

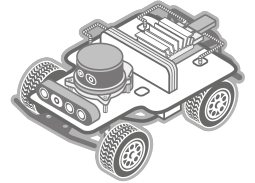
BEAVER WORKS
Lincoln Laboratory | School of Engineering



MIT Beaver Works Summer Institute

Fall 2024 Outreach Program – 7 Courses

Girls Who Program Autonomous Cars



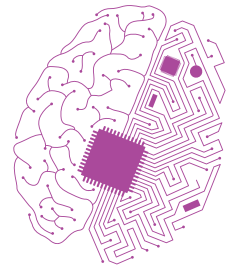
Girls Who Program Cognitive Assistants

Girls Who Want to Learn Many Interesting Things

Girls Who Design, Build and Fly Model Aircraft

Girls Who Want to Learn the Basics of ASICS

Girls Who Program Racing Drones



Girls Who Learn Python

**No Prior
Experience
Required!**

WHO: High School 10th and 11th Grade Female Students *

WHEN: Saturdays 11am–2pm (EST) – October 12, 19, 26,
November 2, 9, 16, 23, December 7 2024

WHERE: Virtually, through Zoom!

REGISTER: https://mit-bwsi.formstack.com/forms/bwsi_fall_2024

Application Deadline: October 1, 2024

* While all BWSI programs are open to eligible students of any gender identity this fall program is designed to encourage and support female students in STEM.

 **LINCOLN LABORATORY**
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Department of Defense
DoDSTEM
Science · Technology · Engineering · Mathematics

DRAPER[®]



Patrick J McGovern
FOUNDATION



School of Engineering

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GIRLS WHO PROGRAM AUTONOMOUS CARS

A BWSI MINI-RACECAR CRASH COURSE

A BWSI MINI-RACECAR CRASH COURSE

NO HARDWARE REQUIRED!

NO COST!



LEARN TO CODE PYTHON!



NO PRIOR EXPERIENCE REQUIRED!

Who: Female High School Students (10th and 11th grade) interested learning about coding and robotics! Beginners encouraged!

When: Saturdays 11am – 2pm (EST) – October 12, 19, 26, November 2, 9, 16, 23, December 7 2024

Where: Virtually, through Zoom!

