

# Manufacturing Systems and Management Masters Programme

Admission Tutor:

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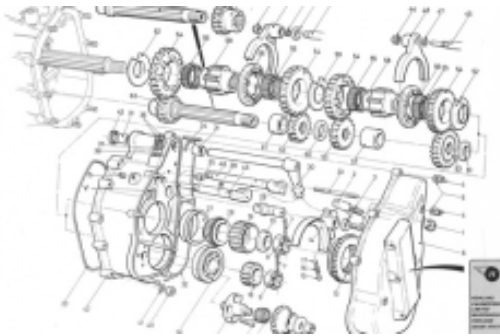


# MSM courses

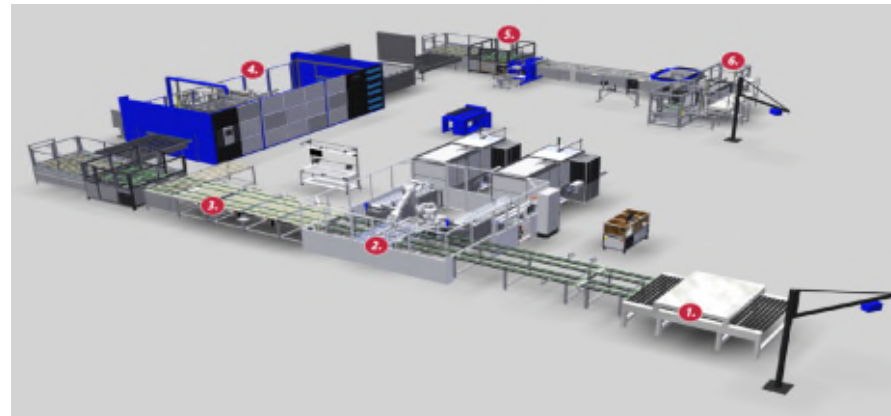
1. Engineering and Management of Manufacturing Systems (EMMS)
2. Manufacturing Consultancy (ManCon)
3. Aerospace Manufacturing (AeroMan)
4. Management & Information Systems (M&IS)
5. Knowledge Management for Innovation (KMI)
6. Global Product Development Management (GDPM)
7. Cost Engineering (PgCert)

# Complementary MSc's

## Engineering Design and Development



## Manufacturing Supply Chain



## Product Support and Service



**GPDM**

**EMMS, ManCon, AeroMan**

**M&IS, KMI, Cost**



**Enabling Infrastructure(IT, Organisation, People)**

# Cranfield Character

## “Learning close to practice”

- Build synergies between academia, industry and policy makers
- “Cranfield is actually the kind of institution that is a model of what I am proposing”
  - Richard Lambert’s review of Business-University Collaboration (2003)
- Industry-sponsored Group & Individual projects
- Industry-case studies during lectures

# Industrial Projects Sponsors



Rolls-Royce



TATA STEEL



PRICE

EPSRC Centre for Innovative Manufacturing  
Through-life Engineering Services



BOMBARDIER

bsi.



