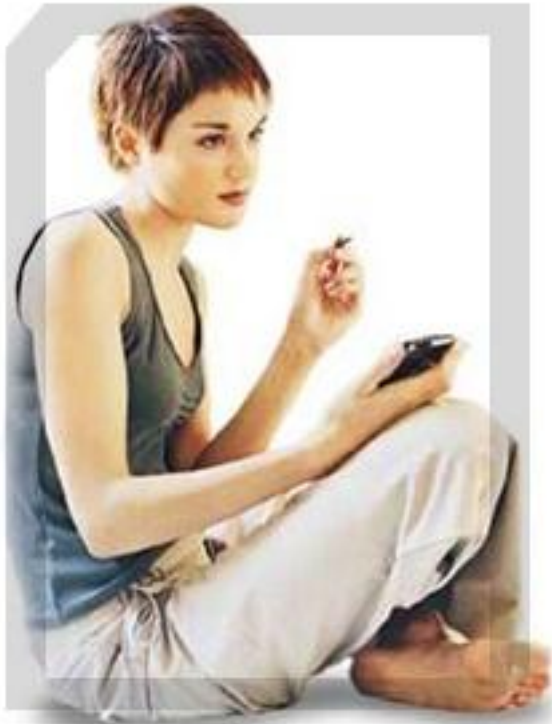




THE INFINITY PROJECT

Engineering Education for Today's Classroom



# The Infinity Project<sup>SM</sup>

*Bringing  
Engineering Education  
to Schools  
Across the Country*



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for today's classroom.

## History of the Program

Started in 1999 as a partnership between SMU Lyle School of Engineering, high-tech corporate leaders, and leading national engineering faculty.

- *Purpose: Respond to the national challenge of exciting and preparing young students for advanced education in science, technology, engineering, and math (STEM).*



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## What is The Infinity Project<sup>SM</sup>?

### Award Winning Engineering Education Program

- Emphasizes innovation in addition to problem solving
- Appropriate for:
  - *Early College Students*
  - *High School Students (11<sup>th</sup> – 12<sup>th</sup>)*
  - *Intermediate School Students (6<sup>th</sup> – 9<sup>th</sup>)*
- Hands-on application of math & science to topics of interest to students
  - *Mobile devices, digital music, digital imaging*
  - *Robotics, health, environment*





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## Program Breadth

- 500+ High Schools/Middle Schools/Colleges in 38 States
  - *Public, Private, Magnet Schools*
- Gaining International Interest
  - *Australia, Bahamas, Ireland, Israel, Lebanon, Mexico, Portugal, Vietnam*

Alabama  
Alaska  
Arkansas  
Arizona  
California  
Colorado  
Connecticut  
District of Columbia  
Florida

Georgia  
Hawaii  
Idaho  
Illinois  
Iowa  
Kansas  
Kentucky  
Louisiana  
Maryland

Massachusetts  
Maine  
Michigan  
Mississippi  
Missouri  
Nevada  
New Jersey  
New Mexico  
New York  
North Carolina

Ohio  
Oklahoma  
Oregon  
Pennsylvania  
Tennessee  
Texas  
Utah  
Virginia  
West Virginia  
Wisconsin



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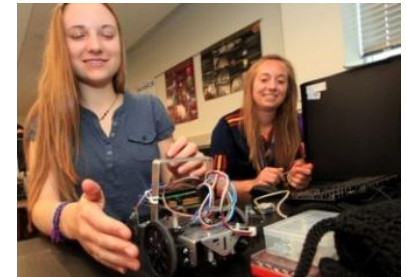
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## The Complete Solution

### High-tech Engineering Curriculum for 6<sup>th</sup> – 12<sup>th</sup> Grade

- Multi-million dollar investment in development of curricula materials
- Developed in partnership with world renowned university engineering professors and leading education experts
- Covers Major Engineering Disciplines
  - Electrical
  - Mechanical
  - Civil & Environmental
  - Biomedical





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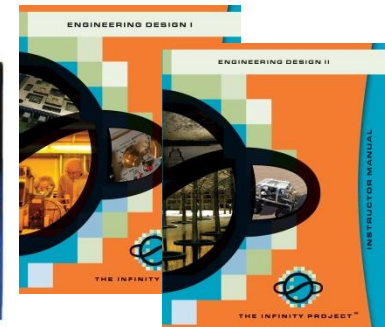
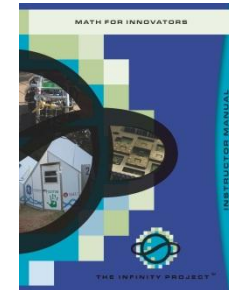
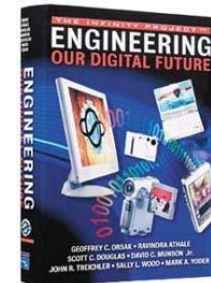
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# The Complete Solution

