

THE WMG INTERNSHIP PROGRAMME



— Manufacturing Skills for the Future





Foreword

Dr Mark Swift, Head of SME Engagement

WMG at the University of Warwick supports innovation in SMEs (Small and Medium Sized Enterprises) and larger businesses. Our mission is to help companies on that triple transition¹ of implementing Digitalisation and Net Zero solutions while boosting Productivity. We do this through a range of knowledge exchange programmes including workshops, networking events, tailored projects, as well as supervised short-term internships.

According to a recent report by Engineering UK, the demand for engineers is predicted to grow faster than other occupations. 25% of roles currently advertised in the UK are for engineering roles and 'green' engineering roles have increased by 50% over the last five years.² With engineers in such high demand, there is a need for industry, research, and education providers to come together to create solutions that will ensure that the new workforce has the right skills to reap the benefits of this demand. Equally, it is essential that manufacturing firms, amongst others can access these skills easily and at the right time.

In recognition of this we set up the WMG Internship programme. It provides an innovative and flexible opportunity to kick start engineers' careers, and helps manufacturers access those often hard to find skills risk-free.

Manufacturers take on a recent graduate or student to tackle an important project. Supported by a WMG supervisor, we manage the administration of sourcing the right candidate and employing them through the University. It is a wonderful way for manufacturers to see what value young students and graduates can bring to the business and indirectly they are encouraging graduates to stay and thrive within the local community after graduation. For the students and graduates, they get to see what it is like to work in this dynamic sector, as well as enhance the student experience of their time at university.

With the UK Government flagging skills as crucial in driving long-term economic growth³ and a means to support the Levelling Up agenda, our vision is to remain in dialogue with our industrial partners and student population to ensure our skills programmes respond to future requirements. This year, we launched a sustainability focused internship scheme to help manufacturers reduce their energy usage and examine opportunities around product life cycle analysis and the optimisation and re-use of waste materials.

WMG Internship Programme

An introduction to the programme

Our internship programme has four key objectives:

- **Supports manufacturers** to address 'skills gaps' within their businesses
- **Supports manufacturers** to address an internal business challenge in the engineering and manufacturing field
- **Supports students and graduates** enhance their employability skills
- **Promotes the manufacturing sector** as a great place to work

Since the programme launched in 2007, our interns have supported over 200 companies to develop new products, boost business productivity, and develop more sustainable supply chains.

What problem are we trying to solve?

The manufacturing sector in the UK needs skilled graduates, passionate about their work and capable of making a difference within the sector. With science and technology developing at unprecedented pace and the intense international competition, engineers are now more important than ever in preserving the UK's role as a world-leading hub of research and innovation.

Although STEM (Science Technology Engineering and Mathematics) graduates are in high demand, smaller businesses often prefer to recruit experienced engineers - instead of training graduates. There is a fear that recent graduates will lack the technical skills necessary to satisfy the demands of the job. This is where work experience comes in. Students and graduates can use an internship opportunity as a chance to shine and develop their skills in a short time frame, highlighting why they are employable in today's competitive job market.

Our solution

Our Internship Programme aims to:

1. Help businesses source vital engineering skills in a quick and uncomplicated way, exactly when they need it.

We do this by:

- Leveraging our nationwide recruitment channels to source capable interns
- Providing a dedicated industrial practitioner to complement the skills of the intern
- Offering our state-of-the-art facilities to accelerate the impact of each project

2. Help students and graduates gain critical expertise for their future employment.

We do this by:

- Offering a variety of real-world projects at manufacturing companies, providing opportunities to hone skills
- Pairing interns with an experienced industrial practitioner to provide support, coaching and guidance throughout the project
- Offering a straightforward application process

Our outreach activities help:

1. Improve the perception around the capabilities of students and graduates
2. Raise awareness of engineering careers to inspire future generations
3. Share insights of the manufacturing sector as a place to work

Read our internship success stories here:

<https://warwick.ac.uk/wmg/business/innovationexperience/interns/>

¹ <https://www.enterpriseresearch.ac.uk/enabling-the-triple-transition-in-uk-smes/>

