

BEAVER WORKS
Lincoln Laboratory | School of Engineering



MIT Beaver Works Summer Institute

Spring 2023 Outreach Program – 9 Courses

Yes! You Can Program Autonomous Cars

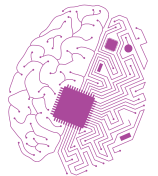


Yes! You Can Design, Build and Fly Model Aircraft

Yes! You Can Program Cognitive Assistants!

Yes! You Can Run Cyber Operations!

Yes! You Can Analyze the Building Blocks of Life!

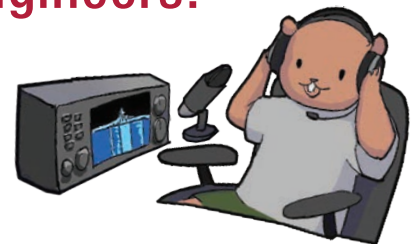


Yes! You Can Program Racing Drones!

Many Interesting Things for Aspiring Engineers!

Ham Radio 101*

Shower Thoughts: The Class**



**No Prior
Experience
Required!**

- WHO:** High School Students (9th and 10th grade)
- WHEN:** Saturdays 11am-2pm (EST) - March 4, 11, 18, 25, April 1, 8, 15, 22, 2023**
- WHERE:** Virtually, through Zoom! (except for the in-person Ham Radio 101)
- REGISTER:** https://mit-bwsi.formstack.com/forms/bwsi_spring_2023

* Ham Radio 101 is in-person at MIT campus Saturdays 11am – 2pm EST.

** Schedule for the “Shower Thoughts: The Class” is different (8 sessions on Saturdays 3pm – 6pm EST).



Patrick J McGovern
FOUNDATION



School of Engineering



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YES! YOU CAN

PROGRAM

AUTONOMOUS CARS

NO HARDWARE REQUIRED!

A BWSI MINI-RACECAR CRASH COURSE



LEARN TO CODE PYTHON!



NO COST!



NO PRIOR EXPERIENCE REQUIRED!

Who: High School Students (9th and 10th grade) interested learning about coding and robotics! Beginners encouraged!

When: Saturdays 11am-2pm (EST) - March 4, 11, 18, 25,
April 1, 8, 15, 22, 2023

Where: Virtually, through Zoom!

