IT-Olympics Venues

There are three venues in the 2012 IT-Olympics competition: cyber defense, robotics, and game design. There is also a best team name and best team logo competition which do not contribute to overall scoring, but are stand alone events for teams.

A student may only compete in one venue during the Olympics. However as part of the IT-Club activities leading up to the Olympics students can collaborate on multiple venues.

A team is comprised of three to ten members. However, we recommend three to six team members which allows everyone on the team an equal chance to participate in the events. **All students and teams need to be registered on the IT-Adventures web site by March 19, 2012.** Registration is made by the IT-Advisor using his or her account on the IT-Adventures web site.

All students will also need to have emergency medical and photography release forms completed and mailed to the IT-Adventures staff by **March 19, 2012**. The forms and mailing address are available from the participants page of the IT-Adventures web site.

Each venue will have three components that the teams will be judged on as described in the pages that follow: community service; the primary competition; the real-time competition. The goals of the competition are to promote interest and exploration of information technology through a fun, unrestricted learning environment that encourages collaboration and experiential learning.

Make Special Note: IT-Advisors and IT-Mentors will be allowed to watch the competition in Hilton Coliseum during IT-Olympics, but will not be able to talk to their teams in an effort to help the solve real-time or primary challenges. Any such help or hints will result in a significant point deduction and potentially a disqualification from the

competition. This applies to all three venues. To help avoid the temptation to ask for help, IT-Advisors and IT-Mentors will not be allowed in the areas of the competition floor where the students are actively working on their real-time or primary challenges.

IT-Olympic competition components:

The teams will be judged based on their performance in each of the three components.

20% community service project
50% primary competition
30% real-time competition

Community Service Project:

Each IT-Club is required to perform a community service project and produce an electronic slide show in Microsoft PowerPoint 2003 that details the project to compete in IT-Olympics.

The community service project can be targeted at any age group and should be focused on some aspect of IT. A school that is participating in multiple venues can perform one community service project that will count for each venue.

Each IT-Club will need to register its community service project and upload the PowerPoint 2003 slide show on the IT-Adventures web site by **April 9, 2012**. If an IT-Club does not register its project and upload the slide show prior to attending IT-Olympics, it will not be given a time slot to present the slide show for judging and will not be able to earn its community service points in the competition. Since the uploaded slide show will be used for the students to make their 5 minute presentation during IT-Olympics, as well as shown on the overhead projection system in Hilton, it is recommended that the slide show only be 5-7 slides in length.

The judging of the community service project will be based on several factors.

25% project concept (IT relevance)
25% creativity in delivering project content
25% slide show and oral presentation
25% project feedback/improvement ideas

Example community service projects include:

- Holding an IT security awareness class for the community
- Arranging for a one day recycling drop off point for used computer and/or other electronics
- Setup a free computer check up day where IT-Club members check computers for spyware and do minor repairs to machines for the community
- Arrange with the school IT support staff to help with computer lab maintenance
- Volunteer to support computers and/or network for the local library

There will a scheduled time on Saturday morning that a team member or members need to make a presentation for the judges using their submitted slide show. The judges will be able to ask detailed questions about the community service project and its goals. This timetable for judging will be available in mid-April once all IT-Clubs have registered their projects.

Primary Competition:

The primary competition is designed to show the technical abilities of the team. The project that the team has worked on and brought to the competition is what will comprise this portion of the score. Each venue will have different scoring methods and judging criteria which are generally enumerated later in this document.

Real-time Competition:

During the IT-Olympics teams will be asked to solve problems in real-time based on the venue. Because these are real-time problems the actual challenges and details are not known ahead of time. The problems and the judging criteria are given out during the course of the two-day competition.

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Game Design Venue
(Primary Competition)

The goal of this venue is to design an educational game that can be used to teach a concept in the areas of Science, Technology, Engineering, or Math (STEM) to students in the grades 6-8, generally considered middle school (junior high) age. The game should be easy to use, fun to play and teach a STEM concept.

Game requirements:

The game program must be created using Alice 2.2.
The target age group is students in the grades 6-8.
The concept or issue being taught must be identified in the program.
The game must have on-line help
Team should produce a one page quick start guide to get players and judges started
The code should be documented and will be submitted along with the game
The game will be brought to the competition and made available for judges and guests at the competition to play.

Judging of Primary Competition (STEM game):

25% based on artistic appeal
25% based on educational content
25% based on ease of use
25% based on code and code documentation

Robotics Venue
(Primary Competition)

The goal of the robotics venue is to design and program an autonomous robot using Lego Mindstorms NXT to compete in a sumo competition.

A Lego sumo competition is when two autonomous Lego Mindstorms NXT robots try to push or flip each other outside of the circular ring. The first robot to touch the floor outside of the ring loses the bout. While pushing may appear the best way to win the bout, flipping, lifting, and disabling its opponent are effective methods to gain control of the robot in order to push it over the edge.

The competition "mat" is a circular ring is four feet in diameter with a two-inch border. The surface is smooth and raised slightly off the ground.

The robots are placed in the ring 12 inches apart and an equal distance from the center of the ring. The robots are set down parallel to each other and facing opposite directions so they have to search for each other (no steamrolling straight ahead). The referee and onlookers will count 3,2,1 and GO! The team representative will start his robot and then move away from the ring. The robot must wait three seconds before any motion is made to allow the team representatives to clear the circle. Then, the first motion must be forward and has to start within ten seconds of the bout. The robot must find its opponent and then start trying to flip, lift, disable or push it out of the ring.

