

Introduction of CollabCAD in CBSE Curriculum

Keeping pace with the changing trends and the latest technological development in the field of collaborative design & development of Industrial Designs, CBSE has updated the curriculum for "Engineering Drawing". As a first step in this process the name of the subject has been modified from "Engineering Drawing" to "Engineering Graphics". A significant step in this direction is the enlargement of the scope of the subject by introduction of "Computer Aided Design" in the updated syllabus.



C.J. ANTONY
Senior Technical Director
NIC HQ
antony@nic.in



S.SENTHIL KUMAR
Technical Director
NIC Chennai
ssk@nic.in

TODAY'S children are tomorrow's scientists and engineers; and hence, one of the primary goals of education should be to prepare them to shoulder this responsibility. The students need to gather scientific knowledge and practical skills for becoming successful in their career. Fully understanding this requirement, the Central Board of Secondary Education (CBSE) has been offering a course on "Engineering Drawing" at Senior Secondary level, in which the students are widely exposed to concepts of 3-Dimensional geometry.

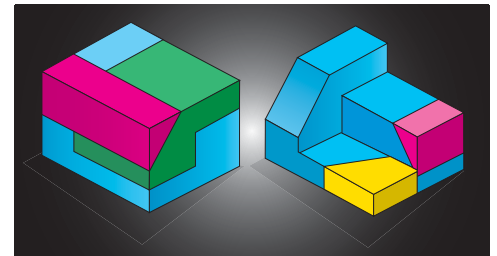
CollabCAD for CBSE

CollabCAD is an initiative of National Informatics Centre, Bhabha Atomic Research Center, Mumbai and Vikram Sarabhai Space Center, Thiruvananthapuram. It provides the facility for solid and surface modeling, feature based modeling, 2D and 3D constraints and assembly. CollabCAD supports reverse engineering, and has an in-built content management system. The Plot Configurator module of CollabCAD facilitates presentation of models as 2D drawings for printing and plotting. Besides it allows collaborative design of models across a network by designers sitting at different geographic locations.

CollabCAD covers every phase of the design process - from conceptualization through visualization and animation; and will be useful to the students irrespective of the discipline she/he takes-up at a later stage. It enables them to learn the design

methodologies related to Computer Aided Design systems, besides enhancing their skills for envisaging complex 3D models from basic building blocks. An early exposure to a CAD/CAM software would be advantageous to the students when they go forth to their engineering courses, and finally become engineers and scientists in various industrial sectors. CollabCAD as a medium of instruction for the "Engineering Graphics" would improve the standard of the course by assimilating the engineering knowledge with computer skills, and thus make the course more interesting and popular.

CollabCAD is developed based on proven open source tools and technologies such as: Java/Java3D, Open Cascade, and PostgreSQL; and this



A Typical Machine Block in "Engineering Graphics"

makes the product highly cost effective for deployment up to the school level. The limited entity demo version of the software that can be freely downloaded from NIC and CBSE web sites would be available to all the students even at home so that they can use it to practice their day-to-day lessons.

Customization for CBSE

The software was customized to suite the content of the "Engineering Graphics" course of CBSE. Direct and

easy-to-use methods were provided to create Prisms, Pyramids and Cones, which form the basic solid primitives in the course. Facility to create auxiliary isometric views was also provided to have a better view of the model depicting maximum features. A tailor made standard layout was provided in the Plot Configurator module of the software for the students to easily create various orthogonal views of the model. Besides, the detailing features in this module were also enhanced to cater the needs of modern day machine drawing.

To make the learning of the software easy, an elaborate course book was prepared in close interaction with the experts in the subject. The book contained introduction to the software, instructions for downloading and installation, and tips on the software usage. Step-by-sep procedure to create various primitives and machine blocks were also provided so as to enable the faculty and the students to carryout the exercises without any external help.

Master's Training

NIC has signed a MoU with CBSE for inducting CollabCAD in the course curriculum of "Engineering Graphics" for students appearing for the class XII examination from the year 2010 - 2011. According to this agreement, NIC would provide Master's Training



DG (NIC) Dr. B.K. Gairola inaugurates the training at Delhi

to the course faculty from various schools under CBSE at different regions across India. The limited entity demo version of the software would be made available for free download from CBSE website, to enable the schools and the students to freely use the basic module of the software.

Such trainings generally consists of elaborate discussion and interaction sessions where the participants are enlightened on variety of topics extending from the use of computers as a medium of instruction to interactive building-up of the 3D machine blocks from the data in 2D drawings. To keep the interaction among the participants and the CollabCAD team alive, a user group is also created

through which ideas can be exchanged and doubts clarified. The members in the group are being periodically updated about the issues of common interest and enhancements in the software through this medium.

Conclusion

Introduction of Computer Aided Design in the updated curriculum of "Engineering Graphics" course of CBSE has been widely appreciated by the engineering and technical fraternity at all levels. In the initial stage the use of CollabCAD is limited to the project work of the course at the internal assessment level, where the students will learn the basics of CAD. The workshop experience would expose the students to CAD concepts in general and 3D modeling in particular. It is hoped that the software would be used in future as a tool to explain the complex concepts in Engineering Graphics by CBSE, and also by other educational agencies.



An interactive session during the workshop at Chennai

For further information

Dr. Savita Dawar
Senior Technical Director
CAD Group
National Informatics Centre
New Delhi-110003
Ph: 011 - 24305159
savita.dawar@nic.in