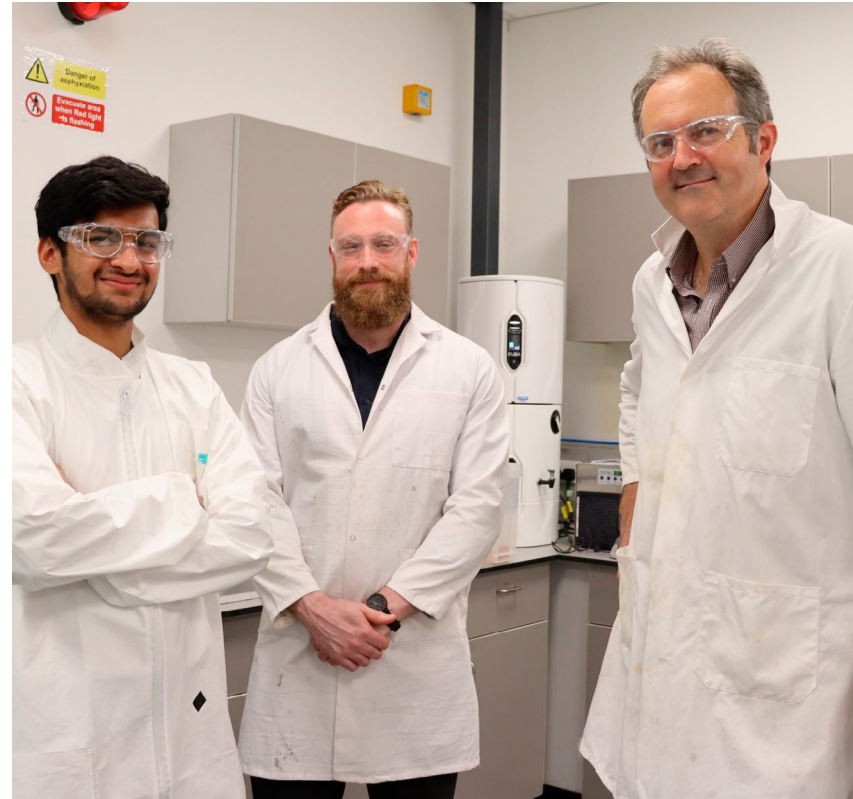
² <https://www.engineeringuk.com/research-policy/industry-workforce/engineering-skills-needs-now-and-into-the-future/>

³ <https://www.gov.uk/government/publications/skills-for-jobs-lifelong-learning-for-opportunity-and-growth>

Programme Achievements



On average, **1/3** of our internships convert into a **job offer**



How does the programme work?

Our interns are placed with a company for 8 to 12 weeks, giving them the opportunity to fully familiarise themselves with the manufacturing environment.



The internship focuses on a targeted project/challenge within the business, injecting the talent and skills from academia, directly into the heart of the UK Manufacturing supply chain.



As part of the programme, our interns are supported by a WMG supervisor, an expert in their field, to ensure that the project is delivered in a timely manner and of a high standard.

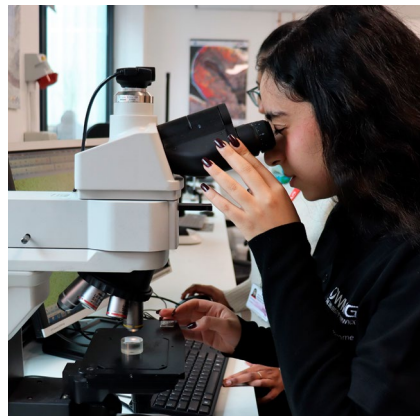


Companies may use WMG facilities, including software and labs to help interns maximise the impact of their projects.



Companies are not limited to taking on just one intern. Taking advantage of our multiple internships offering is an effective way to work on several business objectives at once or double up on something of strategic importance. Interns can then also support and learn from each other.