## Instructional Support Materials

- High School/College Textbook
- Instructional Text with Notes
- Daily Lesson Plan Guide
- Presentation Slides
- Activities & Exercises with Solutions
- Module Exams with Solutions
- On-line Classroom Support
- Professional Development Extensions & Videos





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# The Complete Solution

## Classroom Technology

- Infinity Project Technology Kit
  - Turns PC Into “Engineering Design Platform
  - Cutting-edge LabVIEW Education Software
  - myDAQ Hardware, Speakers, Webcam, Microphone
  - Available through Studica



- Robotics Kit
  - Lego Mindstorms NXT



- Rocketry Kit
  - Estes Alpha III Rocketry Kit





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# The Complete Solution

## Professional Development

- Week-long summer sessions
- Instruction in use of text, hardware, software, and technology associated with curriculum
- Taught by Master Infinity Project Instructor





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## Elements to Success

### Two Key Elements for The Infinity Project's Success

1. Award Winning, High Quality Program
2. Easy for Schools to Implement

### Added Benefits:

- Low Cost
- Works with Existing Teacher Base
- Significant Classroom Support
- High Impact



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## Student Impact

### Findings from Qualitative Assessment prepared for Texas Education Agency as part of Innovative Course Renewal

- **Instructors report that students ...**
  - *Obtain deeper understanding of math and science*
  - *Improve performance in other math and science classes*
  - *Increase willingness to take other math and science classes*
  - *Increase desire to pursue engineering and/or technology degrees in college*
- **Students report ...**
  - 83% “considering engineering as a career”
    - 40 times higher than the typical 2%
  - 95% “learned new math concept”
  - 94% would “recommend course to a friend”





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## Program Benefits

- **Complete “turn-key” solution** for implementing engineering into the secondary classroom
- **College-prep curriculum** developed by subject matter experts in education and engineering
- **Flexible modular content** can be taught as a stand-alone course or incorporated into existing STEM classes
- **Rigorous reinforcement of math & science** concepts through hands-on engineering design projects
- **Relevant topics** of interest to students
- **Prepares students** for university level STEM courses



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## Engineering Curricula

| Course Title                                                                                                                                                                                         | Grade Level                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| <b>Math for Innovators</b><br><i>Year-long curriculum focused on application of math to engineering concepts</i>                                                                                     | <b>11<sup>th</sup> – 12<sup>th</sup></b> |
| <b>Engineering Design</b><br><i>Year-long curriculum focused on math &amp; science concepts behind electrical, mechanical, environmental, biomedical engineering</i>                                 | <b>10<sup>th</sup> – 12<sup>th</sup></b> |
| <b>Engineering for Today's Intermediate School</b><br><i>Year-long curriculum focused on math &amp; science concepts behind electrical, mechanical, civil, environmental, biomedical engineering</i> | <b>6<sup>th</sup> – 9<sup>th</sup></b>   |



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The Human Body  
as a Biomachine



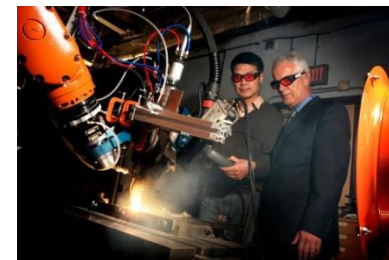
Sounds of a  
Digital Age

## Math For Innovators

Engineering Our  
Environment



The Robotic  
Revolution





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# Math For Innovators

## Course Overview

- Designed for Students in 11<sup>th</sup> – 12<sup>th</sup> Grade
  - *Pre-requisites: Algebra II*
- Year-long Curriculum & Instructional Material
- Students Learn and Apply Math to Engineering Concepts
  - *Robotics, Fluid Power and Pneumatics, Physics of Machines, Electricity, Statics and Structures, Manufacturing & Production, Quality Assurance*



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# Math For Innovators

## The Robotic Revolution

- *Learn the fundamentals of mechanics while designing, building and programming a factory robot.*

## Engineering Our Environment

- *Explore physical and life science issues that bear upon human interactions with natural ecosystems. Learn about environmental impacts while designing a living village.*

## The Human Body As A Biomachine

- *Learn the scientific concepts and mathematical computations that form the foundation of rapidly growing field of biomedical engineering.*

## Sounds Of A Digital Age

- *Review digital audio systems, create sounds and music, digitize and compress audio, and learn how re-mastering and special effects can be used to design the ultimate digital music system.*



