

## Minutes of the Joint School of Engineering and Materials Science (SEMS) Industrial Advisory Board (IAB) meeting.

Date: 4<sup>th</sup> March 2015

Location: Colette Bowe Room, QMUL

Start: 10am

Present: (SEMS) Prof. James Busfield, Prof. Julia Shelton, Dr Emiliano Biliotti, Dr. Pavel Novak, Dr. Lorenzo Botto, Dr. Julien Gautrot

(External members)

Mr	McElroy	Liam	Advanced Healthcare Ltd	Research & Technology Manager
Ms	<i>Farhangnia</i>	<i>Ellah-Naz</i>	<i>ALCOA Manufacturing Ltd.</i>	<i>Sub for Dr Carolyn Small (Process and Product Development Manager)</i>
Dr	<i>Farid</i>	<i>Ahmed</i>	<i>ARTIS</i>	<i>Sub for Martyn Bennett (Chief scientist)</i>
Mr	Dean	Michael	Baxter	Chief Executive & Director
Mr	<i>Garcia</i>	<i>Pedro</i>	<i>Biocompatibles UK Ltd</i>	<i>Sub for Dr Andy Lewis (Technical Director)</i>
Dr	Kinbrum	Amy	De Puy	Senior Engineer - Biomechanical Testing, WW Research & Development
Mr	Hughes	Tony	Ford	Supervisor CAE & Test Methods
Dr	Whear	Roly	Jaguar & Land Rover	Principal Technical Specialist
Prof	Tavakoli	Mehdi	KTN Ltd	Specialist and Lead in Materials and Medical Technologies
Dr	Jackson	Philip	Lucideon Ltd	Technical Manager - Healthcare
Mr	Kinsella	Tony	Lucideon Ltd	Chief Executive
Dr	Stevens	Chris	NGF Europe	Technical Manager
Mr	<i>Weaver</i>	<i>Paul</i>	<i>NPL</i>	<i>Sub for Prof. Markys Cain (Technology Leader)</i>
Dr	Wood	Alan	Victrex	Technical Director & Chairman of the Polymer Society

*(names in italics were substitutes)*

### 1a. Introductions

Introductions to the various panel members who have agreed to contribute to the School IABs. The recorded details of each member of the IAB was circulated to each member and returned with any mistakes corrected. The updated IAB circulation list is given in Appendix 1.

### 1b. Who is on the IAB from SEMS

Each IABs map onto one of the four Discipline Teaching Groups (DTGs) in SEMS. Each IAB should include from QMUL the DTG chairman, the Industrial Liaison Leader in each DTG as well as the various taught programme champions.

## 2. The Role of the IAB

The remit of the IAB was agreed to be as follows:

- To provide a regular channel of communication between the School and relevant sections of industry.
- To ensure that that School receives appropriate and expert advice on the relevance of its teaching and research.
- To ensure that we maintain accreditation status with all our relevant professional bodies.
- To advise on other School activities as the Board sees fit.

The benefits to SEMS were identified as being:

- The quality of the School's degree programmes is maintained.
- The School is advised on which research activities might be undertaken to meet current industrial needs.
- The employability of the School's students is enhanced.
- The board can advise the School on ad hoc matters identified by either by the academic staff or by the panel members.

The benefits to board members were identified as being:

- A raised awareness of the industrial partner's activities amongst staff and the students in the School.
- To ensure that SEMS graduates have the essential skills that are required by them as future employers.
- To provide a suitable academic partner to help secure EPSRC / Innovate UK funding for research projects.
- Networking opportunities with other companies in the SEMS network.
- Access to a large student population to undertake a wide range of projects.
- Access to the extensive equipment and facilities that are available in the School.

3. JJCB presented a briefing on the recent past in QMUL & SEMS and our strategic plan for the next 5 years.

QMUL position:

- QMUL is a large institution 17,000+ students and over 4,000 staff
- 25% international students – 150 nationalities
- £300 million of infrastructure investment in past 5 years
- Queen Mary is a member of the Russell Group of top 24 universities in the UK
- The QS World Rankings (2014) placed Queen Mary:
- 98th in the world overall
- 25th most international university in the world
- 10th in UK for staff to student ratio
- Research Assessment Exercise (2014), ranked Queen Mary 9th in the UK.
- 6 Nobel Prize Winners

SEMS position:

- Formed by the merger of Engineering and Materials Departments in 2007.
- 2014 SEMS REF results were exceptional.
- General Engineering submission was ranked 7th out of 62 in UK and 4th on the basis of our research outputs.
- ~50 FTE academic staff (More than 18 new staff recruited since 2012)
- ~1300 students (1020 UG, 60 PGT, 220 PhD)

- ~60 Research Assistants
- Student Recruitment - Student targets (2014 entry): 300 undergraduate students (215 Home and 85 OS) which can 'easily' be achieved especially with Mech being particularly strong. Average UCAS total tariff at entry is 375pts (AAA = 360pts). 86% home entry from state schools. 90 PGT student target (30 Home and 60 OS), which is never hit. In 2014 we recruited 60 in total.
- Short term recruitment plans (2015-16): Re-launch of Medical Materials; aspiration to raise minimum entry requirements to AAB; recruit an additional 20 UG students each year; organise 50 school visits; increase our 'with industrial experience' student numbers; launch new MSc in 'Advanced Mechanical Engineering'
- Longer Term Recruitment Plans (2020) - Build a Joint Programme with a Chinese Partner. Teaching up to 800 students in China at steady state; build new partner links with Brazil, India and China for entry of students with advanced standing; introduce UG programmes in robotics and chemical engineering.
- Teaching Highlights in SEMS - 4 out of 6 Drapers' Teaching Fellowship awarded since 2013 were to SEMS staff; we host a National Teaching Fellow; the QMUL Teacher of the Year 2014 Award went to Henri Huijberts; year 1 progression rates in 2014 were 95%; award of good honours at around 70%; NSS satisfaction 2014 were 89% (Aero), 86% (Mechanical / Medical) and 95% (Materials). Aero ranked 5th nationally, 1st in London & 4th in Russell group; materials ranked 3rd nationally, 1st in London & 1st in Russell group; new Facilities for Launch in 2015-16 - £25 million being spent on refurbishment including our new dedicated undergraduate Teaching Hub.

