I. **Course Title**
   - Introduction to Engineering Design

II. **Course Prefix/Number**
   - PHYS 102

III. **Credit Hours**
   - 2.0

IV. **Prerequisites**
   - ACT Math Score of 17 or higher; OR ACCUPLACER Math Score of 85 or higher; OR Successful completion of MATH 097

V. **Catalog Description**
   - This course serves as an introduction to engineering design and should be taken by all students who have elected to pursue the pre-engineering curriculum at Adams State College or who have an interest in exploring engineering as a career. Students will be engaged in the design process throughout the entire course. Using the *LEGO Mechanical Engineering Set* and the *LEGO RCX Brick*, students will learn about mechanical systems and design solutions to specific problems.

VI. **Curricular Relationships**
   - This introductory course is a required course in the ASC pre-engineering. It will attract students with widely differing backgrounds and abilities.

VII. **Student Learning Outcomes**
   - Students will develop a general understanding of the broad discipline called engineering.
   - Students will be able to describe many different areas of engineering.
   - Students will recognize many components that comprise complicated machines.
   - Students will be able to design machines to solve problems and/or perform specific tasks.
   - Students will be able to design and program robots that solve problems and/or perform specific tasks.
   - Students will be able to work efficiently as a member of a project team that will solve a significant design problem.
VIII. Content Outline

- Students will spend approximately the first four weeks of the semester working as an individual constructing different LEGO subassemblies. Each week they must turn in written answers to design questions about the individual subassemblies.
- Students will spend approximately five weeks working in pairs programming the LEGO RCX module.
- Students will spend the remainder of the semester working in groups of 3-5 to solve a significant engineering problem using LEGO components and the RCX programmable brick.

IX. Course Procedures/Policies/Grading Scale

- Attendance in class is mandatory and is reflected as a portion of your grade (participation).
- Students must turn in weekly assignments.
- The final project and the written analysis associated with the project will comprise no less than 30% of each student’s final grade.
- The grading scale will be:
  - 90-100 A
  - 80-89 B
  - 70-79 C
  - 60-69 D
  - <60 F

X. Required/Recommended Readings

- Suggested textbooks for the course include some from the Basic Engineering Series and Tools published by McGraw Hill.

XI. Issues Unique to this Course

- The course is a two-credit hour lab course, and therefore meets four hours per week.

XII. Additional Departmental Issues

- none