



**IPRO 330 – Dynamic and Contemporary Science Fair Projects  
for Chicago Public Schools**

# **Project Plan**

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## **1.0 Abstract**

The primary purpose of the Interprofessional Project (IPRO) 330 team is to promote the study of mathematics and the sciences amongst Chicago Public School (CPS) students. We intend to achieve this goal primarily by enhancing the website [sciencefair.math.iit.edu](http://sciencefair.math.iit.edu) and by interacting directly with CPS students, educators, and administrators. The website, entitled *Science Fair Extravaganza*, is already fully functional thanks to the efforts of previous IPRO 330 groups. Our team aims to further improve and publicize this website as well as to look into sustainability options for the IPRO and the website. To improve the website we will be addressing suggestions given by CPS teachers and students as well as outside education professionals in an effort to provide a high quality and useful project. The success of our IPRO will be determined by completion of grant proposals for the intent of sustaining the IPRO.

## **2.0 Background of the Problem**

The purpose of the Chicago Public School (CPS) Science Fair program is to combine the work of many fields into a single interdisciplinary project. The components of these projects include research, creation and execution of the methods, recording of the results, data analysis, the forming of a conclusion, a written report, a visual presentation, and an oral presentation. These steps entail the use of many aspects of English, science, mathematics, and often history. The Science Fair is a powerful tool to raise students' awareness of and interest in the scientific method and scientific work. This is precisely why our IPRO is assisting CPS with this program. IPRO 330 is continuing its quest to rectify the poor quality of projects, the deficient presentation skills, and the general lack of interest in the Science Fair program displayed by many middle and high school students in the CPS system. Students often have trouble finding a project that not only piques their interest but is also appropriate for the Science Fair and lies within their budget. Some students have suggested that this is partially because they have not been able to find acceptable projects through the internet.

A number of other recurring problems arise in Chicago Science Fair projects. The most notable problems are that students:

- Do not understand how to record certain data,
- Do not know how to analyze certain data, especially when applying statistical methods,
- Often use an ineffective graph or chart to display their data,
- Frequently neglect an analysis of their possible sources of error, and

- Demonstrate poor verbal and visual presentation skills.

The societal costs of these problems are indirect but large. The United States currently suffers from a shortage of engineering, mathematics, and science professionals. Students of many countries, including China, Japan, and India, get a better mathematics and science education than do American students. In fact, the United States ranks in the lowest third of all major world countries in the field of mathematics. At the root of this shortage lies, in part, a general disinterest amongst American students in these technical subjects. If our IPRO team is successful in making even one student motivated to pursue the study of mathematics or science in college, then society will inevitably be benefited and we can consider our IPRO a success.

## **2.1 History of IPRO 330**

IPRO 330 will continue to work closely with Chicago Public Schools (CPS), primarily at the high school level, in order to improve the Science Fair program. Although CPS has no financial involvement in this IPRO project, our IPRO has established numerous contacts with educators who are gracious enough to volunteer their time to assist our efforts. Our primary contacts include:

- Angela Dumas – City Science Fair Coordinator
- Tammy Butler – Chicago Public Schools Post-Secondary Specialist
- Eric Williams – Chicago Public Schools Post-Secondary Specialist
- Alicia Choi – Area 23 Science Fair Coordinator
- Sophia Kim – Area 21 Science Fair Coordinator
- Judy Lederman – IIT Director of Teacher Education, Senior Instructor

Although there have been very few efforts in the past to improve the Science Fair program, the Fall 2008 IPRO 330 team increased its relationship with CPS contacts (administrators and teachers). The increase in website hits as well as the overflow of science fair judging requests is evidence of this. By attending LabFest at the Museum of Science and Industry in September 2008, the IPRO team has established a relationship with Science Chicago, a year-long science program for students. We will continue to attempt to establish affiliations with other area organizations designed to encourage the study of science and participation in Science Fairs.