BAE SYSTEMS



# More partners



MOTOROLA



AIRBUS

LOCKHEED MARTIN

BENTLEY

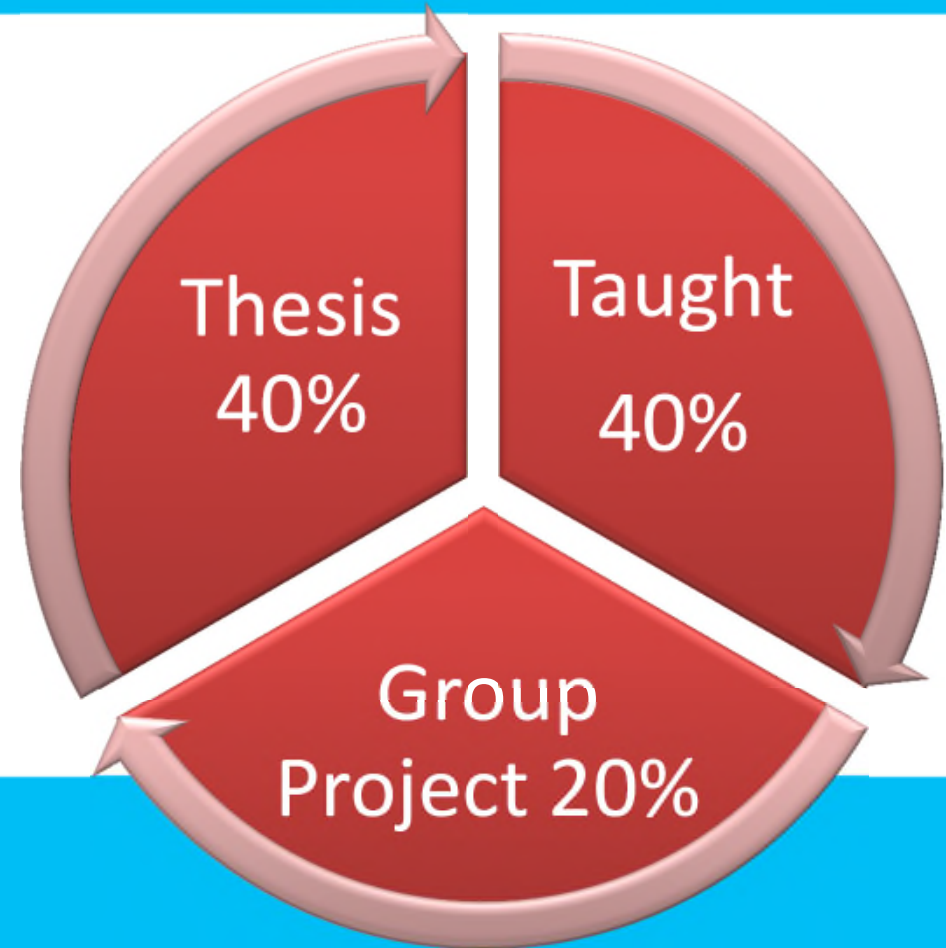
BROMPTON

# Personal Skill Development



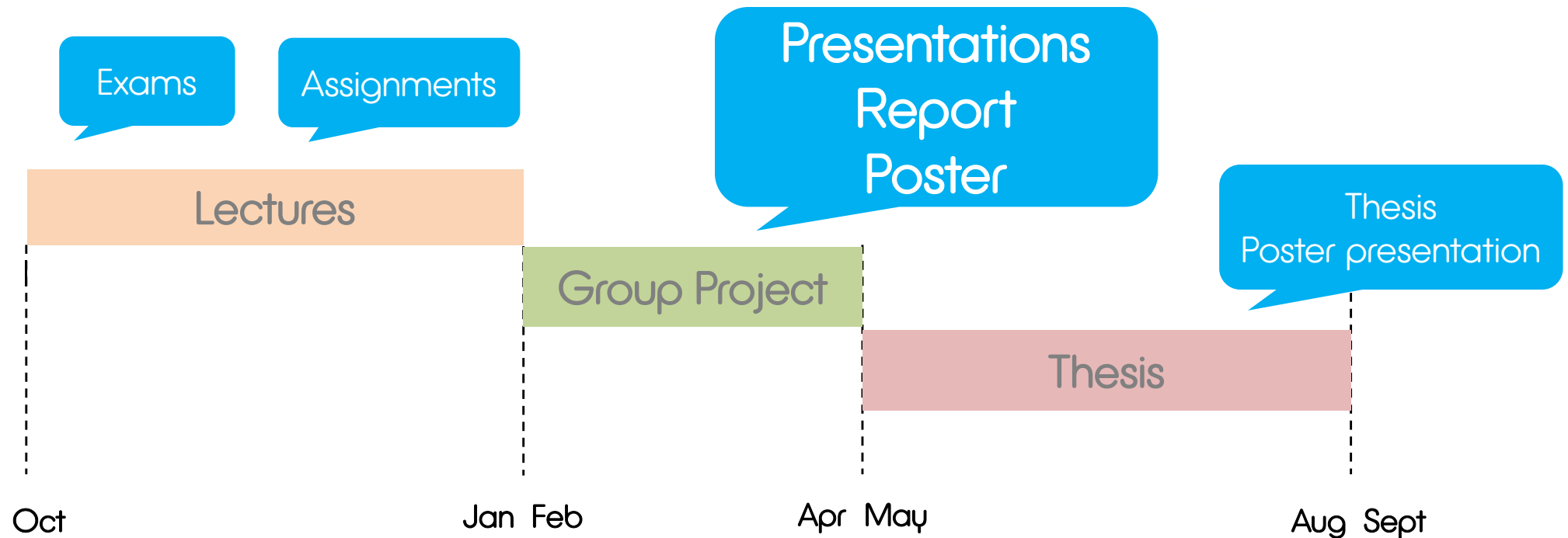
# Course Components

- Taught
  - Intensive 1-week modules
  - 8 assessed modules
- Group Project
- Individual Thesis





