UNIVERSITY OF MICHIGAN

Rocket Science 101 Specialization

Explore modern & historic innovations in rocketry. Gain expertise in global rocketry history, orbits, rocket engines, and the benefits of space exploration.

Instructor: Aaron Ridley

2,519 already enrolled

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3 course series
Get in-depth knowledge of a subject

4.9 ★
(51 reviews)

Beginner level
Recommended experience ⓘ

4 weeks to complete
at 10 hours a week

Flexible schedule
Learn at your own pace

What you'll learn

✓ Analyze spacecraft orbits and fuel requirements, evaluating the costs and benefits of diverse rocket engines and designs.

✓ Explore the historical development of US space programs and the impact of Germany's WWII rocket advancements.

✓ Examine modern applications, including satellite systems supporting daily life, celestial object distinctions, and the experiences of space travel.

Skills you'll gain

Global Positioning Systems | International Relations | Climate Change Programs | Physics | World History | Physical Science | Geographic Information Systems

Environment | Electrical Power | Manufacturing and Production | Engineering Analysis | Mechanical Engineering | Engineering Calculations | Political Sciences

Chemical Engineering | Environmental Science | Emerging Technologies | Timelines | Environmental Monitoring | Scientific Methods | **View less skills**

Details to know

in
Shareable certificate
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Taught in English

See how employees at top companies are mastering in-demand skills

Advance your subject-matter expertise

- Learn in-demand skills from university and industry experts
- Master a subject or tool with hands-on projects
- Develop a deep understanding of key concepts
- Earn a career certificate from University of Michigan

Specialization - 3 course series

Rocket Science 101 focuses on the history of rocketry across the globe, how orbits work, rocket engine functions, and the benefits of space missions. Take a deeper look at how Hollywood's depictions of space travel, and the things it gets right and wrong about rocket science.

The Basics of Rocket Science

Course 1 • 11 hours

Course details ∧

What you'll learn

- ✓ Describe different orbits and how spacecraft can use orbit changes to get from one place to another
- ✓ Determine how much rocket fuel is needed to lift different rockets off the ground and put them into orbit
- ✓ Describe the costs and benefits of different types of rocket engines and designs

Skills you'll gain

Physics   Chemical Engineering   Applied Mathematics   Electrical Power   Mechanical Engineering   Engineering Analysis   Engineering Calculations

The History of Rocket Science

Course 2 • 10 hours

Course details ∧

What you'll learn

- ✓ Describe the progression and the reasoning behind the US's Mercury, Gemini, and Apollo programs
- ✓ Describe the costs and benefits of the space shuttle program, and why the US lost two shuttles
- ✓ Describe how Germany developed rockets for warfare in WWII and how the US and USSR used this technology to develop their rocket programs

Skills you'll gain

Emerging Technologies   World History   Engineering Design Process   Manufacturing and Production   Innovation   Timelines   International Relations   Political Sciences

Rocket Science in Everyday Life

Course 3 • 11 hours

Course details ∧

What you'll learn

- ✓ Understand how different satellite systems help support our everyday life, such as weather and GPS satellites
- ✓ Understand the difference between asteroids and comets, and describe the ramifications of different sizes of objects encountering the Earth
- ✓ Describe how spaceships far away from the Earth can get places, what that should look like, and what forces the people on board would actually feel

Skills you'll gain

Physical Science   Physics   Science and Research   Environmental Monitoring   Climate Change Programs   Scientific Methods   Global Positioning Systems

Emerging Technologies   Environmental Science   Environment   Geographic Information Systems

Earn a career certificate

Add this credential to your LinkedIn profile, resume, or CV. Share it on social media and in your performance review.

Instructor

Aaron Ridley
University of Michigan
3 Courses • 4,856 learners

Offered by

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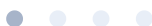
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Why people choose Coursera for their career

Felipe M.
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"To be able to take courses at my own pace and rhythm has been an amazing experience. I can learn whenever it fits my schedule and mood."

