**Goal-directed Instructional Design Plan - Making Computer Science and Engineering Fun for Elementary, Middle School, & Highschool Students!!!**

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1. **A problem or a need** – there must be a problem of practice or an educational need that should be addressed during the lesson.

There is a need to teach teachers how to come up with a curriculum that will make computer science and engineering fun.STEM (Science, Technology, Engineering, and Math) schools are starting to become the wave of the future for a lot of schools. The goal is to teach teachers about lesson plans, and using resourceful tools to get students thinking.

2. **A real-world performance** – how the learning objectives fit into a real-world activity or need.

This fits into real-world activities because technology is growing more and more everyday. With this activity, students will learn how to use technological operations, understand scientific concepts, critical thinking, problem solving, and decision making.

3. **An instructional objective** – the objectives are based on the final outcome, activity or test. These objectives will each be different for the four types of knowledge; *performing skills*, *recalling facts, identifying examples of concepts*, and *applying principles.*

    a. *Creating a measuring tool to determine if students have learned what has been expected of them (ie test, quizzes, term papers)*

    b. *Students will be given the task of demonstrating mastery of the four types of knowledge through an individualized or group classroom presentation.*

    c. *Instructional design methods will have the STEM concept at the core of the curriculum, and these principles will be utilized to create lesson plans for students*

4. **A set of essential content** – the basic ideas and skills that will allow the learner to complete the task or understand the content.

The lesson to teach instructors how to make computer science and engineering fun for all ages will be based on activities and lessons related to real-world experiences. By teaching collaborative group work, promoting creativity, and coming up with projects where the students can be innovative thinkers

5. **An evaluation consisting of a test or observation** – an assessment, observation or product showing that the objectives can be accomplished in the real-world setting.

To assess if the teachers are conveying the skills necessary to there students there will be a test given to test the students learning ability in the technology and comprehensive skills.

6. **A method to help participants learn** – the method to deliver the content; a lesson.

Each lesson is provided in the main section of Blackboard

- **Motivation**:

  - Meaningfulness – content and activities must have meaning for the learner

  Teachers should be able to understand mathematical, computational, problem-solving, and critical thinking skills. It is expected that teachers are able to maneuver around CAD program with comfort, and write a simple computer program. Teachers should have an understanding of most problems and errors that can occur.

  - Pleasant consequences – the effects that achieving the goal will have on the learner

  This lesson will give the teacher a fun, practical way of teaching computer science and engineering to students of all ages.

  - Novelty – an attention-getting, humorous or curious manner that relates to the useful information in your lesson

  The teacher will teach the students how to research there projects about patents, copyrighting, and technical data packages.

- **Socialization** - a strong motivator for student learning

  I would suggest setting up an Edmodo, because students will catch on to this site faster because of the facebook and myspace they already using.This will be a safer atmosphere for the teacher/student to communicate in.

- **Audience** – For what audience are you designing this lesson? Consider the following:

  - Age

    Elementary - Highshchool Students

    Teachers

  - Skill level (including technology skills)

    For teachers - math, science, engineering, CAD background

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| Students - basic math, some science<br>○ Prerequisite knowledge (including technology background)<br>Any instructor that can demonstrate they have the knowledge and skills to complete and understand the assignments pertaining to the subject matter.<br><br>Students - no technology skills needed |
| • **Technology Needs** – the computers, software, programs (such as Angel or other CMS's) printers, equipment, Internet access, time in the computer lab will be needed to successfully complete your technology-rich lesson.<br>Home or School computer with plenty of virtual memory<br>Access to email, word apps/google docs, internet<br>CAD (computer aided design) software |