95% of businesses that participate **note positive cultural change** in their organisations as a result

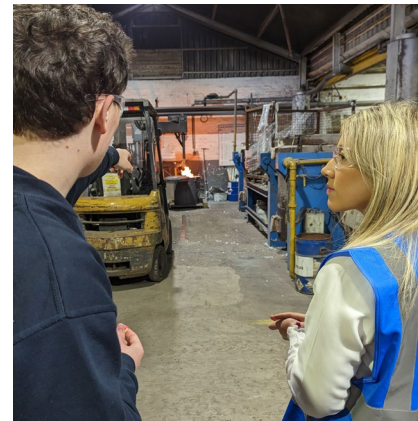


The **majority** of companies come back for a **second internship**



200 internships delivered to date

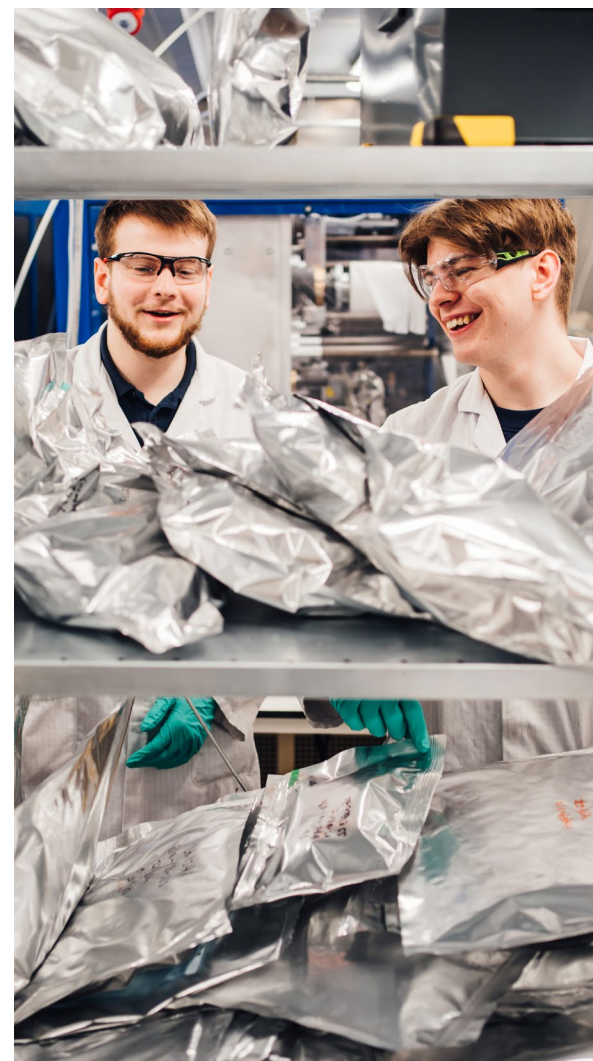
75% of businesses that participate experience **increases in productivity**



Internship Types

Our internships broadly fall within these four themes:

- Net Zero & Sustainability
- Materials & Manufacturing
- Digital Manufacturing
- Business Transformation



Our multidisciplinary team can supervise projects in a wide range of specific areas, including:

- Additive Manufacturing
- Automation & Robotics
- Automotive
- Additive Manufacturing
- Business Models
- Connected/Electronic Devices
- Cyber Security
- Digitally Enhanced Manufacturing
- Energy Systems
- Electronics
- Life Cycle Analysis and Waste Management
- Health and Well-being
- Intelligent Vehicles
- Manufacturing Process, Productivity and Development
- Materials Testing and Characterisation
- Mobility and Transport Systems
- Polymers
- Product Development and Design
- Software and Systems Development
- Supply Chains
- Sustainability/Net Zero
- Strategic Planning

Internship Success Stories

Hydrasun Ltd

Project Area: Net Zero & Sustainability

Hydrasun is a leading specialist provider of integrated fluid transfer, power, and control solutions to the oil and gas, renewable energy, OEM, marine, and defence industries worldwide.

Challenge

The company were looking to achieve, in the long term a Net Zero manufacturing position and wanted to research their overall carbon footprint for the Precision Manufacturing Division based in Aviemore, Scotland

Solution

Over 12 weeks, WMG Intern Declan Kelly, a graduate in Chemical and Process Engineering at Strathclyde University examined the overall carbon footprint of the division's supply chain in terms of production and transport through collaboration with suppliers. He assessed the efficiency of the conversion processes at the Aviemore site, looking at the rate of input versus waste and finished product output. Finally, he mapped the scrap recycling routes in terms of their carbon footprint and identified potential issues.

