

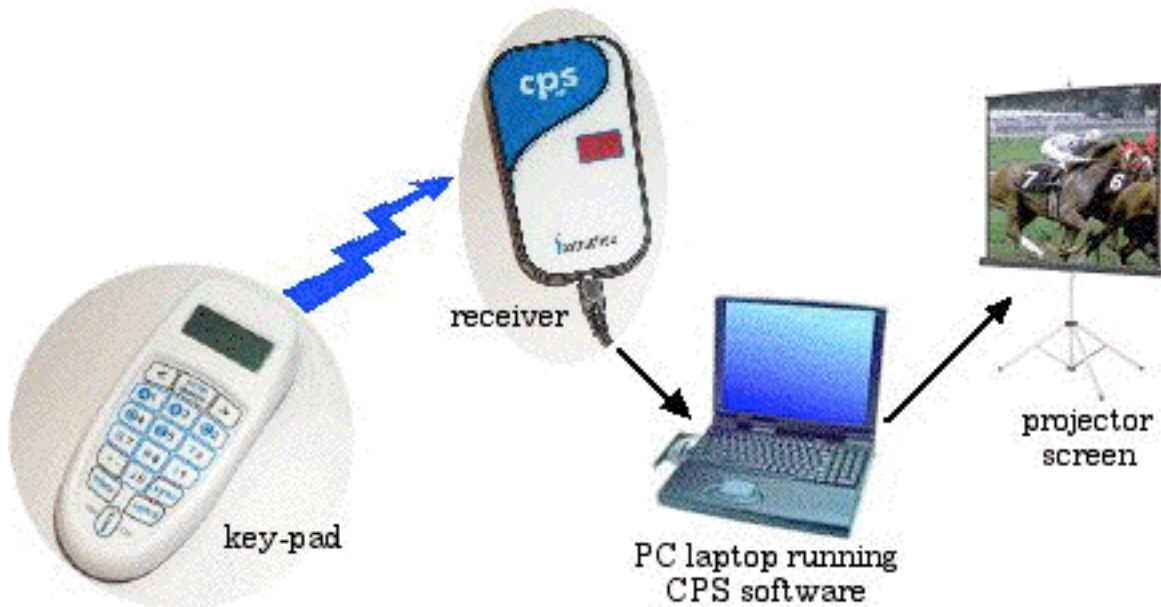
*I think and think for months and years.
Ninety-nine times, the conclusions are false.
The hundredth time I am right.*

Albert Einstein, 1879-1955.
German born physicist and Nobel Prize winner.

CLASS PERFORMANCE SYSTEM (CPS_{RF}) PHY2044

Operation

I will again be using the Class Performance System (CPS) produced by eInstruction. It is an interactive system that enables me to pose a question to the whole class and get individual responses that can be automatically graded and logged into a class grade-book. Each student registered in the class is required to have a key-pad (sometimes called a response pad) - like a TV remote control - that acts as a transmitter. After registration, which is done on-line at eInstruction.com - **for full details see separate handout** - each key-pad has a different "Pad ID number", usually a number between 1 and 200, for the class so each student's key-pad has a unique identifier, known only to the student and the local CPS system administrator, i.e., the instructor. After a question is posed to the whole class, every student will be given some time - usually several minutes - to decide on an answer, from a given set of answers, and having done so can press the appropriate button on the key-pad to select their answer and then hit the SEND button. The response from the key-pad, together with the Pad ID number, is detected by a receiver connected to a PC running the CPS_{RF} software.



In normal operation, the question will be displayed on a projector screen in front of class together with a grid of numbered boxes of the registered key-pad identifiers at the bottom of the screen. When the system detects a signal from a key-pad, the box containing the appropriate code in the grid flashes to confirm it has received a valid response. After the allotted time, all the responses are logged and written to a class grade-book by the CPS_{RF}

software and a histogram of the results from the whole class will be displayed. We can then have a discussion of the result.

During the time allowed for making the choice, students can change their minds and select an alternative response, if necessary, and the grid on the screen will indicate that it has received the new signal. It is the final choice that is logged. However, any choice made *outside* of the available choices will be rejected by the system. **Please note**, having made your final choice, there is no need to continue to press the key-pad buttons, if you do so, you will only be using up the battery power in the key-pad unnecessarily!

Advantages

There are several advantages to both the student and instructor using CPS.

- The system operates in real-time and so the instructor and the students get immediate feed-back on the degree of understanding.
- In contrast to traditional teaching methods, in which quizzes or tests are administered every few weeks, the results of the immediate feedback using CPS allows instructors to "adapt-in-time", i.e., before any test or quiz.
- It will be used as a way of gaining "extra credit" and encourage attendance**.
- It will increase participation in class activities, which is at the very heart of so called *active-learning*.
- Since it is "anonymous" there is no pressure nor embarrassment on students who are normally hesitant in answering questions in class.

** Although you can gain extra credit using the system, I want you to realize that the principal reason for using the system is to enhance your understanding of the material we cover in class.

Types of Questions

Because of the way the system operates, the questions I will pose will necessarily have to be "multiple-choice". But, they will be of three main types:

- 1 Questions that test conceptual understanding, i.e., involving "word" questions/answers .
- 2 Short numerical or estimation problems.
- 3 Meta-cognitive or pedagogical questions, i.e., of the type ... "How would you go about solving the following problem?"

Normally, there will be about 2-3 questions per class period so I expect to ask a total of about 50-60 over the whole semester. Every student who maintains more than a minimum percentage of "correct answers" will be given **extra credit** that will be added to their quiz and test scores.

Credit

Extra credit can be earned by answering questions correctly; the actual amount of credit earned is on a "sliding scale" up to a maximum of 20 points. As a result it is possible to raise your quiz and test grade by a maximum of one half-grade level, e.g., from a C to C+. However, I want you to realize that the principal reason for using the system is to enhance your understanding of the material we cover in class!

Registration

You will have to purchase a CPSRF key-pad from the **FAU Bookstore** at a cost of about \$20. (I am told you can get a refund of about \$10 for returning a used key-pad.) The key-pad must be registered in order for it to become "active" by being given an identification code, probably a number between 1 and 200, that you have to remember! Registration is done online at eInstruction.com - **for full details see separate handout** - and it will require you to have the **class key**, which is **K25174L932**. Registration costs about \$15, payable by a credit card or check. **Please note**, CPSRF is becoming more widely used at FAU; if you are in another class that uses the system, you do not have to purchase another key-pad nor pay a second (or third) registration fee since the fee covers multiple classes for that semester - **see separate handout**.

Responding conventions for students

- Make sure the batteries are good; your key-pad should switch-on when you hit the **PWR/JOIN** button.
- Your response pad should automatically search for a class to join when you turn the pad on. To join a class manually, turn on the response pad and press the **PWR/JOIN** button twice ... when *Join:* appears on the screen type in the channel number for this class, which is 21, then press **send**.
- If your key-pad doesn't respond when everybody else's does, check the batteries and tap the key-pad gently (to make sure the batteries are located correctly) and retry.
- If your key-pad still doesn't function, call eInstruction (1-888-333-7532) to make sure your pad is registered correctly.
- If you believe your key-pad is defective, you can exchange it at the bookstore for another key-pad at no cost.
- Remember to switch your key-pad OFF at the end of class; to do so, you hold the **PWR/JOIN** button down for several seconds.

RGJ
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