Intermediate Physics Course Syllabus (Summer 2022)

Course Aims: The Intermediate Physics Course is an intensive, 12-week long course that prepares 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 Physics category, as well as topics in the Energy category that pertain to Physics. 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 physics knowledge and Science Bowl skills.

Prerequisites: Students should have an understanding of basic physics, and should have completed Algebra 2. If students don't meet these requirements, the instructor will send resources to get students caught up.

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
- Packet readings to test retention of course material

Week 1: Jun 10th 5-7 PM PDT	Mathematics I: Vectors and Trigonometry Mathematics II: Calculus
Week 2: Jun 17th 5-7 PM PDT	1D Kinematics 2-3D Kinematics
Week 3: Jun 24th 5-7 PM PDT	Forces, circular motion, and Newton's laws Torques, and angular momentum
Week 4: Jul 1st 5-7 PM PDT	Momentum and energy Orbital Mechanics
Week 5: Jul 8th 5-7 PM PDT	Waves and Oscillations Fluid Mechanics
Week 6: Jul 15th 5-7 PM PDT	Ideal gases Heat Engines, efficiency and the second law

Week 7: Jul 22nd 5-7 PM PDT	The electric field and the electric potential Magnetic fields and Maxwell's equations
Week 8: Jul 29th 5-7 PM PDT	Resistors, Capacitors, and Inductors AC-circuits and other circuit elements
Week 9: Aug 5th 5-7 PM PDT	Geometric Optics and Wave Optics Special relativity
Week 10: Aug 12th 5-7 PM PDT	Wave-particle duality Schrodinger wave equation and atoms
Week 11: Aug 19th 5-7 PM PDT	Solid-state physics Nuclear Physics
Week 12: Aug 26th 5-7 PM PDT	Particle Physics Miscellaneous Modern Physics

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