Impact

Declan presented Hydrasun with a full overview of the division's carbon footprint which enabled the company to put in place a roadmap to reduce emissions going forward. **He made a series of recommendations including investing in AI to optimise schedules and transport routes as well as ideas to optimise their processes, make more sustainable material choices and improve recycling.**

“This internship was truly eye opening for us. Declan highlighted that there is work to do on our sustainability mission. We have a commitment to our clients and the wider public to be more responsible and are wholeheartedly looking forward to actively pursuing collaboration with upstream and downstream business partners to drive meaningful change.”

Don Morrison
Divisional Manager - Precision Manufacturing,
Hydrasun Ltd

“This project has strengthened my conviction that businesses need to proactively take steps to reduce their impact on the environment. I am really interested in developing a career in sustainability now.”

Declan Kelly
WMG Intern



Internship Success Stories

Sarginsons Industries Ltd

Project Area: Materials & Manufacturing

Based in Coventry, Sarginsons are a metal castings foundry that specialise in high integrity castings as well as CNC machining, metallurgic and heat treatment expertise. They have high-profile clients and work with partners in the automotive, aviation and oil and gas sectors to offer exceptional lightweight components.

Challenge

Sarginsons wanted to get a better understanding of potential difficulties in their melting practices for the foundry and how the metal was prepared for use. Ultimately, they wanted to determine if their current manufacturing control parameters were adequate for their products.

Solution

Arezoo Firouzeh, a metallurgy postgraduate from Iran joined Sarginsons for 12 weeks and was supervised by WMG's Dr Paul Lansdell. She undertook various tests and controls to create a set of robust processes to develop not only their current products, but also products of the future. Sarginsons' clients were requesting further light weighting in their products which require a different set of mechanical properties.

Impact

As a result of the work undertaken by Arezoo, Sarginsons has a set of reports and audit documents that can be used in the preparation of metals for casting. **They expect to see a significant improvement in quality and reduction in their scrap rate.** They are now able to demonstrate robust control of their processes for external auditors. Arezoo now works with the company as a Technical Engineer.

“The team were fantastic and so supportive. I have loved seeing my knowledge being applied in a new industrial setting. If I had a challenge, I used it to continuously improve.”

Arezoo Firouzeh
WMG Intern



Internship Success Stories

Alphateq Ltd

Project Area: Digital Manufacturing

Warwickshire based Alphateq are a leading designer and manufacturer of fixtures and tooling for the foundry and specialist automotive and aerospace industries. They have a highly experienced senior team of expert pattern and toolmakers.

Challenge

Alphateq recognised that digital technology was going to play an ever more meaningful role in the future development of the company's expertise. Alphateq were looking for a new system that would better capture job times and material cost data to enable a better understanding of their individual project breakeven and profitability levels. Their job flow process was also largely paper based which resulted in a great deal of time being dedicated to project management to stop the accumulation of jobs at one station.

Solution

Alphateq took on Shantnu Mehta an Engineering Business Management graduate from the University of Warwick as a digital champion. Shantnu successfully implemented an ERP system to keep track of all the jobs. He trained each Alphateq team member on the system, including how to input data on tablets and delivered a series of briefings to the management team. Once all the jobs are finished, the analytics for time and cost taken to produce them is now created which displays the profit or loss made on that job, providing valuable data to feed into the quotation process.

Impact

The increased transparency on the shopfloor will **boost productivity by 15%**. Shantnu has been offered a permanent position at Alphateq as a Manufacturing Systems Engineer. With better costing data, **Alphateq aim to increase their client conversation rate by 10% which could result in additional turnover of £250,000.** The reduction of paper at the business has boosted their green credentials and the ERP system will provide them with the opportunity to better optimise machine usage, leading to reduced energy costs.

