**Independent Study Applicants only must complete the following addenda.**

# Macintosh HD:Users:jkerekes:Desktop:sbhs.pngINDEPENDENT STUDY ADDENDA

Student Name John Yang Counselor Name Joseph Zimbardo

Independent Study Title (to appear on transcript) Applied Aerodynamics

The following will be completed annually for each Independent Study that is being offered at SBHS. Please type prior to submission.

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| **Content Area:** | *Science* |
| **Supervising Teacher:**  Must be certified in the area of study. | *Dr. Mesut B. Cakir* |
| **Prerequisites (if any):** | *AP Physics C*  *Co-enrollment in Multivariable Calculus and Linear Algebra* |
| **Length of Study:** | *Full Year* *Semester* *Marking Period* *Other* |
| **Meeting Schedule with Supervising Teacher:** | *If subsumed within another class: Day:* *TBA Block:*  *If not: Room:* *Frequency of Meetings:* *Every other day* |
| **General Purpose Statement:**  Why are you pursuing this particular study? What are your goals? | *To gain specific and applicable knowledge and skill in the field of Aerodynamics.* |
| **Standards (NJCCCS or CCSS for LA or Math) Addressed:** | *NJ CCCS Career Ready Practices*  *CRP2. Apply appropriate academic and technical skills.*  *CRP4. Communicate clearly and effectively and with reason.*  *CRP6. Demonstrate creativity and innovation.*  *CRP7. Employ valid and reliable research strategies.*  *CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.*  *CRP11. Use technology to enhance productivity.*  *New Jersey Student Learning Standards:*  *Standard 8: Computer Science and Design Thinking*  *8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.*  *Standard 9: Career Readiness, Life Literacies, and Key Skills*  *NJSLS 9.4.12.CI.I: Demonstrate the ability to reflect, analyze, and use creative skills and ideas New Jersey Student Learning Standards for Mathematics:*  *N-Q.A: Reason quantitatively and use units to solve problems.*  *N-VM.A: Represent and model with vector quantities.*  *N-VM.B: Perform operations on vectors.*  *A-SSE.B: Write expressions in equivalent forms to solve problems.*  *A-CED.A: Create equations that describe numbers or relationships.*  *F-IF.B: Interpret functions that arise in applications in terms of the context.*  *F-IF.C: Analyze functions using different representations.*  *F-LE.B: Interpret expressions for functions in terms of the situation they model.*  *G-GMD.B: Visualize relationships between two-dimensional and three-dimensional objects.*  *G-MG.A: Apply geometric concepts in modeling situations*  *S-MD.A: Calculate expected values and use them to solve problems.*  *New Jersey Student Learning Standards for English Language Arts:*  *NJSLSA.R2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.*  *NJSLSA.R10. Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.*  *RI.11-12.2. Determine two or more central ideas of a text, and analyze their development and how they interact to provide a complex analysis; provide an objective summary of the text.*  *RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.*  *NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.*  *NJSLSA.W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.*  *NJSLSA.W8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.*  *NJSLSA.W9. Draw evidence from literary or informational texts to support analysis, reflection, and research.*  *SL.11-12.4 Present information, findings and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.* |
| **Connections made:** | *Core Values:*  *Responsibility – The student will self-regulate their learning and evaluate their progress.*  *Honesty – The student must adhere to ethical research practices and maintain academic integrity throughout the course.*  *Other Content Areas:*  *Technology and Engineering – The student will apply engineering and design principles and processes to systematically solve problems.*  *Mathematics – The student will apply math concepts and skills to model and analyze situations.*  *English Language Arts – The student will apply skills used in English Language Arts to quickly read and analyze informational texts, and take concise notes.* |
| **Course Objectives:** | *The student will know…*  *In this course, the student will gain mathematical, computational, and practical knowledge in Aerodynamics.*  *The first portion of the course will cover theoretical knowledge. The student will learn the mathematical concepts and methods behind how air interacts with certain bodies that move through it.*  *Next, the student will learn how aerodynamics affects normal and emergency operations from a pilot-oriented perspective.*  *A detailed list of topics is available in the attached document.* |
|  | *The student will be able to…*   * *Use mathematics and physics to model aerodynamic situations under ideal conditions* * *Use computer programs and/or physical models to demonstrate aircraft in real-world conditions* * *Explain the phenomena that cause aircraft to behave in certain ways* |
| **Planned Learning Activities:**  Outline of work to be accomplished. |  |
| **Resources/Materials:**  Human resources  Library resources  Other resources |  |
| **Expected Outcomes:**  What project/demonstration, publication or final project do you propose as a culminating experience/evaluation of the independent study? |  |
| **Assessment Methods:**  Describe in detail the methods of assessment that the advisor will use to evaluate your work. |  |