

## **Report on Cranfield Visit**

1. Cranfield University, Milton Keynes, United Kingdom has a well-established reputation for undertaking applied research and teaching, focused on the needs of industry and government. Prof GL Sharma, Director SAMM visited Cranfield University from 16 - 27 Jan 2018 to explore the possibility of joint research, students' internships, advanced technical courses, joint projects and faculty exchange.
2. Cranfield University offers post graduate courses and Ph D and Post Doc courses only and has two main stream Engineering and Technology and Management.
3. Dr Suresh Samapath, Director would be single point of contact form the Cranfield University to see the effective implementation of the possible collaboration and provide the required impetus to further the effectiveness of the collaboration. It was also suggested that similarly, Dr GL Sharma would be the single point of contact from Manipal University for effective monitoring, however, faculty members can individually approach the specialist from their field and take it forward at the implementation level keeping both SPOC informed.
4. Extensive discussions were held with the various departments of the university enumerated below to understand the core areas of research of the university and their strength:-
  - a. ProVC's international affairs
  - b. Aerospace department and discussions – Propulsion, Aeronautics etc.
  - c. Transport department- Automotive engineering, Motor sport etc.
  - d. Manufacturing department - Additive manufacturing centre, through-life engineering services etc.
  - e. Energy department
  - f. Water department
  - g. Environment department
  - h. Management School
5. The university follows project based approach in teaching and encourage students to undertake industrial projects. The university itself has been assigned various projects in almost all the field of studies and the same projects are executed through students which facilitate the students to understand the Industry

environment and makes them completely industry ready by the time they complete their studies. Typically a PG programme involves 80 credits (800 hours) teaching (40 % ), 40 credits (400 hours) group projects (20%) and 80 credits ( 800 hours) individual thesis( 40%).

A Ph D programme is entirely on Industry based projects allocated to the university and minimum duration for the same is 3 years. A lot course are undertaken by the students in the first one year

6. Crane field University has strong programme in the following areas:-

- (a) Environment Analytics – Atmosphere Emission Technology, Geographical Information Management.
- (b) Environment Management – Environment Management for Business, Environment Consultancy
- (c) Environment Resources – Cleantech Entrepreneurship
- (d) Engineering, Energy and Power – Offshore Energy Engineering, Renewable Energy Marine Structures, Industrial Scale energy experimental facilities. The university also works in the area of (i) Bioenergy and resource management, (ii) Combustion, carbon capture and storage, (iii) Oil and gas exploration and production, (iv) Power Systems and (v) Renewable energy technologies. The university conducts Advanced PG and Certificate courses in the areas of (i) Advanced Chemical Engineering, (ii) Advanced Mechanical Engineering, (iii) Design of Rotating Machines, (iv) Energy Systems and Thermal processes (v) Energy Informatics (vi) Flow Assurance for Oil and Gas Production, (vii) Geothermal Engineering, (viii) Offshore Engineering, (ix) Process Systems Engineering and (x) Renewable Energy.
- (e) Environment and Agrifood – The university undertakes extensive work in Plant, soil and Water interaction. It has unique facilities Big data visualisation suite, National Reference Centre for Soils and World Soils Archive, Soil-Crop system and precision agriculture and Postharvest Laboratory. The university conducts courses in (i) Applied Bioinformatics, (ii) Food Chain Systems and (iii) Future Food Sustainability.
- (f) Aerospace – Cranfield University is top destination for Aerospace engineering and houses the Aerospace Technology Institute , the Rolls Royce University Technology Centre in Performance Engineering, and a recently

established £ 35 million Aerospace Integration Research Centre with co-investment partner Airbus and Rolls – Royce Plc.. The unique facilities include Cranfield Airport, National Wind tunnel facility, Aero-structures Assembly & Systems Installation Laboratory and national High temperature Surface Engineering Centre. In particular, they work in the areas of Aircraft design, Power and propulsion, Aerospace manufacturing and Through-life Engineering. The university has strategic partnership with companies such as Airbus, AVIC, BAE Systems, Boeing and Rolls-Royce.

(g) Engineering Design and thinking – The university has strong courses to meet the innovative design requirements in the areas of (i) Design, Strategy and Leadership, (ii) Digital Design and Strategic Communication, (iii) Innovation and Creativity in Industry, (iv) Technology Innovation and Management for a circular Economy.

(h) Transport Systems – Cranfield University specialises right across the sector: air, road, marine vehicles and Infrastructure, business and logistics as well as human aspects of operating, managing and using transport. The university is world leading provider of accident investigation and test motor sport cars and produce engineers for motor sport companies. It conducts internationally renowned course in Transport management and Airport planning and Management and its own aircraft and airport used for training. It has facility for testing intelligent and autonomous vehicle. The university is also working on the hybrid electric vehicle. The unique facilities available with university are Accident investigation Lab, Crash Impact Centre, Off-Road Dynamics Facility, National Flying Lab Centre

(i) Water management and Water Engineering – The University also conduct courses (i) Environmental Water Management, (ii) Water and Waste water Engineering and (iii) Water and sanitation for Development.

(j) Advanced Motor Sport Engineering – The University offers MSc by research in the areas (i) Advanced motor Sport Engineering, (ii) Automotive and Vehicle Engineering, (iii) Automotive Robotics and Vehicle Mechatronics and (iv) Motorsports Mechatronics.

(k) Cyber Security Course for defence

(l) Manufacturing

- (m) Material and Composites
- (n) MBA – Finance, Marketing, HR, International Business.

7. An MOU has concluded between Cranfield University and Manipal University Jaipur for the following:-

- a) Advanced technique training courses
- b) Internships
- c) Joint research projects
- d) Exchange of faculty members (academic visitors)
- e) Exchange of postgraduate students