WMG
Project Assistant (Ultra Lightweight Brake Calliper Project)

£9.05 per hour (+ £1.09 holiday pay)

Fixed Term Contract: 4 Weeks Full Time (with the possibility of a further 4 weeks’ employment through the partner SME. Applicants must therefore be available for the full 8 weeks)

Working with supervision from WMG’s SME Group, you will support brake component manufacturer EBC Brakes with a project to investigate the use of Composite Material Structures and Other Light-Weighting Techniques for the Production of Ultra-Lightweight Automotive Brake Callipers for SMEV’s (Small Medium Electric Vehicles)

The post will be partly based at the company in Northampton (approximately 70%) and WMG, University of Warwick, Coventry (approx. 20%) with occasional visits to the company’s testing facility in Bristol (for which EBC will fund your subsistence and accommodation). EBC Brakes specialises in the manufacture of brake components. Expanding rapidly in the automotive industry, EBC Brakes has become a world leader in sport, high performance and race brake pads and disc/rotors with a massive trademark range of products.

You will be employed for 4 weeks with WMG, University of Warwick, however at the conclusion of the 4-week period, the placement may be extended for a further 4 weeks with the partner company. Applicants must therefore be available for the full 8-week period.

You will ideally be educated to or working towards degree level in a relevant engineering field (or equivalent).

This post is not eligible for sponsorship and applicants must be eligible to work in the UK under present visa arrangements.

If you are interested in applying for this internship please send a covering letter and CV to Sam Hounsell, Administration Assistant (HR), email address: wmghr@warwick.ac.uk by 09/05/2016. Please quote the reference number WMG004/16 in all correspondence.
JOB DESCRIPTION

POST TITLE: Project Assistant (Ultra Lightweight Brake Calliper Project)

DEPARTMENT: WMG

POST RESPONSIBLE TO: WMG SME Group, University of Warwick

SALARY IN THE RANGE: £9.05 PER HOUR (+ £1.09 HOL PAY)

REFERENCE NUMBER: WMG004/16

CLOSING DATE: 09/05/16

JOB PURPOSE:

The WMG SME Group works with many SMEs each year. This summer they are offering up to 25 internships in SMEs across the UK. This particular project will involve an in-depth investigation into the use of Composite Material Structures and Other Light-Weighting Techniques for the Production of Ultra-Lightweight Automotive Brake Callipers for SMEVs (Small Medium Electric Vehicles).

In the relentlessly evolving automotive industry, vehicle manufacturers are constantly researching new and innovative solutions to reduce vehicle weight, with the aims of increasing vehicle performance whilst simultaneously lowering vehicle emissions. Reducing vehicle weight is of particular importance to small medium electric vehicles (SMEVs), where weight is stripped back to an absolute bare minimum in order to extend the range of the vehicle.

Until now effort has predominantly focused on reducing the sprung weight of the vehicle (for example aluminium body panels, lightweight interiors etc). However, in order to retain acceptable vehicle dynamics and adequate safety, a reduction in the sprung weight of a vehicle must also be matched by reductions in the un-sprung weight of the vehicle.

A dominant contributor to a vehicles un-sprung weight is the braking system, which for decades has most commonly consisted of heavy grey cast iron discs, brake pads, and a cast iron brake calliper. SMEV manufacturers are therefore faced with a significant dilemma. Solutions must be found to reduce the vehicles un-sprung weight, particularly the braking system weight, before any further reductions in sprung weight can be made. Additionally, because SMEVs employ regenerative braking techniques, the demand on the braking system is significantly less. This opens up the possibility for significant light-weighting and innovative composite material structures that perhaps otherwise would not be considered suitable materials for a 'conventional' braking system without a regenerative element.

EBC Brakes are already experimenting with the use of plastic composites to replace the cast iron brake disc, thus hoping to significantly reduce this components weight. The aim of this project however is to focus on the other main contributor to braking system weight, the cast iron brake calliper.

This post is expected to be based split between the premises of the SME (Northampton), their testing facility in Bristol, and at WMG at the University of Warwick. This may be flexible depending on personal situation. Travel subsistence is provided.
DUTIES AND RESPONSIBILITIES:

1. Conduct a literature review to propose promising material composites and light-weighting techniques which would likely be of relevancy to the project.
2. Work with engineers at EBC Brakes to narrow down prospects and identify a small selection of ideas to progress further.
3. Create innovative designs for a brake calliper prototype, including appropriate documentation.
4. Document findings and propose future areas for improvement.

If time permits, there is a desire to also:

1. Conduct a preliminary evaluation of your design using CAD modelling, FEA analysis and small scale lab experiments.
2. Collaborate with engineers at EBC to propose how a full scale prototype can be manufactured.
3. Create a physical prototype.
**PERSON SPECIFICATION**

**POST TITLE:** Project Assistant (Ultra Lightweight Brake Calliper Project)

**DEPARTMENT:** WMG

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<th>REQUIREMENTS</th>
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<tr>
<td>The post holder must be able to demonstrate:</td>
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<td>a) Application Form</td>
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<td>Educated to, or working towards a relevant science or engineering degree</td>
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<td>b) Test/Exercise</td>
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<td>(or equivalent)</td>
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<td>c) Interview</td>
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<td>Good problem solving skills</td>
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<td>Knowledge of manufacturing processes and prototyping techniques</td>
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<td>Basic knowledge and an interest in automotive engineering and the</td>
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<td>automotive industry</td>
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<td>Ability to undertake desk based research</td>
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<td>Good organisational skills</td>
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<td>Ability to be flexible to work in different environments</td>
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<td>Experience of using CAD modelling and knowledge of FEA software</td>
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<td>Experience of product development, materials testing, specification and</td>
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FURTHER PARTICULARS

For further information about the University of Warwick, please visit our website at http://www2.warwick.ac.uk/services/humanresources/jobsintro/furtherparticulars

For further information about the Department of WMG, please see our website at http://www2.warwick.ac.uk/fac/sci/wmg

For further information about WMG’s SME Group http://www2.warwick.ac.uk/fac/sci/wmg/business/sme/

For further information about EBC Brakes http://ebcbrakes.com/
Recruitment of Ex-Offenders Policy

As an organisation using the (DBS) Disclosure and Barring Service to assess applicants’ suitability for positions of trust, the University of Warwick complies with the DBS Code of Practice and undertakes not to discriminate unfairly against any subject of a Disclosure on the basis of a conviction or other information revealed. More information is available on the University's Vacancy pages and applicants may request a copy of the DBS Code of Practice.