

# Integrative STEM Education



## Overview

The Festo Didactic STEM solution for secondary education focuses on technology and engineering design based learning while integrating science and mathematics concepts using a project-based approach, with the goal of providing students the opportunity to optimize solutions for real-world problems.

Our integrated approach to STEM emphasizes innovation, problem-solving, critical-thinking, and creativity using hands-on training systems that allow students to apply math/science fundamentals to complete projects using the engineering design process. Students learn concepts related to STEM disciplines in a “learning by doing” environment.

The hands-on trainers combined with our project-based, standards-based curriculum introduces a number of relevant technologies and emerging technologies to provide an exploratory STEM experience.

## Learning Approach

The Festo Didactic STEM solution for secondary education consists of a range of pedagogical methods organized to create an essential teaching instrument.

<b>Learning experience:</b>	<b>Traditional learning:</b>	<b>Inductive learning:</b>	<b>Connect student learning to a mission:</b>
Backward design	SBL (subject-based learning)	CBL (collaborative/ scenario-based learning)  PBL (problem-based learning)	EML (entrepreneurially-minded learning)

## Courseware

The Festo Didactic STEM solution for secondary education courseware is SCORM compliant. It has been optimized for use with the MindSight Series Multimedia eTraining System. If you have purchased this proprietary LCMS, please refer to your installation and user guide to install the content.

The Festo Didactic STEM solution for secondary education is multimedia-based courseware. Equipment and/or software included enhance students’ understanding of the curriculum by providing opportunities for real-world application of knowledge.

All content, activities, challenges, and projects are linked to learning objectives and corresponding Standards for Technological Literacy (STL), developed by the International Technology and Engineering Educators Association (ITEEA), and The Next Generation Science Standards (NGSS).

The Instructor Guide is specific to each course. It provides an equipment checklist, course installation and classroom preparation recommendations, any required hardware set-up directions, assessment answer keys, and links to the NGSS and ITEEA standards. In addition, the Instructor Guide provides the details for the Project Challenge and Support Projects and includes possible solutions for each. A Rubric for evaluating the project-based activities is supplied.

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## Course Structure

The STEM courses are designed with an emphasis on project-based learning with real-world scenarios. Each STEM course is presented with a Project Challenge path. This overarching challenge is proposed to students when they begin the course. After being introduced to the Project Challenge, students progress through the course by completing Support Projects using the Engineering Design Process. The Support Projects are where they build the knowledge and skills necessary to ultimately develop their solution for the Project Challenge.

As learners navigate down the path, an engineering design worksheet is used to document and monitor their progress. Support Projects are introduced, supplying them with topic-specific resources. Students explore these resource pages containing the information, skills, and activities needed to design, construct, or resolve their Project Challenge.



With the use of icons, the four STEM disciplines are integrated into the resources. Students know at a glance which subjects relate to the on-screen information. If the icon is blue, the content is related to the discipline. When it is gray, other disciplines are associated with the content.

Due to the exploratory nature of the projects, screens are marked with navigation icons to further guide students along the Project Challenge path. The following icons indicate the course pages:

### Projects:

-  Project Challenge
-  Support Project

### Resources:

-  Information
-  Activity
-  Skill

 **Science**

 **Technology**

 **Engineering**

 **Math**

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