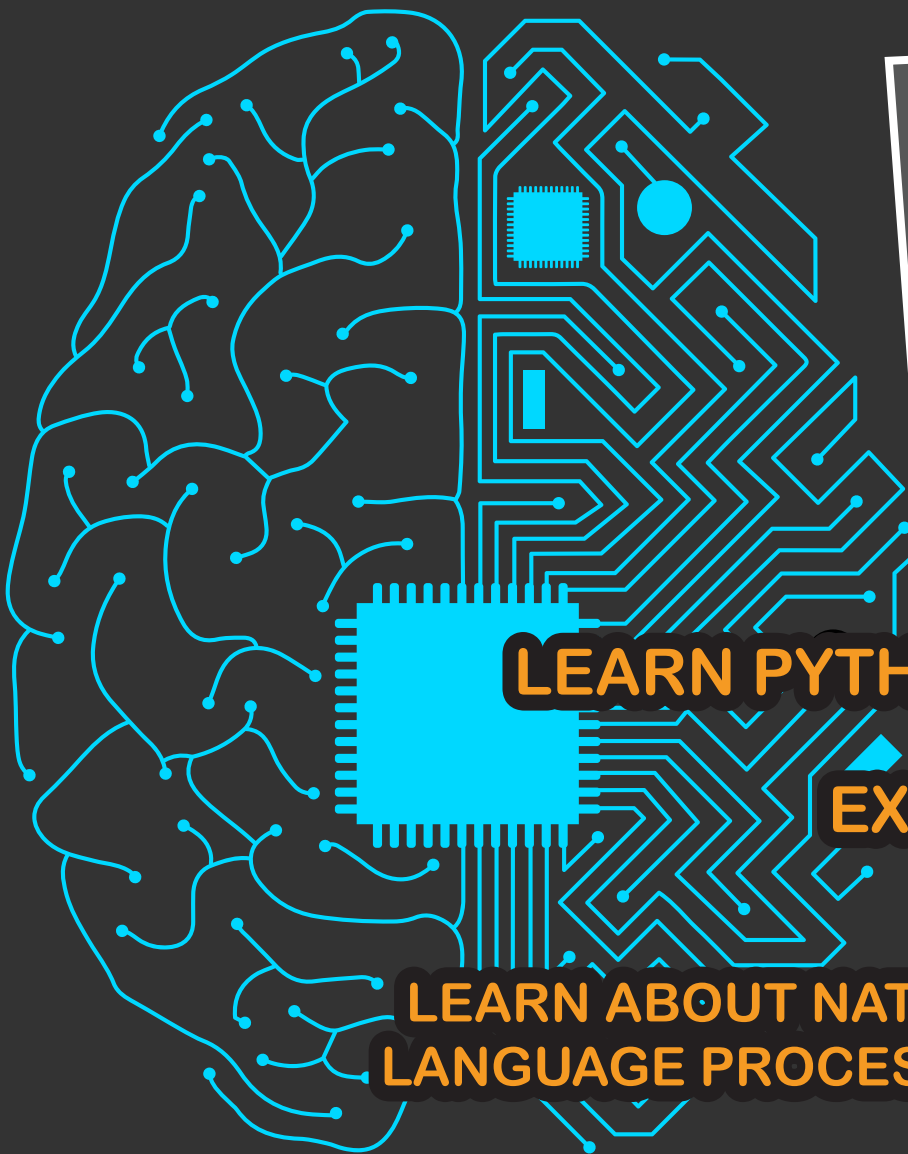
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Girls who program cognitive assistants! — a BWSI crash course



An introduction to Artificial Intelligence through building an autonomous cognitive assistant!

LEARN PYTHON!

EXPLORE MACHINE LEARNING!

LEARN ABOUT NATURAL LANGUAGE PROCESSING!

**No
Prior
Experience
Required!**

Who: Female High School Students (10th and 11th grade) interested in learning about code and artificial intelligence! Beginners Encouraged!

When: Saturdays 11am – 2pm (EST) – October 12, 19, 26, November 2, 9, 16, 23, December 7, 9 2024

Where: Virtually, through Zoom!

Registration Form: https://mit-bwsι.formstack.com/forms/bwsι_fall_2024

Application Deadline: October 1, 2024

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Many Interesting Things:

For Aspiring Engineers
From Transistors to Data Science

A BWSI Medlytics intro course

An early introduction to the technologies that shape our world,
with applications to medical data analytics!

Python • Computer Architecture • Machine Learning
Computer Vision • Linux • The Internet

No prerequisites.
No pressure.

**NO PRIOR
EXPERIENCE
REQUIRED!**

WHO: Female High School Students (10th and 11th grade) interested learning about computers, coding and medical data analytics. Beginners Encouraged!

WHEN: Saturdays 11am – 2pm (EST) – October 12, 19, 26, November 2, 9, 16, 23, December 7 2024

WHERE: Virtually, through Zoom!