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Engineering Our  
Digital Future



Engineering  
Earth

## Engineering Design

The Human  
Machine



The Challenge  
of Roving Callisto





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# Engineering Design

## Course Overview

- Designed for Students in 11<sup>th</sup> – 12<sup>th</sup> Grade
  - *Pre-requisites: Geometry, Algebra II, Chemistry, Physics*
  - *Students may be concurrently enrolled in Algebra II*
- Year-long Curriculum & Instructional Material
  - *May also be implemented as a two year program*
    - *10<sup>th</sup> – 11<sup>th</sup> Grade: Engineering Design I*
    - *11<sup>th</sup> – 12<sup>th</sup> Grade: Engineering Design II*
- Students Apply Concepts Through Hands-on Design Projects
  - *Digital Music Player, Robotic Rover, Prosthetic Implant*



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# Engineering Design

## Engineering Our Digital Future

- *Explores the fundamentals of engineering and technology in the information and communications age.*

## The Challenge of Roving Callisto

- *Focuses on engineering principals necessary to create & design a robot to roam the surface of Jupiter's moon.*

## The Human Machine

- *Links biology, physics, chemistry, and math together to investigate and improve the human condition.*

## Engineering Earth

- *Utilizes science, technology, and math to support human needs and develop ecological solutions.*



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Imaging the  
Human Body

Global Climate Change:  
Engineering Our  
Planet's Future

Engineering the  
Human Machine

Introduction to  
Engineering Design



Sound Engineering:  
Making Great Sounds

Pixel Yourself in the  
Digital Domain

## Engineering For Today's Intermediate School

Engineering in the  
Natural World

Structures:  
Building From the  
Ground Up



Machines: Making  
Things Work

Rocketry:  
Achieving Liftoff

Watt's Up In Power

Robots from  
Concept to  
Completion





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# Engineering For Today's Intermediate School

## Course Overview

- Complete Solution for Introducing STEM
- Flexible, Rigorous, Relevant Curriculum
- Designed for Students in 6<sup>th</sup> – 9<sup>th</sup> Grade
- Reinforces Math & Science Behind Electrical, Mechanical, Civil, Environmental, Biomedical Engineering
- Provides Year-long Curriculum & Instructional Material
- Teacher Certification in Math, Science, or Technology Education
- Students Apply Concepts Through Hands-on Design Projects
  - *Loudspeaker, Robot, Bridge, Rocket, Prosthetic Leg*



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# Engineering For Today's Intermediate School

## Introduction to Engineering Design

- *Learn how engineers apply a nine-step design algorithm to create objects students use every day*

## Sound Engineering – Making Great Sounds

- *Discover how technology is used to make music and movies sound great*

## Digital Imaging – Pixel Yourself in the Digital Domain

- *Learn how technology is used to create and manipulate digital images*

## Watt's Up in Power?

- *Uncover the secrets behind electrical power generation and transmission*





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# Engineering For Today's Intermediate School

## Robots from Concept to Completion

- *Learn the mechanical aspects of robots, how they move, manipulate objects and think*

## Rocketry: Achieving Liftoff

- *Explore the physics behind rocket motion. Discover where rockets engines get their power and understand rocket trajectories*

## Machines – Making Things Work

- *Examine the basics of machine technology and how it has helped the development of civilization*

## Structures – Building from the Ground Up

- *Discover the concepts behind solid structures and their ability to stand the test of time*





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# Engineering For Today's Intermediate School

## Engineering in the Natural World

- *Increase awareness of environmental issues and how technology can be used to develop solutions*

## Global Climate Change-Engineering Our Planets Future

- *Explore how the Earth's climate is changing and how new technologies will meet the challenge*



## Imaging the Human Body

- *Find out how modern medicine is using space age technology to better understand how the human body works*

## Engineering the Human Machine

- *Learn how engineers & medical scientists are tackling human health issues and expanding our understanding of what it means to be human*



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## Implementation Process

- Complete & submit Infinity Project application
  - [www.infinity-project.org/joinnow](http://www.infinity-project.org/joinnow)
- Interview conducted with school principal & instructor
- School acquires curriculum, classroom technology, and student manuals
- Instructors attend Professional Development Institute
- Course offered in fall



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## Contact Information

### General Information

- The Infinity Project
- 214-768-4038
- [ipmail@infinity-project.org](mailto:ipmail@infinity-project.org)

### Program Specific

- Dianna McAtee
- Director, Academic Relations
- 214-768-1920
- [dmcatee@infinity-project.org](mailto:dmcatee@infinity-project.org)