

Overview of ASCEND Tutorial Series

Talk to a Teacher Project

<http://spoken-tutorial.org>

National Mission on Education through ICT

<http://www.sakshat.ac.in>

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Learning Objectives



Learning Objectives

In this tutorial, we will introduce you to

► **ASCEND**



Learning Objectives

In this tutorial, we will introduce you to

- ▶ **ASCEND**
- ▶ **Problems that can be solved using ASCEND**



Learning Objectives



Learning Objectives

In this tutorial, we will introduce you to

- ▶ **ASCEND interface using a sample MODEL**



Learning Objectives

In this tutorial, we will introduce you to

- ▶ **ASCEND interface using a sample MODEL**
- ▶ **Topics covered in this series**



System Requirements



System Requirements

- ▶ **Ubuntu Linux OS v.12.04**



System Requirements

- ▶ **Ubuntu Linux OS v.12.04**
- ▶ **ASCEND v. 0.9.8**



Prerequisite



Prerequisite

- ▶ User doesn't require any prior knowledge of ASCEND



Prerequisite

- ▶ User doesn't require any prior knowledge of ASCEND
- ▶ To know more about ASCEND, please visit <http://ascend4.org>



What is ASCEND



What is ASCEND

- ▶ **ASCEND** is a open-source software program for solving mathematical models.



What is ASCEND

- ▶ **ASCEND stands for Advanced System for Computations in Engineering Design**



Applications of ASCEND

ASCEND can be used for



Applications of ASCEND

ASCEND can be used for

- ▶ **solving systems of non-linear equations**



Applications of ASCEND

ASCEND can be used for

- ▶ **solving systems of non-linear equations**
- ▶ **linear and nonlinear optimization problems**



Applications of ASCEND

ASCEND can be used for

- ▶ **solving systems of non-linear equations**
- ▶ **linear and nonlinear optimization problems**
- ▶ **dynamic systems**



Applications of ASCEND

Examples of Process Simulation Problems that can be modelled in ASCEND are:



Applications of ASCEND

Examples of Process Simulation Problems that can be modelled in ASCEND are:

- ▶ **Model a flash drum for separating a given mixture**



Applications of ASCEND

- ▶ **Model a process flow-sheet comprising of a Mixer, Reactor and Separation unit**



Learning Objectives



Learning Objectives

**We will learn how to install ASCEND
in**

► **Linux**



Learning Objectives

**We will learn how to install ASCEND
in**

- ▶ **Linux**
- ▶ **Windows**



Learning Objectives



Learning Objectives

We will also learn how to

- ▶ **Open a MODEL in ASCEND and Solve it**



Learning Objectives



Learning Objectives

We will learn how to

- ▶ **Build a basic MODEI**



Learning Objectives

We will learn how to

- ▶ Build a basic MODEL
- ▶ Add METHODS to the basic MODEL



Learning Objectives

We will learn how to

- ▶ **Build a basic MODEL**
- ▶ **Add METHODS to the basic MODEL**
- ▶ **Write dimensionally consistent equation in ASCEND**



Learning Objectives



Learning Objectives

We will learn how to

- ▶ **Create a reusable MODEL**



Learning Objectives

We will learn how to

- ▶ Create a reusable **MODEL**
- ▶ Reuse the **MODEL** for different components



Learning Objectives

We will learn how to

- ▶ Create a reusable MODEL
- ▶ Reuse the MODEL for different components
- ▶ Import data from Thermodynamics library



Learning Objectives

We will learn how to

- ▶ **Create a reusable MODEL**
- ▶ **Reuse the MODEL for different components**
- ▶ **Import data from Thermodynamics library**
- ▶ **Solve the MODEL**



Learning Objectives



Learning Objectives

We will learn how to

- ▶ **MODEL a Mixer**



Learning Objectives

We will learn how to

- ▶ **MODEL a Mixer**
- ▶ **MODEL a Reactor**



Learning Objectives

We will learn how to

- ▶ **MODEL a Mixer**
- ▶ **MODEL a Reactor**
- ▶ **Connect different components of a flowsheet**



Learning Objectives

We will learn how to

- ▶ **MODEL a Mixer**
- ▶ **MODEL a Reactor**
- ▶ **Connect different components of a flowsheet**
- ▶ **Run the Flowsheet**



Learning Objectives



Learning Objectives

We will learn how to

- ▶ **Use FOR loop in ASCEND**



Learning Objectives

We will learn how to

- ▶ Use FOR loop in ASCEND
- ▶ Use Arrays in MODEL



Learning Objectives

We will learn how to

- ▶ Use FOR loop in ASCEND
- ▶ Use Arrays in MODEL
- ▶ Plot Graphs using ASCEND



Summary

This tutorial was an overview of what you will learn in the ASCEND series. Hope you found it interesting.



About the Spoken Tutorial Project

- ▶ Watch the video available at http://spoken-tutorial.org/What_is_a_Spoken_Tutorial
- ▶ It summarizes the Spoken Tutorial project



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- ▶ If you do not have good bandwidth, you can download and watch it



Spoken Tutorial Workshops

The Spoken Tutorial Project Team

- ▶ Conducts workshops using spoken tutorials
- ▶ Gives certificates to those who pass an online test
- ▶ For more details, please write to contact@spoken-tutorial.org



Acknowledgments

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- ▶ It is supported by the National Mission on Education through ICT, MHRD, Government of India
- ▶ More information on this Mission is available at

<http://spoken-tutorial.org/NMEICT-Intro>



Thank You

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