**PROGRAM DESCRIPTION**

The Pre-Engineering Camps strive to develop and enhance students’ problem solving and critical thinking skills, provide an opportunity for creative expression, and foster students’ curiosity about science and technology through fun-filled engineering projects. It is a hands-on, project-based program designed to engage and inspire youth in the areas of math, engineering, science and technology. The University of Iowa, College of Engineering will be offering the following pre-engineering camp:

- **Simple Machines (Grades K-1)**
  This program is designed to have a perfect mixture of fun and learning, using LEGO Simple Machines. Students will have the opportunity to discover basic physical science concepts such as gears, pulleys, levers, and wheels and axles; and discover their hidden talents as they design, and build their own creation.

- **Junior Robotics I (Grades 2)**
  This program is designed to have a perfect mixture of fun and learning, using LEGO WeDo Robots. Students will have the opportunity to explore new adventures, learn the basic concepts of robotics, and discover their hidden talents as they design, build, and program their own creation.

- **Junior Robotics II (Grades 3)**
  This program is designed to have a perfect mixture of fun and learning, using LEGO WeDo 2.0 Robots. Students will have the opportunity to explore new adventures, learn the basic concepts of robotics, and discover their hidden talents as they design, build, and program their own creation.

- **Robotics I (Grades 4-5)**
  This program is designed to introduce students to the principles of robotics, computer programming, and teamwork. Students will have the opportunity to use their imagination and critical thinking skills to design, program and control fully functional robotic models that will accomplish specific tasks by using software to plan, test and modify sequences of instructions. This camp will focus on pushing an opponent’s robot out of a sumo ring.

- **Robotics II (Grades 5-6)**
  Students will design, build and program autonomous robots using the LEGO Mindstorms Robotics kits. Participants will work in a team environment to create a robot to complete various missions. Using an EV3 brick, servo motors, and various sensors, the robots will move on wheels or treads. Besides having fun, participants will learn problem solving, communication and team work skills. As well as learning functional programming, principles of simple machines, gearing and mechanics.

- **Tetrix Robotics (Grades 7-9)**
  Students will design and build a robot working in pairs using Tetrix Robotics Technology, remote controlled robots. Students will delve into authentic scientific research and a hands-on robotic design. A robotic challenge at the end of the week will put their skills to the test. Instruction will include basic engineering skills and how input/output devices can be used to affect the behavior of their very own robots.
PROGRAM FEES
- Simple Machines, Junior Robotics I & II, Robotics I & II are half-day programs with a **$75.00** fee
- Tetrix Robotics is a full-day program with a **$112.00** fee

PROGRAM DATES & LOCATION
- The pre-engineering camps will be held in classrooms within the West Liberty High School, 310 W Maxson Ave, West Liberty, IA 52776
- **July 23-27, 2018**

<table>
<thead>
<tr>
<th>Time</th>
<th>Programs</th>
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<tbody>
<tr>
<td>9am-12pm</td>
<td>Simple Machines, Junior Robotics I</td>
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<tr>
<td>1pm-4pm</td>
<td>Simple Machines, Junior Robotics II</td>
</tr>
<tr>
<td>9am-4pm</td>
<td>Tetrix Robotics</td>
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PROGRAM WITHDRAWAL AND REFUND POLICY
- If you would like to withdraw your child from a program they are already registered in, all requests should be made in writing by sending an email to k12-outreach@uiowa.edu prior to May 28, 2018.
- *Program registrations are non-refundable after May 28, 2018.*

WHAT TO BRING AND WHAT TO WEAR
- Please dress your child appropriately, as sometimes a thin sweatshirt may be necessary.
- Students should wear closed-toe comfortable shoes.
- Please note all clothing should be labeled with student’s full name.
- In an effort to build the kind of community that is so integral to a memorable camp experience, we ask that cell phones, music players, and personal gaming systems be left at home.

PICK-UP AND DROP-OFF INFORMATION
- Students may be dropped-off and picked-up in the main entrance lobby of each school, more information will be emailed to registered participants families prior to the start of the program. A Pre-Engineering Camps representative will be in the lobby to welcome students. There will be plenty of parking in front of the building.
- Students need to arrive no earlier than 8:55am (Morning) and 12:55pm (Afternoon).
- Students need to be picked-up no later than 12:10pm (Morning) and 4:10pm (Afternoon).
- We request a parent/guardian to sign-in and sign-out your child daily.
- If your child will be carpooling, please complete the *Notification of Alternative Transportation Form* on the first day.
- Children not picked up 15 minutes after the end of the program without any notification, the UI police and the department of human services will be contacted for assistance.

FREQUENTLY ASKED QUESTIONS (FAQs)

GOALS
Pre-Engineering Camps at the University of Iowa are designed to get children excited about science and technology, and:
- Teach the benefits of teamwork and valuable communication skills.
- Expose students to concepts of engineering, architecture, physics and mathematics.
- Develop and enhance students’ problem solving and critical thinking skills.
- Introduce basic design skills through a hands-on approach.
CAMP FORMAT
- Projects typically start with an introduction and short presentation followed by a design/building assignment.
- Students are introduced to engineering terminology that they are encouraged to use throughout the class when identifying pieces, posing questions, or assisting each other.
- Instructors and mentors circulate and assist the children in realizing their project goals.

CURRICULUM
- The following concepts and key learning values will be covered in the program:
  - Observing and investigating the operation of simple and compound machines found in everyday life: gears, wheels and axles, levers and pulleys.
  - Following a design brief as part of the engineering design process.
  - Investigating and working through observations, reasoning, predicting, reflecting and critical thinking.

MORE INFORMATION:

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