Registration Form: https://mit-bwsi.formstack.com/forms/bwsi_spring_2023



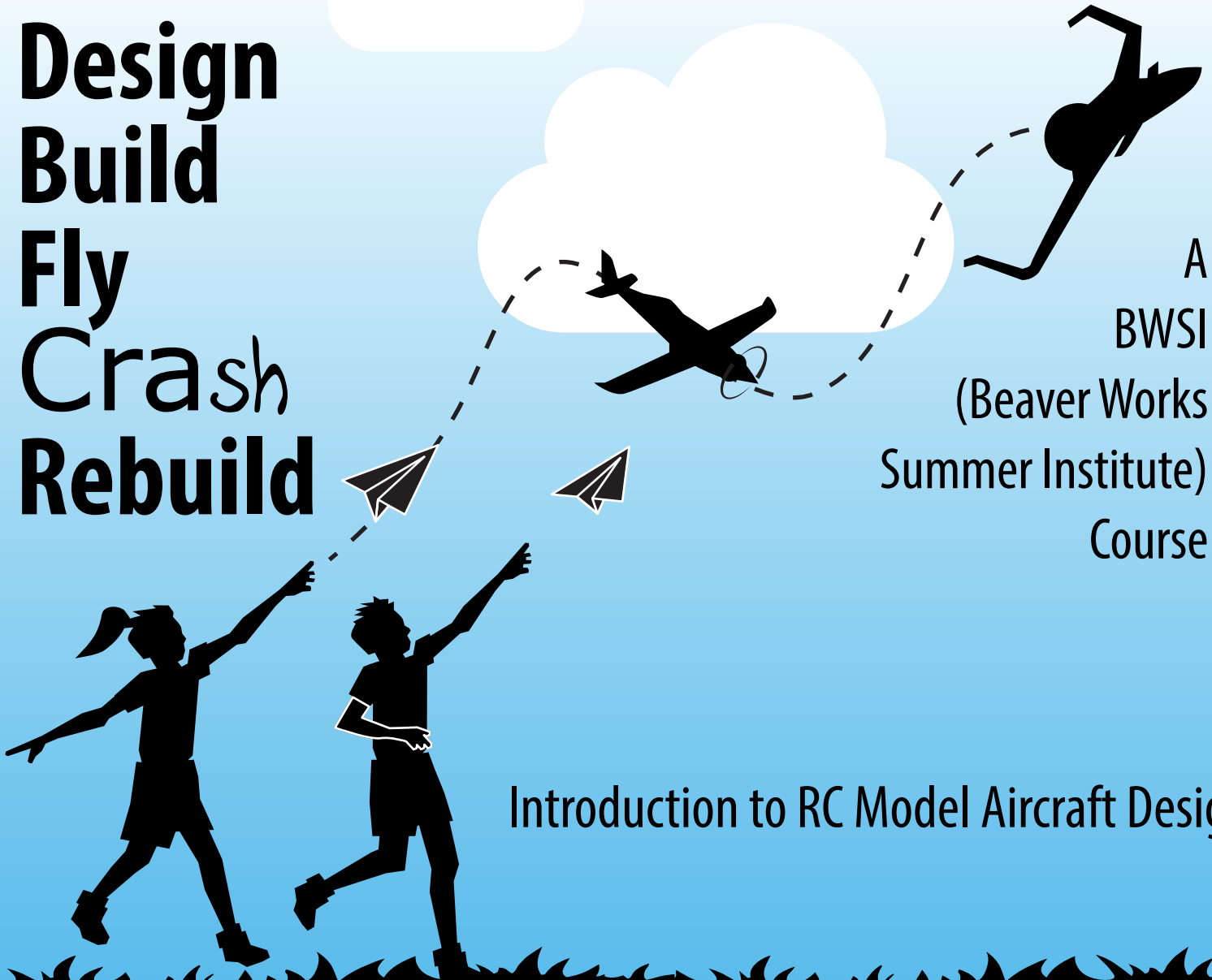


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Yes! You Can Design, Build and Fly Model Aircraft!

**Design
Build
Fly
Crash
Rebuild**



A
BWSI
(Beaver Works
Summer Institute)
Course

Introduction to RC Model Aircraft Design

**No Prior
Experience
Required!**

Who: High School Students (9th and 10th grade) interested in Aerospace and Aeronautics.

When: Saturdays 11am-2pm (EST) - March 4, 11, 18, 25, April 1, 8, 15, 22, 2023

Where: Virtually, through Zoom!