# Timeline

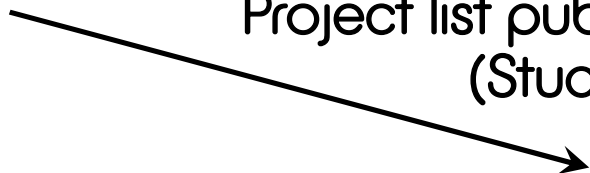


Staff source projects

Project list published

(Students express preference on some programmes)

Projects allocated



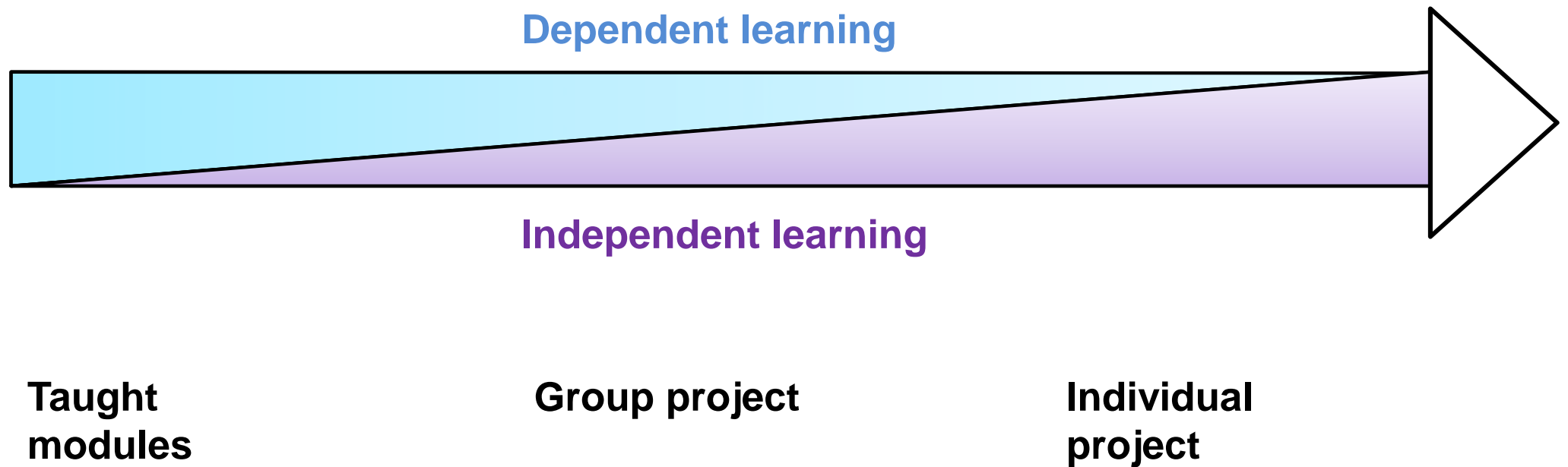
# Manufacturing Systems & Management Programme structure

Week	AEROMAN	EMMS	MANCON	GPDM	M&IS	KMI	
01	6-10 Oct	Induction					
02	13-17 Oct	Operations Management		Technology & Prototyping	Enterprise Systems		
03	20-24 Oct	Private study	Enterprise Systems		Operations Management		
04	27-31 Oct	Machining, Moulding and Metrology	Private Study				
05	3 – 7 Nov	Composites Manufacturing	Operations Analysis		Private Study	Business Process Analysis & Engineering	
06	10 – 14 Nov	Precision Engineering	Private Study		Managing Innovation & new product development	Private Study	
07	17 – 21Nov	Failure of Materials & Structures	General Management		Private Study	General Management	
08	24 – 28 Nov	Private Study		General Management	Private Study		
09	1 – 5 Dec	Manufacturing Systems Engineering		Design Driven Innovation Processes	Business Change Management	Design Driven Innovation Processes	
10	8 – 12 Dec	Private Study		Product Development	Private Study		
11	15 – 19 Dec	Advanced Welding Processes	Management of technology and innovation	Consultancy Skills	Private Study	Business Management	
12	22 – 26 Dec	Christmas					
13	– 4 Dec	Christmas					
14	5 – 9 Jan	Private study – Exams					
15	12 – 16 Jan	Supply Chain Management			Enterprise Modelling		
16	19 – 23 Jan	Manufacturing Strategy		Decision Engineering	Project and Programme Management	Strategic Knowledge Management	
17	26 – 30 Jan	Aircraft Assembly	Private Study – Exams				

