

[\(/cuc/\)](#)

[Home \(/cuc/\)](#) > [Study \(/cuc/study/\)](#) > [Skills Bootcamps \(/cuc/study/skills-bootcamps/\)](#)  
> Electric Motor Fundamentals Skills Bootcamp



Deadline for applications: 4 October 2024.

## Course overview

The innovative Skills Bootcamp on Electric Motor Fundamentals aims to equip you with a thorough understanding of the principles, operation, and control of electric machines and drive systems.

# SKILLS FOR LIFE

## SKILLS BOOTCAMPS

The course offers you the opportunity to familiarise and learn the following content:

- › Understand the principles of electromechanical energy conversion.
- › Understand the principles and operation of various types of electric machines.
- › Apply knowledge of electric machines and drives to practical applications.

**Apply for this course** (<https://webapp.coventry.ac.uk/CUapply/>)

## Course duration

This course will run over 10 weeks from **4 November 2024 to 13 January 2025**. For more details please contact [CUSkillsBootcamp@cusltd.co.uk](mailto:CUSkillsBootcamp@cusltd.co.uk) (<mailto:CUSkillsBootcamp@cusltd.co.uk>).

## Venue

This course will delivered online.

## Why you should study this course

The 10-week course covers essential topics such as electromechanical energy conversion, the detailed functioning of transformers, DC machines, induction machines, and synchronous machines, as well as special machines like stepper motors and brushless DC motors.

# About Skills Bootcamps

Skills Bootcamps are flexible courses of up to 16 weeks for adults aged 19 or over and can give you the opportunity to build up valuable sector-specific skills based on local employer demand and can provide a direct path to a job on completion. They are free to individuals. Where an employer is training an existing employee, they must contribute to the cost of the course. For small or medium sized enterprise: £440 and large sized enterprise: £1320. Please contact [CUSkillsBootcamp@cusltd.co.uk](mailto:CUSkillsBootcamp@cusltd.co.uk) (<mailto:CUSkillsBootcamp@cusltd.co.uk>) for more information.

Skills Bootcamps are aimed at adults who are either unemployed, in work, self-employed, looking to change career or returning to work after a break. They are an opportunity to learn and develop technical skills in the chosen Skills Bootcamp. We encourage all eligible adults to apply, including those from underrepresented groups.

*Places are limited and will be allocated on a first-come, first-served basis to eligible applicants. Please note that individuals are only eligible to participate in one Skills Bootcamp per financial year and must not be on more than one Skills Bootcamp at any one time, but you can apply for multiple Skills Bootcamps.*

## Collaborations with other organisations

### West Midlands Combined Authority



### Gradcore



### What you'll study

You will learn about different electric motors and their control and will explore power electronic converters and their crucial role in electric drives. Practical applications in industrial automation, electric vehicles, and renewable energy systems are emphasised, ensuring that you can apply theoretical concepts to real-world scenarios.

### Week 1: Introduction to Electric Machines and Drives

- > Overview of electric machines and drives

## **Week 2: Principles of Electromechanical Energy Conversion**

- › Magnetic materials and properties
- › Electromagnetic induction: Faraday's Law, Lenz's Law
- › Magnetic losses: hysteresis and eddy currents
- › Energy conversion principles
- › Force and torque production in electric machines.

## **Week 3: Transformers**

- › Construction and operating principles
- › Equivalent circuit and phasor diagrams
- › Voltage regulation and efficiency
- › Three-phase transformers

## **Week 4: DC Machines**

- › Construction and types (shunt, series, compound)
- › Operating principles
- › Performance characteristics
- › Control of DC motors
- › Applications and drive systems

## **Week 5: Induction Machines**

- › Construction and types (squirrel cage, wound rotor)
- › Operating principles
- › Equivalent circuit and starting method
- › Performance analysis and efficiency
- › Applications and drive systems

## **Week 6: Synchronous Machines**

- › Construction and types (cylindrical rotor, salient pole)
- › Operating principles
- › Equivalent circuit and phasor diagrams
- › Performance characteristics
- › Methods of starting and synchronization

