NEXT ENGINEERS

CHALLENGE YOURSELF

Pi Day: Delicious Pi

All Engineering

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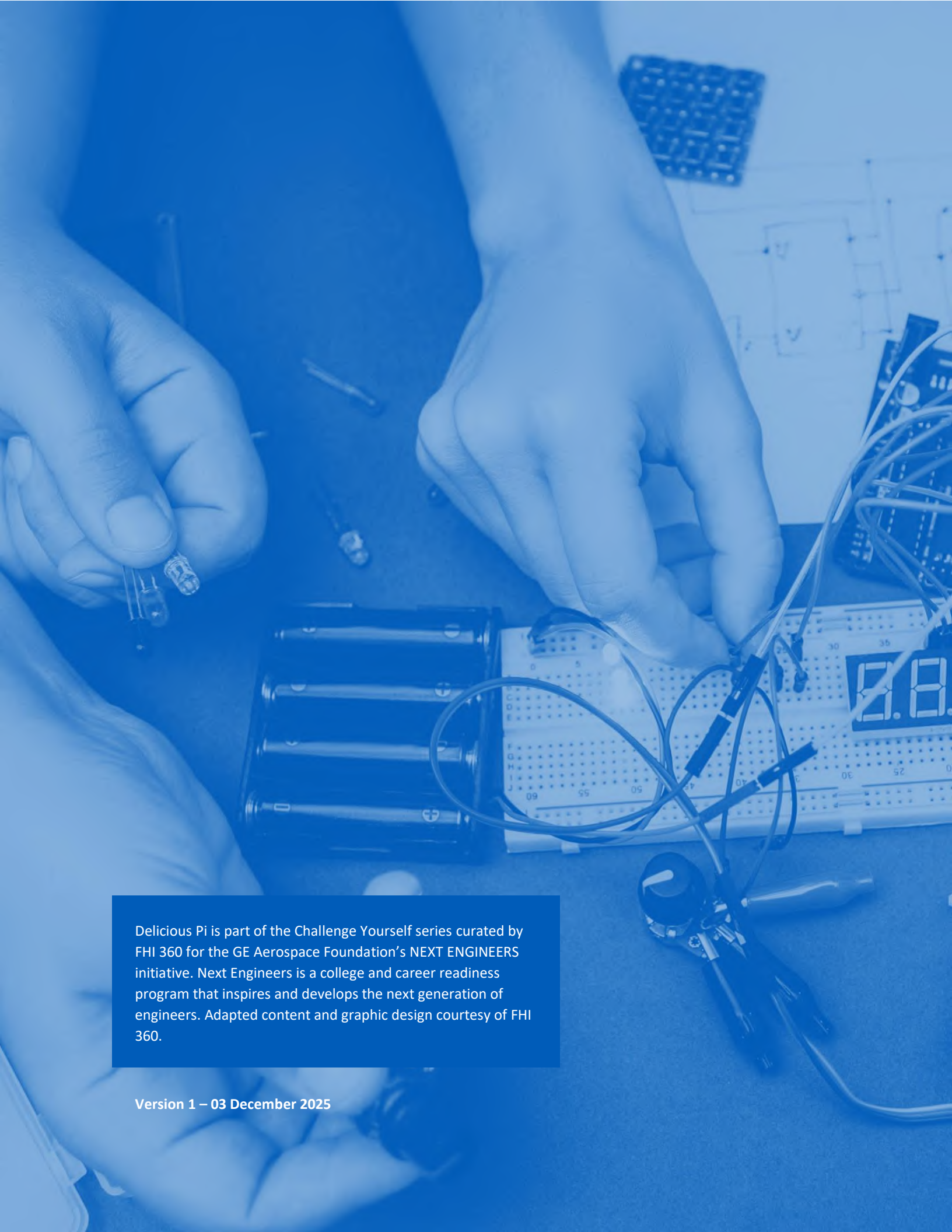

Delicious Pi is part of the Challenge Yourself series curated by FHI 360 for the GE Aerospace Foundation's NEXT ENGINEERS initiative. Next Engineers is a college and career readiness program that inspires and develops the next generation of engineers. Adapted content and graphic design courtesy of FHI 360.

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Delicious Pi

NERD OUT

The taste of pi(e)

Who doesn't like a slice of warm, delicious pie? Apple, pecan, or even chicken! Big or small, sweet or savory, pies of various kinds are eaten the world over. Pies are food with an edible lid, sides, and bottom. Come to think of it, the pie is a masterpiece of gastronomical engineering.

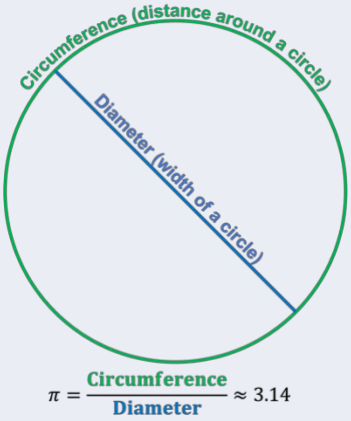
It is something of a wonderful coincidence that it was an ancient Greek who first proposed a method for calculating the digits of π and an ancient Greek who first invented pie pastry. To be fair, the ancient Egyptians did have a pie-like dish called a galette.

Passed on from generation to generation, each culture around the world has added its own unique 'taste' to the humble pie. Barring a few exceptions, all pies are round, which makes them the perfect food with which to celebrate Pi Day!

Different kinds of pies
Image used under fair use
https://www.rockrecipes.com/top-ten-pie-recipes-rock-recipes/

WHAT IS PI?

Pi (represented by the symbol π) is the ratio of the length of a circle's circumference to its diameter and has a value of approximately 3.14.



LEARN MORE

To learn more about the history of pies visit the following websites:

- *A shortcrust history of pies* (https://www.bbc.co.uk/bitesize/articles/zmtn2sg)
- *The History of Pie* (https://www.everythingpies.com/history-of-pie/)

The π in pie

Because most pies are circular, π shows up automatically. For example, the circumference C of a pie is calculated as

$$C = 2\pi r$$

The area A of the surface of a pie is calculated as

$$A = \pi r^2$$

Knowing the circumference and area can help you work out how much crust you need. But what about the filling? Well, the volume V of a pie is calculated as

$$V = \pi r^2 h$$

where h is the height of the pie.

When it comes to cutting a pie into equal slices, π shows up again. To divide a pie into equal slices, the central angle θ of each slice (measured in radians) must be equal. If there are n slices, this angle will be

$$\theta = \frac{2\pi}{n}$$

So, if you cut a pie into 6 equal slices, each angle will be

$$\theta = \frac{2\pi}{6} = \frac{\pi}{3}$$

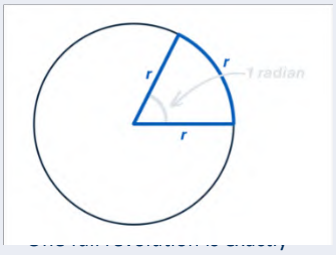
These angles are measured in radians.

I don't know about you, but just thinking of all these pies is making me hungry! It is time to bake your own pie using your favorite recipe. Make sure that you decorate the top with your homage to the mathematical constant π.

When you are done, share your masterpiece at **#NextEngineersDIY** before you eat it!

WHAT IS A RADIAN?

Radians are another way to measure angles. One radian is the angle formed by tracing along the circumference of a circle the same distance as the radius of that circle.



2π radians.