

# Minutes from the Mechanical Engineering IAB meeting

## Date

The 29<sup>th</sup> of October 2015

## Location

Senior Common Room

## Start

2 pm

## IAB Members present

Chairman - Mr Ian Care (Rolls Royce)

Mr Tony Hughes (Ford)

Dr Zulshan Mahmood (Ford)

Mr Mark Jiskoot (Cameron)

## IAB Members sending apologies

Mr Ashley Gillibrand (Jaguar & Land Rover)

## SEMS staff present

Dr Adrian Briggs (Chair of Mechanical Engineering DTG), Dr. Lorenzo Botto (Industrial Liaison for Medical Engineering)

## Introductions

All members of the board introduced themselves and briefly described their background and which industrial partner or field they represent. SEMS staff members described their role in the school. The recorded details of each member of the IAB were circulated to each member and returned with any mistakes corrected.

## Future Conduct of the meeting

It was suggested that IABs could be split up into two parts of an hour each one part that was stream specific and then a broader cross SEMS session to get the bigger picture. Especially as many of the new initiatives such as the Robotics programme clearly impact in multiple DTG areas

**Actions: Make suggestion to ELC for consideration**

## Comments from the IAB on our curriculum

The distinctive feature of a programme at QMUL should if you reflect the staff profile be something like "MECHANICAL ENGINEERING TOWARDS MATERIALS AND CHEMOMECHANICS"

Specific examples where local expertise could be exploited include teaching more about polymers and elastomers for the mechanical engineering streams.

In general mechanical engineers are not well informed about how mechanical behaviour is impacted by environmental process such as corrosion or swelling. In addition how they can be altered using heterogeneous materials.

Mechanical engineers are typically weak in their knowledge of the electrical behaviour of materials and a wide range of devices. However in the modern sense these are of huge importance in sensor systems, computer control, mechatronics, robotics etc.

## MECHATRONICS OR ROBOTICS

The group was very animated about the developments in mechanical engineering that will be enabled by the development of smart mechatronic system. There was however very little excitement about the term robotics. Manufacturing has been using automation and hence robots for decades, but the prospect of more versatile and autonomous systems are much more interesting for the future of the industry in the UK. This requires again a multi-disciplinary approach whereby the electronics are embedded into mechanical object (sensor, controller & actuator)

## NEED FOR UNDERSTANDING OF “NEW” MANUFACTURING PROCESSES

Important to teach the difference between the different manufacturing processes. Specifically the concept of “design for manufacturing”. How can we embed simultaneous engineering into the curriculum.

As an example additive manufacture for example using 3D printing is completely different from continuous manufacturing, thus the designs must be different and the material forms that are available to the designer are also different

## OTHER

Teaching about design of experiments and how to measure behaviour (whether that is the reliability, robustness, stiffness, etc) and how that this can be evaluated using variance and other statistical approached is crucial in the role of a mechanical engineer.

Teaching need for validation and calibration of simulations. Everybody agreed that students do not know how to do this.

Students based in work experience in companies should be broadened. It is an opportunity for them to have an “extended interview”, and should be treated as such.

Organise school level competitions about big/cool challenges amongst the students. This could be simple car racing with Formula student or human powered flight. Alumni should be engaged and make it an annual event. Develop that idea that it is part of the social calendar like the boat race for Oxford/Cambridge). Build initiatives around existing infrastructure.

Is it not attractive for students to be able to “try something different” (select moduels that are off their specified programme) in later years of programme. AB pointed out that there are practical problems with this (prerequisites for level 6 and 7 modules, timetabling) are quite formidable.

IABs should be a platform to encourage collaboration between companies on shared problems (with QM involvement obviously)

## INDUSTRIAL COLLABORATIONS: KEYWORDS

Controlling friction (and more broadly how to get maximum fuel efficiency out of a system)

Coatings to make materials harder wearing, chemically inert or more thermally stable.

Heath management

Multi objective optimisation [issues](#).