The combat continues until one robot is disabled, pushed out of the ring or the bout is over (one minute.) If any parts fall off the robot they are left on the mat until the end of the bout. Once a bout has ended they are removed and given to the representative, and the robot finishes the match without it. A robot loses the bout if any part of it falls off the edge and touches the floor. Hanging on the edge is not considered out. It must touch the floor.

The judgment of the ring official is final. There is no appeal process. If a robot accidentally puts itself over the edge, it is considered a suicide and the opponent is credited with the win.

There will be several rounds to the competition. Each round is three minutes in length or three bouts, whichever is first. If there is no winner at the end of three bouts, the round is considered a draw. The winner of a round is the robot who won the most bouts in that round. The winner of a round gets two points, the loser zero. A draw gives one point to each robot.

If the robots get entangled during a bout and there is wear and tear on the robot, the two team representatives can agree to restart that bout. The clock will stop, the robots will get disentangled and the bout will continue with the time remaining in that bout.

Robot requirements:

The robots must be built using only the components sent to the IT-Adventures Club and must come from kits 979797 and/or 979648. No other components are allowed to be purchased and added in. If the team has access to more than one kit in the building process, be sure to not include any extras of any given part. There will be significant point deductions for having any extra parts, and they will need to be removed before it can compete in any matches.

The robot cannot exceed two pounds and must fit in a 1' x 1' frame.

Documentation about design choice for the sumo robot must be included for judging. This should include pictures. Please see the template and documentation rules for more information.

Code for the program running during the competition should be documented and submitted to the judges. It will be a .rbt file.

Judging of the Primary Competition (the Sumo bot):

Documentation
- Mechanical Design (30%)
- Code Structure (30%)

Match Win/Lose Score from both days of Competition (40%)

Cyber Defense Venue
(Primary Competition)

Cyber Defense requirements:

In a cyber defense competition, the high school teams (the Blue Teams) play the role of IT support staff. They configure a network of computers and provide services to the end users of their network (the Green Team) throughout the event. They also must defend their network for an extended period of time from hackers (the Red Team). In addition to configuring and protecting their network, the Blue Team will be asked to participate in anomalies introduced by the Green Team. By successfully completing each of the tasks they better their score for the competition. The Green Team anomalies and defending from the Red Team attacks comprise the real-time portion of the competition.

The high school teams are provided a scenario of a company and the types of services they are required to run on their networks in a separate document. Generally, they are required to provide domain name service (DNS), email (SMTP and POP/IMAP), remote desktop (RDP), remote programming and web services. It generally behooves a team to also install a firewall in their network. Additionally, each team is given an end user machine or a remote desktop machine which has Windows XP or Vista installed on it which they need to configure and support for their Green Team. A complete scenario with full details of the requirements for this year's competition will be available in the participants area on the IT-Adventures web site in March.

Approximately one month prior to coming to campus for this weekend event, the students are given instructions on how to remotely access our research environment to configure their competition network. The team members spend nearly a month installing operating systems from a preboot execution environment (PXE) or from cds. They can choose from a variety of operating systems including Windows and unix/Linux flavors. Each team is given remote access to virtual computers to be configured as servers, firewalls and/or routers for their network and allowed free reign in their installation. They also are given an IP range/ranges that they can use in our virtual Internet environment. A special chat program will also be in place during the remote setup that is specifically for questions and help from the ISU students who are supporting the competition.

Judging of the Cyber Defense Competition:

The cyber defense competition has been changed to positive scoring. Each team begins the competition with a zero balance. You earn points for positive things like having services up and good documentation on your network. You also earn points for good reports about attacks that occurred and the steps you took to protect your network.

Points are deducted for problems such as services being down, vulnerabilities being exploited, non-completion of an anomaly and non-submittal of documentation.

More details about scoring is in the rules document that will be available in late March. The team with the highest score at the end of the competition is the winner.

Best Team Name and Best Team Logo Competitions
(Does not count in overall scores)

Each team entered in the IT-Olympics competition is encouraged to create a unique team name and design a unique team logo. The students will vote during Saturday morning to decide who has the best team name and the best team logo. The students cannot vote for their own teams. Deadline for registering for the Best Team Name and Best Team Logo is April 9, 2012.

IT-Advisors will register each team and designate a team name. This will be the name entered in the Best Team Name competition. If a team wants to change their name prior to April 9, the IT-Advisor has a screen on the web site that allows the teacher to make the change for the students. However, all name changes will be final for the competition as of April 9, 2012. If a name change is submitted via the web after the April 8 deadline, the new name will not be entered in the Best Team Name competition.

All team logos must be submitted by the IT-Advisor through the IT-Adventures web site using the web screen for logo submission. The logo must be a vectorized graphic using one of the following extensions: WMF,EPS, PDF, SVG. If you submit some other format, such as JPG, that is a rasterized graphic format, your logo will appear blurry when we show it on the screen to be judged. Again, the IT-Advisor has the ability to submit a new logo for a team, but all logos will be final for the competition as of April 8, 2011. If a new logo is submitted via the web after the April 8 deadline, the new logo will not be entered in the Best Team Logo competition.

All entries in the best team name and best team logo events must be made by **April 9, 2012**. There will be no late entries accepted.

At least two software programs may be available to students so they can create a vectorized graphic logo. The first is Adobe Illustrator which is a commercially available product your school may own. However, if your school does not license Adobe products, GIMP is a free, open source software that can be downloaded from www.gimp.org. The user's manual for GIMP is available at http://docs.gimp.org/2.6/en/. It works very much like Adobe Illustrator, but has no cost associated with it.