

## **IPRO 314 - FALL 05 - PROJECT PLAN**

**PROFESSOR:** Dr. Paul Fagette and Dr. Connie Hall

### **TEAM MEMBERS:**

Niekoo Abbasian	Jennifer Barta	Tim Britt
Abhi Das	Rebecca Hannah	Mary Hannink
Brendan Inouye	Ryan Jungels	Justin Ram
Shawn Stumpf	Joe Sutalo	Michael Turturro
Sam Vazquez	Aaron Whiting	

**COMMUNITY PARTNERS:** Museum of Science and Industry, Chicago

### **OBJECTIVES:**

The IPRO team will continue to work with the staff from the Museum of Science and Industry to develop a prototype of a cardiovascular- mechanical function display of the changes in pressure and flow that occur at the moment of birth. The team will refine the previously developed computer-based display of the physiological functions in the pre-natal and neo-natal experience. The bench-top working model that demonstrates the closure of one of the fetal cardiovascular aspects will be refined as well. Students will work with museum staff to understand how the public interacts with displays and then field test the display in the Museum for feedback and further refinement. Multiple skill areas are required to carry out this project: fluid mechanics, materials, physiology, control systems, interactive design capabilities, all of which will enhance the learning experience of this interdisciplinary group. The team will turn over both displays to the museum curator at the end of the semester

### **BACKGROUND:**

The Museum of Science and Industry has embarked upon a 6 year renovation of the science and health displays. The Museum is currently developing a number of new human physiology and health displays. It is hoped that the IPRO project could evolve into a display that could eventually be utilized in the Prenatal exhibit. IIT is involved in this experience as the Museum wishes to present more current scientific and engineering concepts to better educate the public on the relationships between physiology, pathology, and medical technology.

### **METHODOLOGY:**

The IPRO project team has determined a multi-step process. The initial phase has 3 teams. A two person team will handle upgrade to the computer animation program, Flash based. The model team will work on refining the fluid based mechanical display. Another team, in 2 parts, is reworking the narrative for the animation program and adding to the secondary information base and animated pictures.

The second phase will involve the testing of the displays at the Museum of Science and Industry with aid from the staff. Appropriate refinement will occur after each testing.

The teams have purposely been created with a mix of engineering and biology students to insure an interdisciplinary perspective. Each team presents results of research to the entire group for critique before progressing to the next level.

In order to insure that pertinent clinical and physiological data is accurate, a consulting physician, an obstetrician, has agreed to provide commentary and critique.

### **EXPECTED RESULTS:**

The IPRO team will create a polished, scientifically accurate computer and mechanical display of the change in pressure and flow in the cardiovascular system that occurs at the moment of birth. The computer display will be user friendly and accessible in a learning manner to wide range of public users. The mechanical display will also be accessible to the same audience.

It is hoped that this two semester project will convince the Museum of Science and Industry to continue and maintain a long-term relationship with the Department of Biomedical Engineering and the University for future projects.

### **SCHEDULE OF TASKS AND MILESTONE EVENTS:**

The first half of the semester is dedicated to refining both the animation and mechanical model. The challenges and achievements of this process will be given in the mid-term report.

An advance team will visit the Museum to determine some of the criteria for refining the display before the semester break.

The second portion of the semester will comprise the testing of both components at the Museum.

The finished product will be presented to the Museum before the end of the semester.

### **BUDGET/LIST OF ANTICIPATED EXPENSES:**

Pump supplies for mechanical display: \$200

Related fluid materials : \$125

LED display and circuit board: \$450

WIIT recording and narrative costs: \$150

### **ASSIGNED RESPONSIBILITIES:**

The IPRO team has divided itself into a requisite number of teams and will evolve the number and makeup as the project evolves throughout the semester. Team makeup will reflect the interdisciplinary nature of the problem and the students.