# Group Project



# Developing independent learning skills



# Professional / transferable skills

- A significant opportunity for the development of skills relevant to career development
  - The project cycle
  - Leadership
  - Project planning
  - Project delivery / deploying human resources
  - Progress monitoring, iteration, problem-solving
  - Personal development, reflection, personal targets, peer-feedback and response to feedback from peers and supervisor
  - Client management
  - Reporting
    - Technical report writing
    - Oral presentation
    - Poster presentation
- Guidance in GP induction week
- On-going support needed from supervisors

# Group project

- Sponsored by companies
- Tight time-scale - 12 weeks
- Tackling real industrial problems
- Supervised by Cranfield academic(s) + sponsor
- 5 – 8 students per group
- Deliverables: work, report & presentations



# 2015 Group Projects

- Development of Consultancy Tools from Research which Help Organisations
- A demonstrator for cyber security in manufacturing
- Cyber security in manufacturing: A survey of current status and future needs
- Development of a virtual reality based demonstrator for Defence Manufacturing scenarios and business cases
- Developing a visual management tool to track the DPD Oldbury Superhub productivity levels in real-time
- Proactive problem solving for airbus ICT
- Augmented Reality technology for complex surgical procedures
- Managing the Knowledge Content and the Development of Scholarly Electronic Database
- Developing a production planning and control system

# 2015 Group Projects

- An analysis of UK Reshoring Capability
- Knowledge-Driven Process Model to Support the Establishment of Successful Entrepreneurship Businesses
- Development of WEE Material Separation Technology for the re-manufacture of consumer goods
- Transforming the landscape of consumer goods through big data and re-distributed manufacture
- Whirlpool pushing the boundaries of Materials design manufacture in pursuit of innovation
- Circular Economy Identification of future global business aftermarket supply chain opportunities
- Improve recycling processes in an industrial floor manufacturing company



# 2015 Group Projects

- Degradation study of heat exchangers
- Rotor dynamics, design criticality and effects of imbalance
- Developing ultrasound scanning as an alternative to CT scanning of thick-walled composites for energy saving in passenger vehicles
- Degradation Assessment of industrial composites using thermography and ultrasound
- Manufacturing Cu nanowires TCE with high transmittance for energy and display applications
- Maier UK – Feasibility study of Manufacturing wear resistant Sol-Gel Coatings with High Gloss
- Sandstorm simulation and sand particle collection for solar power applications

# 2015 Group Projects

- Development of automated ballistic counter system for through-life support of target rifles
- Design, development and build of a reel-to-reel micro-embossing system for production of emerging film products
- Watch-it-made – go mobile
- Design, development and testing of a space optics super finishing technology
- Optical Fibre Refractive Index Sensor
- Bearing temperature sensor for the variable frequency generator on the A380 platform
- Laminate Adhesion and Next Generation Electrical Generators
- SPI - comparison of different welding modes of a pulsed lasers
- Advanced Engineering solutions to address the removal of process related compound from vaccine manufacturing equipment
- Development of CSD Robot

**Cranfield**

**Design for Cost**  
New Support Facility  
Buckingham

**Background**  
The client required a new support facility to house the production of a new range of products. The facility was to be built on a greenfield site and had to be designed to meet the client's requirements for cost, quality and lead time.

**Approach**  
The client required a new support facility to house the production of a new range of products. The facility was to be built on a greenfield site and had to be designed to meet the client's requirements for cost, quality and lead time.

**Results**  
The project was completed on time and within budget. The new facility has enabled the client to meet its requirements for cost, quality and lead time.

**Cranfield**

**Manufacturing System Design**  
USIS, Special Products

**Background**  
The client required a new manufacturing system to produce a range of special products. The system was to be designed to meet the client's requirements for cost, quality and lead time.

**Approach**  
The client required a new manufacturing system to produce a range of special products. The system was to be designed to meet the client's requirements for cost, quality and lead time.

**Results**  
The project was completed on time and within budget. The new system has enabled the client to meet its requirements for cost, quality and lead time.

