 **Date: 09/10/2012**

Course Name and Number: Biology lab

80-057-01 Fall

80-058-01 Spring

**Type of course: Laboratory**

**Year of Studies:**2013- 2014 **Semester:** Fall / Spring **Hours/credits:** 1

**Instructor: Dr. Abraham Jacob**

**The courses objectives: (Overall Objectives/ Specific Objectives)**

Basic understanding of lab procedure, safety and behavior.

Experimental design and understanding how to run experiments.

How to use basic laboratory apparatuses.

Perform labwork in parallel to course material to further understand, and apply the theoretical knowledge.

**Course Description:**

Biology lab, basic

**The Process of the Course:**

**(Teaching Methods, use of technology, Guest Speakers)**

Frontal explanations and introductions.

Hands on laboratory practice.

Frontal summary and conclusions.

Use of video.

Use of standard laboratory techniques.

**Course requirements**

**Pre-requisites**

Biology course, basic

**Requirements/ Assignment/Tasks**

Participation in minimum 80% of the labs to pass. Each lab missed, unless by medical reason with documentation will result in -5 points to final grade.

Zero tolerance for safety rule infringes.

Handing in fully filled-out work sheets, including pre and post-lab questions.

**Grade Components (Number grade or pass/fail)**

* Grade determined by participation, hand in work and answers to pre- and post lab questions (40%)
* Final (60%)

**Detailed Lesson plan:**

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| **Topic of the Lesson** | **Lesson #** |
| The Scientific Method:  Understand the organization of information, inference, observation, hypothesis, prediction, testing, significance, conclusion. | 1 |
| Microscopy:  Theory and light microscopy. Practical use of light microscopes and their use in various disciplines. | 2 |
| Organic compounds /Testing and Identifying unknowns:  Major groups, mono-, di-, and polysaccharides, neutral fats, function and chemical structure, assays for the different compounds. | 3 |
| Diffusion, Osmosis and Biological Membranes:  Plasma membranes, physical vs. physiological processes, examination of cells under various osmo-pressures, | 4 |
| Enzymology:  Chemical and structural aspects of enzymes, role of enzymes, effects of pH, temperature and inhibitors on enzymes. | 5 |
| Mitosis/Meiosis:  Interactive lab, movies to understand the entire cell cycle, differences between mitosis and meiosis. | 6 |
| Human Genetics:  Dominate and recessive traits, physical genetic traits | 7 |
| Population genetics:  Understand natural selection, Hardy-Weinberg equation, gene frequency in populations, fitness. | 8 |
| Developmental Biology:  Chick embryo slides, dissection of 5 and 10 day old chick embryos. | 9 |
| Circulatory system and Blood Pressure:  Interactive lab with movies reviewing the systems, blood type testing, physical exertion and practical measurements with class wide statistics. | 10 |
| Cell structure and function:  Understand basic cell theory and characteristics, prokaryotes and eukaryotes, plant and animal cells, principles of cell organelles and their functions. | 11 |