“This internship helped me understand the practical side of a manufacturing business and its processes. I now have experience of digital transformation in a manufacturing environment.”

Shantnu Mehta
WMG Intern

“Working with WMG's Intern programme has been such a fruitful process, we couldn't have asked for anything more.”

Brian Garforth
Managing Director, Alphateq Ltd



Internship Success Stories

Kennet Aviation Ltd

Project Area: Business Transformation

Kennet Aviation is a specialist vintage aircraft restoration business with a team of 11 experts working on making Seafire, Spitfires, and others airworthy again. Based in Bedfordshire their capabilities include CNC router operations, CNC machining, project coordination, design engineering, systems engineering, tooling, and assembly.

Impact

The new comprehensive costing model will assist the business to price estimates quickly and accurately. Kennet is now better equipped to ensure that the correct margins are in place to improve profitability and can use the tool to improve its conversion rate. **Febry's recommendations when implemented could save the business up to 29% in production costs and many hundreds of man hours.**

Challenge

As a small manufacturing business, Kennet were looking to increase profitability to future-proof the business. They contacted WMG to see how they could increase efficiencies focusing on the Seafire Mk XV Aircraft's Elevator System (the aircraft's tail) which is all sheet metal components work as well as develop a more comprehensive cost model to increase their profitability.

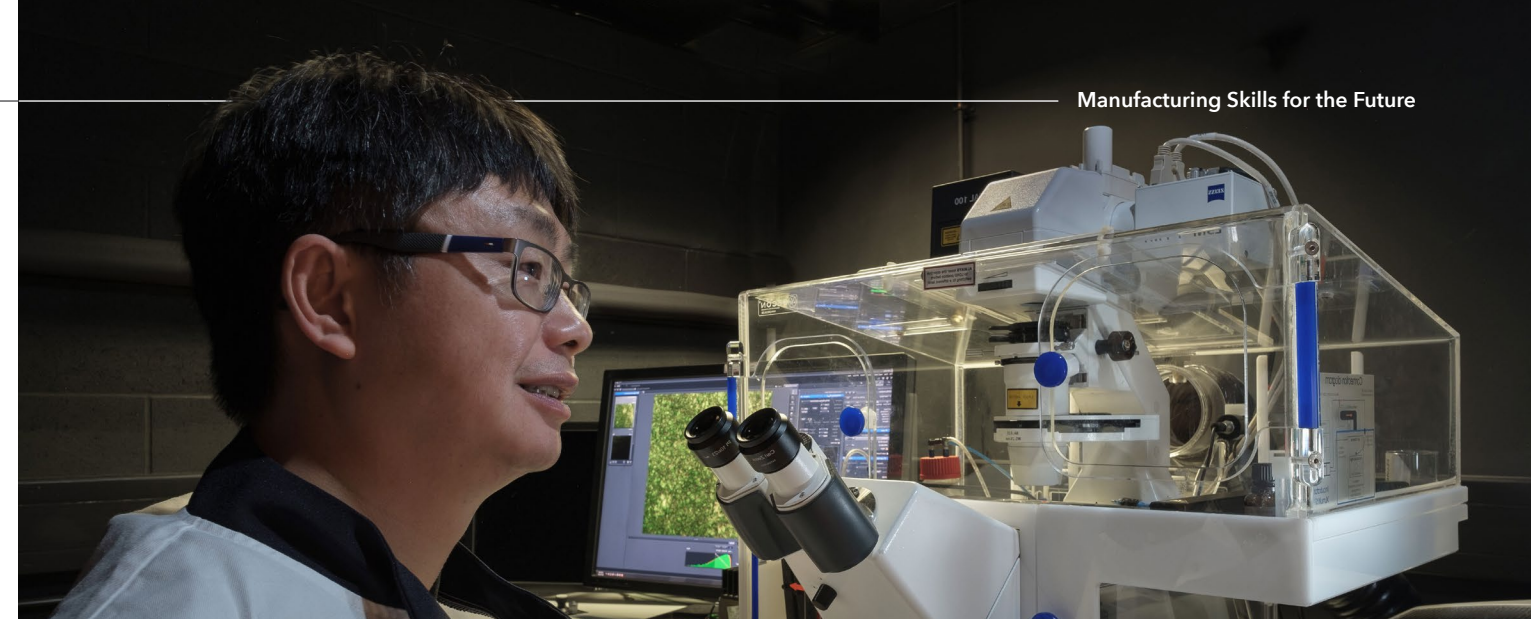
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This was a great opportunity to apply my Masters knowledge in real life to successfully manage a project. It also increased my expertise in both technical and strategic matters, making me an engineer who specialises in both, in other words, a well-rounded engineer.”

