse across different age groups as well as DAWN data for deaths related to drug and alcohol abuse and evaluate and describe how specific drugs; alone or in combination, lead to death.• Apply scientific principles in gathering and interpreting scientific data related to the study of addiction through the development and administration of surveys to identify addiction trends among different populations.
3. Represent scientific data symbolically, graphically, numerically, and verbally.	<ul style="list-style-type: none">• Students will label the neuron and describe the function of each part as it relates to neural transmission.• Students will label the reward pathway on a diagram of the brain and describe how these parts within the reward pathway are affected by drugs of abuse and alcohol.• Students will label specific parts of the brain associated with behavior and memory.• Students will analyze PET scan images of brains of normal functioning brains versus the brain of a cocaine, addict, methamphetamine user, ecstasy user, THC user and evaluate reasons why there are differences

	in activity levels.
4. Interpret scientific information and draw logical references from representations such as formulas, equations, graphs, tables, and schematics.	<ul style="list-style-type: none"> Students will interpret statistics on rates of substance abuse across different age groups as well as DAWN data for deaths related to drug and alcohol abuse and predict how specific drugs; alone or in combination lead to death. Students will be able to draw appropriate scientific conclusions from evidence and experimental data derived from NIDA and SAMSHA data on addiction trends and treatment outcomes. Students will effectively communicate scientific observations, and summarize data analyses about treatment outcomes and trends in the field of addiction in a written research paper utilizing APA format.
5. Evaluate the results obtained from scientific methods for accuracy and/or reasonableness.	<ul style="list-style-type: none"> Describe the methods of inquiry that lead to scientific knowledge in the field of addiction research and be able to distinguish science from pseudoscience. Students will effectively communicate scientific observations, and summarize data analyses about treatment outcomes and trends in the field of addiction in a written research paper utilizing APA format.
	<p><i>Additional Outcomes for Biology of Addiction Course:</i></p> <ul style="list-style-type: none"> Define and describe terminology and methods of scientific inquiry relating to the study of the biological basis of drug and alcohol addiction Describe physiological dependence to drugs of abuse and alcohol Describe the biological basis for tolerance including what occurs with neurotransmission and neural receptor sites within the brain Describe drug classifications and schedules and the laws relating to regulation of illegal drugs Describe the biological effects of drugs of abuse (alcohol, opiates, benzodiazepines, stimulants, cannabis, ecstasy, hallucinogens, designer drugs, steroids, nicotine, inhalants), on all body systems and brain including effected neurotransmitters Describe the medical and psychological complications of drugs of abuse ((alcohol, opiates, benzodiazepines, stimulants, cannabis, ecstasy, hallucinogens, designer drugs, steroids, nicotine, and inhalants). Describe pharmacokinetic factors that influence drug effects Differentiate between antagonistic and agonistic effects on drug receptors Describe how inactivation and elimination of drugs of abuse (alcohol, opiates, benzodiazepines, stimulants, cannabis, ecstasy, hallucinogens, designer drugs, steroids, nicotine, inhalants) occur Evaluate routes of administration of drugs of abuse and the dose-response relationship