Internet Multimedia Courseware on Transistor Devices

University of Regina

Objectives for Innovation

Web-based instruction with Java applets

Intended Audience

Students in electrical and electronics engineering at the University of Regina

Students in electronics technology at SIAST

Results Achieved

Interactive web-based instruction on transistor devices

Interactive demonstrations of operating transistor devices

Flexible access for students across the world and at the University of Regina

Information technology experience for students helping to develop and maintain the web site

Partners

ISM, TR Labs, SIAST Engineering Technology Programs

Implementation

May 1999

This program provides web-based instruction on transistor devices to support introductory courses in electronics, electronic devices and electronic systems. Online tutorials are enhanced by interactive Java applets. These are programs that run independently on a computer's web browser, allowing the user to interact with the material and to see the dynamic display resulting from the interaction. Java applets can thus illustrate complex relationships that change over time in response to the user's input.

The web site hosts tutorials on the Metal Oxide Semiconductor Field Effect Transistor (MOS FET) and Bipolar Junction Transistor (BJT). Java applets provide three-dimensional interactive models of these transistors, enabling students to manipulate and control input voltages and currents. In addition, students can vary certain component values and parameters. This allows students to examine realistic or typical operation of the transistors, as well as extreme situations in the functioning of the devices.

Students must grasp concepts such as pinch-off and saturation to understand the operation of these transistors. They can more easily understand what is happening with the transistor, since it operates when they can see it. Simulation and experimentation using Java applets can be much more conducive to learning than the passive display of web pages.

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