Febry Mulia Wardhana
WMG Intern

Solution

Together with WMG project supervisor Gun Gokmen, Kennet took on Febry Mulia Wardhana, an Engineering Project Management postgraduate who had studied at Coventry University. Febry created a new efficient cost model that outlined material preparation costs and direct labour costs for each stage of a project rather than just the hourly fees integrating it into the company's existing MRP system. He worked on analysing and defining the Elevator manufacturing process in detail looking at potential bottlenecks and root causes to existing problems and developed a new layout plan. He then went on to research how digitalisation could impact efficiencies in the business, recommending the business invest in a digital scanner to reduce the amount of time spent designing and drawing parts.



Other Internship Projects

Bellagio Stone

Intern analysed cause and effects within the existing processes by applying Lean Six Sigma tools and to make recommendations for immediate improvements in machine set up times. This led to 30% time-saving in the machine setup time, building the capacity to take on three more client jobs per day, equating to £5,000 to £6,000 a day increase in turnover.

Dtronix Ltd

Intern established that batteries, which are destined for recycling can be reused or repurposed. Dtronix now have a clear strategy to help them achieve their vision of reducing the number of batteries going to landfill through the sustainable solutions brought on with the help of the internship programme.

Composite Braiding Ltd

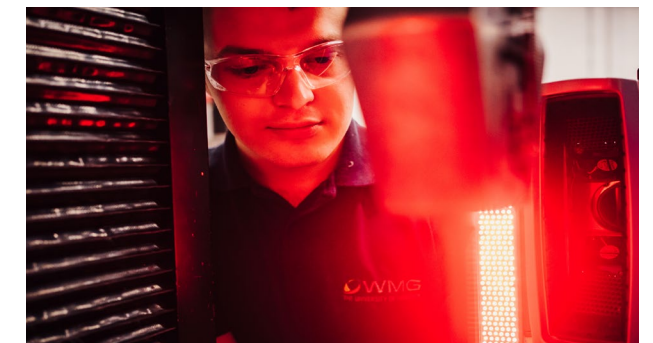
Intern provided research on opportunities for making new types of products out of waste material, opening a new form of revenue for the business. The advantages of approaching the internship with a sustainability outlook on the project were huge, reducing their waste and in turn bringing economic advantages with the creation of a new product.

Cast Iron Welding Services Ltd

Through their digitalisation intern project, the average data entry time was reduced by 90%, from an hour to just a matter of minutes. Up to a 70% reduction on costs were saved by CISW, by choosing to work with an intern instead of software consultants.

5DHPG

Intern, Noor worked on the development of solid antimicrobial materials into product forms suitable for plastics and coatings processing. The use of nanotechnologies and WMG facilities throughout enabled the success of the internship and will continue into the trialling phase in the next stage of their development.



Company Information

What are the requirements for taking part in the programme?

You are required to provide a brief idea of the project you would like the intern to conduct.

Before the project starts, our team will support you with project scoping, the job description, role advertising, candidate interviews and the recruitment process.

Throughout the project, the WMG supervisor will monitor project progress, quality and delivery.

How much does it cost?

For SMEs:

- 8-week internship: £4000+VAT
- 12-week internship: £5500+VAT

For larger companies:

- 8-week internship: £5000+VAT
- 12-week internship: £7500+VAT

The cost covers the salary for the intern; all other benefits - as outlined above - are subsidised by HEIF (Higher Education Innovation Fund).

What are the eligibility criteria?

Companies must be:

Registered in the UK and manufacture in the UK or be part of the manufacturing supply chain.