Application Deadline:
October 1, 2024

REGISTER: https://mit-bwsi.formstack.com/forms/bwsi_fall_2024

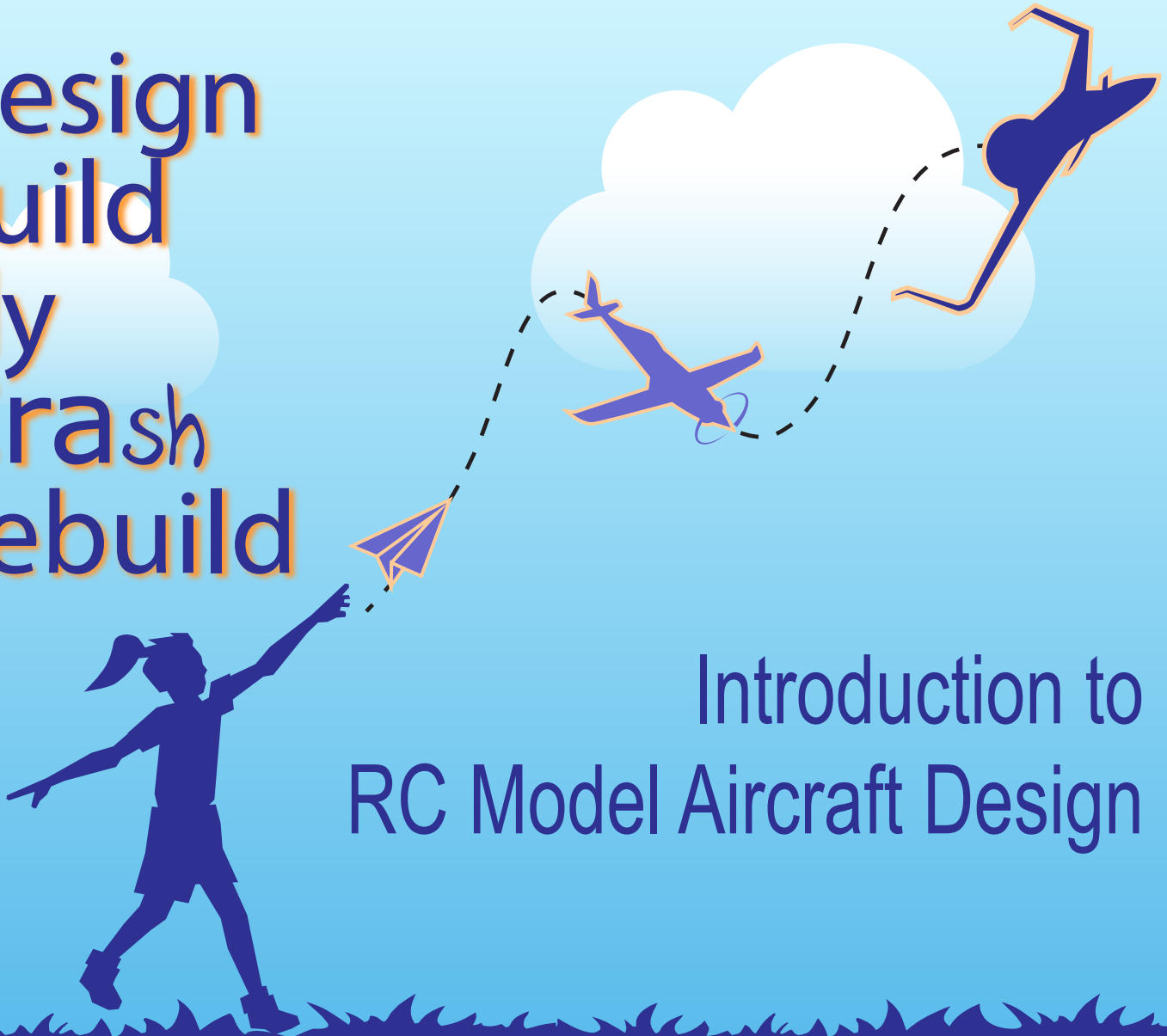
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Girls Who Design, Build and Fly Model Aircraft — A BWSI Crash Course.

Design
Build
Fly
Crash
Rebuild



Introduction to RC Model Aircraft Design

No Prior Experience Required!

Who: Female High School Students (10th and 11th grade) interested in Aerospace and Aeronautics.

When: Saturdays 11am – 2pm (EST) – October 12, 19, 26, November 2, 9, 16, 23, December 7, 2024

Where: Virtually, through Zoom!