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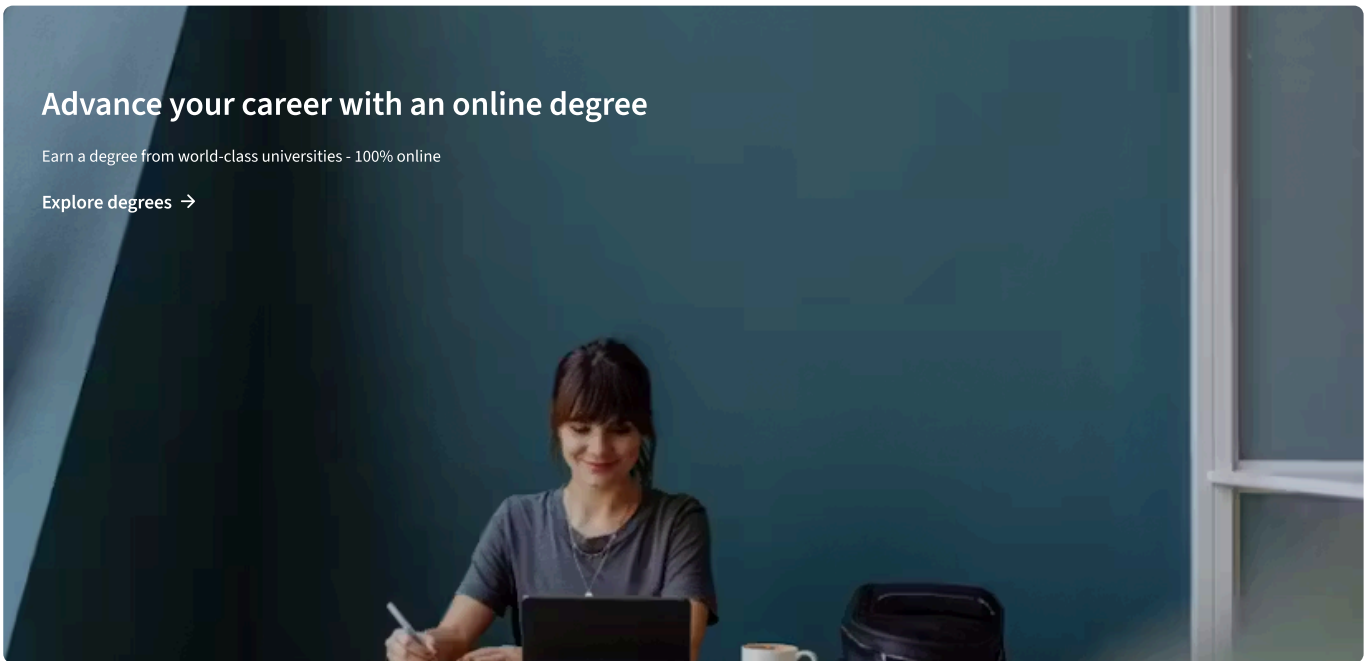
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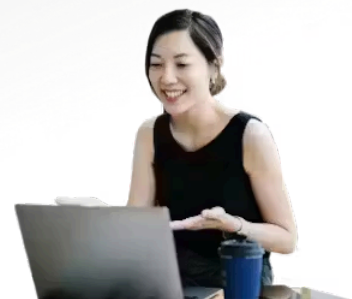Earn a degree from world-class universities - 100% online

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Frequently asked questions

⌃ **What background knowledge is necessary?**

There is no required background, as the material is introductory. Some algebra-level mathematical concepts are discussed, but not required to know.

⌃ **How long does it take to complete the Specialization?**

We estimate it will take learners 4 weeks to complete each course and 12 weeks to complete the entire Specialization.

⌃ **Do I need to take the courses in a specific order?**

We recommend taking the courses in order: The Basics of Rocket Science, The History of Rocket Science, and Rocket Science in Everyday Life.

Show all 8 frequently asked questions ⌄

More questions

⊘ **Visit the learner help center**

Financial aid available, learn more

Skills

Artificial Intelligence (AI)

Cybersecurity

Data Analytics

Digital Marketing

English Speaking

Generative AI (GenAI)

Microsoft Excel

Microsoft Power BI

Project Management

Python

Certificates & Programs

Google Cybersecurity Certificate

Google Data Analytics Certificate

Google IT Support Certificate

Google Project Management Certificate

Google UX Design Certificate

IBM Data Analyst Certificate

IBM Data Science Certificate

Machine Learning Certificate

Microsoft Power BI Data Analyst Certificate

UI / UX Design Certificate

Industries & Careers

Business

Computer Science

Data Science

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Engineering

Finance

Healthcare

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Marketing

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Career Aptitude Test

Examples of Strengths and Weaknesses for Job Interviews

High-Income Skills to Learn

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