**Cranfield**

**Cost Benefit Analysis for**  
Introducing Virtual Testing in EU Legislation  
(APROSYS, CIC)

**Background**  
The client required a cost benefit analysis to determine the value of introducing virtual testing in EU legislation. The analysis was to be conducted using the APROSYS software.

**Approach**  
The client required a cost benefit analysis to determine the value of introducing virtual testing in EU legislation. The analysis was to be conducted using the APROSYS software.

**Results**  
The project was completed on time and within budget. The analysis has enabled the client to determine the value of introducing virtual testing in EU legislation.

**Cranfield**

**Development of Metrics for**  
Quality Assurance Capability  
Improvement within the Firms Contract

**Background**  
The client required a development of metrics for quality assurance capability improvement within the firm's contract. The metrics were to be developed using the firm's data.

**Approach**  
The client required a development of metrics for quality assurance capability improvement within the firm's contract. The metrics were to be developed using the firm's data.

**Results**  
The project was completed on time and within budget. The metrics have enabled the client to improve its quality assurance capability.

**Cranfield**

**Improving UK Manufacturers' Resilience (EEF)**

**Background**  
The client required a project to improve UK manufacturers' resilience. The project was to be conducted using the EEF methodology.

**Approach**  
The client required a project to improve UK manufacturers' resilience. The project was to be conducted using the EEF methodology.

**Results**  
The project was completed on time and within budget. The project has enabled the client to improve its resilience.

**Cranfield**

**Exploring Integrated Vehicle Health**  
Management practice across different sectors  
(Cranfield/Boeing (IHM Centre))

**Background**  
The client required a project to explore integrated vehicle health management practice across different sectors. The project was to be conducted using the IHM Centre methodology.

**Approach**  
The client required a project to explore integrated vehicle health management practice across different sectors. The project was to be conducted using the IHM Centre methodology.

**Results**  
The project was completed on time and within budget. The project has enabled the client to explore integrated vehicle health management practice across different sectors.

**Cranfield**

**Optimised Judge of Quality and**  
Performance Metrics in the Aerospace  
Engineering and Design Environment (Airbus UK)

**Background**  
The client required a project to optimise judge of quality and performance metrics in the aerospace engineering and design environment. The project was to be conducted using the Airbus UK methodology.

**Approach**  
The client required a project to optimise judge of quality and performance metrics in the aerospace engineering and design environment. The project was to be conducted using the Airbus UK methodology.

**Results**  
The project was completed on time and within budget. The project has enabled the client to optimise judge of quality and performance metrics in the aerospace engineering and design environment.

**Cranfield**

**Planning for High Ramp-up**  
Production of the A350 Lining  
(Airbus)

**Background**  
The client required a project to plan for high ramp-up production of the A350 lining. The project was to be conducted using the Airbus methodology.

**Approach**  
The client required a project to plan for high ramp-up production of the A350 lining. The project was to be conducted using the Airbus methodology.

**Results**  
The project was completed on time and within budget. The project has enabled the client to plan for high ramp-up production of the A350 lining.

**Cranfield**

**Benchmarking for**  
Manufacturing Cost

**Background**  
The client required a project to benchmark manufacturing cost. The project was to be conducted using the Cranfield methodology.

**Approach**  
The client required a project to benchmark manufacturing cost. The project was to be conducted using the Cranfield methodology.

**Results**  
The project was completed on time and within budget. The project has enabled the client to benchmark manufacturing cost.

**Cranfield**

**Improving engine assembly facilities**  
through simulation studies  
(Ford Motor Company)

**Background**  
The client required a project to improve engine assembly facilities through simulation studies. The project was to be conducted using the Ford Motor Company methodology.

**Approach**  
The client required a project to improve engine assembly facilities through simulation studies. The project was to be conducted using the Ford Motor Company methodology.

**Results**  
The project was completed on time and within budget. The project has enabled the client to improve engine assembly facilities through simulation studies.

**Cranfield**

**Competitive Landscape**  
of Components

**Background**  
The client required a project to explore the competitive landscape of components. The project was to be conducted using the Cranfield methodology.

**Approach**  
The client required a project to explore the competitive landscape of components. The project was to be conducted using the Cranfield methodology.

**Results**  
The project was completed on time and within budget. The project has enabled the client to explore the competitive landscape of components.