Registration Form: https://mit-bwsi.formstack.com/forms/bwsi_spring_2023

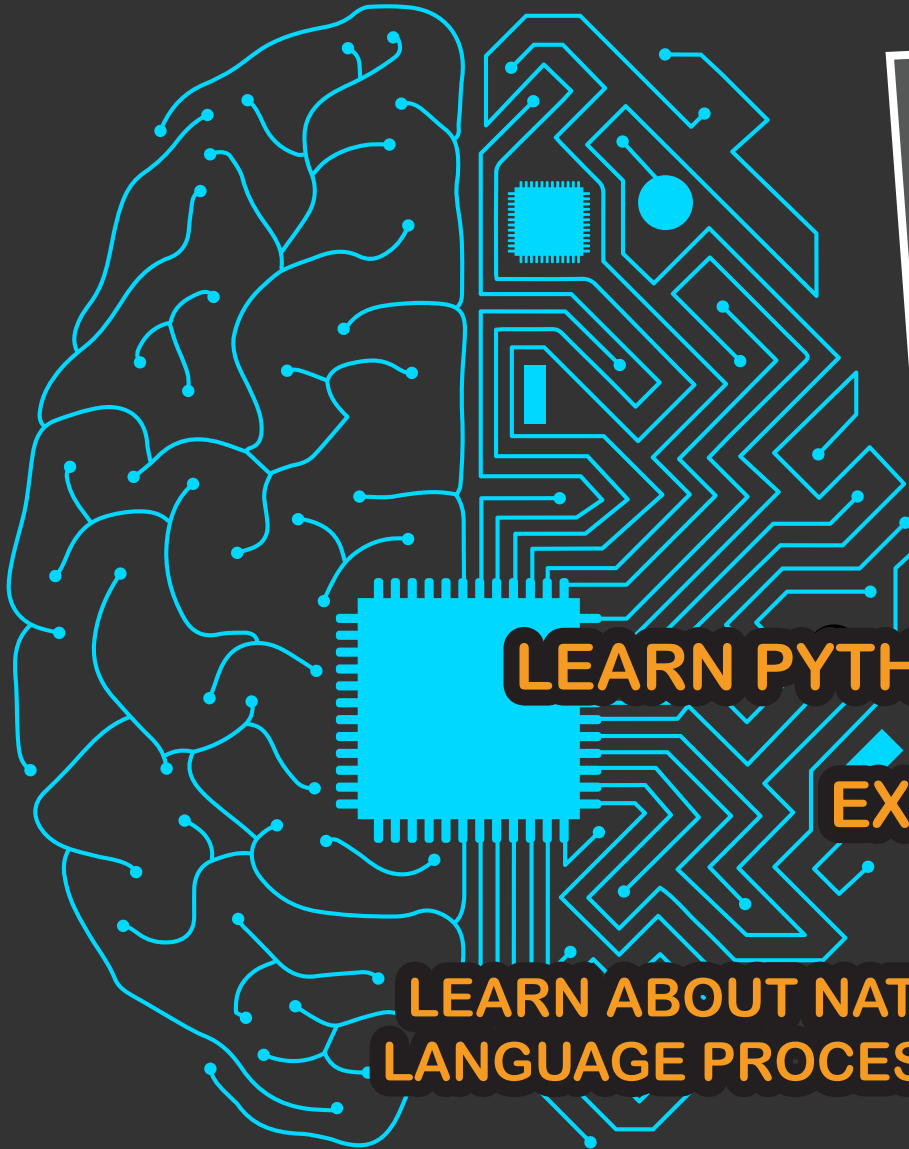




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Yes! You Can Program Cognitive Assistants! — a BWSI crash course



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: High School Students (9th and 10th grade) interested in learning about code and artificial intelligence! Beginners Encouraged!

When: Saturdays 11am-2pm (EST)-March 4, 11, 18, 25,
April 1, 8, 15, 22, 2023

Where: Virtually, through Zoom!

Registration Form: https://mit-bwsι.formstack.com/forms/bwsι_spring_2023



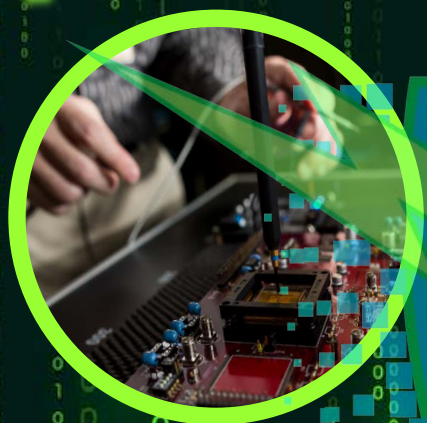


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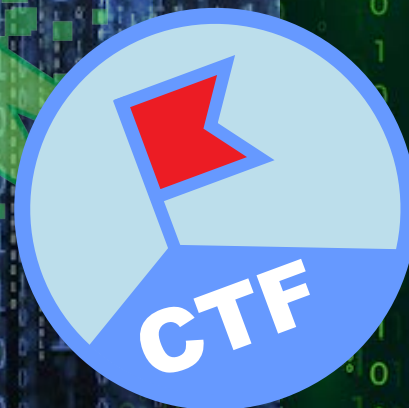


YES! YOU CAN RUN CYBER OPERATIONS!

No Cost!



```
char release_message[1025];  
// get message  
for (int i = 0; i < release_message.length;  
    release_message[i] = uart_read(UART1, BLOCK_SIZE);  
    comboMetadata[54+i] = release_message[i];  
}  
  
// Create 32 bit word for flash programming, version 1 at lower  
uint32_t metadata = ((size & 0xFFFF) << 16) | (version & 0xFFFF);  
program_flash(METADATA_BASE, (uint8_t*)(metadata));  
fw_release_message_address = (uint8_t *) (FW_BASE + size);
```



**No Prior
Experience
Required!**

Who: Female High School Sophomore & Juniors interested in learning about defensive and offensive cyber operations! (Previous applicants of [Summer] Cyber Operations are also encouraged to reapply!)

When: Saturdays 11am-2pm (EST) - March 4, 11, 18, 25, April 1, 8, 15, 22, 2023

Where: Virtually, through Zoom! Discord for general communications & labs.