4. An overview of the typical curriculum that our students will undertake in the specific disciplines. (This session was broken out into both a Materials and an Engineering Discussion). The focus of the discussion was the following 4 questions

**A. Are we preparing our graduates well for the workplace?**

None of the IAB members thought that they were well enough informed to answer this question yet.

**B. What things are we doing well?**

TK (Lucideon) - Much more opportunities to engage than previously imagined & the high calibre of the students.

RW (JLR) - QMUL's greatest asset is the student enthusiasm combined with the high standard of work being presented.

MD (Baxter) - I enjoy the ILF and reviewing the projects – I think that your format works very well.

PJ (Lucideon) - I greatly enjoyed my discussions with students during the poster session. I was impressed both with their enthusiasm but also their awareness of the bigger picture – how their project was addressing real environmental, healthcare challenges.

AW (Victrex) - The development of your 'industrial experience' courses is beneficial in terms of broadening the background of the students. From personal experience at Manchester, the students that spent the third year in industry were the ones that asked questions at the end of lectures and were eager to learn. This broadening of their background also significantly improved their employment prospects as they had a proven industrial track record.

LM (AHL) - The approach you are taking to strengthen industrial relations and help the employability of graduating students is a very good thing. Taking on a student here at AHL for a summer placement or even better, a year's placement would be something we are very interested in.

**C. What things are missing from our current programmes?**

TK (Lucideon) - Where is marketing and commerce in the curriculum? Can you provide a clear calendar of when things have to happen in order to facilitate interactions with industry?

MD (Baxter) – Do you give any introduction to the concept of good manufacturing practice, how in your projects do you teach equipment and process validation and where is design of experiments?

**D. What can we target to improve the student experience?**

TH (Ford) - More people from industry coming in to present to students. For example I have a presentation on the development of the 1.0 Ecoboost, which won “International Engine of The Year” for three years running (2012, 2013, 2014). The structural, dynamic and fluid systems design was all carried out here at Dagenham and the whole engine is basically an Essex product, with the combustion/calibration/controls/fuelling development work being carried out at Dunton. I'd be very happy to come in and do the presentation, either to a lecture group or a student body of some sort.

RW (JLR) - Additional skills around problem solving and project planning would improve the projects. Students need help to talk with clarity around the question they are trying to answer? Know why they had done the experiment and how that will help solve their problem and then they must learn to sit down and draw out a plan of action before they start?

PJ (Lucideon) - We have patented a process for making “sol-gel + drug” powders. These powders show controlled drug release. We would run a project whereby a group of students identify potential processing routes and, taking one route each, explore the viability through small-scale pilot trials. Also we have a range of soluble inorganic glasses for evaluation. These glasses are interesting in that they dissolve in water but can then be converted back to a solid glass by drying. We would like to add a chosen drug to these glasses when a solution and then use gentle heating to create a solid that is milled back to a powder. We would then need dissolution tests carried out to show drug release vs time.

AW (Victrex) - Try and increase the number of students going out into industry and to try and scatter them across the country.

5. Discussion about the types of collaboration that we can facilitate with engagement in our IAB.

JJCB outlined the following methods of collaboration that are available in SEMS.

- Individual BEng Project - Company suggests a project, we have more than 350 projects a year in Engineering / Materials / Design at QMUL. Typically all we need are consumable costs.
- Individual MSc / Group MEng Project - A company suggests and supports a masters level student project. Modest funding requirements. Typically this is ~£2,500 consumable pot.
- Industrially Sponsored Research - Part Funded PhD Programme - A company pays for a QMUL research student to undertake pioneering research. Collaborating with the university and using our facilities. Part funding from EPSRC/QMUL/CSC/Case Award. Partial costs are charged. ~£60,000 for 42-48 months.

- Industrially Sponsored Research - Fully Funded PhD Programme - A company pays for a QMUL research student to undertake pioneering research. Collaborating with the university and using our facilities. Full economic costs are charged. ~£110,000 for 42 months.
- Embedded Collaborative Researchers - A company pays for an employee to be embedded in our research environment. Collaborating within the university and using our facilities. A facilities fee is paid. ~£50k pa
- Industrially Sponsored Research - Research Assistant - A company pays for a QMUL staff member to undertake pioneering research. Collaborating within the university and using our facilities. Full economic costs are charged. ~£80,000 pa.
- In Curriculum Support Options include: Guest lectures, field trip hosting, prize sponsorship, careers fair participation, vacation work experience, annual placements.

#### 6. Identification of future chairs for each Board.

It was agreed that each of the four IABs should for the next ILF on the 29<sup>th</sup> October be led by an external chairperson. Sounding were to be made over the next month for suitable external chairs. The discipline specific industrial liaison lead would continue to act as the 'host' for the meeting to help organise any issues.

Meeting Finished: 11:15am

Minutes Recorded by Prof. James Busfield