From previous semesters of IPRO 330, we have inherited a great reference guide for CPS students to consult when they are looking for a science fair project or are preparing their presentation. The Fall 2008 IPRO 330 team ensured that the project ideas listed on the website followed numerous ethical guidelines. They rewrote a number of projects to guarantee that they simply provided guidelines for students to complete a project. That is, they made sure that our website did not detail the entirety of any project – including results and analysis that students could copy verbatim and present as their own project. New projects posted to our website will be held to the standards employed by the Fall 2008 IPRO team.

The hard work of earlier IPRO 330 teams is evidenced by our website, [sciencefair.math.iit.edu](http://sciencefair.math.iit.edu). Visitors to this site may not only view our various projects and guides, but they may also see the list of IIT students who have worked on the project. Additionally, the website has been designed to allow users to give feedback either through e-mail or by responding to a simple survey. The website is currently obtaining approximately 80 hits per day, with the record of 195 hits in a single day being set on November 14, 2008.

### **3.0 Objectives**

IPRO 330 has one clear and main purpose: to increase high school student interest and awareness in science and mathematics in Chicago Public Schools (CPS). This is a very lofty and broad goal, so IPRO 330 has chosen to use the CPS Science Fair program as a vehicle to achieve this purpose. IPRO 330 is a continuing IPRO, meaning that we have a foundation and a base of work that has already been accomplished. The website is almost a finished project. Thus, we will continue to perform maintenance and add features as the team sees fit. Some of the items of the website we wish to address are:

- Addition of pictures/videos to project procedures
- Search tool for the entire website
- Adding more project categories (astronomy, botany, etc.)
- Assessing error while experimenting feature

Our goal is to make the website a comprehensive tool for student use by the end of the semester. Part of this goal is to minimize the technical maintenance of the website. If the IPRO were not to continue at a later point, the website could be self-sustaining and require little attention. This would be a very tangible final product of the IPRO.

Some more outreach efforts that will be accomplished this semester are the Jr. Science Cafes and the Engineering Week at IIT Rice Campus. With these, we will further our outreach for the IPRO as well market our website. Jr. Science Cafes are informal sessions where scientists and engineers meet with a group of students and discuss science. We would bring a few of our projects from the website and allow students to perform the experiments. Engineering Week is a similar setting. We would again bring materials to perform experiments and give a hands-on experience for any students present.

The larger focus of the semester will be based upon writing a grant proposal. This proposal will be another effort to sustain the efforts of the IPRO in a larger sense. The general idea for the proposal will be further our relationship with CPS and to develop a program for their students on campus at IIT. Ideally, a lab-environment would be created to allow high school (and possibly younger) students to come to IIT's main campus and develop their science and math skills. This initiative would require the help of IIT students to work and manage the lab on a weekly basis, thus creating paying on-campus jobs for IIT students. High school students could receive help with their science fair projects, use lab equipment and materials, or just perform pre-determined experiments with the assistance of the student staff on hand. The proposal would request for lab equipment, experiment materials, funds for space (if necessary), and funds for student salary. Another benefit of this proposal would be to bring exposure to IIT to high school seniors. This would greatly assist the recruitment efforts of the university and help to increase enrollment.

### **3.1 Ethics**

One of the most critical goals of IPRO 330 is to act responsibly and ethically at all times. The overarching principle of IPRO 330 is to guide and encourage the participation of high school students in Science Fairs and future careers in scientific research, and to maintain the integrity of all our activities throughout this process.

Specific Ethical Guidelines:

- All aspects of the Science Fair website will abide by the constraints set by applicable local, state, and national laws.
- Material presented to the *Science Fair Extravaganza* visitors will be original creations or will give appropriate citations; plagiarism is strictly prohibited on the website.
- The credibility of the material presented online or from other reference material needs to be verified and confirmed with expertise. Reference for the work of others must be

cited and properly identified in order to prevent breach of copyright and intellectual property laws.