## **Week 7: Special Machines**

- › Stepper motors
- › Brushless DC motors
- › Permanent magnet synchronous motors (PMSM)
- › Switched reluctance motors (SRM)
- › Linear motors

## **Week 8: Power Electronics for Electric Drives**

- › Introduction to power electronic devices: diodes, thyristors, transistors, IGBTs
- › Introduction to power electronic converters
- › Rectifiers, inverters, and choppers
- › Pulse Width Modulation (PWM) techniques

## **Week 9: Control of Electric Drives**

- › Basic principles of drive control
- › Speed control methods for DC and AC drive
- › Scalar control (V/f control)
- › Vector control (Field-Oriented Control, FOC)
- › Direct Torque Control (DTC)
- › Sensorless control techniques

## **Week 10: Drive System Design and Applications**

- › Drive system components and integration
- › Application-specific drive design: traction, robotics, renewable energy systems
- › Energy efficiency and performance optimization
- › Case studies of industrial drive systems

We regularly review our course content, to make it relevant and current for the benefit of our students. For these reasons, course modules may be updated.

---

## **Teaching contact hours**

This course is delivered online Monday to Thursday 6pm to 8pm offering you the opportunity to study from home and around other commitments. Skills Bootcamps are flexible courses that can allow you to build up valuable sector-specific skills based on local employer demand and can provide a direct path to a job on completion.

Our experienced academic staff will provide engaging and stimulating class sessions, bringing in their industry technical experience and research to the virtual classroom.

Throughout this course, you can expect up to 80 hours of learning activities, made up of online teaching and independent learning. Additionally, you will be expected to undertake significant self-directed study of approximately 120 hours, depending on the demands of individual modules.

As an innovative university, we use different teaching methods including online tools and emerging technologies. So, some of your teaching hours and assessments may be delivered online.

---

## **Entry requirements**

---

## **Fees and funding**

---

## **Facilities**

---

## **How to apply**

---

## **Careers and opportunities**

---

## **Further study**

## **Disclaimers**

## Contact us

### 📍 [CU Coventry \(/cuc/\)](/cuc/)

CU Coventry  
8 Mile Lane  
Coventry CV1 2TU  
United Kingdom

**Tel: [+44 \(0\)24 7765 8787 \(tel:+442477658787\)](tel:+442477658787)**

## Our locations

### 📍 [CU London \(/cul/\)](/cul/)

### 📍 [CU Scarborough \(/cus/\)](/cus/)

## Useful links

- › [Contact us \(/cuc/contact/\)](/cuc/contact/)
- › [Find us \(/cuc/life-at-cuc/living-in-coventry/travel-to-the-city/\)](/cuc/life-at-cuc/living-in-coventry/travel-to-the-city/)
- › [How to apply \(/cuc/study/how-to-apply/\)](/cuc/study/how-to-apply/)
- › [Our start dates \(/cuc/study/academic-calendar/\)](/cuc/study/academic-calendar/)
- › [News and Events \(/cuc/news-and-events/\)](/cuc/news-and-events/)
- › [Order a prospectus \(/cuc/order-a-prospectus/\)](/cuc/order-a-prospectus/)
- › [Safeguarding \(/cuc/legal-documents/safeguarding-is-everyones-responsibility/\)](/cuc/legal-documents/safeguarding-is-everyones-responsibility/)
- › [Partner with us \(/cuc/careers-employability/employers/\)](/cuc/careers-employability/employers/)
- › [Vacancies \(/jobs/\)](/jobs/)
- › [Complaints \(/cuc/legal-documents/complaints-and-compliments/\)](/cuc/legal-documents/complaints-and-compliments/)

## Follow us

 (<https://www.facebook.com/CUCoventry/>) (<https://twitter.com/cucoventry>)

 (<https://www.youtube.com/cucampuses>)  (<https://www.instagram.com/cucoventry/>)

 (<https://www.linkedin.com/school/cucoventry/>)

 (<https://www.snapchat.com/add/cucampuses>)

## Sign in

 **Student portal** (<https://livecoventryac.sharepoint.com/sites/students-portal-cug>)

 **Staff portal** (<https://livecoventryac.sharepoint.com/sites/staff-portal>)