What are the benefits for a business?

You will benefit from:

- Access to the university recruitment channels
- Support from WMG Engineers and research teams
- Access to WMG facilities, software, and equipment

What are the deadlines for the programme?

The programme runs throughout the year; there are no deadlines to participate.

What is next after the internship project ends?

- Further internship(s)
- Knowledge Transfer Partnership
- Opportunity to further engage with WMG on collaborative Research and Development

How do I get involved?

For more info, either contact:
wmgsme@warwick.ac.uk

Or fill out our online form:
<https://warwick.ac.uk/wmg/business/innovationexperience/interns/register>

Company Testimonials

"The value of having highly capable, dedicated extra resource provided by WMG and access to WMG's testing facilities for this work has been very beneficial. We knew there was potential for making useful, attractive, complimentary products from our minimal waste material and Adam's work has proven this."

Alastair Barnett
Director & Senior Engineer,
Composite Braiding Ltd

"The WMG Internship Programme offers us a flexible way to engage with interns taking their first steps into industry post-graduation. It showed us that a young mind can pick up new knowledge and produce flexible solutions quickly and bring innovation and creativity to the team."

Tomas Dobo
Director, Aeristech Ltd

"Sustainability is the driving force of everything we do here at Dtronix. Taking an intern on-board gave this project the focus and the time it needed. It has been a valuable journey which will help us grow the business in a new direction. We're excited to see the benefits of putting Arun's hard work into action!"

Monica Dass
Director, Dtronix Ltd



"We've had a really positive experience working with WMG, Nayan did such a great job that he is now working at Jaltek permanently as a continuous improvement engineer."

Steven Blythe
Business Manager,
Jaltek Systems Ltd



Intern Information

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What type of projects will I work on?

Typical projects include product development, materials testing, software and systems development, automation and robotics, electronics, and innovative business models.

What are the eligibility criteria?

The programme is open to students, graduates, postgraduates and PhDs who are:

- Based in the UK
- Eligible to work in the UK
- Available to work 36.5 hours/week (full time)
- Internships cannot be counted as a work placement as part of your studies

How much will I get paid?

Interns are paid a competitive salary, above the national recommended living wage.

Who will be my supervisor?

You will be supervised either by one of the experts in the **WMG SME Group** or by one of the engineers in the various Research Group at **WMG**.

Meet the SME team: <https://warwick.ac.uk/wmg/business/innovationexperience/team/>

How can I apply?

Register your interest to receive email notifications when there are available positions:

<https://warwick.ac.uk/wmg/business/innovationexperience/interns/registerinterest>

Vacancies are posted with Unitemps at the University of Warwick and on our WMG Internship vacancies web page.

If you are shortlisted, you will be invited by the Unitemps team for a question-based interview.

Intern Testimonials

"Nothing is more expensive than a missed opportunity. I gained more knowledge in people management, taking initiatives at meetings, leadership skills, business development and practical use of lean practices like Kaizen."

Nayan Wani
Intern at Jaltek Systems Ltd

"The most exciting thing about working in a manufacturing company is that you can actually see the product you are working on being developed."

Devin Shah
Intern at Aeristech Ltd

"I cannot thank Summit Systems enough for this opportunity. They have been excellent at helping me to develop my skills and knowledge of the products and systems. I would recommend Summit Systems to anyone considering an internship in Research and Development."

Zain Mahmood
Intern at Summit Systems Ltd

"Collaborative research has been a large portion of my internship experience. Being able to fully conduct an experiment by having the right connections has been very valuable and everyone has been so helpful with my project which has been amazing."

Rahil Haria
Intern at Gtechniq Ltd



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I had a wonderful time working on the 5DHPG project at WMG. The most satisfying part was the environment I worked in. I was anxious before joining but the friendliness of the environment made a big difference."

Noor Tara
Intern at 5DHPG

THE WMG INTERNSHIP PROGRAMME



To discuss WMG's skills offerings further or to find out more about the work WMG does on internships, please contact us via:

 warwick.ac.uk/WMGSMES

 WGMES@warwick.ac.uk

 @WMBusiness

 WMG Business