Laboratory Project 2: Projectile Launcher
Report Contents and Grading

30   *Communication*
- –   IEEE single column, double spaced format, title, author, etc. (–20 pts if not used)
- 5   Style (written in the style of article, rather than disjointed figures and tables)
- 5   English (grammar, punctuation, and etc.)
- 5   Clarity (purpose of each section clearly explained)
- 3   Succinctness and precise wording (detailed information in as few words as possible)
- 3   Organization (ease of locating figures/code/equations/etc.)
- 3   Section numbers and headings (use section numbers shown below)
- 3   Equations explained (at least one sentence between equations)
- 3   Figures complete (every figure numbered, captioned, and referred to in text)

5   ***Abstract*** (succinct summary of results, including numerical values as appropriate)

10   **I.**   **INTRODUCTION**
- 6   Motivation/background for projectile launcher [e.g., space, military, etc.]
- 2   Circuit overview [schematic and brief description of how circuit works]
- 2   Report organization [briefly describe contents of sections that follow]

13   **II.**   **CAPACITOR CHARGING CIRCUIT DESIGN, CONSTRUCTION**
- 6   Explanation of differential equation for v_C
- 2   Presentation and explanation of solution for v_C
- 2   Presentation and explanation of expression for i_C
- 3   Explanation of choice of R to limit charging current to 10 mA

17   **III.**   **ANALYSIS OF LAUNCHER CIRCUIT**
- 7   Presentation and explanation of differential equation for i_L [give final differential equation]
- 4   Presentation and explanation of solution for i_L for overdamped case [i.e., actual launcher]
- 6   Matlab® plot of underdamped solution

10   **IV.**   **CONSTRUCTION AND TESTING OF LAUNCHER CIRCUIT**
- 3   Measured R_s and L and C for launcher
- 2   Description of launcher
- 5   Table listing launch distances

10   **V.**   **CALCULATION OF KEY LAUNCHER VALUES**
- 4   Calculated C for critical damping [equations may be omitted; give value]
- 4   Calculated maximum current [describe derivation in words; give value]
- 2   Calculated maximum voltage [describe derivation in words; give value]

5   **CONCLUSION** (summarize key results; include numerical values as appropriate)