- All Information on the website is under the regulation of the law.
- No derogatory statements will be presented in the website.
- Substances listed under all projects will be legal for students under 18 years of age to utilize or present in public conventions under regulations.
- The service offered (i.e. the website) will not differentiate amongst users, but will allow access to anybody in the community who desires use of the service. Specifically, there will be no use of a login function to allow some users wider access than others.
- Feedback requisition from Chicago Public School students will be accepted as guidance to ensure website credibility and promote the success of students during their science fairs.
- Program systems are required to ask students to input their age. People below 13 years old may still input their data, but we shall only utilize the feedback of users above 13 years old.
- Contracts and agreements, both intra-team and external, must be established and followed by every participant.
- Careful documentation, such as records, meeting minutes, original plan and status report, should be completed in a periodic fashion regarding agreement and accomplishments between those who have collaborated with the project in the form of a contact list.
- All collaborators, including science fair coordinators, Chicago Public School teachers, and IIT faculty who contribute meaningful suggestions or information to the website will receive appropriate credit and be referenced on the website.

We also recognize that we have an all male team this semester. This may turn out to be a disadvantage due to lack of female input and ideas. We will be careful to monitor our work and to ensure that it is gender appropriate and not male-dominant.

#### **4.0 Methodology and Gantt Chart**

The Gantt Chart below details all of the major tasks to be completed by our IPRO team this semester. Included in the chart are IPRO deliverables, Jr. Science Cafes, Website Maintenance, grant research, and grant composition.

## IPRO 330 Spring 2009 Tasks

Tasks	Start	End
<b>IPRO Deliverables</b>	<b>1/20/2009</b>	<b>5/8/2009</b>
Project Plan	1/20/2009	2/14/2009
Midterm Presentations	3/2/2009	3/12/2009
Abstract/Brochure	3/12/2009	4/26/2009
Poster	3/12/2009	4/27/2009
Final Presentation	3/12/2009	4/29/2009
Final Report/Grant Proposal	1/20/2009	5/8/2009
Work Product CD	5/8/2009	5/11/2009
File Uploads	1/20/2009	5/11/2009
IPRO Day Exhibit	5/1/2009	5/1/2009
<b>Grant Proposal</b>	<b>2/4/2009</b>	<b>5/8/2009</b>
Grant Proposal Framework	2/11/2009	2/18/2009
Potential Grant Applications	2/4/2009	3/12/2009
Timeline of Objectives	2/4/2009	2/11/2009
Institutional Advancement Approval	2/11/2009	5/1/2009
Space Availability Queries/Issues Resolution	2/4/2009	5/1/2009
Writing Proposal	2/18/2009	5/8/2009
<b>Outreach</b>	<b>1/20/2009</b>	<b>5/8/2009</b>
IIT Rice Campus Engineering Weekend	2/21/2009	2/21/2009
CPS Science Fair Judging	1/20/2009	5/11/2009
Junior Science Cafes - Science Chicago	1/21/2009	2/18/2009
<b>Website</b>	<b>1/20/2009</b>	<b>5/8/2009</b>
Refresh HTML Knowledge	1/20/2009	2/18/2009
Update Content as Necessary	1/20/2009	4/26/2009
Modify Current Layout	1/20/2009	4/26/2009
Google Analytics	1/27/2009	4/26/2009
Linking to Other Sites	1/27/2009	4/26/2009
Website Feedback from IIT	2/11/2009	3/12/2009

The IPRO 330 methodology is developed with a mix of structure and flexibility that we believe will allow us to take on any goal we adopt. It is necessary to have some flexibility in our plans because many of our activities are dependent on the approval and requests of our collaborators. If a Science Fair coordinator wants us to volunteer for a specific area Science Fair, we will do our best to adjust our schedules to make it to that particular Science Fair.

IPRO 330 has divided into three subgroups, each designed to work on a different aspect of the overall project. These subgroups are specified below. All team members are responsible for keeping track of their tasks completed and time logging throughout the semester. This will help in peer-reviews and to satisfy the time log recommendation of the IPRO office.