Registration Form: https://mit-bwsi.formstack.com/forms/bwsi_spring_2023

Frequently Asked Questions: <https://beaverworks.ll.mit.edu/CMS/bw/FAQ>

Experience in: Linux, Bash, Python highly recommended, but not required.

Recommended Hardware: PC/Mac capable of virtualization.

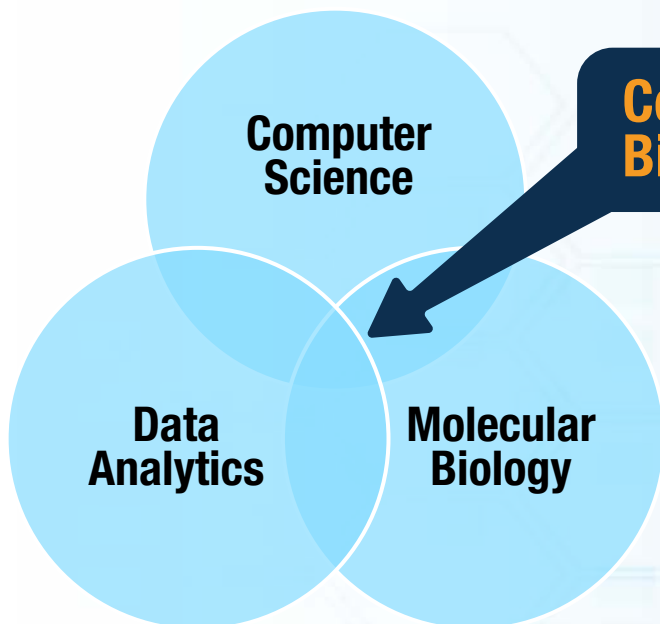




Yes! **You** can analyze the building blocks of life!

Computational Biology And The Microbiome

MITRE – Lincoln Laboratory Project



The future of bio is now! Join us this spring for BWSI's *Computational Biology and the Microbiome* course — co-developed by MITRE and MIT Lincoln Laboratory. Learn about fundamental computational biology concepts like genomics, programming, data visualization, and digital biosecurity in a fun, low stress environment.

**No
Prior
Experience
Required!**

Who: High School Students (9th and 10th grade) interested in computational biology and the microbiome! Beginners encouraged!

When: 12 sessions from March 4th to April 22nd, 2023. Asynchronous weekly modules (recorded lectures, notes, assignments), Office-hours on Tuesdays at 4pm EST.

Where: Virtually, through Zoom for office-hours.

