

# 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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**18 October 2013**



# 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**



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



# Prerequisite



# Prerequisite

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



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- ▶ 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](http://spoken-tutorial.org/What_is_a_Spoken_Tutorial)
- ▶ It summarizes the Spoken Tutorial project



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- ▶ It summarizes the Spoken Tutorial project
- ▶ 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](mailto:contact@spoken-tutorial.org)



# Acknowledgments

- ▶ Spoken Tutorial Project is a part of the Talk to a Teacher project
- ▶ 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

## Thank You