**Cranfield**

**Design Optimisation of a**  
Sip Ring for a Green Aircraft  
(MOOG Components Group)

**Background**  
The client required a project to design optimise a sip ring for a green aircraft. The project was to be conducted using the MOOG Components Group methodology.

**Approach**  
The client required a project to design optimise a sip ring for a green aircraft. The project was to be conducted using the MOOG Components Group methodology.

**Results**  
The project was completed on time and within budget. The project has enabled the client to design optimise a sip ring for a green aircraft.

**Cranfield**

**Improving Warehouse**  
Management Performance  
(DSE)

**Background**  
The client required a project to improve warehouse management performance. The project was to be conducted using the DSE methodology.

**Approach**  
The client required a project to improve warehouse management performance. The project was to be conducted using the DSE methodology.

**Results**  
The project was completed on time and within budget. The project has enabled the client to improve warehouse management performance.

**Cranfield**

**Design Optimisation of a**  
Sip Ring for a Green Aircraft  
(MOOG Components Group)

**Background**  
The client required a project to design optimise a sip ring for a green aircraft. The project was to be conducted using the MOOG Components Group methodology.

**Approach**  
The client required a project to design optimise a sip ring for a green aircraft. The project was to be conducted using the MOOG Components Group methodology.

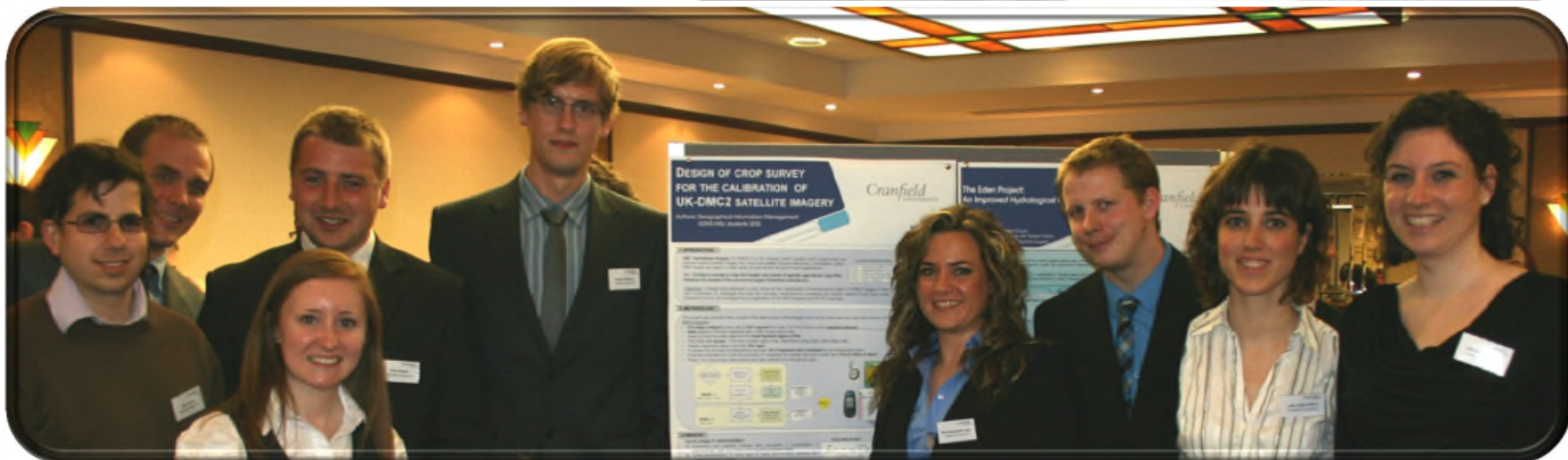
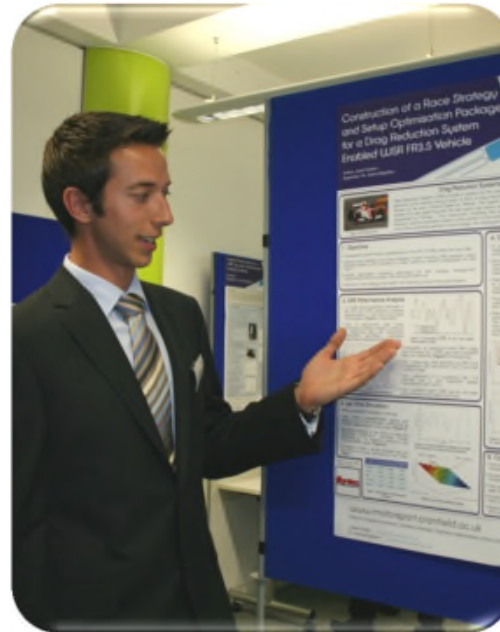
**Results**  
The project was completed on time and within budget. The project has enabled the client to design optimise a sip ring for a green aircraft.