Registration Form: https://mit-bwsf.formstack.com/forms/bwsf_spring_2023





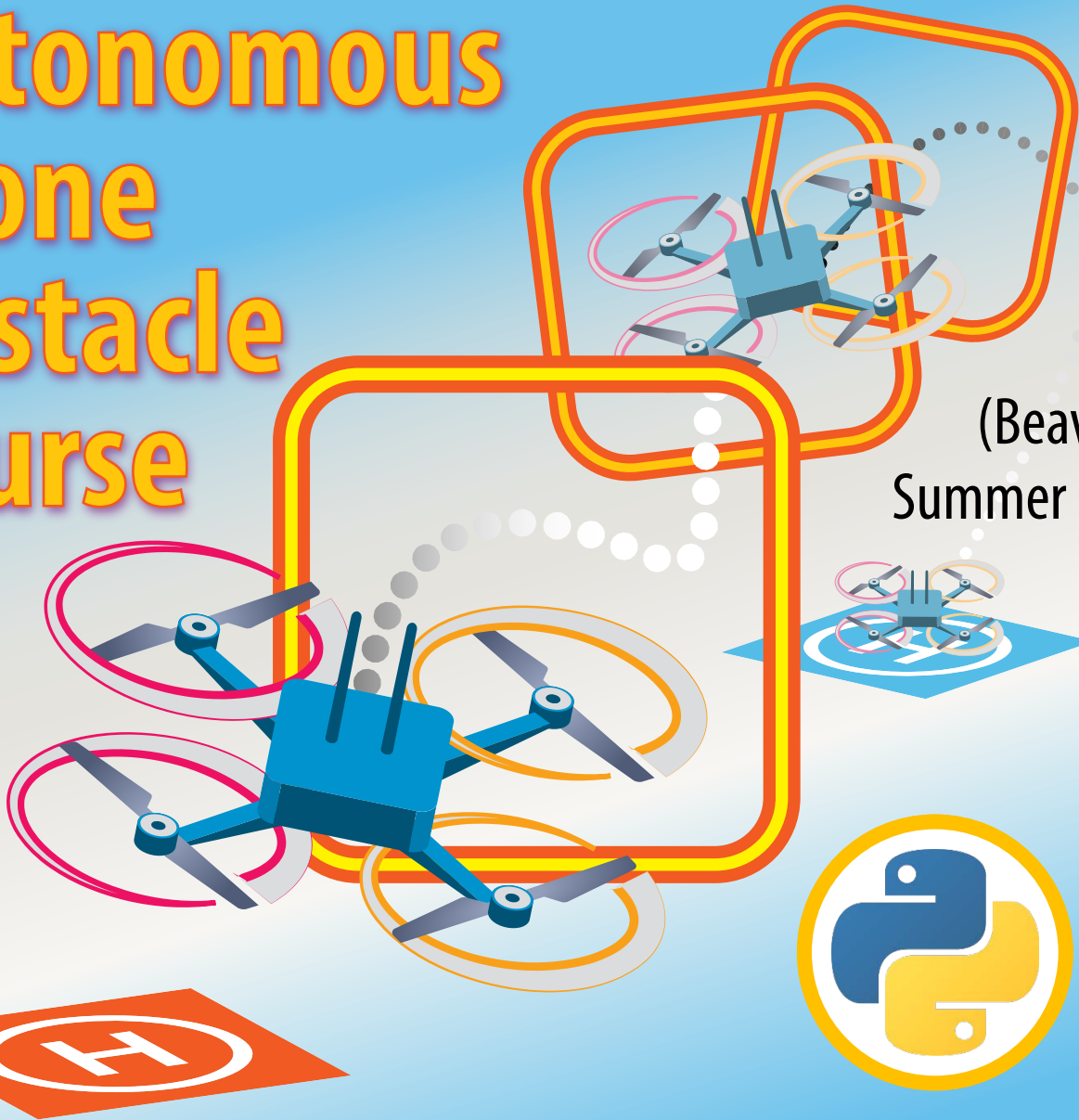
BEAVER WORKS
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Yes! You Can Program Racing Drones

Beaver Warrior

Autonomous Drone Obstacle Course



A
BWSI
(Beaver Works
Summer Institute)
Course



Learn
to Code
Python

No Prior Experience Required!

Who: High School Students (9th and 10th grade) interested in Aerospace and Aeronautics.

When: Saturdays 11am-2pm (EST) - March 4, 11, 18, 25,
April 1, 8, 15, 22, 2023

Where: Virtually, through Zoom!

Registration Form: https://mit-bwsi.formstack.com/forms/bwsi_spring_2023





Many Interesting Things:

For Aspiring Engineers
From Transistors to Data Science

A BWSI Medlytics intro course by Christian Cardozo

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: High School Students (9th and 10th grade) interested in learning about computers, coding and medical data analytics. Beginners Encouraged!

WHEN: Saturdays 11am-2pm (EST)-March 4, 11, 18, 25, April 1, 8, 15, 22, 2023

WHERE: Virtually, through Zoom!

REGISTER: https://mit-bwsi.formstack.com/forms/bwsi_spring_2023





**No Prior
Experience
Required!**

Who: High School Students (9th and 10th grade) interested in Ham Radio Technology.

When: Saturdays 11am-2pm (EST) - March 4, 11, 18, 25, April 1, 8, 15, 22, 2023

Where: In-person at MIT campus!

Registration Form: https://mit-bwsi.formstack.com/forms/bwsi_spring_2023





Correlation does not imply causation. **But it sure is fun.**



Shower Thoughts: The Class.

A data science intro course by
Christian Cardozo

No prerequisites. No pressure.

**No PRIOR
EXPERIENCE
REQUIRED!**

WHO:

High School Students (9th and 10th grade) interested in learning about computers, coding and data analytics. Beginners Encouraged!

WHEN:

Saturdays (8 Sessions) 3pm-6pm (EST) –
March 4, 11, 18, 25, April 1, 8, 15, 22, 2023

WHERE:

Virtually, through Zoom!

REGISTER:

https://mit-bwsi.formstack.com/forms/bwsi_spring_2023

