Intermediate Biology Course Syllabus (Summer 2022)

Course Aims: The Intermediate Biology Course is an intensive, 12-week long course that aims to prepare students for the NSB High School Regional and Middle School National Competitions. This course will teach the topics that most frequently show up in the Biology category and topics in the Energy category, which pertain to Biology. Students should note that the course will be rigorous and fast-paced, but if one puts in the work, they will see significant improvement in their biology knowledge and Science Bowl skills.

Prerequisites: Students should have an understanding of basic chemistry, or should read chapters 2, 3 and 4 of *Campbell Biology* prior to Week 1.

What's Included:

- Weekly lectures on Zoom
- List of recommended reading material and supplemental resources
- 1-on-1 advising about study planning (by appointment)
- Access to exclusive discord server
- Seminars about study tips, buzzing strategies, teamwork skills
- Weekly Office Hours
- Flashcard sets on important topics
- Packet readings to test retention of course material

Lesson Plan:

Week 1: Jun 6th 5-7 PM PST	Macromolecules: Carbohydrates, Lipids, Proteins Eukaryotic Organelles: Nucleus, Endomembrane System, Cytoskeleton
Week 2: Jun 13th 5-7 PM PST	Cellular Membrane: Structure and Function Metabolism: Thermodynamics, ATP Hydrolysis, Enzymatic Activity
Week 3: Jun 20th 5-7 PM PST	Cellular Respiration: Glycolysis, TCA Cycle, ETC, Fermentation Photosynthesis: Light Reactions, Calvin Cycle, Plant Adaptations
Week 4: Jun 27th 5-7 PM PST	Signaling: Reception, Transduction, Response Cell Cycle: Mitosis, Meiosis
Week 5: Jul 3rd 5-7 PM PST	Genetics: Mendelian Inheritance, Disorders, Chromosomes DNA: Structure, Replication, Cancer
Week 6: Jul 11th 5-7 PM PST	Central Dogma: Transcription, Splicing, Translation Bacteria and Viruses: Structure, Diversity, Diseases

Week 7: Jul 18th 5-7 PM PST	How to Study Diversity: Tips, Tricks, and Resources An Introduction to Evolution and Ecology
Week 8: Jul 25th 5-7 PM PST	Plants: Structure, Growth, Nutrient Transport Plants II: Angiosperm Reproduction, Plant Hormones, Stimuli
Week 9: Aug 1st 5-7 PM PST	Anatomy and Physiology: Basic Principles Nutrition: Nutrients, Digestive System, Adaptations
Week 10: Aug 8th 5-7 PM PST	Gas Exchange: Circulatory System, Respiratory System Immune System: Innate and Adaptive Immunity, Autoimmune Diseases
Week 11: Aug 15th 5-7 PM PST	Osmoregulation: Nitrogenous Waste, Excretory System Endocrinology: Hormones, Feedback Pathways
Week 12: Aug 22nd 5-7 PM PST	Neurons: Structure, Action Potential, Synapses Central Nervous System: Cerebral Structure, Memory, Diseases

Note: If you are unable to attend a lesson, we can send you a recording of the lecture