# Group Projects Presentations

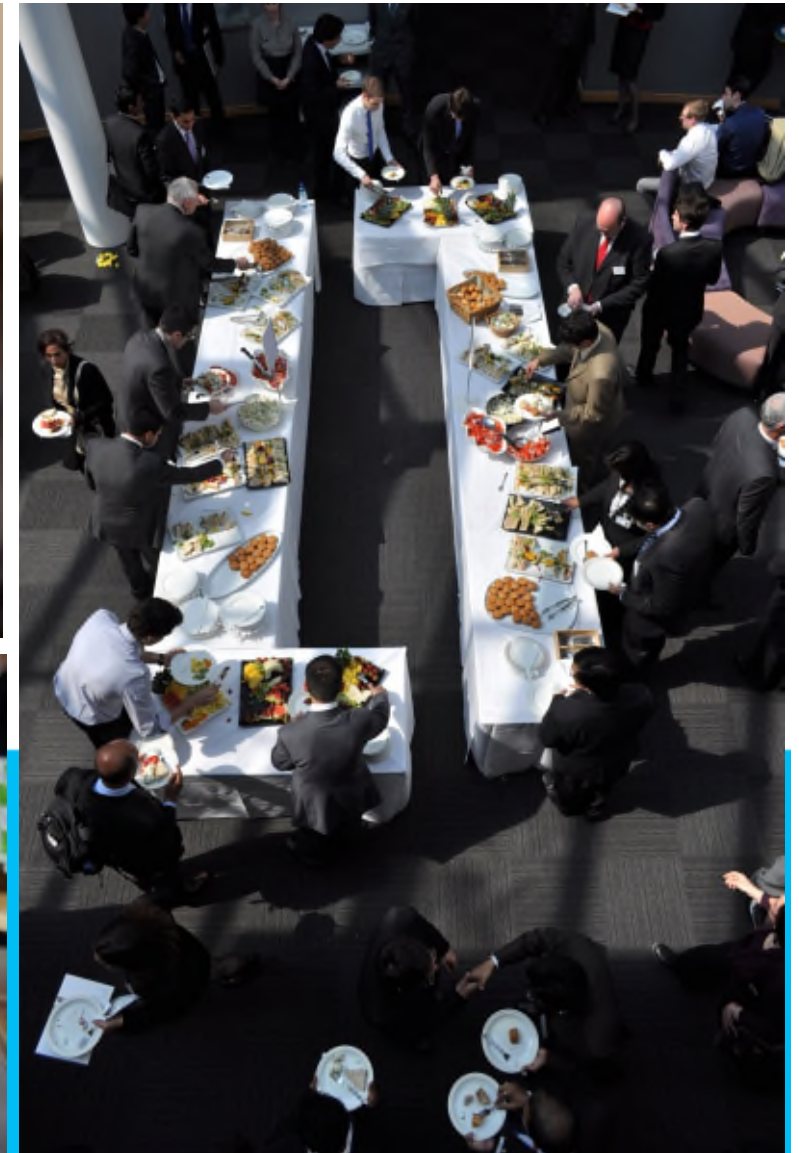


# Posters

An opportunity to discuss work during breaks



# Group Projects Networking



# Networking ...



# Interviews from Group Projects

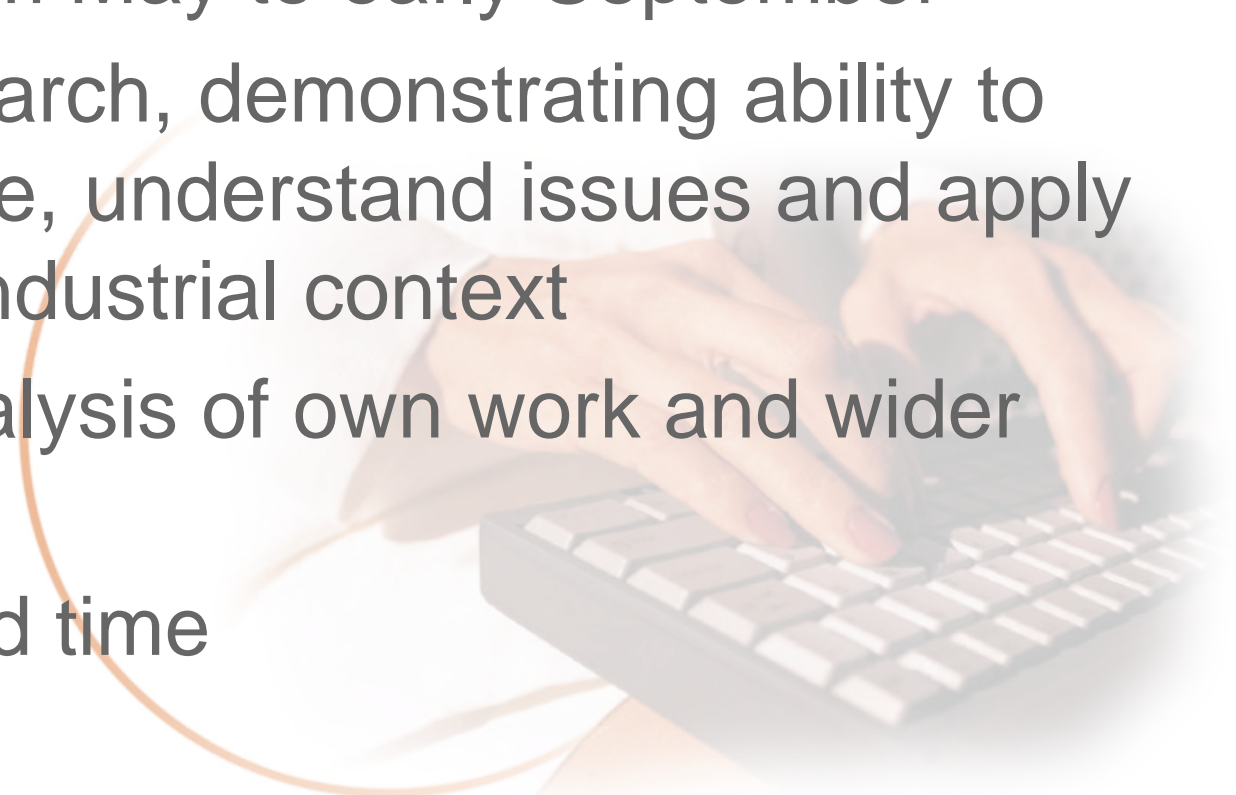
- [From Students](#)
- [From Customers](#)



# Thesis Project



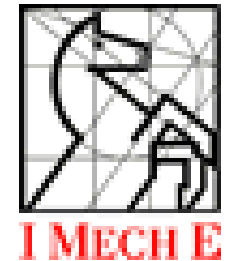
# Thesis Project

- Industry-focus or academic-focus
  - Full time work from May to early September
  - Independent research, demonstrating ability to acquire knowledge, understand issues and apply in a business or industrial context
  - Expect critical analysis of own work and wider literature
  - 40% of credits and time
- 

# Thesis allocation

- Students find own topic
- Students offered thesis topics (and companies)
  - Project descriptions
  - Sponsoring company
  - Modes of work (on or off campus?)
- Students express their preference by nominating ' $n$ ' out of ' $m$ ' projects available
- Selection/allocation are cross programmes
- Students allocated the project & supervisor(s)

# Professional accreditations



... for meeting the 'further learning requirements'  
for **Chartered Engineer** registration

Professional recognition...

Ensure employability...

Trusted professional relations...

# SAP University Alliance

- Use of SAP Hands on as part of Enterprise Systems module
- Opportunity to self study 'Integration of Business Processes' (TERP10), a full Certification from the SAP
- The course covers the fundamentals of the world's leading, modern management information system - SAP - investigating the integration of business processes such as sales, procurement, manufacturing, logistics, product development and financial control through to strategic conceptual tools such as Balanced Scorecard and Strategic Enterprise Management
- Much reduced from commercial price
- Additional hard work
- [www.erp4students.co.uk](http://www.erp4students.co.uk)

**SAP**  
**University**  
**Alliances**

# Entry Requirement

- BSc degree certificate (or equivalent)
- Transcript in English
- English Certificate
  - IELTS 6.5 (Writing 6.0)
  - English class available to improve English

Questions?