Project proposal template
Graduate School studentships
March 2015

Project title	Optical-Fibre Sensors for Structural Health Monitoring (SHM) of Composite Structures
First Supervisor	Professor — Jian Wang
Second Supervisor	Indika Wanninayake
School	Aerospace and Aircraft Engineering
Other member of supervisory team (no more than three KU supervisors in total)	
Specific requirements beyond 2:1 degree	A good first degree in Aeronautical/Mechanical Engineering

Project summary

(max 4,000 characters)

The use of composite materials in the past has been restricted to secondary non-critical structural components. However, with the increasing use of composite in aircraft design and manufacturing, the composite components now undergo transition from secondary structural components to primary critical load bearing structures- One of the major features of Boeing 787 Dreamliner design was its lightweight composite structure with 50% of the structure is made up of composite material. Airbus has boosted the usage of composite to 53% with the new A350WXB. For composite to be used with confidence in primary critical structures, methods of monitoring strains and excessive damage to the composite structure are essential.

The aim of this project is to develop an optical-fibre based sensor network to monitor state of in service structural health of composite structures. The sensor network will be an integral part of the structure and will serve as a nervous system for in service health monitoring. The project initially involves developing optical-fibre sensors for measuring temperature, pressure, and other physical and chemical properties. Then, these sensors will be integrated into the composite material without compromising the composite matrix structure. It is likely that the successful candidate will get involved in developing image processing algorithms to monitor and process output of sensor network.