## The Spoken Tutorial Project

▶ Self explanatory: uses simple language

▶ Audio-video: uses multisensory approach

Small duration: has better retention

▶ Learner-centered: learn at your own pace

▶ Learning by doing: learn and practice simultaneously

▶ Empowerment: learn a new FOSS

## Target group

▶ Undergraduates/Postgraduates

▶ Research scholars

▶ Teachers

The Spoken Tutorial Project Team conducts workshops on OpenModelica and several FOSS using spoken tutorials and gives certificates to those who pass an online test.

For more details, please write to

contact@spoken-tutorial.org

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is funded by the
National Mission on Education
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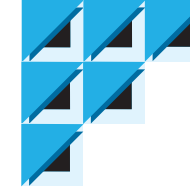Government of India.

### Contact Us
Email: contact@spoken-tutorial.org
Website: http://spoken-tutorial.org

IIT Bombay

# Spoken Tutorial
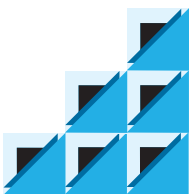
## OpenModelica

## Overview

OpenModelica is an open source modelling and simulation environment intended for industrial and academic usage. It is an object oriented declarative multi domain modelling language for complex systems. The OpenModelica environment allows most of the expression, algorithm, and function parts of Modelica to be executed interactively, as well as equation models and Modelica functions to be compiled into efficient C code. The generated C code is combined with a library of utility functions, a run-time library, and a numerical DAE solver.

## Features

Modelica has emerged as a strong contender in the arena of simulation languages. This environment can be used to work for both steady states as well as dynamic systems. As all the equations are solved simultaneously, it doesn't matter whether the unknown variable is an input or output variable. Listed below are six major components of OpenModelica.

▶ OpenModelica Compiler (OMC) is used for converting Modelica code to C. This Advanced Interactive OpenModelica Compiler (OMC), can interact using API

▶ OpenModelica Connection Editor (OMEdit) is a GUI used for creation and modification of the models. OMEdit uses the OpenModelica Compiler through an existing C API to perform simulation, model query and plotting

▶ OpenModelica Shell (OMShell) is an interactive Command Line Interface session handler which has simple editing functions apart from parsing

▶ OpenModelica Notebook (OMNotebook) is a lightweight notebook editor, compared to the more advanced Mathematica notebooks available in MathModelica

▶ OpenModelica Python (OMPython) API is a free, open source, highly portable Python based interactive session handler for Modelica scripting

▶ Modelica Development Tooling (MDT) is an Eclipse Plugin as part of OMDev – The OpenModelica Development Environment integrates the OpenModelica compiler with Eclipse
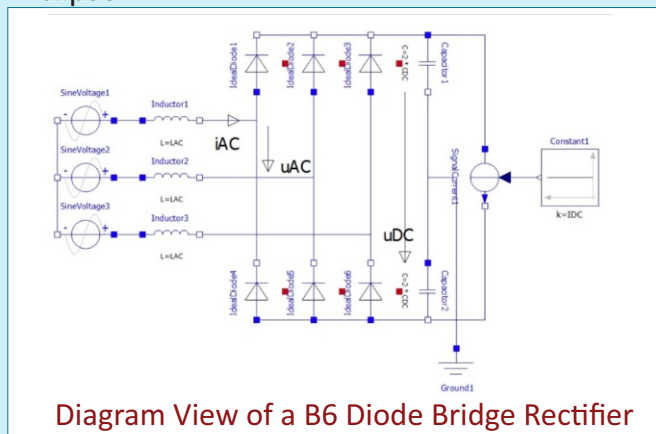


Diagram View of a B6 Diode Bridge Rectifier

## Textbook Companion Project

The Textbook Companion Project (TBC) aims to port solved examples from standard textbooks using OpenModelica.

The objectives of this project are:

▶ To make it easy for users of such textbooks to start using OpenModelica

▶ To improve the documentation available for OpenModelica

## Completed TBCs

1. Basic Principles and Calculations In Chemical Engineering by D. M. Himmelblau, J. B. Riggs, Prentice Hall, New Delhi, 2012

2. Chemical Reaction Engineering by Octave Levenspiel, Wiley India, New Delhi, 2006

3. Introduction to Chemical Engineering Thermodynamics (in SI Units) by J M Smith, H C Van Ness And M M Abbott, New Delhi, 2010

4. Fluid Flow, Heat Transfer And Mass Transfer by J M Coulson & J F Richardson, Butterworth Heinemann, 1999

5. Elementary Principles of Chemical Processes by Richard M. Felder And Ronald W. Rousseau, John Wiley & Sons, Singapore, 2000

6. Elements of Chemical Reaction Engineering by H. Scott Fogler, Pearson Education, Inc., New Jersey

7. Fluid Mechanics For Chemical Engineers by Noel de Nevers, McGraw-hill Higher Education, New York, 2005

8. Heat Transfer 10th Edition by J P Holman, McGraw Hill Higher Education,NewYork, 2010

9. Transport Processes And Unit Operations by Christie J. Geankopolis, Prentice Hall International, 1983

10. Unit Operations Of Chemical Engineering by Warren L. McCabe, Julian C. Smith, Peter Harriott, McGraw Hill Education (India) Pvt. Ltd., New Delhi, 2014

For all other completed textbooks please visit:

https://om.fossee.in/textbook-companion/completed-books