## Why should I study this course?

Hydrogen fuel cells have an important role in reducing greenhouse gas emissions by storing renewable energy and mitigating climate change, which is critical to protecting humans, wildlife, and ecosystems. There has been an increase demand for knowledge of this specific field and an emerging skills gap in the market.

This introductory skills course will help to give you the basics about Hydrogen and Fuel cell technology and help you decide if this is a career you might be suited for. Or perhaps you are considering investing in renewable energy or transport and want a short course to give you more information.

### What does this course lead to?

#### As this is a short modular course and it is designed to lead to next steps training.

As this is a short modular course and it is designed to lead to next steps training. If you are already a engineer or trades person this will act a steppingstone to a longer, further renewable suite of qualifications. If you are new to renewables this course will act as opportunity to sample the industry and consider a change in career to look at engineering or construction pathways at Level 2.

### Who is this course for?

Adults who are interested in learning more about renewables, specifically hydrogen fuel cells. Learners do not need to have any prerequisite knowledge, we just ask for a willingness to learn and have functional English and mathematical skills.



# Riverside College



# **Learning Plan**

Introduction To Hydrogen Fuel Cells

# **Introduction To Hydrogen Fuel Cells**

This course is to introduce learners to hydrogen fuel cells, their fundamental workings and why they can play a role in decarbonisation.

### Engineering Level 3

Programme	Introduction to Renewables
Unit(s)	Unit 1: Why CO2 Matters Unit 2: Overview and Characteristics of Hydrogen Unit 3: Fundamentals of Hydrogen Fuel Cells Unit 4: Appraisal and summary of Hydrogen Fuel Cells
Who is the course for?	The course is aimed at those looking to gain a better understanding of why there is a need to decarbonise, the characteristics of hydrogen, a brief introduction to electrolysis and the fundamentals of how hydrogen fuel cells work.
Outcomes	<ul> <li>The learner will be able to:</li> <li>Define the need to decarbonise</li> <li>Describe greenhouse gases</li> <li>Summarise the effects of climate change</li> <li>Recognise how to minimise CO2</li> <li>Name the characteristics and behaviour of hydrogen</li> <li>Arrange and analyse colours of hydrogen production</li> <li>Describe electrolysis</li> <li>Define the efficiency of fuel cells</li> <li>Explain the fundamentals of how a hydrogen fuel cell</li> </ul>
	<ul> <li>Explain the fundamentals of now a hydrogen fuel cell works</li> <li>Differentiate between anodes and cathodes</li> <li>Breakdown fuel cell flow plates and their individual roles</li> <li>Arrange the components of a hydrogen fuel cell in the correct order</li> <li>Appraise the advantages and disadvantages of fuel cells</li> <li>Outline the different applications of fuel cells</li> </ul>

### **Overview of Course**

Lesson No	Topics
1	<ul> <li>An introduction to net zero, CO2 and climate change</li> <li>Why CO2 matters</li> <li>What are greenhouse gases</li> <li>Climate change</li> <li>Knowledge check</li> </ul>
2	<ul> <li>A brief overview of hydrogen</li> <li>Characteristics and behaviour of the gas</li> <li>Comparative megajoules of hydrogen, petrol and diesel</li> <li>'Colours' of hydrogen</li> <li>Knowledge check</li> </ul>
3	<ul> <li>Introduction to Electrolysis and hydrogen fuel cells</li> <li>Fundamentals of electrolysis</li> <li>Fundamentals of a hydrogen fuel cell</li> <li>Introduction to anodes and cathodes</li> <li>Knowledge check</li> </ul>
4	<ul> <li>A closer look at hydrogen fuel cells</li> <li>Overview of flow plates</li> <li>Overview of backing layers</li> <li>Applications of fuel cells</li> <li>Advantages and disadvantages of fuel cells</li> <li>Knowledge check</li> </ul>

#### Assessment

Learners will be assessed at the end of each lesson with a paper based test. Success in this will lead to a college-issued certificate of completion.