Registration Form: https://mit-bwsi.formstack.com/forms/bwsi_fall_2024

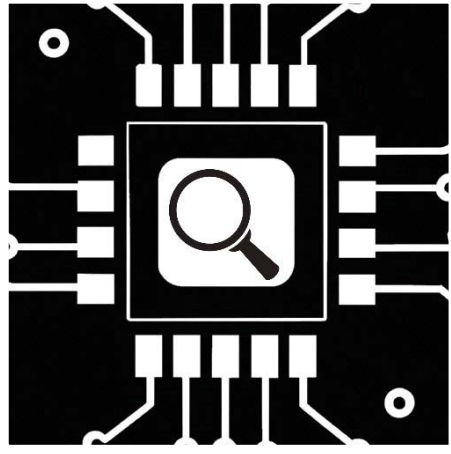
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Application Deadline:
October 1, 2024





Girls Who Want to Learn the Basics of ASICs



This course will explore topics on open source semiconductor design and fabrication. Students will receive hands-on experience on how to design and arrange semiconductors on a nanometer scale to perform a specific function.

makerchip PROJECT TUTORIALS HELP

EDITOR NAV-TLV LOG

```

@1
  $aa_sq[7:0] = $aa[3:0] ** 2;
  $bb_sq[7:0] = $bb[3:0] ** 2;
@2
  $cc_sq[8:0] = $aa_sq + $bb_sq;
@3
  $cc[4:0] = sqrt($cc_sq);

```

DIAGRAM

Figure 1: Pipelined Pythagorean Theorem Logic

This pipeline is 3 cycles deep. It has a throughput of one transaction per cycle, where a transaction performs one Pythagorean Theorem calculation per cycle.

SILWIZ

Legend: p substrate, n well, n diffusion, p diffusion, p tap, n tap, polysilicon, mim capacitor, metal via, metal2

Undo Redo Load Save Clear STL Preset

WAVEFORM

ZOOM IN ZOOM OUT ZOOM FULL << >>

Signal	0	1	2	3	4	5	6	7	8
TLV	0	1	0	1	0	1	0	1	0
TLV	0	1	0	1	0	1	0	1	0
TLV	0	1	0	1	0	1	0	1	0
TLV	0	1	0	1	0	1	0	1	0
TLV	0	1	0	1	0	1	0	1	0
TLV	0	1	0	1	0	1	0	1	0
TLV	0	1	0	1	0	1	0	1	0
TLV	0	1	0	1	0	1	0	1	0
TLV	0	1	0	1	0	1	0	1	0
TLV	0	1	0	1	0	1	0	1	0

NO PRIOR EXPERIENCE REQUIRED!

Who: Female High School Students (10th and 11th grade) interested in learning about semiconductor design and fabrication! Beginners encouraged!

When: Saturdays 11am – 2pm (EST) – October 12, 19, 26, November 2, 9, 16, 23, December 7, 2024

Where: Virtually, through Zoom!

Registration Form: https://mit-bwsf.formstack.com/forms/bwsf_fall_2024

Application Deadline: October 1, 2024

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Girls Who Program Racing Drones *Beaver Warrior*

Autonomous Drone Obstacle Course



A
BWSI
(Beaver Works
Summer Institute)
Course

Learn
to Code
Python

No Prior Experience Required!

Application Deadline:
October 1, 2024

Who: Female High School Students (10th and 11th grade) interested in Aerospace and Aeronautics.

When: Saturdays 11am – 2pm (EST) – October 12, 19, 26, November 2, 9, 16, 23, December 7 2024

Where: Virtually, through Zoom!

Registration Form: https://mit-bwsi.formstack.com/forms/bwsi_fall_2024

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GIRLS WHO LEARN PYTHON



Learn to think like a programmer!



Learn Python!



No prerequisites, no pressure!

No Prior Experience Required!

Who: Female High School Students (10th and 11th grade) interested learning about coding. Beginners encouraged!

When: Saturdays 10am-11am (EST)
October 12, 19, 26, November 2, 9, 16, 23, December 7 2024

Where: Virtually, through Zoom!

Registration Form: https://mit-bwsj.formstack.com/forms/bwsj_fall_2024

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