



Students learn in real aircraft, like this fighter jet, in the NTU aerospace engineering program.

Aerospace Engineering Degree Program Soars

Nanyang Technological University (NTU) has successfully launched the first aerospace engineering degree program in Singapore.

Singapore is positioned to become a global aerospace hub and Singapore's Nanyang Technological University (NTU) recognized the need for engineers who are well-trained in the fundamentals of aerospace engineering. The vision for the new program is "to place the School of Mechanical and Aerospace Engineering in NTU in the forefront of aerospace engineering education, research and outreach programs in Asia and the Pacific region."

Dave Barkley, Engineering Manager at Electronics Incorporated and an engineering instructor at Purdue School of Technology, met with Dr. Shaker Meguid at NTU twice in the past two years. Dr. Meguid was the task force leader for the program. When Barkley toured the aerospace division in 2005, the project was little more than a few offices scattered across the campus. But even then, Dr. Meguid and NTU were formalizing plans for a revolutionary aerospace school. When Barkley visited the university this spring, the transformation was astonishing. The new Aerospace Engineering Division includes a Main Aircraft Laboratory which consists of a 14,000 sq. ft. aerospace laboratory on the ground floor, 18 smaller specialized aerospace engineering laboratories and a Hall of Fame/Aviation Gallery on the ground and mezzanine floors. The large aerospace laboratory houses a fighter jet, two helicopters and an Unmanned Aerial Vehicle (UAV) and, together

with the other specialized laboratories, contains the finest and most extensive inventory of actual aerospace components and training equipment available anywhere. Mr. Barkley's reaction was, "where can I sign up?"

Some of the exceptional features of the program include:

Hands-On Discovery Course

First year students are exposed to the wonders of flight and are given a historical background to mankind's involvement and fascination with aviation.

Clusters

These courses are structured to address the appropriate core competencies and integrated system view of aircraft design, manufacturing, assembly and Maintenance, Repair and Overhaul (MRO). The clusters cover:

- Aircraft Design and Manufacturing
- Aerodynamics, Propulsion and Performance
- Aircraft Maintenance and Reliability
- Aircraft Materials and Structures
- Avionic Systems Engineering

Industrial Participation

Industrial Mentorship provides students with the vital practical link to the aviation industry. Students spend one full semester in an aerospace company in their 3rd year.

Emphasis on Design

Problem-based learning and divergent thinking are very distinctive features of the program.

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We were fortunate to be able to interview Professor Khin Yong Lam, Chair of School of Mechanical and Aerospace Engineering, and he shared his insights on the NTU program.

Q: What were your biggest challenges in developing this program?

Prof. Lam: With keen worldwide competition for talent, one of our challenges is to attract and recruit the best faculty staff to develop our program and facilities. We are also working with our overseas partners and local industry on research programs as well as collaborating with renowned institutions worldwide for our student exchange/attachments.

Q: What were your biggest advantages in creating this program?

Prof. Lam: Ours is the first aerospace engineering degree program in Singapore and was developed in response to the strong demands for professionals in the fast expanding aerospace industry in Singapore.

Q: What has the reaction been from your first two years of students?

Prof. Lam: Students have been very excited about the multi-disciplinary program which provides them with specialized knowledge and skills in addition to their training on the fundamentals of mechanical engineering.

Q: Has the local aerospace industry been supportive of the program?

Prof. Lam: With its relevance to industry, the program has received overwhelming support and we will continue to work with the aerospace community.

Q: How is shot peening covered in the curriculum?

Prof. Lam: We cover the concept of shot peening in varying depth and details across a number of courses: AE2011 - Introduction to Aircraft Design & Manufacturing, AE2009 - Aerospace Materials and AE4011 - Aircraft Design.

Q: What makes this program different from any other?

Prof. Lam: Our program emphasizes creative, independent and entrepreneurial thinking with our methods of teaching and research. We inject realism into the program by using real aircraft and actual aerospace components among other aerospace training equipment. Our program ensures students develop core competencies in aerospace engineering as well as provides ample opportunities for staff and students to cultivate and nurture close ties with industries via our industrial mentorship scheme and industrial attachment program. Every aerospace engineering student has an industrial mentor and an academic mentor. The industrial mentor is changed each year as the student progresses into the senior years. Therefore in four years, a student would have access to four industrial mentors with varied expertise and would have gained different perspectives of the aerospace industry as well as good job opportunities upon graduation.

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The airframe section of the NTU Aerospace Engineering Division's Hall of Fame.

Q: How many students can attend the school?

Prof. Lam: The response to our aerospace engineering program has been very strong and our first intake of freshman numbers 85.

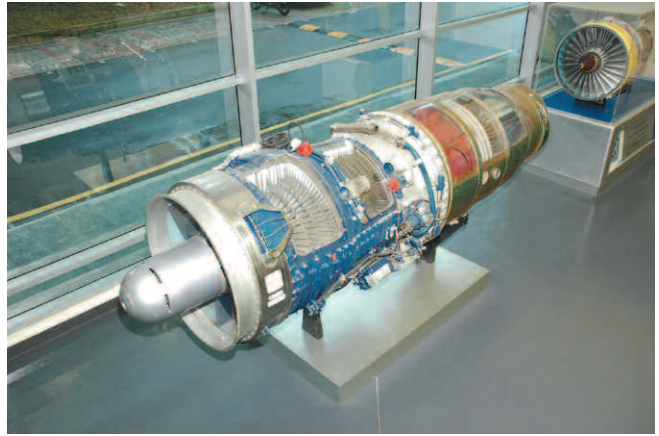
Q: Has enrollment been successful? Is the program popular and in demand?

Prof. Lam: Absolutely in high demand. We have many top high school students applying for our degree program.

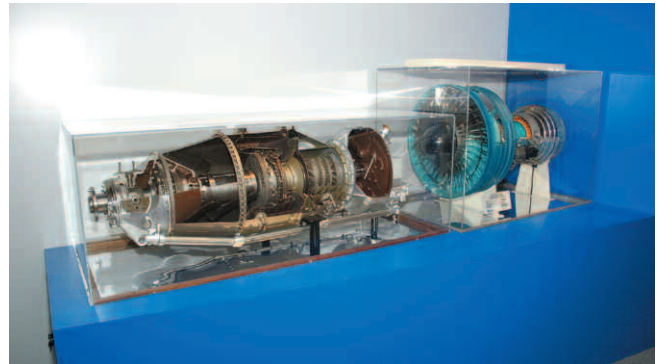
Q: What are your future plans?

Prof. Lam: Continuing our recruitment of faculty to enhance and provide varied core expertise in the aerospace engineering division. Further development of the laboratories to enhance their support of teaching and research. Increase collaborations with industry and research institutions/organizations local and worldwide. Increase student exchange programs with renowned overseas institutions. Development of graduate aerospace engineering degree program. ●

For more information on the NTU Aerospace Engineering Program, visit www.ntu.edu.sg/mae/admin/divisions/lae/ae.asp



A Rolls-Royce jet engine in the NTU Aviation Gallery.



Left exhibit: Cut-out scaled model of Pratt & Whitney PT6A engine. Right exhibit: Scaled model of Pratt & Whitney PW4000 Turbofan engine.



Helicopters, scaled models of commercial aircraft and an Unmanned Aerial Vehicle are housed in the Main Aircraft Laboratory. These aircraft give students an unparalleled edge to their learning experience.

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