FOSSEE - Promoting Free and Open Source Software in Education

The aim of the FOSSEE project (http://fossee.in) is to eliminate the use of proprietary/commercial software packages in Science and Engineering Education across India and replace them with Free and Open Source Software (FOSS). The shift to FOSS packages will help educational institutions monetarily.
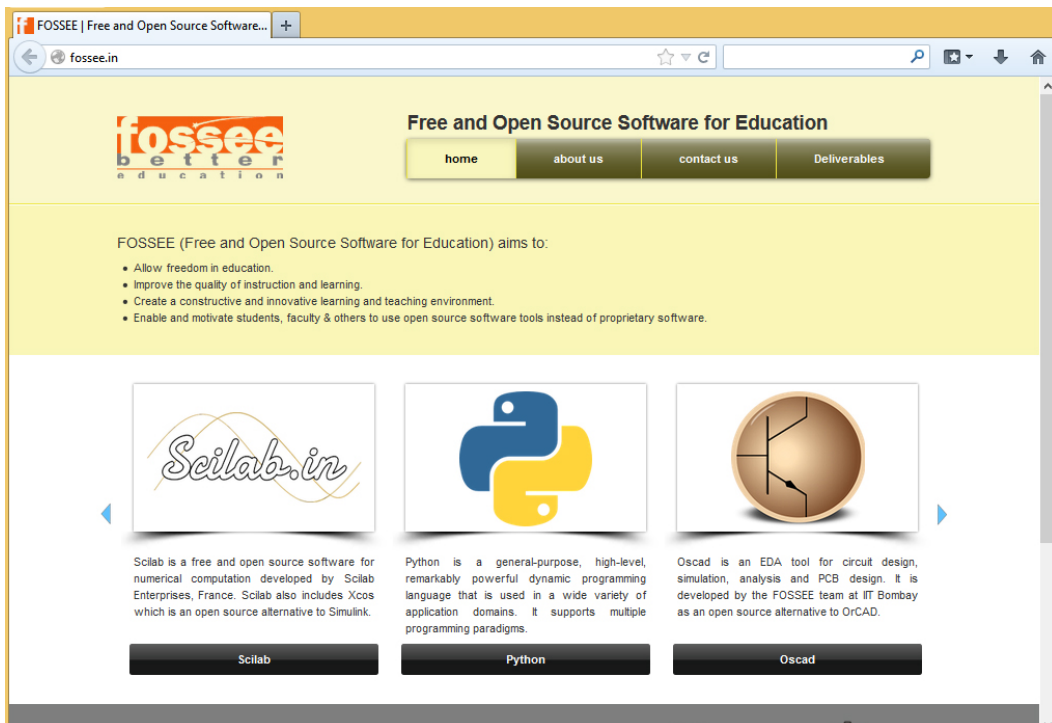

Figure 1: http://fossee.in

Two of the flagship activities promoted by the FOSSEE team are **Textbook Companion** (TBC) and **Lab Migration.**

One of the major shortcomings of FOSS tools is the lack of documentation. FOSSEE addresses this important issue by promoting Textbook Companion activity. **Textbook Companion** activity creates code for solved examples of standard textbooks using FOSS. It is available online for free download and use. It is done by students and the faculty of colleges from different parts of India.

As long as a college uses proprietary tools as part of their lab curriculum, we cannot eliminate the use of commercial software. To address this issue, we have started the **Lab Migration** activity that aims to migrate college labs using proprietary software to a FOSS only lab. The FOSS code created by a student/teacher is released in open source code for public use.

Students and faculty involved in both the above mentioned activities are given honorarium for their efforts.

Various other FOSSEE activities are as follows:

- **SELF Workshops**: are Spoken Tutorial based Education and Learning through Free FOSS study workshops. These workshops have been conducted in different parts of India. During the last one year, a total of about 450 Scilab, 240 Python and 8 OpenFOAM, SELF workshops have been conducted in this manner, training about 22,000 students and faculty members.

- **Course Conversion**: The course conversion effort aims to provide the necessary help to teach a course using Scilab. Five courses have been converted using Scilab.

- **Hardware Interface**: FOSSEE has come up with Scilab based data acquisition systems using COMEDI (COntrol and MEasurement Device Interface with drivers for more than 400 A/D cards and digital I/O cards), Xcos (block oriented simulation tool) and HART (hardware access real time toolbox).

- **FOSS on Aakash**: The FOSSEE team helped port C, C++, Python, Scilab and Oscad onto the Aakash tablet.

Currently, FOSSEE team promotes the following software extensively:

Scilab is a free and open source software for numerical computation developed by Scilab Enterprises, France. It is a FOSS alternative to MATLAB. It also includes Xcos which is an open source alternative to Simulink. The Scilab team have successfully created more than 275 Textbook Companions and ported 12 labs through the Lab Migration activity till date. To increase ease of executing Textbook Companion code online, FOSSEE has ported TBC on GARUDA cloud (http://scilab.in/scilab-on-cloud). Please visit http://scilab.in for more details.

Python is a general-purpose interpreted, high-level, object-oriented programming language that is used in a wide variety of application domains.The Python team promotes the use of the language through Python Textbook Companion. Under Python Textbook Companion, 53 textbook companions have been completed. For more information visit http://python.fossee.in/

Oscad is developed by the FOSSEE team at IIT Bombay it is an EDA tool for circuit design, simulation, analysis and PCB design. Free tutorials of Oscad are available at http://oscad.in/resources/tutorials.

COIN-OR or **CO**mputational **IN**frastructure for **O**perations **R**esearch is a project to build and support an open-source software for operations research and its applications. **Simpy** (Simulation in Python) is an open source, Python-based, discrete-event simulation software. OR Tools at FOSSEE is promoting COIN-OR, Simpy and other FOSS by developing tutorials, textbook companions and software interfaces in Scilab and Python. For more details please visit http://or.fossee.in

OpenFOAM is a free, open source CFD software package developed by OpenCFD Ltd and distributed by the OpenFOAM Foundation. Tutorials in the form of web-casts, for self learning OpenFOAM have been developed by our team. These are available free of cost at http://cfd.fossee.in.

The FOSSEE team is dedicated in promoting FOSS tools in educational institutions across India. We invite institutions to join us in making this project a success for years to come.