## **5.0 Project Budget**

Our project has no financial sponsors outside of the IIT Interprofessional Project Office. Our largest expenditures are the printing costs for brochures, business cards, and poster boards. Due to our participation in Science Chicago our budget request also contains money for science experiment supplies. Lastly, our budget entails some money for transportation costs as members will have to travel to pick up supplies for Science Chicago and to attend science fairs throughout the semester. The budget breakdown by category is as follows:

Category	Requested	Explanation and Details
Supplies	\$250	Experiment supplies for Jr. Science Cafes and Engineering Week activities, and other lab experiments including canola oil, wood skewers, balloons, M&M's, and various other small supplies.
Services	\$250	Printing of materials for lab experiments and publicity of the website, including business cards, brochures, and posters.
Travel	\$200	Expenses for important off-campus meetings with CPS teachers and administrators, attending science fairs in the Chicago land area, attending Jr. Science Cafes
TOTAL	\$700	

## **6.0 Team Members**

Name	Year – Major	Strengths
Sam Nemanich	3 <sup>rd</sup> Year – Biomedical Engineering/Science Education	Contact with CPS Office of Math and Science/Previous IPRO 330 experience



Joshua Tate	4 <sup>th</sup> Year – Applied Mathematics	Mathematics/ Previous IPRO 330 Experience
Kyle Pinsonneault	5 <sup>th</sup> Year- Industrial Technology Management	Business (marketing)
Ken Boubel	3 <sup>rd</sup> Year – Mechanical Engineering	Outreach Experience and Leadership
Rick Matusiewicz	3 <sup>rd</sup> Year – Applied Mathematics	Experience with CPS
Eugene Lamie	5 <sup>th</sup> Year- Applied Math and Science/ And Computer Engineering	Website Maintenance
Satchal Erramilli	5 <sup>th</sup> Year – Molecular Biochemistry and Biophysics	Experience with outreach from previous IPRO
Anil Vasireddi	2 <sup>nd</sup> Year- Biomedical Engineering	Research Experience
Yaofu Zhou	2 <sup>nd</sup> Year - Physics	Scientific Research Experience
Edgar Palacios	3 <sup>rd</sup> Year- Physics	Long time participant in CPS science fairs

## **6.1 General Team Structure**

- Team Leaders

The team will be led by Sam Nemanich and Joshua Tate. Both of these students were members of the Fall 2008 IPRO 330 team. The leaders will be responsible for coordinating the sub-teams, ensuring that each sub-group is coordinating with the other sub-groups and progressing at an appropriate pace, running all meetings, and considering all aspects of this project before providing a directed vision. Rocio and Joshua are also responsible for meeting with Professors Fasshauer and Pelsmajer (Faculty Advisors) to get feedback on their plans and to make sure that they are covering all aspects of the project that need to be addressed at the upcoming meetings.

These leaders may change throughout the semester as other team members take on larger responsibilities and leadership roles. It will be upon each team member to ask to be a team leader.

- Sub-teams

Sub-team	Members	Sub-team Leader
Grant Researchers	Satchal Erramilli, Yaofu Zhou, Edgar Palacios	Satchal Erramilli
Grant Proposal Writers	Joshua Tate, Ken Boubel, Sam Nemanich, Kyle Pinsonneault	Ken Boubel
Website Maintenance	Eugene Lamie, Rick Matusiewicz, Anil Vasireddi	Eugene Lamie

- Sub-team Responsibilities

The grant research team is in charge of finding different grant proposal formats from various organizations, including public and private donors. They will report back with content of the proposal, format details, and deadlines. The grant proposal writers are responsible for the actual composition and technical writing involved with the grant. They will base their writing off of suggestions from the group as well as example grant proposals found by the research team. They also will be involved in re-drafting and editing the document. The whole team will agree upon the final draft. The website maintenance team will be responsible for any updates or revisions agreed upon by the team to the website. They will also investigate sustainability options in order to minimize upkeep for the future.

## **6.2 Project Monitoring Roles**

- Meeting Roles
  - Minute Taker – Josh Tate
  - Agenda Maker – Joshua Tate
  - Time Keeper – Ken Boubel
- Assigned Status Roles

- Weekly Timesheet Collector/Summarizer – Each team member
- Master Schedule Maker – Sam Nemanich
- iGroups Organizer – Kyle Pinsonneault