

## 2011-2012 Course Description

The Administration requires all teachers to fill out the information on the form for the course(s) you have taught this year and/or will be teaching next year (see Mr. Lombard for clarification on this if needed).

Please make as many copies of this form as necessary to document your course(s).

Course Name:

Technology 8

Is this course a **Full Credit** or a **Half Credit**?

Half Credit – Meets every other day

Major Units covered in this Course (List in order of coverage):

Ongoing all year – TechScience (year 3 of a 3 year GenYes program)

The need for STEM (Science, Technology, Engineering and Math) education has never been greater. Modern science and modern technology go hand in hand, yet many science classrooms have not changed in decades. To make matters worse, elective opportunities are being reduced and teachers don't have time to squeeze technology lessons into the school day. Middle school students are not being taught to use the technology they will need to succeed in high school science classes and in future careers.

TechYES is a Student Technology Literacy Certification designed to introduce students to technology and information literacy through science projects. TechYES Science can be part of any middle school science class, and meet two needs at once. The completed TechYES Science projects are assessed both for science content and technology use. TechYES is correlated to the ISTE NETs standards for students and meets the NCLB 8th grade technology literacy mandate.

By having students act as TechYES Peer Mentors, TechYES Science can expand the opportunities for all students and help all science teachers bring more technology into their lessons. With TechYES Science, science teachers can focus on their science lessons, and do not have to teach or assess technology.

Fall Semester (1st and 2nd Quarters) – Future City Competition: (year 2 of a 2 year Future City program)

The mission of the National Engineers Week Future City Competition is to provide a fun and exciting educational engineering program for seventh- and eighth-grade students that combines a stimulating engineering challenge with a "hands-on" application to present their vision of a city of the future.

This will be accomplished by:

Fostering engineering skills, such as teamwork, communication and problem solving skills;

Providing interaction among students, teachers, and engineer mentors;

Informing the community about the multi-disciplines within the engineering profession;

Inspiring students to explore futuristic concepts and careers in engineering.

The National Engineers Week Future City Competition requires:

Problem-solving

Team work

Research and presentation skills

Practical math and science applications

Computer skills

The competition employs a team-based approach. All members of the team have an important role that is necessary for the completion of the project.

In necessary continue on the next page.

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### Units Covered Description Extra Text Box if needed:

#### 3rd Quarter:

##### Lego Robotics Mindstorm (Year 3 of a 3 year program):

In LEGO® MINDSTORMSTM for Schools and the Robotic Command System, students will be introduced to both the hardware, components of the robotic system and ROBOLAB, the simple, yet powerful programming language that allows the student to program LEGO models to autonomously perform tasks. The guide and software were developed by the Center for Engineering Educational Outreach (CEEEO) at Tufts University (Massachusetts, US). The CEEEO works with schools to help them integrate the teaching of math, science, reading, and writing into the solving of engineering design problems. The design and programming components of robotic-based projects promotes integrated learning. To support this, LEGO has developed the ROBOLAB software with LEGO Educational Division and National Instruments (Texas, US). The CEEEO has the goal of not only getting more elementary school teachers to use engineering to teach, but to also educate all students, male and female, that engineering is not a scary or difficult subject, but rather a multi-faceted subject that is an integral part of everyone's day to day life.

The project areas represent the five things that you will do while the students Invent and Investigate.

##### Program Areas Used

- To write the programs for the RCX.
- Used for downloading the programs to the RCX.

##### Upload Areas

- Upload transfers the data from the RCX to the computer.
- Every set of uploaded data is stored on its own individual data page within the upload area.

##### View and Compare Areas

- Used to look at all of the data that has been gathered.
- Can view statistics (max, min, mean, etc.) of data.
- Can compare different sets of data to each other.

##### Compute Area

- Used to adjust the data with arithmetic functions for calibration or scientific understanding.
- Includes five levels of computation, from simple statistics to differentiation and integration.

##### Journal Area

- Used to document your project. For example, users can create pages for each part of their experiment: problem statement hypothesis predictions (text and sketches) discussion of results conclusions
- Used to import digital images or graphs to support your project.

#### 4th Quarter: (year 3 of a 3 year program)

##### Alice 3 D Animation Programming: Developed by Carnegie Mellon University (Year 1 of a 3 year program)

Alice is an innovative 3D programming environment that makes it easy to create an animation for telling a story, playing an interactive game, or a video to share on the web. Alice is a freely available teaching tool designed to be a student's first exposure to object-oriented programming. It allows students to learn fundamental programming concepts in the context of creating animated movies and simple video games. In Alice, 3-D objects (e.g., people, animals, and vehicles) populate a virtual world and students create a program to animate the objects.

In Alice's interactive interface, students drag and drop graphic tiles to create a program, where the instructions correspond to standard statements in a production oriented programming language, such as Java, C++, and C#. Alice allows students to immediately see how their animation programs run, enabling them to easily understand the relationship between the programming statements and the behavior of objects in their animation. By manipulating the objects in their virtual world, students gain experience with all the programming constructs typically taught in an introductory programming course. The third year of Alice programming expands the students ability to program and animate more complex movements of the objects in Alice.

Programs Used – TechYes, Lego Robotics, Movie Maker/iMovie, Alice 3 D Animation, an Office Productivity Suite of Programs (ie Microsoft Office, Google Office etc.)

## 2011-2012 Course Description

### Describe any Project and/or Research Papers that will be assigned and the approximate Quarter the Project and/or Research Paper will be assigned

During the year, the topics covered are based upon either as a team or individual projects, as part of the TechScience program, students submit a topic they would like to create a project around, have the project approved not only by the teacher but also by peer mentors. Students will be monitored by the teacher and peer mentors to insure progress is made during the semester on the project and that the project will be completed by an established deadline.

In the Fall Semester (Quarters 1 and 2) students, working in teams, will have to plan a city using SimCity 30000, research and write and research paper on a topic given by Future City (past topics were the use of nanotechnology in urban developing, recycling grey water and developing emergency shelters for those affected by a natural disaster or economic conditions, and designed and build a scaled model of a city of their own design. Two teams chosen from among the 7<sup>th</sup> and 8<sup>th</sup> grades will represent the school at the annual Capital Region Future City Competition in January.

Quarter 3, the unit's project to build a Robotic Unit and write programs for the Robot demonstrating the Robot's and their own programming functionality.

Quarter 4, students will learn Alice 3 D programming and create 3 animations.

Semester Research Multimedia Presentation on "How Is It Made and How Does It Work". Each semester each student will conduct research and compile a multimedia presentation on how an item is made and how does it work. The student chooses a item – Example – Bicycle. The student then conducts the research necessary to explain how a bicycle is made and then explain how a bicycle work, through the use of a flow chart, which is the basis of the presentation. The student will choose an item in the Fall and a different item for the Spring Semester for a total of two for the year. The Semester Project will count as the Midterm Grade for the Fall and will count as the final for the Spring Semester.

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Describe how technology will be integrated into the course.

The entire course is based on the learning and use of various forms of technology. Using the computer, students will gain knowledge of basic computer techniques, word processing, internet research, program writing, multi-media hardware use and multi-media creations.

Will your midterm be a **Project, Research Paper** or **Test**?

Multimedia Research Presentation Project

Will your final be a **Project, Research Paper** or **Test**?

Multimedia Research Presentation Project

## 2011-2012 Course Description

**If a NYS Assessment Exam or Regents Exam part of your course, how do you prepare for this test?**

Students become certified as having attained national ISTE NETS technology standards by completing and being certified through the GenYes program.

**If this is an AP course, how do you prepare for this test?**